FDR® UPSTREAM®

Unattended
Backup/Restore Software
for PCs and LANs
to MVS Mainframes

MVS

Installation and User's Guide V3.1.0

INNOVATION® DATA PROCESSING

INNOVATION DATA PROCESSING is pleased to present FDR/UPSTREAM-MVS User Manual.

PURPOSE OF THE GUIDE

The purpose of this guide is to provide you with the information to install, use and understand the MVS component of FDR/UPSTREAM.

WHAT IS FDR/ UPSTREAM?

FDR/UPSTREAM is an unattended PC/LAN to MVS Mainframe Backup and Recovery product.

LAN File Server Backups. FDR/UPSTREAM will backup and recover LAN File Servers and UNIX systems connected to the Mainframe (Novell® Netware®, Windows NT®, Banyan® VINES®, AIX/ 6000, HP/UX and Sun Solaris).

Workstation Backups. FDR/UPSTREAM supports backing up OS/2®, WINDOWS®, DOS, AIX/6000, HP/UX and Sun Solaris Workstations on a LAN or connected direct to the Mainframe. One Workstation can be used to backup an entire LAN network without requiring Host communications software on all the workstations.

Performance. FDR/UPSTREAM uses state-of-the-art APPC LU 6.2 and/or TCP/IP communications.

FDR/UPSTREAM Data Compression, File and Network handling techniques assure the fastest possible transfer to the mainframe.

FDR/UPSTREAM is a trademark of INNOVATION DATA PROCESSING and is registered with the US patent office.

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YEAR 2000 COMPLIANCE

Innovation Data Processing considers its products to be Year 2000 (Y2K) compliant if the product is capable of correctly processing dates within the 20th and 21st centuries, including proper processing of leap years, provided that the products are used on platforms (hardware, operating systems, and associated products from other vendors) that are also Year 2000 compliant.

As of V3.0.0, all known changes have been made to all components in FDR/UPSTREAM for Year 2000 compliance. Testing on a dedicated Y2K test MVS system has been done to insure that all areas of concern to Y2K work as expected. Any additional Y2K problems which are uncovered will be promptly fixed.

Dates that are used by FDR/UPSTREAM fall into three categories:

- Those which are part of system data areas such as the last modified dates, expiration dates, and creation dates, as well as the current date (run date). These dates are handled by Innovation's products in the same fashion as the operating system. In FDR/UPSTREAM-MVS, most of these dates are valid through the year 2155. Special dates, such as 99.365 or 99.366 for permanent retention, or 99.000 used for catalog control by some tape management systems, will be properly handled.
- Dates or durations (number of days) specified on control statements. Most date parameters have been updated to accept a 2-digit or 4-digit year; for 2-digit years any year number less than 70 is assumed to be in the 21st century (20xx). Parameters which specify a duration calculate a future date or a prior date and will properly handle Y2K and leap years. This also applies to expiration dates in workstation profiles.
- Cosmetic dates, such as those which appear in printed output. Most dates in heading lines and similar displays use 4-digit years. In some cases, these dates may still appear with two digit years. In USTRPORT, two digit years appear in reports, but a minus sign (-) preceding a date indicates it is in the previous century and a + indicates it is in the next century, relative to the run date.

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SUMMARY OF MODIFICATIONS FOR FDR/UPSTREAM-MVS V3.1.0

NOVELL NLM VERSION

FDR/UPSTREAM can now be run on your Novell server. This version has been NetWare certified for NetWare v5 and carries the Novell Yes/Approved logo.

NOVELL SMS SUPPORT

The NLM and Windows NT versions now support Novell Storage Management Services which means that UPSTREAM now gets all previously unsupported Novell features such as Macintosh names spaces, compressed data (without decompression), and more...

PHYSICAL RESTORE TO DIFFERING GEOMETRIES

FDR/UPSTREAM can now perform physical disk restores to volumes which have a different count of sectors, tracks or heads from the original volume in such a way that they can now be booted.

SQL-BACKTRACK IMPROVE-MENTS

SQL-BackTrack improvements. FDR/UPSTREAM backups using BMC's DataTools SQL-BackTrack software now allow complete database backups to be contained on a single tape set.

IMPROVED ULTRA PERFORM-ANCE

In many environments (Windows NT servers for example), it is often faster to use ULTra to access files on a LAN attached server than Microsoft Networking.

SAP R/3 BACKUP AGENT

FDR/UPSTREAM now supplies a SAP certified agent for backing up Oracle based SAP R/3 databases. Systems supported include Windows NT, AIX, Solaris and HPUX.

IBM DB/2 UNIVERSAL SERVER BACKUP AGENT

This full featured backup agent also includes a user exit and supports Windows NT, OS/2 and AIX systems.

ENHANCED PROPRIETARY REPOSITORY FORMAT

When the FDR/UPSTREAM proprietary format is used for one or more of the UPSTREAM repository files (Catalog, File-Info and/or File-Data) instead of native VSAM, V3.1.0 supports a new variable-length overflow format which will more efficiently manage space in those files. The variable overflow will reduce the space required for the File-Info data set. Previously the proprietary format was not recommended for the File-Data data set, but the variable overflow allows it to be used and is now recommended.

The new variable-length overflow format will be used for all new repository data sets created under V3.1.0 and above in enhanced format (ENHANCED FORMAT=YES on the ISPF define panel). To convert your existing repository data sets to the new variable overflow format, create new repository data sets and REPRO the old data set to the new one. The FDR/UPSTREAM ISPF dialogs can be used to do this (See Section 2.5). After the REPRO you can rename the data sets so that the new file has the same name as the old file.

If you are creating FDR/UPSTREAM repository files without using the ISPF interface, or want to customize the DEFINE generated by the dialogs, contact Innovation for assistance.

SUMMARY OF MODIFICATIONS FOR FDR/UPSTREAM V3.0

YEAR2000 COMPLIANCE

FDR/UPSTREAM V3.0.0 is Year2000 (Y2K) complaint. See the preceding pages for details.

USTBATCH CONTINUATION

USTBATCH now allows workstation override parameters to be continued onto additional records, to accommodate long file names.

DATABASE MANAGEMENT

A new section 9.2 has been added to this manual, describing the usage and maintenance requirements of the FDR/UPSTREAM-MVS database files.

1.1 OVERVIEW

OVERVIEW FDR/UPSTREAM is a PC/LAN-to-MVS-mainframe backup system. FDR/UPSTREAM will ensure your valuable PC data is stored where it is safest, on your MVS mainframe. FDR/UPSTREAM's flexibility and advanced features make it useful for software and data distribution as well.

With today's rapidly evolving technology and the increasing proliferation of business Local Area Networks, more company's “mission critical” data is residing physically remote from the mainframe computer center. This data is subject to loss in a myriad of ways. The traditional backup methodologies do not ensure true integrity, security, and reliability; that a full restore could be performed at any time. The mainframe computer center, with it's traditionally safe and secure data environment can now provide that same security to their population of workstations and LANs through FDR/UPSTREAM from Innovation Data Processing.

Enterprise computing is a new far-reaching technological phenomenon. Companies are taking a close look at their “total” computing resources. Those that find ways to get the “parts” that comprise this “total” to work together, will emerge with a dramatic, competitive edge.

Innovation Data Processing, with its FDR/UPSTREAM automated backup software, has taken the practical point of view for integrating open architecture and internetworking within a cooperative processing environment. Now PCs and network file servers can backup and restore their hard disks to a MVS mainframe. FDR/UPSTREAM makes disaster recovery for PCs and networks a reality today.

Innovation Data Processing, the makers of FDR, an MVS backup system with over 5000 customers, is committed to producing the best backup products in the PC/LAN environment.

1.2 FDR/UPSTREAM FEATURES

FDR/UPSTREAM is a state-of-the-art communications application. Its many features include:

SAA

FDR/UPSTREAM uses APPC (Advanced Program-to-Program Communications) to transmit data over SNA communication links. APPC, being peer-to-peer, provides higher speed and more flexibility over the old LU 2 screen-based approach used by many micro-to-mainframe vendors. And only APPC applications can take advantage of APPN (Advanced Peer-to-Peer Networking), IBM's networking architecture of the future.

FDR/UPSTREAM is CUA (Common User Access) compliant. This guarantees an interface that is standard across many types of applications, easing the burden of training and other “startup” issues.

TCP/IP

FDR/UPSTREAM also supports TCP/IP for PC-to-MVS communications. TCP/IP (Transmission Control Protocol/Internet Protocol) is being implemented in many installations as a simpler way of establishing internal communication links, and also to communicate with external networks such as the Internet.

UNATTENDED OPERATION

Through the use of an integrated scheduler or your own mainframe job scheduler, you can configure FDR/UPSTREAM to run at any combination of times. Backups and restores can be timed to run daily, weekly, monthly, or in virtually unlimited numbers of combinations. If you leave your machine running, FDR/UPSTREAM will run, saving the current application, and restoring it as if nothing had happened.

FAST

FDR/UPSTREAM uses APPC and/or TCP/IP, and due to its unique, efficient architecture, FDR/UPSTREAM is the fastest micro-to-mainframe communications facility available today. High speed compression assures fast transfers even on slow links.

FDR/UPSTREAM on MVS is an application written entirely in assembler language, which interfaces to VTAM and TCP/IP natively. This provides the fastest possible transfers as well as MVS CPU efficiency.

MERGE BACKUPS

The MERGE BACKUP facility, introduced in FDR/UPSTREAM-MVS V2.3.2, drastically reduces the elapsed time of full backups, by utilizing already existing mainframe backups of files which have not changed, instead of transmitting them from the PC. Using a sophisticated technique, FDR/UPSTREAM can construct a complete full backup without the PC having to read or send most of the files, resulting in extraordinary performance for full backups.

MERGE BACKUPs include duplicate file support. When many files are duplicated on many workstations, such as the files associated with operating systems, word processors, and other software packages, you can improve the efficiency of the backups by transmitting those files to the FDR/UPSTREAM-MVS host from one workstation only once, yet they can be included in the backup image on the host for each of those workstations, automatically.

EFFICIENT

FDR/UPSTREAM can store your PC data on the mainframe in compressed format. This conserves mainframe disk space. Using the *Non-keyed* Backup or *Sequential tape* Backup options will allow you to retain your PC data on MVS tape, also conserving valuable DASD space. Additionally, the use of 31-bit reentrant assembler language code ensures fast, efficient internal resource utilization.

SECURE

UPSTREAM interfaces to the most common mainframe security systems including RACF, ACF2, and TOP SECRET (i.e. any security system which supports the MVS SAF Router interface). This level of security is unavailable with any pure PC backup system.

SAFE

With FDR/UPSTREAM your mission critical data is saved on the most safe and secure repository in your company, your MVS mainframe.

1.2 CONTINUED

DATA SHARING AND SOFTWARE DISTRIBUTION

When your data is stored in a location common to all users, other users can easily retrieve it (subject to security constraints). Since FDR/UPSTREAM is so fast and easy to use, many of your data sharing and distribution requirements are easily solved. FDR/UPSTREAM's fast, secure and unattended nature makes it ideal for software distribution. Since restores can be automated, PC users can backup their critical applications nightly, and at the same time retrieve new software and data updates.

RESTART/ RECOVERY

FDR/UPSTREAM can restart a failed backup that was terminated due to communications line failure, host unavailability, or just about anything else, at the point it failed. FDR/UPSTREAM can also remember files that were unavailable due to LAN data sharing issues, and retry those files as well.

EASY TO USE

Because FDR/UPSTREAM is transparent in normal operation, there is nothing for a workstation user to maintain on a day-to-day basis. A system administrator can set up an FDR/UPSTREAM backup system in a matter of minutes. The CUA screens are familiar and simple to use, allowing you to select the Backup or Restore IDs and files quickly and easily.

INTELLIGENT

FDR/UPSTREAM always remembers where your data is stored. If you archive your data to tape, FDR/UPSTREAM will remember on which tape it is stored, completely eliminating another User record keeping headache. FDR/UPSTREAM can *automatically* restore your files back to a specific date, intelligently combining restores from full and incremental backups.

INCREMENTAL BACKUPS

FDR/UPSTREAM checks the PC archive bit before sending files from the PC to MVS, allowing you to send only changed files to the mainframe. FDR/UPSTREAM allows you to reset archive bits which provides even greater flexibility.

BACKUP MIGRATION

Backup directly to DASD is inherently more efficient, since tape mounting and positioning is avoided. But tape is a less expensive medium. FDR/UPSTREAM gives you the benefits of both, by allowing the workstation to do backups directly to DASD, but moving those backups to tape as a background operation. This “migration” also makes more efficient use of tape by placing many backups on the same tape volumes.

VAULTING

Disaster/Recovery is an important issue at most installations, and FDR/UPSTREAM has features which directly address this need. You can create secondary “vault” copies of all your sequential backups (or any subset you need). These vault copies can be placed in offsite storage. When a disaster strikes, a simple process makes the vault backup the “primary” backups for restores. Vault backups can also be used for long-term “offline” storage.

REPORTING

FDR/UPSTREAM logs Backups, Restores, communications failures, failed files, statistics, and every other significant event on BOTH sides of the operation. This ensures that both the PC User and the mainframe Administrator can monitor, control, and verify every aspect of Backups and Restores.

FDR/UPSTREAM also generates a summary log with one line of information for every UPSTREAM operation performed, to provide instant reporting. The FDR/UPSTREAM history feature keeps on-line records of UPSTREAM operations; these records can be queried by a batch reporting program.

FLEXIBLE

Because FDR/UPSTREAM supports SNA/APPC and TCP/IP communications using workstation communications products from a variety of vendors, you can use FDR/UPSTREAM in just about any communications environment. In addition, with the choice of among four different backup types (*Keyed*, *Non-keyed*, *Sequential disk*, *Sequential tape* plus MERGE BACKUPS), you can easily tailor FDR/UPSTREAM to your environment and needs.

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1.2 CONTINUED

TRUE ARCHIVING

UPSTREAM can be used for true archiving because your data is stored on your company MVS mainframe. As free disk space on PCs and LAN servers becomes critically low, you can use FDR/UPSTREAM to backup up those files which are rarely used and then automatically delete those files which have been successfully backed up.

For servers using Novell, OS/2 with HPFS or Banyan Vines in HPFS mode, FDR/UPSTREAM can automatically detect those files on your server which have not been accessed for a given amount of time and automatically include them in a backup. Combining this process with the deletion process, you have true Grooming. MERGE BACKUPS can include these files with regular backups.

CENTRAL CONTROL

With FDR/UPSTREAM storing PC data on your MVS mainframe, all the advantages of central storage including security, data sharing, and disaster recovery are realized while continuing to enjoy the performance, ease of use, and other benefits of decentralized computing. Using *sequential tape* or *sequential disk* backups, the data retention methodologies used to secure your PC or LAN server will readily integrate into your current mainframe backup and archiving schemes.

Backups or restores can be initiated by MVS batch jobs or a central PC, allowing you to control your environment without user intervention.

FILE TRANSFER

FDR/UPSTREAM may be used to transfer workstation files to or from the MVS host system. No additional software or communication connection is required, and the transfer uses all the speed of UPSTREAM's APPC or TCP/IP communication. Text files may be optionally translated between ASCII on the workstation and EBCDIC on the host. The transfers may be requested at the workstation, or initiated automatically using USTBATCH.

FILE MIGRATION

File migration is the process of backing up, and then deleting from the workstation, files which no longer need to be online (perhaps because they have not been used in a considerable period of time). Files may be migrated as part of normal backups, or may be processed separately. On some workstation platforms, automatic recall (auto-recall) of migrated files is supported.

RAW BACKUPS

The normal FDR/UPSTREAM backups are file-by-file, but the option is now offered to do “raw” backups. A raw backup is a byte-by-byte backup of a physical harddisk on a server or workstation. All data blocks on the disk are backed up, regardless of whether they are in use or not.

FDRSOS INTEGRATION

FDRSOS is a separately priced product from Innovation. It works in conjunction with EMC Symmetrix DASD subsystems to provide hi-speed MVS backups of data on Open System volumes in the Symmetrix, without transmitting the data over the network. FDRSOS backups are executed independent from FDR/UPSTREAM, but FDR/UPSTREAM can record those backups in its repository data base, so they can be queried and restored. Normal FDRSOS restores are done separate from FDR/UPSTREAM, but they can also be done over the network just like a raw restore, in cases such as disaster/recovery where MVS access to the Symmetrix may not be available.

FDR/UPSTREAM now supports "FDRSOS Local Backup Volumes" in the EMC Symmetrix to dramatically improve backup performance. FDRSOS Local Backup Volumes are Symmetrix Open System volumes specially formatted for use by FDR/UPSTREAM. When the backup is directed to such a local backup, it is written to that volume and is not sent over the network, so it runs much faster. When the backup is complete, FDR/UPSTREAM-MVS reads the local backup file directly and writes a copy to MVS tape or disk. FDRSOS Local Backups require that you be licensed for FDR/UPSTREAM/SOS, a version of FDR/UPSTREAM which supports them, as well as FDRSOS, Innovationsí product for backup of Symmetrix Open System volumes (FDRSOS is used to initialize the volumes).

1.3 WHAT IS FDR/UPSTREAM-MVS

FDR/ UPSTREAM-MVS COMPONENTS

FDR/UPSTREAM-MVS is an application program written entirely in assembler language for speed and efficiency. It consists of these components:

- the FDR/UPSTREAM-MVS Configurator (USTCONFG)
- the FDR/UPSTREAM-MVS on-line process (USTMAIN)
- the FDR/UPSTREAM-MVS “batch initiator” utility (USTBATCH)
- the FDR/UPSTREAM-MVS “Regen” utility (USTREGEN)
- the FDR/UPSTREAM-MVS “Maint” utility (USTMAINT)
- the FDR/UPSTREAM-MVS “Reorg” utility (USTREORG)
- the FDR/UPSTREAM-MVS “Migrate” utility (USTMIGRT)
- the FDR/UPSTREAM-MVS “Vault” utility (USTVAULT)
- the FDR/UPSTREAM-MVS Archive process (USTARCH)
- the FDR/UPSTREAM-MVS deferred MERGE utility (USTMERGE)
- the FDR/UPSTREAM-MVS “file definition” utility (USTCAMS)
- the FDR/UPSTREAM-MVS reporting utility (USTRPORT)
- the FDR/UPSTREAM-MVS backup file report utility (USTBKPRT)
- the FDR/UPSTREAM-MVS duplicate file audit utility (USTDUPRT)
- the FDR/UPSTREAM-MVS scheduler program (USTSCHED)
- the FDR/UPSTREAM-MVS ISPF application

CONFIGU-RATOR (USTCONFG)

The FDR/UPSTREAM-MVS Configurator, USTCONFG, maintains a configuration file that is loaded by the FDR/UPSTREAM-MVS on-line component to control its functions. It is described in more detail in Section 3 “Configuration”. This configuration specifies:

- global attributes, such as the VTAM APPLID and the TCP/IP port number to be used by FDR/UPSTREAM, and the level of security checking to be used for verifying workstation requests.
- Backup attributes to be used by workstations attached to FDR/UPSTREAM, stored under various “Workstation Profiles”.

USTCONFG reads control statements specifying new or changed parameters and profiles and generates a new configuration file. It can optionally read an existing configuration file and update it, creating a new file or overwriting the old. Every workstation (PC or server) attached to FDR/UPSTREAM will be assigned one (or sometimes more than one) Profile name to be used for its backup and restore operations.

Every workstation needs at least one profile, but may be assigned more than one profile to be used for different functions (such as backing up different disks or directories). Profile names should not be shared by workstations for backups; multiple workstations may share a profile for restore-only, in order to “distribute” software or data to multiple locations.

The configuration may contain a profile defined with a prefix instead of a fully-specified profile name. Any profile name entered at a workstation that begins with the prefix name will automatically use the attributes of this profile, allowing you to add multiple workstations to the configuration with one entry.

The profile defines which of the various backup types supported by FDR/UPSTREAM (See Section 1.4) that this workstation will be allowed to use, and other parameters associated with those backups (such as the dataset names and allocation parameters to be used with “sequential” backups, and dataset retention). For “*keyed*” and “*non-keyed*” backups, the number of backup versions to be retained is specified, allowing automatic deletion of obsolete versions. USTCONFG produces a log file listing all the input source statements you specified, as well as any errors it may have encountered. It also reports the number of workstations defined and the time and date the configuration was generated. You may also request that USTCONFG print the entire configuration, either in a report format or in a format that reproduces the control statements necessary to recreate the configuration.

The configuration can also be updated from a workstation using a FDR/UPSTREAM dialog, or by a TSO user via an ISPF dialog, subject to security restrictions.

1.3 CONTINUED

ON-LINE TASK (USTMAIN)

The on-line started task (USTMAIN) is the major functional component of FDR/UPSTREAM-MVS. It contains the APPC and TCP/IP interface routines to communicate with the workstations to perform Backups, Restores, and Inquiries. The subtask modules are reentrant and use 31-bit addressing and storage whenever possible for the majority of program and work areas.

The primary functions of USTMAIN and it's subtasks include:

- APPC and TCP/IP communications handling
- system console communications
- security authorization
- backups and restores directly to and from MVS tape (*sequential tape* processing)
- backups and restores directly to and from MVS sequential DASD (*sequential disk* processing)
- on-line (*keyed*) and archive (*non-keyed*) backup and restore processing
- version and file inquiry processing
- oldest version “rolloff”
- error handling and restart functions
- on-line utility execution
- event and status logging

The started task accepts commands from the system console (the STOP (P) command and the MODIFY (F) command) to control it's operation such as displaying the current activity, turning the diagnostic trace facilities on or off, running various utility functions, and stopping FDR/UPSTREAM-MVS.

BATCH INITIATOR UTILITY (USTBATCH)

Backups and restores may be initiated via a batch job submitted on the mainframe or from another workstation in the network. The USTBATCH utility runs as a submitted batch job on the mainframe to initiate a backup or restore for one or more workstations or servers. This utility job may be set up and submitted through your existing mainframe operations scheduling system. Details are found in Section 8.

USTBATCH parameters specify the workstation(s) for which the operation is to be initiated. The workstation can be identified by VTAM LU name, TCP/IP network address or FDR/UPSTREAM registered name (where the workstation defines its own unique name, independent of the network location). The operation to be performed can be specified on one of 3 ways:

- a FDR/UPSTREAM parameter file may be predefined at the workstation, by FDR/UPSTREAM-PC, which completely defines the operation; the parameter file name is specified as a USTBATCH parameter.
- USTBATCH parameters can be specified which modify or override the FDR/UPSTREAM parameter file on the workstation.
- the operation can be defined entirely via USTBATCH parameters, without using a workstation parameter file at all.

The USTBATCH interface also allows you to execute a "job" (any arbitrary program, batch file or script) at the target workstation. This might be used to perform required functions in preparation for backups, such as closing data bases.

The FDR/UPSTREAM ISPF dialog (See Section 6) includes facilities for generating, saving, and executing USTBATCH jobstreams using panels similar to those used by FDR/UPSTREAM-PC on the workstation.

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1.3 CONTINUED

MIGRATION UTILITY (USTMIGRT)

USTMIGRT is a utility program that will "migrate" recently created *sequential disk* backups to tape. It can be invoked only as a subtask of USTMAIN, in response to a console command (See Section 5.7) or an ISPF panel (See Section 6).

If you use USTMIGRT, you can allow workstations to do backups to disk instead of tape; this improves their efficiency since more such backups can operate simultaneously and have no tape mount requirements. Periodically you collect those backups with USTMIGRT and move them to tape, freeing up disk space. This may be especially useful if you want to do daily incremental backups to disk but do not have enough available disk space to hold the entire set of incrementals between full backups (note that the COPYINCR option of MERGE backups will also move incrementals from disk to tape, but not until the FULL MERGE backup is taken). USTMIGRT can move many backups, for many workstations, to the same tape, reducing the number of tape volumes compared to direct backups to tape.

You have full control over which profiles will be processed by USTMIGRT, and can also control when migration will occur for specific profiles. See Section 7.7 for details.

Note: Migration is recommended over *keyed* (on-line) backups for most purposes. It is more efficient and flexible.

VAULTING UTILITY (USTVAULT)

USTVAULT is a utility program which will create secondary copies of *sequential disk* or *sequential tape* backups for selected workstation profiles. These secondary copies are always on tape, which allows them to be easily sent to offsite storage for **disaster recovery**. USTVAULT can be invoked only as a subtask of USTMAIN, in response to a console command (See Section 5.7) or an ISPF panel (See Section 6).

USTVAULT will scan for sequential backups that have not already been processed for vaulting, and will create a secondary copy on tape. Workstation profiles which are enabled for vaulting must specify DASDPREF= or TAPEPREF= dsnames which include a question mark (?) somewhere in the name. The original sequential backup dataset will have a "1" substituted for the question mark, indicating the primary copy (copy 1). The secondary copies created by USTVAULT will have another copy number (from 2 to 9) in that position.

The FDR/UPSTREAM control records will normally point to the copy 1 backup data set, so that all restore requests will use the primary copy. When the secondary copy is created by USTVAULT, it also creates a copy of the control records updated to point to the secondary copy; these updated records are placed in a special "control file" which is added to the end of the vault tape. If a disaster occurs and you need to use the vault copies (e.g., at a disaster recovery site), the USTREGEN utility (See Section 7.6) is used to quickly update the FDR/UPSTREAM records so that all restores will use the secondary copy.

You have full control over which profiles will be processed by USTVAULT, and can also control when vaulting will occur for specific profiles. See Section 7.8 for details.

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1.3 CONTINUED

ARCHIVE FACILITY (USTARCH)

The FDR/UPSTREAM-MVS archive utility, USTARCH, processes *non-keyed* (Archive) backups (see Section 1.4). Run at your discretion, USTARCH scans for *non-keyed* backup versions temporarily stored in the on-line repository. The file data associated with each of those versions is then written to new archive tape volumes.

USTARCH runs in MERGE or NOMERGE modes (not related to MERGE BACKUPS).

- In MERGE mode, the prior archive tape volumes are read and any archived file versions not flagged for deletion as a result of “rolloff” processing will be copied to the new archive tape. After a successful run of the USTARCH utility, the old archive tape volumes may be returned to the “scratch pool” for reuse. This methodology eliminates the need to keep track of multiple archive tape volume sets, and lends itself to the use of Generation Data Group (GDG) allocation for the archive dataset. You may wish to define a GDG with a limit of one generation to catalog the new archive dataset and automatically return the old one to the “scratch pool”.
- In NOMERGE mode, the prior archive tape volumes are NOT read; each execution of USTARCH produces a new archive tape containing only the files being moved from the on-line repository in this run. You will need to retain all of the archive tapes created until you are sure that no files on them are still required.

The USTARCH utility should be run periodically, depending on the quantity of *non-keyed* backup data you anticipate having to store. How often you run it is entirely up to you. USTARCH can be executed as a separate job, at a time when the FDR/UPSTREAM on-line task is not active. It can also be executed dynamically in NOMERGE mode as a subtask of the on-line task, in response to a console command (see Section 5.7) or an ISPF panel (see Section 6). If you do not allow any Workstation Profile to do *non-keyed* backups, USTARCH need not be run at all. USTARCH is described in detail in Section 7.5.

DEFERRED MERGE UTILITY (USTMERGE)

During FULL MERGE BACKUPs, as described in Section 1.4, part of the backup process normally reads previous backups of workstation files which have not changed and copies them to the new full backup. If those previous backups are on tape, a tape drive must be available on which to mount those backups; another tape drive will be required for the new backup, if on tape. If many FULL MERGE BACKUPs are being run concurrently, or run along with other jobs requiring tapes, backups may be delayed waiting for tape drives.

However, if a profile has the MERGE=DEFER option set, the MERGE BACKUP will not read the previous tape backups at that time, reducing the tape requirement and shortening the time that the workstation is involved. The USTMERGE utility will identify profiles which have an uncompleted, deferred MERGE BACKUP and will complete them by copying the required files from those previous backups to the new backup; this can be done at a time when more tape drives are available. USTMERGE can be invoked only as a subtask of USTMAIN, in response to a console command (See Section 5.7) or an ISPF panel (See Section 6).

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1.3 CONTINUED

REGEN UTILITY (USTREGEN)

The "regen" utility, USTREGEN, is used to update the FDR/UPSTREAM on-line repository control information with information from a backup file. This might be done if:

- you have created a second copy of a FDR/UPSTREAM backup, by copying a backup file with an MVS utility, or by using the NODELETE mode of USTARCH, the repository records will not point to that copy. If the original copy becomes unusable or unavailable, USTREGEN will make the second copy the active copy.
- you have created a second copy of a FDR/UPSTREAM backup using USTVAULT. The vault tape contains a "control file" with copies of repository records pointing to the vault copy. USTREGEN can read that control file and update the repository with the modified records, making the vault copy the active copy.
- you have a backup file whose records have been deleted from the on-line repository (by Profile Management or USTMAINT), you can insert the control records back into the repository and make the backup file usable again.

USTREGEN reads any type of FDR/UPSTREAM sequential backup file, including:

- archive tape backup files
- *sequential tape* backup files
- *sequential disk* backup files
- vault tape control file
- FDRSOS sequential tape or disk backups

These backup files must be cataloged in the appropriate MVS catalog at the time USTREGEN is run; if necessary, recatalog them before running REGEN. USTREGEN will read all the control and descriptive information about the workstation files on the backup, and will update the FDR/UPSTREAM records to point to those backups.

USTREGEN is also used to read the control file produced by USTVAULT and update the FDR/UPSTREAM records so that restores will be done from the secondary (vault) copy of the backups.

USTREGEN can be executed as a separate job, at a time when the FDR/UPSTREAM on-line task is not active (See Section 7.6). It can also be executed dynamically as a subtask of the on-line task, via a console command (See Section 5.7) or an ISPF panel (see Section 6).

REORGANIZATION UTILITY (USTREORG)

USTREORG is a utility program that can be invoked only as a subtask of USTMAIN, in response to a console command (See Section 5.7) or an ISPF panel (See Section 6). It will dynamically reorganize the data sets which make up the FDR/UPSTREAM on-line repository, without having to shut UPSTREAM down during the reorganization. However, FDR/UPSTREAM-MVS must be idle (no backups, restored, inquiries, or other utility functions running) when this is done. You can request that the reorganization of a given data set be done only when the free space in that data set falls below a specified threshold.

MAINTENANCE UTILITY (USTMAINT)

The FDR/UPSTREAM-MVS sequential backup maintenance utility, USTMAINT, is used to remove entries for *sequential tape* and *sequential disk* backups from the on-line repository control files. When your DASD and tape management systems delete these backup datasets, USTMAINT utility will detect that they are no longer cataloged and remove the information regarding these deleted backups from the FDR/UPSTREAM control files. USTMAINT also deletes history records from the FDR/UPSTREAM catalog when they exceed the retention specified in your configuration. The USTMAINT utility is automatically executed during the initialization of USTMAIN, the FDR/UPSTREAM on-line program. You may also execute it dynamically at any time while USTMAIN is active by entering a console command (See Section 5.7) or using an ISPF panel (See Section 6).

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1.3 CONTINUED

FILE DEFINITION UTILITY (USTCAMS)

USTCAMS is a front-end to the IBM utility, IDCAMS. It accepts all normal IDCAMS commands, and most messages produced will be normal IDCAMS messages. However, any DEFINE for a VSAM cluster which has "$UST" anywhere in the cluster name will actually be defined as a non-VSAM file using a proprietary Innovation file structure. USTCAMS must also be used whenever a REPRO is used to reorganize these proprietary Innovation files (reorganization can also be done by the on-line utility USTREORG just described). If standard VSAM clusters are to be defined, deleted, or reorganized, you may use either USTCAMS or IDCAMS.

The FDR/UPSTREAM ISPF dialog (see Section 6) may be used to define the FDR/UPSTREAM on-line repository data sets, and is recommended over direct use of USTCAMS.

REPORT PROGRAM (USTRPORT)

FDR/UPSTREAM-MVS can record, in its catalog data set, history records detailing every recent operation performed by UPSTREAM. Options in the UPSTREAM configuration control how long these records are kept.

USTRPORT is a batch generalized reporting program which can read these history records and report on them in a variety of ways. Selection criteria can be specified to create custom reports which detail various aspects of UPSTREAM operation; for example, you can select only records for a given workstation (or group of workstations), only those in a certain date/time range, only restores, and many other combinations. By default the report will include either all statistics about each operation, or an abbreviated set of statistics plus information on the backup data sets written or read. The reports can be customized to include only the data you want to see, in a layout you specify. USTRPORT can also produce several other types of reports, such as reporting on sequential backups. See Section 7 for details.

Some reports can be generated from the FDR/UPSTREAM ISPF application (see Section 6).

DUPLICATE FILE AUDIT UTILITY (USTDUPRT)

USTDUPRT can be used to scan the backup records in FDR-UPSTREAM looking for workstation files which may be duplicated on multiple workstations. This supports the Duplicate File Support in MERGE BACKUPs as explained in Section 1.4. See Section 7.11 for details.

BACKUP REPORT UTILITY (USTBKPRT)

USTBKPRT is a batch utility which will display the contents of any FDR/UPSTREAM-MVS sequential backup data set. You simply point it to a single backup data set, and it will display the name and statistics of every workstation file that was included in this backup. See Section 7.11 for details.

SCHEDULER (USTSCHED)

USTSCHED is executed as a subtask of the FDR/UPSTREAM-MVS main online task. Based on schedule definitions which are maintained using the FDR/UPSTREAM ISPF interface, it issues MVS console commands at the defined times and dates. These commands may be used to control FDR/UPSTREAM operations or may be used for any other purpose desired. USTSCHED may be automatically invoked when the FDR/UPSTREAM-MVS main task is initialized, or may be manually started or stopped at any time via a console command. The schedule definition may be updated and refreshed at any time. Multiple copies of USTSCHED, each running with a unique schedule definition may be started.

1.4 FDR/UPSTREAM'S ARCHITECTURE

FDR/UPSTREAM-MVS maintains a repository for all backups. This repository contains all the Backup information specified by the User at the Workstation, information about the files (including file dates, times, locations, attributes and the like), and, in the case of *keyed* and *non-keyed* backups, the file data itself.

BACKUP IDENTIFICATION

All backups are identified in several ways, hierarchically:

Workstation Profile Names: These are User-specified names which identify groups of backups and the backup options associated with them. Every workstation (PC or server) for which backups will be done must have at least one Profile Name. In the case of *keyed* and *non-keyed* backups, each Profile Name has a maximum number of backups retained in the on-line repository. When this limit is reached, the oldest one is purged *(rolled off)* to make room for the newest.

Version Dates: Each backup is additionally identified by a “Version Date”. This is the date and time (on MVS) that the backup was originally created. Combined with the Profile Name, “Version Dates” allow you to identify a particular backup instance.

File Sets: Each backup can have one or more “File Sets” specified on the workstation. A “File Set” is a file specification combined with other information. This allows you to backup whole drives, one directory, partial directories, some files, or one file, and have them grouped together under one **“Version Date”** tag. You can also simultaneously specify files to exclude from the backup process. In general, a given Profile Name should be used with a fixed set of “File Sets”, especially for full and incremental backups.

1.4 CONTINUED

BACKUP TYPES

FDR/UPSTREAM supports several types of backups:

Sequential Tape Backup: A *sequential tape* backup is written as an MVS sequential dataset directly to mainframe tape volumes. The dataset is dynamically allocated at the beginning of the backup process according to parameters specified in the associated Profile in the FDR/UPSTREAM-MVS configuration. You may specify a *dataset name prefix* which FDR/UPSTREAM-MVS will use to construct the full dataset name, or optionally specify an MVS GDG base name. In the case of an MVS GDG, FDR/UPSTREAM-MVS will dynamically allocate the next generation to contain the backed up data. The profile contains allocation parameters such as the *dataset name prefix,* the *retention/expiration* and the tape *unitname*.

Sequential tape backups usually call for scratch tapes to be mounted, but MERGE BACKUPS may call for a previously used tape to which backup data will be added. The tape volumes will contain all the file data for this one backup version and, for MERGE BACKUPS, may contain several versions (one or more incremental backups plus a full backup). These tape volumes may be under the control of your mainframe tape management system, and therefore, may be “scratched” at any time without FDR/UPSTREAM-MVS's knowledge. Therefore, if you intend using *sequential tape* backups, you will have to periodically run the USTMAINT utility to erase any information in the FDR/UPSTREAM-MVS control files for deleted tape datasets (by default, USTMAINT is run automatically whenever the FDR/UPSTREAM on-line task is started and can be run on demand via a console command).

Sequential Disk Backup: A *sequential disk* backup process writes the backup file data to a sequential MVS DASD dataset. As with *sequential tape* backups, the dataset is dynamically allocated at the time of the backup according to parameters specified in the FDR/UPSTREAM-MVS configuration file. The profile contains the *dataset name prefix* and DASD *unitname* or *volume serial* to be used, and for SMS installations, the STORAGECLASS and/or MANAGEMENTCLASS values to be assigned. The file space allocation is automatically performed by FDR/UPSTREAM according to an estimate provided by the workstation at the beginning of the backup process.

These *sequential disk* backups may be managed by a DASD management system such as FDR/ABR; FDR/UPSTREAM-MVS will automatically recall the backups if they have been archived/ migrated. **However, if disk space for *sequential disk* backups is limited, Innovation recommends that you use the disk-to-tape migration facilities of USTMIGRT** (see Section 7.7) **instead of DASD management software like ABR or DFHSM.**

Archive backup: An Archive (*non-keyed*) backup is initially written to the FDR/UPSTREAM on-line repository. However, it is then flagged for archiving by the USTARCH utility. When the USTARCH utility is run, at your discretion, all Archive backup data is written to mainframe tape volumes for offline storage. Once the *non-keyed* backup data is safely on mainframe tape, the file data is erased from the repository, freeing valuable mainframe DASD space. In the event a restore is required of this archived file data, the restore is performed **directly** from the tape volumes. UPSTREAM does not *“stage”* the data back to DASD to perform the restore process.

Archive backups may be useful for quick backups of small numbers of files which must be moved off of disk to recover space. However, MERGE Backups (described on the following pages) may also include the backups of files which have been deleted from workstation disk.

Keyed backup: A *keyed* backup is retained in the on-line repository until it is “rolled off” by a subsequent backup exceeding the specified number to be retained. *Keyed* backups may be useful for the on-demand backup of a small number of volatile files. *Keyed* backups are also used for the duplicate file support in MERGE BACKUPs, as described later in this section.

It is important to note that, for all of the backup types above, all the control information for the backups is still retained in the on-line control files, as well as a copy written to the backup files. This allows version and file inquiries to be performed without having to access the actual file data, avoiding a potential tape mount. Since FDR/UPSTREAM readily integrates into existing tape and DASD management systems, you control and manage the backup data. Backups can be recovered easily by a user or administrator, subject to security constraints, using the FDR/UPSTREAM workstation screens.

Raw backup: unlike the above backups which are file-by-file, raw backups process a physical disk volume on the workstation byte-for-byte. The backup will be an exact image of the contents of the disk, including all allocated and unallocated blocks, all directory information, and system information such as boot data.

Sequential tape and/or disk backups, especially MERGE BACKUPS as described on the next page, are recommended over *non-keyed* (archive) and *keyed* (on-line) backups for most purposes.

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1.4 CONTINUED

MERGE BACKUPS

Merge backups allow FDR/UPSTREAM PC to send a fraction of the total data on a disk (only slightly more than an incremental backup) and still end up with a complete full backup. Using a sophisticated technique, the PC sends a complete directory of the drives to be backed up to the FDR/UPSTREAM host system which uses prior backups plus changed files to construct the full backup.

Advantages:

- A full backup is created with the PC only having to send a tiny fraction of the total data.
- Easier to use, understand and manage. The beauty of a merge backup is that all the complexity is behind the scenes; it is actually as easy or easier to use than non-merge backups.
- If you are using tapes for incremental backups, you use fewer tapes.

Merge backups use only *sequential disk* or *sequential tape* backups (or a combination of the two).

A single backup profile name is used for full and incremental backups. It is recommended that this single profile represent a single, unchanging group of file specs (a single server, a single PC disk, etc.). The facility is flexible enough for you to be able to add or remove drives, however it is not recommended that you use a profile for more than one entity.

The technique requires that you perform a first-time baseline full backup of the file specifications that you wish to maintain. In this backup you do transmit all the files. Once you have this full backup, you perform incremental merge and full merge backups. Incremental merge backups are backups where only the changed files are transmitted to the host. The first incremental merge backup after a full backup begins a new tape or disk file; subsequent incremental merge backups to tape are appended to previous incremental backups. Subsequent incremental merge backups to disk create new host files.

Full merge backups are appended to the end of the incremental backup file (if the backup is on tape), or a new file is created (if the incremental backups are on disk). The PC sends all the changed files as well as the directory entries for all files which it does not believe have been changed. FDR/UPSTREAM MVS then examines this list of files, retrieves from old backups (the last full or any of the prior incrementals) files which haven't changed, and requests from the PC files which it doesn't have (see the description of “Duplicate File Support” later in this section).

Before FDR/UPSTREAM will use a file from a previous backup, it will verify a match of the complete, qualified file name, the last modified date and time, and the file size. If any one of these conditions do not match, the host software will request a transmission of the file from the PC. The result is a complete full backup without the PC software having to read or send the vast majority of the data, and deleted files are properly reflected.

If a MERGE backup is interrupted, and another MERGE backup is done, it may call for backup tapes even earlier than the previous one, in order to copy unmodified files from it. It will do this until an uninterrupted full backup is encountered, or until the unmatched files total less than 25% of the total on the disk; any remaining files will be requested from the workstation.

This technique (MERGE backup) is recommended for all new or existing FDR/UPSTREAM customers. To upgrade to this facility, upgrade your FDR/UPSTREAM PC and MVS software if required, modify your PC parameter files to use a single backup profile and correctly use the MERGE option. You will also have to make changes to the FDR/UPSTREAM-MVS configuration, to define new profiles with the MERGE option (or modify existing profiles). Then perform a FULL MERGE backup. Subsequently, our recommendation is that you perform daily incremental backups and weekly full merge backups.

The following scenarios should help you understand the process.

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1.4 CONTINUED

Scenario #1: Full and Incremental Backups to Tape

Figure 1-1 shows a diagram of how a tape only system would work. This scenario's advantages are:

- No intermediate disk requirements. Data goes directly to tape without having to be staged through disk. This saves on host disk space.
- Good for large volumes of data.
- Only one tape is created per backup cycle (usually weekly). This saves on tape management.

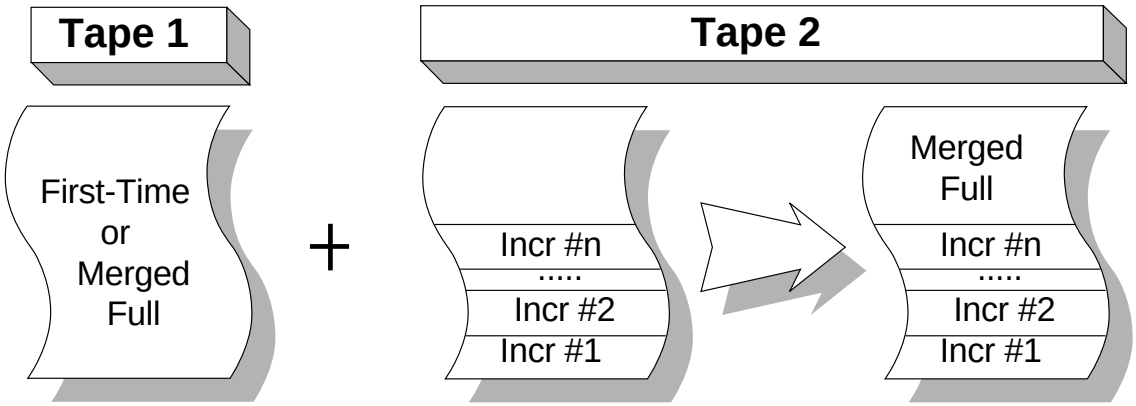

Figure 1-1
Full and Incremental Backups to Tape

When you run your first-time full backup, a new tape is created which holds all the data on your PC or server (tape 1 in the figure). The first incremental after a full creates a new tape (tape 2 in the figure). Subsequent incrementals are appended to the end of the tape file.

After your first-time full backup, subsequent full backups are full merge backups. In a full merge backup the PC sends up all the files changed since the last incremental as well as a directory listing. The tape holding the prior full backup is mounted (tape 1) as well as the tape holding the incremental data (tape 2).

Any files that have not been changed will be copied from tape 1 to tape 2 unless they are in the incremental on tape 2 already. The files which were in the prior incrementals on tape 2 are recorded as being part of both the full and incremental backups. The host software then requests any files which could not be matched.

The result is a new full backup tape which will be used as the source for the next full backup. Note that if you have specified retention periods for the tapes in the profile you should be aware that the true expiration date will be calculated from the retention when the first incremental file is placed on the tape; it may not be updated as additional data is added to that tape file. For example, if you use RETPD=7, the tape may expire 7 days from the date the first incremental was placed on the tape; when the full backup is added to the tape 6 days later, it may be ready to expire the next day! You must set the retention periods in MERGE profiles to accommodate this.

Options may be set in the MERGE profile to modify the above scenario so that a new scratch tape will be used for every full backup (NEWTAPE=FULL) and/or for every incremental (NEWTAPE=INCR). This may be useful in installations where tapes must be manually fetched from a library. However, this means that more tapes must be mounted during the full backup (to read the incrementals) and that data must be copied from the incremental backups (as well as the previous full backup) to the new full backup, which will increase the elapsed time of the full backup.

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1.4 CONTINUED

Scenario #2: Full Backups on Tape and Incremental Backups on Disk

Figure 1-2 shows a diagram of how a system where full backups are stored on tape and incremental backups are stored on disk would work. You may want to choose this option if you have sufficient host disk space and do not wish to mount the backup tapes each day. In addition, recovery is quicker for incremental data.

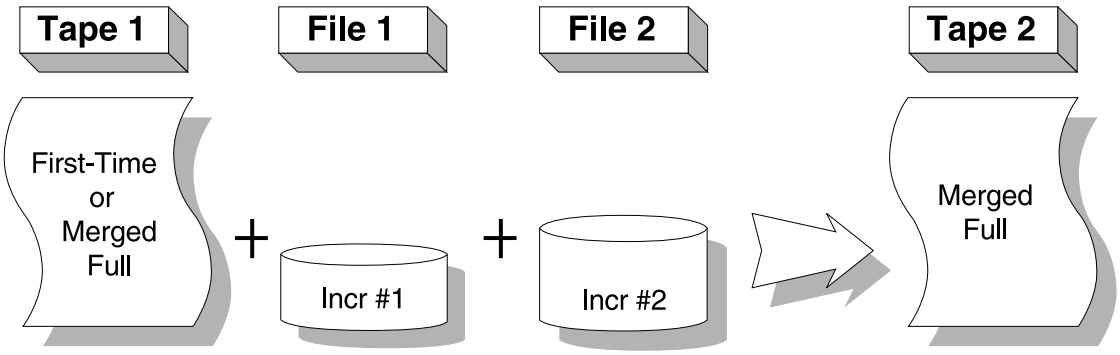

Figure 1-2
Full Backups on Tape, Incrementals on Disk

When you run your first-time full backup, a new tape is created which holds all the data on your PC or server (tape 1 in the figure). The first incremental creates a file on disk (file 1). Subsequent incrementals create new files on disk.

When you run a full merge backup, the tape holding the prior full backup is mounted (tape 1) as well as the new tape for output (tape 2). The PC sends up all the files changed since the last incremental as well as a directory listing.

The host software then copies the PC files which were requested in the PC directory listing from its most current backup on the incrementals (file 1 and file 2) or the last full (tape 1) to the new full (tape 2). The host software then requests any files which could not be matched.

The result is a new full backup tape which will be used as the source for the next full backup.

An option may be set in the MERGE profile (COPYINCR) which will cause the FULL MERGE process to copy the incremental backups to the FULL tape, scratching them from disk after the copy and thus freeing up disk space. The FDR/UPSTREAM control records will be updated to point to the new location of the data on tape. This may not be necessary if the disk backups have a short retention and are scratched by DASD management.

If you do not have enough disk space for a weeks worth of incremental backups for all workstations, another option is to use the USTMIGRT migration utility daily or every few days to move accumulated disk backups to tape (see Section 1.3 for details). However, this places backups for multiple workstations onto one tape; during the FULL MERGE backup, it may be necessary to mount that tape many times to copy backup files onto the full backup tape for each workstation.

Note: This combination (full backups on tape and daily incrementals on disk) works well with FDR/UPSTREAM vaulting. Vaulting is the creation of secondary copies of sequential backups for storage in offsite vaults for disaster recovery purposes. USTVAULT, the vault program, is described in detail in Section 7.8. Placing the incrementals on disk, and running USTVAULT regularly (before USTMIGRT, if migration is also used) can create the vault copies with minimal tape handling.

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1.4 CONTINUED

Scenario #3: Full and Incremental Backups on Disk

Figure 1-3 shows a diagram of how a disk only system would work. You may want to use this scenario for small backups or where restore speed is important.

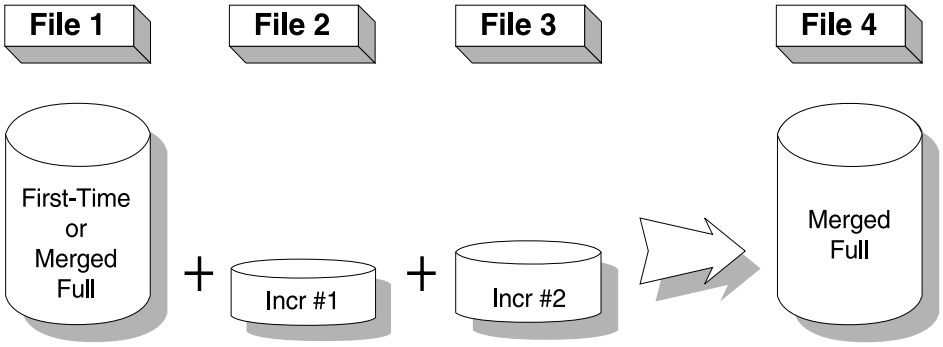

Figure 1-3
Full and Incremental Backups on Disk

When you run your first-time full backup, a new file is created on the host which holds all the data on your PC or server (file 1 in the figure). Each incremental afterwards creates a new host file (file 2 and file 3).

When you run a full merge backup, the PC transmits the changed files and they are written to the new full backup file (file 4). Then the host software takes the directory listing transmitted from the PC and copies from the incrementals (file 2 and file 3) and the last full (file 1) all of the unchanged files.

The host software then requests any files which could not be matched. The result is a new full backup file which will be used as the source for the next full backup.

If you wish, the backups on disk may be moved to tape using the USTMIGRT utility (described in Section 7.7). Also, if you use deferred MERGE BACKUPs, the disk backup can be automatically moved to tape, as described below.

DEFERRED MERGE BACKUPS

Although MERGE BACKUPs are the most efficient kind of full backup, there might be limitations on the use of full backups on tape in some installations:

- the FULL MERGE BACKUP will require 2 tape drives: one for the output and one to read the previous backups. There may not always be sufficient tape drives to satisfy this need, especially if multiple backups are run at once.
- if tape libraries (silos) are not used, there may not always be an operator to satisfy requests for specific input tapes.

To circumvent these limitations, there is an option for DEFERRED MERGE BACKUPs. It is invoked if the profile under which the backup is done has the option MERGE=DEFER set (see Section 3.5). With MERGE=DEFER, the FULL MERGE BACKUP will do all of the steps described in the preceding text, except that it will not actually copy older files from the previous full or incremental backups if they are on tape. Normal processing will occur if the required previous backups are on disk. For every file that it would have copied from a previous backup, it will record in the FDR/UPSTREAM repository files that the file has been "deferred".

This means that during the FULL MERGE BACKUP, it will not need to mount any previous tapes. If the backup parameters at the workstation are set to request backup to sequential tape, it will still need to mount an output tape, but if NEWTAPE=FULL is set in the profile, this will be a scratch tape. However, if you prefer, you can set the workstation to do the full backup to sequential disk; in this case, **no tapes will be required** at all during the actual backup.

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1.4 CONTINUED

DEFERRED MERGE BACKUPS *(continued)*

However, if DEFERRED MERGE BACKUPs are used, the backup is not truly complete until the deferred workstation files have been properly copied. The FDR/UPSTREAM utility program USTMERGE will complete this processing. Normally you will want to run it *as soon as possible* after the DEFERRED MERGE BACKUPs, as soon as tape limitations or operator availability permit. USTMERGE will identify profiles whose most recent FULL MERGE BACKUP was done with MERGE=DEFER in effect, for which deferred processing is still required to complete the backup. It will complete those backups by:

- copying the full backup data set from disk to tape, if the initial FULL MERGE BACKUP was taken to sequential disk. The profile must be enabled for both sequential disk and sequential tape backups.
- mounting the required previous full and incremental backup tapes and copying to the new full backup tape any workstation files which were deferred during the full backup.

USTMERGE has been designed for efficient operation and efficient use of tapes, if used properly. Normally, one execution of USTMERGE will process the backups for multiple workstation profiles. By default, it will create one output tape which contains the FULL MERGE BACKUPs of all of those profiles, in seperate files on the tape. When it is executed again for the same profiles, all of the previous full backups that it has to read are already contained on one tape and it will be able to read them in order without dismounting or repositioning the input tape.

Since USTMERGE may also need to read incremental backup tapes, the USTMIGRT utility has been enhanced to provide a similar efficiency. When USTMIGRT is executed to migrate incremental backups from disk to tape, and the optional USTMIGRT parameter "FORWARD" is specified, USTMIGRT will read previous incremental backup tapes for the profiles it is processing and "forward merge" them onto the new output tape, creating one tape which has multiple files, each containing all the incremental backups (since the last full backup) belonging to one profile. If the operations of USTMERGE and USTMIGRT are coordinated to process the same sets of workstation profiles (which is very easy with the GROUPID= operand in the FDR/UPSTREAM configuration), then USTMERGE will be able to read one set of full backup tapes and one set of incremental backup tapes with a minimum number of tape mounts. This is illustrated in Scenario #5 below.

It is possible to put off execution of USTMERGE if you prefer. The FDR/UPSTREAM restore programs have been enhanced so that if files in defer status are found, the required previous full and/or incremental backups will be read to restore those files. In fact, you could put off USTMERGE for quite a while; the result would be that a restore might need to read many previous backups, possibly including several full backups, to find all the files required for the restore. The danger with this technique is that the older backups may expire, losing the latest backups of some files. For this reason, Innovation strongly recommends that you run USTMERGE regularly. However, if the backups of files are lost in this way, those files will be automatically requested from the workstation during the next FULL MERGE BACKUP.

USTMERGE can be run only under the FDR/UPSTREAM online task, as described in Section 5.7. More details on USTMERGE are found in Section 7.9 and on USTMIGRT in Section 7.7.

Use of DEFERRED MERGE BACKUPs leads to several more backup scenarios.

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1.4 CONTINUED

Scenario #4: DEFERRED MERGE Backups on Disk

Figures 1-4 and 1-5 show a DEFERRED MERGE where the backups are directed to disk. If you have sufficient disk space to keep the week's worth of incremental backups on disk, this is the most efficient way to use DEFERRED MERGE.

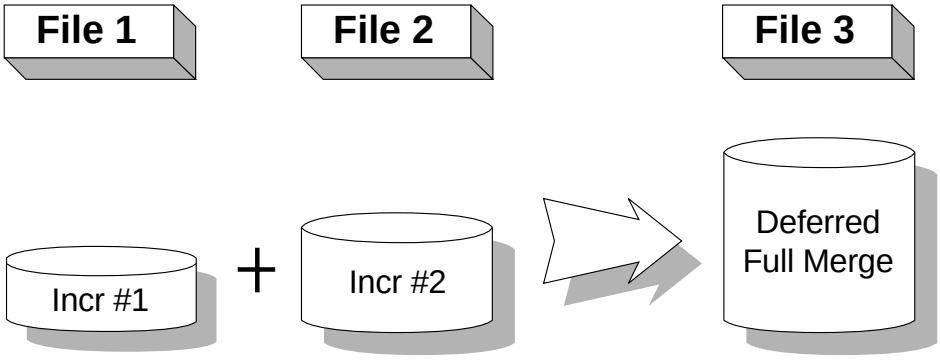

Figure 1-4
Full and Incremental Backups to Disk

Each daily incremental backup is taken to disk (FILE 1 and FILE 2). The weekly full backup is also taken to disk with the MERGE=DEFER option set in the profile (FILE 3). The MERGE BACKUP process will backup all updated files from the workstation, and it will request any files for which it does not have a current backup. Then it will copy any files that were updated during the week from the appropriate incremental backup into the full backup data set. However, any files that have not been updated since the last full backup will be "deferred", since that full backup resides on tape. The full backup data set on disk will not be much larger than the daily incremental data sets, since it only contains the accumulated workstation files that were updated during the week.

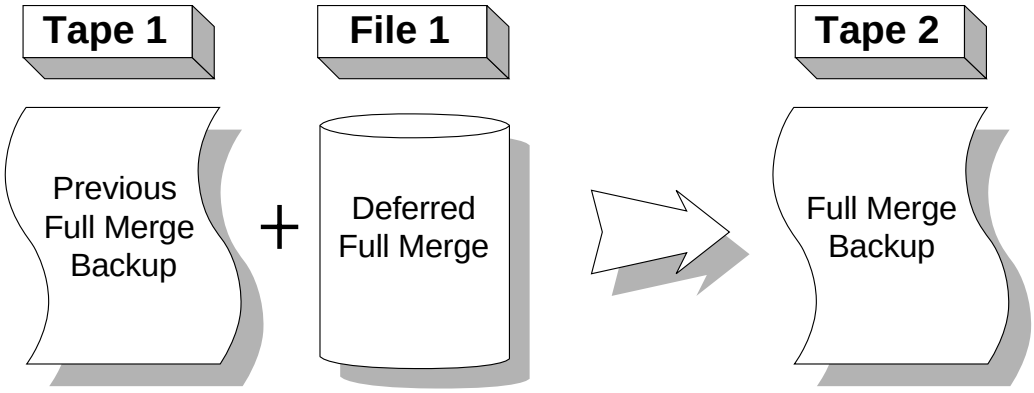

Figure 1-5
USTMERGE Completes Full Backup on Tape

When USTMERGE is executed for this workstation profile, it will copy the full backup from disk (FILE 1) to tape (TAPE 2). It will also mount the previous full backup on tape (TAPE 1), and copy any workstation files that were "deferred" during the actual backup. The new full backup on tape is now complete, containing a copy of every file that was on the workstation at the time of the backup.

As an option, USTMIGRT could be run at this point to move the incremental backups from disk to tape to free up disk space. Note that if this was done before the full backup, then USTMERGE would have to mount those incremental backup tapes in addition to the previous full backup tape.

Another option would be to do the full DEFERRED MERGE BACKUP directly to tape. The processing would be similar, except that USTMERGE (executed with its NEWTAPE option) would simply add the required deferred files from the previous full backup tape to the end of the new full backup tape. This will also create a separate tape for each profile, which will require more tape mounting during USTMERGE execution.

Although Figure 1-5 does not show it, USTMERGE will normally process multiple workstation

1.4 CONTINUED

profiles in one execution. TAPE 1 and TAPE 2 will actually have multiple files containing backups for multiple profiles.

Scenario #5: DEFERRED MERGE Backups on Disk with Daily Migration

Figures 1-6 and 1-7 show a DEFERRED MERGE where the backups are directed to disk but the incrementals are migrated to tape on a daily basis. This might be used if you do not have sufficient disk space to accumulate a week's worth of backups. These figures illustrate the normal processing of USTMERGE and USTMIGRT where they process a number of workstation profiles, and create multiple files on the output tapes, each containing data for one profile. The figures show 3 profiles, for PC #1, PC #2, and PC #3, but you could include any desired number of profiles in one execution (controlled by the GROUPID= option in the workstation profile definition), and they could represent individual workstations or network servers.

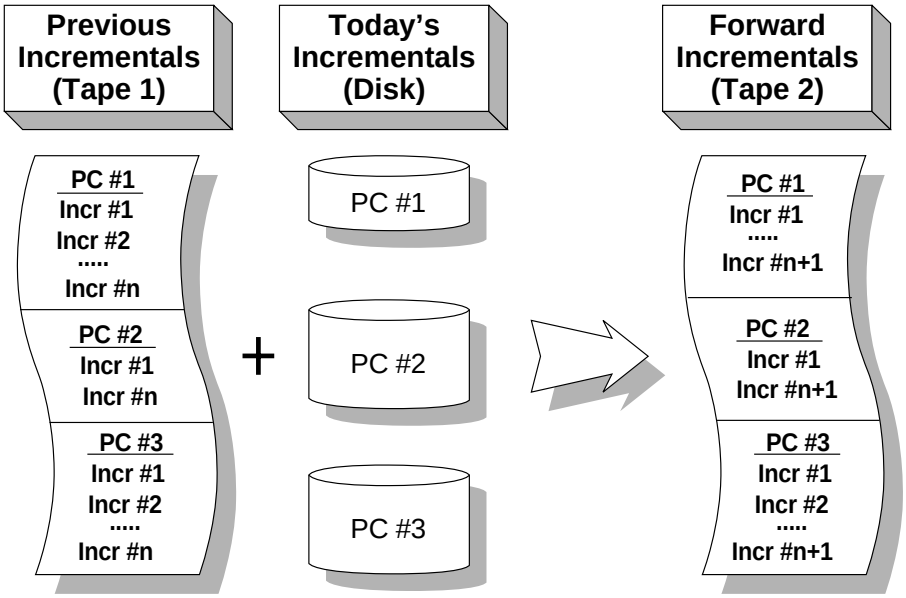

Figure 1-6
Incremental Backups Migrated to Tape

Each daily incremental backup is taken to disk (shown as "Today's Incrementals"). USTMIGRT is run daily to move the incremental backups for a set of profiles to tape and free up the disk space. The FORWARD option of USTMIGRT is specified, which causes it to read the previous incremental backups on tape (TAPE 1) and "forward merge" them onto the new output tape (TAPE 2). The result is that the tape produced daily by USTMIGRT will contain all of the incremental backups taken for these profiles since the last full backup. Note that you could get a similar result by taking the incremental backups directly to tape (see Scenario #1) but this would put each profile on a separate tape, which will require more tape handling during USTMERGE execution.

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1.4 CONTINUED

The weekly full backup is also taken to disk with the MERGE=DEFER option set in the profile. The MERGE BACKUP process will backup all updated files from the workstation, and it will request any files for which it does not have a current backup. All other files will be "deferred", since the backups reside on tape.

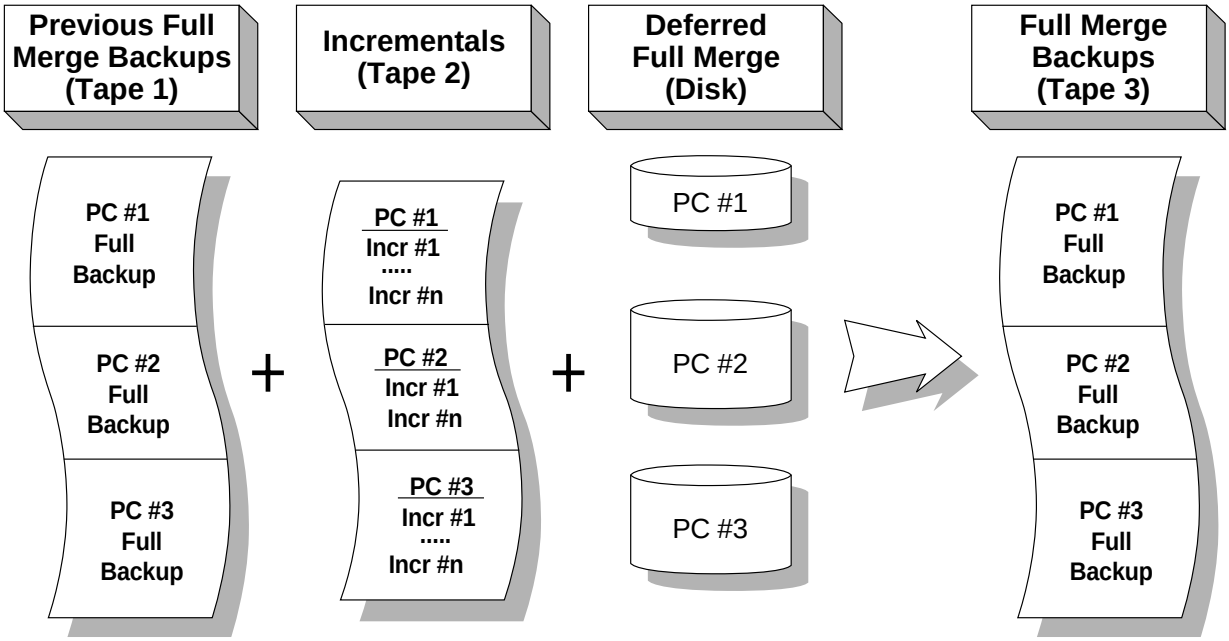

Figure 1-7
USTMERGE Completes Full Backup on Tape

When USTMERGE is executed for the same set of workstation profiles, it will copy the full backups (shown as "Deferred Full Merge") from disk to tape. It will also mount the previous full backup on tape (TAPE 1), plus the most recent accumulated incremental backup tape (TAPE 2), and copy any workstation files that were "deferred" during the actual backup. The new full backup on tape (TAPE 3) is now complete, containing a copy of every file that was on the workstation at the time of the backup. Note that the workstation profiles in that set will always be processed in the same order by USTMERGE and USTMIGRT, so their backups will always be in the same relative positions on the tapes. This allows USTMERGE to mount each previous full backup tape and each incremental backup tape only once and read through them sequentially with a minimum of tape mounts.

You could optionally do the full DEFERRED MERGE BACKUP directly to tape. The processing would be similar, except that USTMERGE (executed with its NEWTAPE option) would simply add the required deferred files from the previous full and incremental backup tapes to the end of the new full backup tape. This will also create a separate tape for each profile, which will require more tape mounting during USTMERGE execution.

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1.4 CONTINUED

AUTOMATIC DUPLICATE FILE SUPPORT

In many cases, software packages such as operating systems (DOS, WINDOWS, OS/2, etc.), word processors, and others, must be installed on every workstation that uses them. Even software that can be installed on file servers may exist on many such servers. Most of the files associated with this software (executable programs, graphics, screen layouts, etc.) will be identical on each workstation; only configuration and data files are usually unique. Although FDR/UPSTREAM has no problem backing them up from each workstation, the additional overhead to backup many copies of this software when a new version is installed on many workstations may be considerable.

For example, if you installed WINDOWS 95 on 100 PCs, the next full backup of each of those PCs would have to backup many megabytes of WINDOWS data from each PC, most of which is identical on each PC. The slower the link between the PC and FDR/UPSTREAM-MVS, the greater will be the impact of this duplication. This impact could be dramatically reduced if duplicated data can be transmitted to the host **just once**.

This is what the FDR/UPSTREAM Automatic Duplicate File Support (ADFS) does. ADFS keeps special backups of files which may be duplicated; during MERGE BACKUPs it will identify files that it already has in that list and *include them in the backup without transmitting them.* The duplicate backups can be built by ADFS *automatically* without any effort on your part, or you can take the backups manually:

- If you enable the DUPLICATE=AUTO option in the FDR/UPSTREAM-MVS configuration (see Section 3.4) duplicate files can be identified without doing any special backups. For files with update timestamps more than a certain number of days ago (30 days by default), FDR/UPSTREAM-MVS will monitor MERGE BACKUPs from various workstations looking for apparent duplicates (same filename, update timestamp and size). When such a file has been backed up twice, a copy of that file will be saved under the USTDUPFL profile name, just as if a *keyed* backup had been done as described below.
- If you can also identify directories on one or more workstations that will include duplicate files (e.g., the DOS, WINDOWS, MSWORD directories), you can do a special keyed backup of those directories using the special USTDUPFL profile name (see Section 3.8). This special backup can be done from any workstation on which the software is installed and it should be done promptly after the installation of the new software on the first workstation. FDR/UPSTREAM-PC will default to “high compression” for USTDUPFL backups; also, if “duplicate file checking” is enabled it will only include files with update timestamps in the past (30 days ago by default).

The backups of the duplicate files are stored in the FDR/UPSTREAM-MVS “file-data” cluster (like any *keyed* backup). Multiple versions of the same software can be included in the duplicate backups, since each version of the same file will have unique update timestamps and sizes. If your workstation supports long file names, only those names 30 characters long or less will be recorded; longer names will not be recognized as duplicates.

During a full or incremental MERGE BACKUP, FDR/UPSTREAM-PC will automatically transmit to the host any workstation file which has the archive (update) flag set. Files belonging to newly installed software usually have the archive flag but has a much older timestamp. To invoke the duplicate file support for such files, you must enable an option in the backup specifications (it is on the MORE panel for BACKUP) for duplicate file checking; it specifies that files with the archive flag on but which have an update timestamp in the last (over 30 days by default) will **not** be automatically transmitted during the initial phase of the backup.

When FDR/UPSTREAM-MVS gets to the final step where it identifies files that must be requested from the workstation since no current copy exists on the host, the duplicate backup support is invoked. Before requesting the unmatched files from the workstation, it will check to see if there is a backup of each such file with a matching name, update timestamp, and file size under the USTDUPFL profile. The check for matching name does not include the drive/directory information, so it will match even if it is installed on varying drives and/or directories on the various workstations.

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1.4 CONTINUED

DUPLICATE FILE SUPPORT *(continued)*

If a match is found under USTDUPFL, the matching file is included in the MERGE BACKUP using the *keyed* backup that already exists. You have two options for processing the matching file, controlled by the DUPLICATE= option in the profile under which the MERGE BACKUP is done (see Section 3.5):

- DUPLICATE=COPY – the matching files will be copied from the *keyed* backup into the MERGE BACKUP output file. In subsequent backups, that copy will be carried forward by normal MERGE BACKUP processing and the *keyed* backup will not be used again. This has the advantage that the backup files will be self-contained, and the backups under USTDUPFL can be deleted once all workstations that require them have done backups.
- DUPLICATE=NOCOPY – the MERGE BACKUP output file will be updated with *pointers* to the duplicate files in the *keyed* backup. During any restore that requires those files, the *keyed* backups in the FDR/UPSTREAM-MVS file-data cluster will be read. This has the advantage that the backups will be faster (since no data movement is required for the duplicate files) and less tape or disk space is required, but it does require that the *keyed* backups be retained as long as any workstation backup may point to them; it also requires that the current file-data cluster be available during disaster/recovery. If you set DUPLICATE=NOCOPY in the USTDUPFL profile definition as well, this will prevent inadvertent deletion of duplicate files from the *keyed* backups. If the duplicates are deleted but are still pointed to by the backups of some workstation, FDR/UPSTREAM-MVS will detect this and request the files from the workstation during the next full MERGE BACKUP.

You should note:

- Duplicate file support will work only if the duplicate files are installed on the workstation without changing the update timestamp. The installation procedure used for most software will create the files with the same timestamp on all workstations. This support can be used for files other than those associated with software packages, but the duplicate files must have the same update timestamp on each workstation.
- You may want to do the USTDUPFL backup even for existing software products if you plan to start doing new FDR/UPSTREAM MERGE BACKUPs for existing workstations, so that those duplicate files do not need to be transmitted from each workstation. However, the “first-time full” backup function will transmit all files on the workstation and will not invoke the duplicate file support. FDR/UPSTREAM-MVS has eliminated the need for the “first-time full” backup; you can do a normal FULL MERGE BACKUP as the first backup causing UPSTREAM to request the non-updated files (which are most of them) from the workstation, invoking the duplicate file support.
- To avoid cluttering up the on-line repository with records for potential duplicate files that actually exist only on one or two workstations, ADFS includes an automatic cleanup function, controlled by the MAXDUPL= operand in the FDR/UPSTREAM configuration (see Section 3.4), which specifies a number of days and defaults to 30. If a potential duplicate has been backed up only once, it creates only a single record in the FDR/UPSTREAM catalog; if a matching file is not backed up from any other workstation within MAXDUPL days, it is discarded. If a matching file is backed up from a second workstation, a copy of the file is saved as described above, but if it is not backed up from a third workstation within MAXDUPL days of the second backup, the saved copy and all of its records are discarded. Not until it has been backed up from a third workstation will it be retained indefinitely (until manually deleted).

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RAW AND FDRSOS BACKUPS

Unlike all of the preceding backups which process only named files and transmit data file-by-file, "raw" backups process a physical hard disk on the workstation or server, and do a byte-by-byte backup of the disk. The backup will contain an image of the physical disk, including every physical block. It will contain all allocated blocks, unallocated blocks, directory information, and system information (such as boot data).

A "raw" restore is the reverse, putting all the data blocks from the raw backup back to the target disk byte-by-byte so that the resulting disk will look exactly like the original. If the original was bootable, the restored disk will be bootable. The output disk must be the same size as the original input disk; it may also be larger, but the extra space will probably not be available for use.

If you wish to use raw backups on disks which are part of a volume group (where several physical disks work in conjunction), you will need to do the backups and restores of that volume group all at once; otherwise, the restored data may not be usable.

Raw restores are restartable. FDR/UPSTREAM takes a checkpoint of a raw restore every two minutes. If you restart it, it will resume from the last checkpoint.

FDRSOS is a separately priced product from Innovation. It works with Symmetrix DASD subsystems from EMC Corporation. These Symmetrix systems are attached to both MVS (via ESCON or parallel channels) and to Open Systems or servers via SCSI channels. The EMC volumes involved are used by the Open System or server, but FDRSOS allows channel-speed full-volume backups and restores of those volumes.

Although FDRSOS backups and restores are executed independent of FDR/UPSTREAM, USTREGEN can read a FDRSOS backup and enter it into the FDR/UPSTREAM repository data base. Unlike other FDR/UPSTREAM backups, where USTREGEN must read the entire backup, for FDRSOS backups it only reads a few blocks from the beginning of the backup. A REGEN of a FDRSOS backup will create or add to an artificial profile name, which is “F#volser” where “volser” is the FDRSOS volume serial of the Open System volume; these profiles **do not** have to be defined in the FDR/UPSTREAM-MVS configuration. One REGENed, query against that profile name will show the FDRSOS backups and the date/time of their creation.

When possible, it is preferable to do regular channel-speed FDRSOS restores outside of FDR/UPSTREAM. However, if FDRSOS restores are not possible (e.g., a disaster site where the MVS connection to the EMC Symmetrix is not available), you can also request FDR/UPSTREAM to restore the FDRSOS backup. Since the FDRSOS backup is essentially a raw backup, it is restored over the network like a raw backup (see raw restores above). This will take much more time than a FDRSOS restore, but is invaluable when it is the only choice available.

At a disaster/recovery site (where no Symmetrix system is available, or it is not connected to the MVS host), you must take these steps to restore the FDRSOS backups:

- Execute USTREGEN against each FDRSOS backup tape. This will record the backups under the F#volser profile name. If you like, you can do this REGEN on a regular basis so that your FDR/UPSTREAM repository is always updated and ready to restore FDRSOS backups. However, you may still need to REGEN FDRSOS backups which were taken after the latest backup of the repository itself.
- Do queries on the F#volser profile names, and request raw restores of the most recent FDRSOS backup for each required volume. This restore will work even if you are restoring to a non-EMC disk, as long as it is the same size or larger than the original disk.

As a convenience, the FDR/UPSTREAM ISPF dialog can generate batch jobs to do regular FDRSOS backups and restores, on panel 1 (USTBATCH).

1.5 FILE TRANSFER

FDR/UPSTREAM can be used to transfer single files from a workstation or server to MVS, and from MVS to a workstation or server. File Transfer uses all of the speed of FDR/UPSTREAM backup and restore. If you already have a workstation configured for FDR/UPSTREAM backups, you can do file transfers simply by defining appropriate profile names. No additional software or communication connection is required.

File transfer may be used for text (printable) files, so FDR/UPSTREAM includes ASCII-EBCDIC translation and automatic record conversion. However, you may also use the file transfer function for binary files. Only one workstation file can be transferred at a time.

File transfers may be initiated by USTBATCH, as described in Section 8.

FILE TRANSFER PROFILES

Special workstation profiles must be defined and used for file transfers. These profiles must have the TRANSFER attribute specified in the configuration and must be enabled for *sequential disk* backups (for transfer to disk data sets) and/or *sequential tape* backups (for transfer directly to tape). The disk or tape data set name in the profile will be used for the MVS data set unless it is overridden by the workstation user. These file transfer profiles cannot be used for any other purpose.

WORK-STATION TO MVS TRANSFER

Since any workstation file may have variable-length records, a file transferred to MVS will be placed in a MVS disk or tape data set in variable format (RECFM=VB). The LRECL of the output data set will be the RECORDSIZE specified at the workstation when the transfer is initiated (+4 for the variable format length fields) and the BLKSIZE will be the value of DASDBLK in the associated file transfer profile which must be at least RECORDSIZE+8. The size of the individual records depends on options chosen, as described below.

When the transfer is initiated, the name of the input workstation file, transfer options, and disk or tape output is indicated. The data set name of the output MVS data set can optionally be specified; if omitted, the *sequential disk* or *sequential tape* name from the associated profile will be used.

If the output is a sequential data set or a GDG generation it will be allocated as a new data set with the DCB characteristics shown above and cataloged by FDR/UPSTREAM. The options in the file transfer profile for *sequential disk* or *sequential tape* backups will be used to allocate the data set (except for the name, if overridden). If you override the MVS name with a GDG name you **must** specify "(+1)" at the end of the name, e.g., "A.B.C(+1)". You can also output to a member of an existing PDS (partitioned data set) if you specify a member name at the end of the name, e.g., "A.B.C(MEMBER1)", but that PDS must have the proper DCB characteristics (RECFM=VB and an appropriate LRECL and BLKSIZE). The output PDS must be preallocated, FDR/UPSTREAM will never allocate a PDS.

If the file being transferred is a text file, you can request ASCII to EBCDIC translation; this is enabled by default.

Since text files are usually broken into records delimited by a CR/LF (just LF alone on UNIX systems), you can request that FDR/UPSTREAM scan for those delimiters and transmit the individual records (with the delimiters removed); this will result in a MVS file with the same records as the workstation file. This option is also enabled by default, but if it is not used the transmitted file is considered to be a continuous set of data bytes and delimiters are not removed. Since MVS requires that data sets consist of individual records, FDR/UPSTREAM will break the transmitted data in records of the size specified by RECORDSIZE. For example, if RECORDSIZE is 6000, the MVS data set will consist of variable length records, all of which are 6000 bytes in length (except the last).

If you are transmitting a non-text (binary) file, you must turn off the EBCDIC translation option and probably not use the record delimiter option. However, unless you have detailed knowledge of the format of the binary file, the transferred file will probably be useful only if you later transfer it back to a workstation.

1.5 CONTINUED

WORK-STATION TO MVS TRANSFER *(continued)*

Another option allows you to request that the transfer be recorded by FDR/UPSTREAM under the transfer profile name used, allowing you to query and report on the transfers that have occurred. If you do not choose that option (enabled by default), the transfers are not recorded. Transfers to a PDS member are never recorded. Another option allows the workstation file to be deleted after successful transmission.

One suggested use for file transfer to MVS is for the transmission of FDR/UPSTREAM logs on workstations. They can be moved to MVS, deleted from the workstation and analyzed or printed.

MVS TO WORK-STATION TRANSFER

When transferring a file from MVS to a workstation, the MVS input data set may have any record format (fixed, variable, or undefined). It must be a sequential disk or tape data set (including GDG generations) or a member of a PDS.

When the transfer is initiated, the name of the output workstation file and transfer options are specified. The data set name of the input MVS data set can optionally be specified and most of the time it must be given. If omitted, the name of the output MVS data set from the most recent transfer to MVS under the transfer profile name will be used as input, but this will work only if the option to record the transfer to MVS was chosen; this might be useful to transfer a file from one workstation and then transfer it back to one or more additional workstations. If no transfer has been recorded under the transfer profile name used, the input MVS name **must** be given.

FDR/UPSTREAM will automatically allocate the specified input data set using the MVS catalog. You do not need to specify if it is on tape or disk.

If the file being transferred is a text file, you can request EBCDIC to ASCII translation; this is enabled by default.

Since text files are usually broken into records delimited by a CR/LF (just LF alone on UNIX systems), you can request that FDR/UPSTREAM transmit the individual records from the MVS data set with the appropriate delimiters inserted; this will result in a workstation file with the same records as the MVS file. This option is also enabled by default, but if it is not used the transmitted file is considered to be a continuous set of data bytes and all bytes in the file will be transmitted without delimiters. Individual records in the MVS data set will be combined in the workstation file.

If you are transmitting a non-text (binary) file, you must turn off the EBCDIC translation option and probably not use the record delimiter option.

FILE TRANSFER SECURITY

Because FDR/UPSTREAM file transfer can be used to transfer to or from any sequential MVS data set, security for file transfer is different from normal FDR/UPSTREAM security. If SECLVL=1 or more is specified in the FDR/UPSTREAM-MVS configuration, a security userid and password must be associated with the file transfer request. All access to MVS data sets will be verified under that userid, so it must have CREATE authority to the MVS names for transfer to MVS, and READ authority for transfer to the workstation.

1.6 FILE MIGRATION

File Migration is the process of moving inactive files off the workstation by backing them up with FDR/UPSTREAM and then deleting them from the workstation. This is usually done to gain disk space on the workstation/server and is sometimes called "grooming".

Files to be migrated are selected with special migration file specs in the backup definition. Although you can designate files to be unconditionally migrated if you know they will not be needed in the near future, it is more common to use an option to select files which have not been used in a certain number of days (e.g., 180 days). As part of the spec, you also indicate how long the migrated files are to be retained by FDR/UPSTREAM; migrated files past their retention period will be discarded.

On some platforms, it is possible to do automatic recall (auto-recall) of migrated files when they are referenced by a user or program.

You should also read the documentation on file migration is found in the FDR/UPSTREAM-WORKSTATION/SERVER manual. Note that file migration is different from the backup migration done by the FDR/UPSTREAM-MVS utility USTMIGRT.

SEPARATE FILE MIGRATION

The recommended way of doing file migration is to use separate special profiles for migration.

In the FDR/UPSTREAM Configuration you can indicate that a profile is to be used only for file migration (see PCMIGRATEONLY=YES in Section 3.5). Any attempt to use these profiles for normal backups will fail. Obviously, you must define other profiles for normal backups of the workstations involved. Conversely, any attempt to use a normal profile for migration (other than as part of MERGE BACKUPs) will fail.

These profiles are used with a new FDR/UPSTREAM function, invoked by the File Migration option in the FDR/UPSTREAM dialogs on the workstation, or the PC Migration option in the ISPF USTBATCH dialogs. The migration invoked by these panels operates similarly to MERGE BACKUPs, except that only migrated files are involved. Migrations may be done to sequential disk or directly to tape.

On the migration panel, you can choose from:

- **Full Merge Migration** - similar to a full MERGE BACKUP, this creates a backup of all newly migrated files, plus it copies any unexpired files from previous full migrations and any files that were migrated with Simple Migration since the last Full Merge Migration. The Simple Migration backups will be uncataloged (if on disk, they will also be scratched). This is usually directed to tape.

- **Simple Migration** - similar to an incremental MERGE BACKUP, this creates a backup of only the newly migrated files. This is usually directed to disk for faster backup and restore. You should not allow DASD management systems (such as FDR/ABR or DFHSM/DFSMShsm) to migrate these backups.

- **Migration End Set** - identical to a Full Merge Migration, except that it marks the profile so that the next Full Merge Migration will not copy forward any migrated files from this (or previous) full migration backups. As the name "end set" implies, this ends a set of migration backups so that the next migration will create the beginning of a new self-contained set for this profile. See Note 3 below. This is usually directed to tape.

1.6 CONTINUED

SEPARATE FILE MIGRATION (continued)

Usage notes:

1)Migrated files are not deleted from the workstation until all of them are backed up. For Full Merge Migration, the deletion does not occur until the merge from previous backups is complete. If the migration fails while the workstation is sending files to MVS and the migration is marked restartable, you may restart the migration. However, if the migration fails while it is merging migrated files from previous backups, the backup will be discarded and must be started over. If the merge fails because some expected previous backup is not available (e.g., no longer cataloged or not on the expected disk), you must recover a vaulted copy of the missing backup or manually delete the unavailable backup from FDR/UPSTREAM's records (see the REMOVEDSN command in Section 5) before redoing the migration. If it was the previous full migration backup that was missing, the latter action (REMOVEDSN) will cause the next migration will read the preceding full migration backup to recover most of the previously migrated files, losing only what was migrated between the two full migrations.

2) Innovation recommends that you do Simple Migrations on a frequent basis (e.g., daily or weekly) to disk. This allows for fast restores if the data is needed. Full Merge Migrations should be done on an infrequent schedule (perhaps monthly). The data set names used for the Simple Migrations on disk (DASDPREF) and for the Full Merge Migrations on tape (TAPEPREF) should be different. You may want to make the tape backups a GDG, with a limit of at least 3 or 4 generations so that backup copies of the migrated files are retained (but see the notes on backup retention below); the disk backups do not need to be a GDG, but you must insure that they are retained until the next Full Merge Migration (not deleted by a DASD management system).

3) "Migration End Set" can be used when the amount of unexpired migrated data in the current full migration backup has become so large that merge processing time or the number of tapes required has become too large. The Full Merge Migration backup it creates will be the last one in this "set" of migration backups; subsequent migrations will contain only the files migrated after this point. But this means that this migration end set must be retained until all of the migrated files on it reach their individual expirations; see the notes on backup retention below. Migration End Set will probably not be required unless:

- a large amount of data has been migrated under this profile with a long retention.
- the maximum file retention used under this profile exceeds 1 year.
- you do manual migration (not based on date of last usage) of a set of files and need to keep them for an extended period (longer than the usual migration retention).

4) Since these migration backups are the only copies of the migrated data sets, Innovation strongly recommends that you create backup copies using the USTVAULT utility (See Section 7.8).

MIGRATION AS PART OF BACKUPS

In releases of FDR/UPSTREAM prior to V2.5.4, file migration was done as part of regular backups. This can still be done, but the separate migration described above is now the recommended way of doing this. In this mode, migration file specs are included with the backup file specs and the migrated files are included in the backups. For MERGE BACKUPs, the migrated files are copied forward to each successive full backup until they reach their expiration date.

CONTINUED . . .

1.6 CONTINUED

FILE RETENTION VS BACKUP RETENTION

As mentioned earlier, migrated files are given a retention period as part of the file spec used to select them. This retention used to calculate an expiration date associated with each migrated file. When a Full Merge Migration is done, previously migrated files are always copied forward to the new full backup unless they are past their expiration date, so expired files are automatically discarded. If you do not use the Migration End Set option, this means that the latest full migration will contain all unexpired files that have ever been migrated under this profile (we recommend that you retain several previous full migration backups for safety).

However, if you do use the Migration End Set option (see Note 3 above), the migrated datasets on the backup created by that option are not copied forward to subsequent migration backups. You must insure that this end set backup is retained until every migrated file on it has reached its individual expiration date.

The easiest way to do this is to use the configuration option to include an exclamation mark (!) in the backup dataset prefix in the profile (see TAPEPREF in Section 3.5); "Migration End Set" will replace that with an "E", while it is replaced with a "F" for Full Merge Migration or "N" for Simple Migration. This allows you to create one GDG for the normal Full Merge Migrations (keeping 3 or more generations) and a separate GDG for the Migration End Set backups, allowing them to be kept much longer. Depending on how often you intend to do a Migration End Set, you must define this GDG with sufficient generations so that the backups are retained until the migrated files with the highest retentions reach their expiration dates. For example, if you do Migration End Set once a quarter, and the highest retention is 365 days (1 year), the end set GDG should have at least 5 generations (5 quarters).

If you are doing migrations as part of MERGE BACKUPs, note that if you do a "First Time Full" backup, this will not copy any previously migrated files from previous full backups, so the previous full merge backup will need to be retained until all of the migrated files expire. There is no convenient mechanism for automating this, so you may need to manually change the retention of that previous full backup in your tape management system. This is one reason why separate migration is now the recommendation.

1.7 LOCAL BACKUPS

LOCAL BACKUPS

FDR/UPSTREAM supports an option for local backups, which can be invoked on the workstation/server anytime that a sequential backup is taken.

In addition to creating the normal sequential tape or disk backup on the mainframe host, local backups create a workstation/server file containing the same data (to avoid overtaxing the workstation, the local copies can be restricted to files under a certain size and the total local file size can also be limited). These local backups will be recorded in the FDR/UPSTREAM repository, along with the locations of the mainframe backups.

When a restore is requested, if the local backup file is still available and accessible, files will be restored from the local backup file without transmitting them from the mainframe over the network, thus improving restore performance. If the required local backup is not available, the data is sent to the workstation over the network, just as if the local backup was never taken.

Use of local backups for backup is controlled by parameters specified in FDR/UPSTREAM on the workstation/server. For remote initiated backups, they can be specified as USTBATCH parameters.

Use of local backup during restore is automatic. FDR/UPSTREAM-MVS records the location of the local backup and passes that information to the workstation/server during the restore. If the local backup can’t be found at that location, the backup data from MVS is transmitted instead.

FDRSOS LOCAL BACKUPS

FDR/UPSTREAM/SOS introduces the new concept of "FDRSOS Local Backup Volumes" to dramatically improve FDR/UPSTREAM backup performance by avoiding the need to transmit all of the data over your LAN or network. FDR/UPSTREAM/SOS is a separately priced version of FDR/UPSTREAM which provides this support.

FDRSOS is a separately priced product from Innovation Data Processing. It is used by customers who have EMC Symmetrix disk subsystems with the ESP (Enterprise Storage Platform) option allowing Open System (FBA) and S/390 (CKD) disk volumes to coexist in the same subsystem; such a system also has SCSI adaptors for Open System access (which includes Windows, OS/2, and Netware) and S/390 adapters for ESCON or parallel channel access. FDRSOS uses special support developed in partnership with EMC to access Open System volumes from MVS. FDRSOS itself provides high-speed physical backups and restores of these Open System volumes to and from MVS disk or tape. The FDRSOS User Guide contains details on configuring the Symmetrix for FDRSOS use.

FDRSOS Local Backup Volumes extend the local backup concept. They can be used whenever the MVS system running FDR/UPSTREAM/SOS and the workstation/server to be backed up have access to the same Symmetrix subsystem, via IBM and SCSI channels respectively. When a FDR/UPSTREAM backup on the workstation/server is run and the output is directed to a FDRSOS Local Backup Volume, the data is written only to that volume. File data is not sent over your LAN or network so the backup will run much faster than a normal FDR/UPSTREAM backup; if your LAN or network is relatively slow, the speed difference may be dramatic.

As the backup is written to the FDRSOS Local Backup Volume, FDR/UPSTREAM/SOS will read the local backup data directly, using I/O techniques developed for use with FDRSOS. It will copy the data to MVS tape or disk, as controlled by the FDR/UPSTREAM profile parameters, just like a normal backup. However, the speed of this copy is limited only by channel, disk, and tape speeds, so it is usually very fast.

1.7 CONTINUED

FDRSOS LOCAL BACKUPS (continued)

FDRSOS Local Backup Volumes must be specially formatted. This formatting is done by the LOCALBACKUP statement of FDRSOS, so you must be licensed for FDRSOS (V5.3 level 05 or above) as well as FDR/UPSTREAM/SOS. You must also use the LABEL statement of FDRSOS to assign a MVS-style volume serial to each Open System volume to be used for FDRSOS local backups. Please consult the FDRSOS User Manual for complete details.

Control records on the FDRSOS Local Backup Volume document all of the FDR/UPSTREAM profiles which have used the volume for backups, the locations of the backups, and values which are used to manage those backups. It is possible to add, modify, and delete profiles using a facility provided by FDR/UPSTREAM on the workstation/server, but profiles can also be automatically added upon their first use of the volume (if permitted by an option set by FDRSOS during initialization). The management values include how many backups to keep for a given profile (older backups are automatically deleted when a new backup is run for the profile), the maximum size of a backup and the maximum size of a file to be backed up (if either is exceeded, the data is transmitted to FDR/UPSTREAM/SOS automatically).

FDRSOS Local Backup Volumes can be used for multiple profiles (up to a limit set by FDRSOS during initialization). If your EMC configuration and SCSI hardware allow the volume to be accessed by multiple systems, it is also possible to use a volume for backups from each of those systems (allocation of space in the FDRSOS Local Backup Volume is controlled by FDR/UPSTREAM-MVS).

Note: unlike FDRSOS backups, which can only backup data stored on Open System volumes within the EMC Symmetrix disk subsystem, the FDRSOS local backup volumes in the Symmetrix can be used to backup and restore data from other non-Symmetrix disk volumes attached to the Open System.

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1.8 COMMUNICATIONS ARCHITECTURE

APPC

FDR/UPSTREAM is a SNA (IBM's Systems Network Architecture) layer 7 APPC (Advanced Program-to-Program Communications) communications application. This means that FDR/UPSTREAM uses standard APPC services provided by IBM and other vendors, rather than coding its own communication protocols.

FDR/UPSTREAM-MVS uses the *native* VTAM APPC services. FDR/UPSTREAM-PC operates using the services of APPC implementations from a number of different vendors, so you may have APPC already available, or available at minimal cost. This allows easy integration of FDR/UPSTREAM into your current SNA communications environment.

APPC PERFORM-ANCE

APPC is ***much*** faster for bulk data transfer than the older LU (Logical Unit) 2 protocol used by many other SNA communications applications. LU 2 was originally intended for use by dumb terminals and does not provide for the transfer of any data other than printable characters. These vendors must “translate” the non-printable bytes found in most files (including data bases and executables) into more than one byte. This is inherently inefficient.

Since LU 6.2 was designed for program-to-program communications, it does not have any extraneous data, such as screen format characters, transferred with the data.

SNA ADVANCED NETWORKING

Only LU 6.2 applications can take advantage of APPN(Advanced Peer-to-Peer Networking). This revolutionary technology allows conversations between applications which are connected in ways determined dynamically, using the SNA network like a telephone exchange. LU 0 and LU 2 nodes cannot use this technology. PU 2.1 is required and it is only supported using APPC.

TCP/IP

FDR/UPSTREAM also supports TCP/IP as a communication alternative. TCP/IP (Transmission Control Protocol/Internet Protocol) was developed for data transmission over the Internet, but it has become increasingly popular even for private networks because it is relatively easy to install and configure. An ever-widening group of products support TCP/IP on workstations. Although TCP/IP may not be able to match the efficiency of APPC, its simplicity and the fact that it is already used on many networks make it a viable alternative to APPC. Both IBM's TCP/IP product and Interlink's SNS/TCPaccess are supported.

1.9 REQUIREMENTS

SOFTWARE REQUIRE-MENTS

FDR/UPSTREAM-MVS requires the following software environment:

- IBM MVS/XA or ESA or OS/390 with JES2 or JES3
- IBM Data Facility Product (DFP) V2R4 or above, or IBM DFSMS/MVS V1R1 or above (DFSMS is included with OS/390)
- IBM TSO/E V2 or above, and IBM ISPF/PDF V3R3 or above (for ISPF dialogs)
- For SNA/APPC support, IBM ACF/VTAM V3R2 or later. Even if all of your workstations will communicate with FDR/UPSTREAM via TCP/IP, VTAM is still required for USTBATCH.
- For TCP/IP support, **either**
  IBM TCP/IP V2R2 or above **or**
  Interlink SNS/TCPaccess V3 or above.

  TCP/IP is required only if some or all of your workstations will use TCP/IP instead of SNA/APPC to communicate with FDR/UPSTREAM.
- OS/390 includes both ACF/VTAM and TCP/IP. As of OS/390 V2R5, they are now combined into one product called "OS/390 eNetwork Communications Server" which is a standard component of OS/390.

FDR/UPSTREAM-MVS may use both VTAM and TCP/IP concurrently. However, only one of the TCP/IP implementations may be used at a time. If you have multiple TCP/IP stacks active on your MVS system, such as IBM TCP/IP and Interlink SNS/TCPaccess, FDR/UPSTREAM may communicate with only one of them. If necessary, you may start multiple FDR/UPSTREAM-MVS main tasks, each communicating with a different TCP/IP, but you must also have a separate set of repository files for each FDR/UPSTREAM task.

Notes for TCP/IP users:

The IBM TCP/IP support in FDR/UPSTREAM-MVS was originally written to use an API (Application Program Interface) called IUCV; at the time it was the only available IBM interface which provided all the functions required by FDR/UPSTREAM-MVS. In TCP/IP V3R2, IBM introduced a new API called HPNS (High Performance Native Sockets). FDR/UPSTREAM-MVS supports both IUCV and HPNS.

Although TCP/IP V3R2 supports both IUCV and HPNS, the IUCV support will be withdrawn in succeeding releases, leaving HPNS as the only supported IBM interface used by FDR/UPSTREAM-MVS. In OS/390 V2R5 the IBM TCP/IP product does not support IUCV, so HPNS will be required if OS/390 V2R5 or above is installed.

You may see this message in the FDR/UPSTREAM-MVS job log and/or system log:

```
CSV003I REQUESTED MODULE EZBSOH03 NOT FOUND
```

This message may be ignored. FDR/UPSTREAM determines if HPNS support is present by looking for that module.

Also, the "OS/390 eNetwork Communications Server" uses Open Edition (UNIX services for OS/390) for the HPNS API; this requires that the security userid associated with the FDR/UPSTREAM started task have an OE segment (see the IBM "eNetwork" documentation for details).

Interlink SNS/TCPaccess has its own native API, which FDR/UPSTREAM-MVS supports. In addition, SNS/TCPaccess V4 has added support for the IUCV API when the proper Interlink maintenance is installed (contact Interlink for details). FDR/UPSTREAM-MVS supports the Interlink IUCV API as well as the native API.

2.1 THE DISTRIBUTION TAPE

DISTRIBUTION TAPE FORMAT

The FDR/UPSTREAM-MVS product is distributed on a standard labeled (SL) magnetic tape volume. The volume serial of the distribution tape will be:

UST30T – for a trial (evaluation) tape

UST30P – for a production (licensed) tape

The appropriate tape volser must be inserted into the installation JCL shown in the following sections.

TAPE FILES

These are the files that will be found on the distribution tape, with their file sequence number:

1 – DSN=UPSTREAM.INSTALL – an executable program which is used to load the files on this tape to disk.

2 – DSN=LOAD – an IEBCOPY-unloaded PDS containing the FDR/UPSTREAM-MVS load modules.

3 – empty – no longer used.

4 – DSN=ICL – an IEBCOPY-unloaded PDS containing the FDR/UPSTREAM-MVS Installation Control Library (ICL), a library of JCL and control statement example members, and other useful information relating to the installation of UPSTREAM.

5 – DSN=CLIST – an IEBUPDTE-format file containing CLISTs for the FDR/UPSTREAM-MVS ISPF application.

6 – DSN=PANELS – an IEBCOPY-unloaded PDS containing ISPF panels for the FDR/UPSTREAM-MVS ISPF application.

7 – DSN=MESSAGES – an IEBCOPY-unloaded PDS containing ISPF messages for the FDR/UPSTREAM-MVS ISPF application.

8 – DSN=SKELETON – an IEBCOPY-unloaded PDS containing ISPF skeletons for the FDR/UPSTREAM-MVS ISPF application.

9 – DSN=TABLES – an IEBCOPY-unloaded PDS containing ISPF tables for the FDR/UPSTREAM-MVS ISPF application.

REPLACING A TRIAL VERSION WITH PRODUCTION

If you are completing a trial of FDR/UPSTREAM and are now replacing the trial version of FDR/UPSTREAM-MVS with a production version from a new tape, you will need to:

- load the new FDR/UPSTREAM libraries from the distribution tape (See Section 2.3 LOADING THE UPSTREAM LIBRARIES FROM THE DISTRIBUTION TAPE)
- if the FDR/UPSTREAM repository data sets created for the trial are of adequate size for production use, no action is required. Otherwise, you will need to define larger data sets; if any backups created during the trial must be retained for production use, you will need to copy the contents of the old data sets to the new (as shown in Section 2.5) before deleting the old data sets.
- if new workstations or servers are to be backed up by FDR/UPSTREAM, update the FDR/UPSTREAM configuration to add new profiles (Sections 3 and 6.4).

2.2 INSTALLING FDR/UPSTREAM-MVS

The installation of FDR/UPSTREAM-MVS involves ten steps outlined below. You may wish to use this page as a checklist while performing the installation.

ALL USERS Step 1 and 9 must be done by all customers installing a new FDR/UPSTREAM-MVS distribution tape, including trial customers replacing a trial version of FDR/UPSTREAM with a production version. Step 10 should be done if you wish to access the FDR/UPSTREAM-MVS on-line documentation with BOOKMANAGER.

NEW AND TRIAL USERS Steps 2 through 8 are required only for new users (usually trial users) of FDR/UPSTREAM-MVS. However, existing UPSTREAM users should review these steps to see if any changes affect their existing UPSTREAM system; the UPSTREAM library names in UPSTREAM JCL procedures may also need to be updated.

STEP 1 Load the FDR/UPSTREAM-MVS libraries to disk using the Tape Install program (See Section 2.3). For existing users of UPSTREAM, Innovation recommends that the UPSTREAM libraries be loaded to new data set names. The program (load) library **must** be made an APF authorized library.

STEP 2 Define the FDR/UPSTREAM-MVS configuration data set and on-line repository data sets using the FDR/UPSTREAM ISPF dialog (See Sections 2.4 and 2.5).

STEP 3 If you will be using VTAM APPC, or will be using USTBATCH, copy sample VTAM application definition into your VTAMLST, modify it as required and activate it (See Section 2.6). You may also need to add a VTAM mode table or mode table entry for FDR/UPSTREAM use (see Section 2.7).

STEP 4 If you will be using TCP/IP, set TCP/IP options (See Section 2.8).

STEP 5 Copy the FDR/UPSTREAM-MVS start-up PROC and tailor it for your installation (see Section 2.9).

STEP 6 Verify that the workstations which will communicate with FDR/UPSTREAM are configured correctly in VTAM and NCP and/or TCP/IP (See Section 2.10).

STEP 7 Execute the FDR/UPSTREAM Configurator to define FDR/UPSTREAM options and to create the workstation backup profiles. This may be done by a batch job or using the ISPF dialog (See Section 2.11).

STEP 8 If you have a security system and have specified SECLVL=1, 2, or 3 in the FDR/UPSTREAM configuration, See Section 4 “Security” for details on implementing UPSTREAM security rules. Trial users may wish to set SECLVL=0 during initial testing.

STEP 9 Complete the installation of the FDR/UPSTREAM ISPF dialogs (See Section 2.12).

STEP 10 Softcopy versions of this manual in IBM Bookmanager format or Adobe Acrobat PDF format are provided on CD-ROM or diskette (See Section 2.16).

2.2 CONTINUED

REPLACING A TRIAL VERSION WITH PRODUCTION

If you are completing a trial of FDR/UPSTREAM and are now replacing the trial version of FDR/UPSTREAM-MVS with a production version from a new tape, you will need to:

- load the new FDR/UPSTREAM libraries from the distribution tape (Section 2.3)
- if the FDR/UPSTREAM repository data sets created for the trial are of adequate size for production use, no action is required. Otherwise, you will need to define larger data sets; if any backups created during the trial must be retained for production use, you will need to copy the contents of the old data sets to the new (as shown in Section 2.5) before deleting the old data sets.
- if new workstations or servers are to be backed up by FDR/UPSTREAM, update the FDR/UPSTREAM configuration to add new profiles (Sections 3 and 6.4).

TESTING A NEW VERSION

A new version of FDR/UPSTREAM can be tested while an existing version continues to be used for production. To insure that they don't interfere with each other:

- load the new FDR/UPSTREAM libraries from the distribution tape (Section 2.3) being sure to specify new library names.
- create new configuration and repository data sets for testing (Sections 2.4 and 2.5).
- If using VTAM, create a new VTAM application definition using names different from those used for production (Section 2.6).
- If using TCP/IP, assign a port number different from that used by production (Section 2.8)
- Define the test configuration (Sections 3 and 6.4), specifying the test VTAM application and TCP/IP port names. The test profiles should have names different from those used for production and should create different backup data set names (DASDPREF= and TAPEPREF=).
- copy the FDR/UPSTREAM proc, USTPROC, to your procedure library under a different name such as USTTEST, updating it to point to the test data sets.
- while testing the new ISPF dialogs, the USTALLOC procedure shown at the beginning of Section 2.4 can be used to invoke them.

UPGRADING A TEST VERSION TO PRODUCTION

When testing of a new version is complete, it can be easily placed in production:

- replace the FDR/UPSTREAM production proc with the test proc in your procedure library, updating it to point to the production configuration and repository data sets. Alternately, if the proc distributed with the new release is not changed from the old, simply update the old proc with the new FDR/UPSTREAM program library name. The old proc and libraries should be saved for quick fallback.
- change the STEPLIB in any USTBATCH jobstreams and other batch UPSTREAM jobs to point to the new program library.
- The ISPF dialogs can be updated by reinstalling them (Section 2.12) so that the new libraries are used, or by renaming the new libraries to the old FDR/UPSTREAM ISPF library names (saving the old libraries under another name for fallback).
- Once the new version has been running successfully for a time, the libraries from the old version can be deleted.

2.3 LOADING THE UPSTREAM LIBRARIES FROM THE DISTRIBUTION TAPE

The FDR/UPSTREAM Tape Install Program, USTLOAD, makes the installation of an FDR/UPSTREAM-MVS distribution tape very easy. You can execute USTLOAD directly from tape if you have access to a TSO userid that has the “MOUNT” attribute, or if you are able to issue or request a command on a system console to have a tape mounted. Otherwise, you must copy the Tape Install Program to disk using the JCL shown in Step 3.

If you have access to a TSO userid with the MOUNT attribute, logon to that id and proceed to Step 2. If you don't know if your userid has the MOUNT attribute, you probably don’t so proceed to Step 2.

Step 1 Use this step if your TSO userid does not have MOUNT privileges and you are able to issue (or request to be issued) a command on a MVS system console to have a tape mounted. If your userid has MOUNT privileges, proceed to Step 2; otherwise proceed to Step 3.

If your TSO userid does not have the MOUNT attribute, you can still access a tape from TSO by having the operator issue a MOUNT command. You or the operator must mount and ready the tape on a free tape drive **BEFORE** issuing the following command on a MVS system console:

MOUNT uuu,VOL=(SL,UST30T) Change “uuu” to the actual tape unit address.
Change UST30T to UST30P if this is a production tape.

Now go to Step 2, but remember that when you are done with the tape, it must be unloaded by the MVS system command:

UNLOAD uuu

Note: if the tape unit has a 4-digit address, you must precede it with a slash, e.g.,
MOUNT /1234,VOL=(SL,UST30T) and UNLOAD /1234

Step 2 Use this step if your TSO userid has the MOUNT attribute, or if you have completed Step 1.

If you are using ISPF, issue the following TSO commands from ISPF Option 6 (TSO COMMANDS). You can also exit ISPF and issue them from the TSO “READY” prompt.

Enter this TSO command to allocate the FDR/UPSTREAM distribution tape:

ALLOC DA('UPSTREAM.INSTALL') VOL(UST30T) UNIT(TAPE) SHR Change UST30T to UST30P if you are loading from a production tape. Change the UNIT parameter to the appropriate tape unit name.

If you get the message “IKJ56221I DATA SET USTLOAD NOT ALLOCATED, VOLUME NOT AVAILABLE”, it may be because your userid does not have the MOUNT attribute; go back to Step 1. If you have already done Step 1, then the problem is that the tape was mounted AFTER the MOUNT command was issued. Issue an UNLOAD console command and go back to step 1.

Now issue this TSO command to invoke the Tape Install Program:

LOADGO 'UPSTREAM.INSTALL'

The Tape Install program (USTLOAD) will be loaded from the tape and begin execution. Proceed to Step 4.

2.3 CONTINUED

Step 3 Use this step to submit a batch job to copy the Tape Install Program to a disk file, from which it can be executed under TSO.

Submit this jobstream:

```
//IEBGENER    EXEC    PGM=IEBGENER
//SYSPRINT    DD      SYSOUT=*
//SYSIN       DD      DUMMY
//SYSUT2      DD      DISP=(,CATLG),SPACE=(3200,10),
//          DSN=user-specified-name.       <=== specify a dataset name
//          UNIT=SYSALLDA,VOL=SER=vvvvvv   <=== specify a disk volume
//SYSUT1      DD      DISP=OLD,DSN=UPSTREAM.INSTALL,LABEL=EXPDT=98000,
//          UNIT=TAPE,                     <=== change if required
//          VOL=SER=UST30T      <=== change to UST30P if production tape
```

After the successful completion of the IEBGENER job, issue this TSO command from ISPF Option 6 (TSO COMMANDS) or the TSO READY prompt:

LOADGO '*user-specified-name*'

Specify the same data set name given in the JCL, in quotes.

The Tape Install program will be loaded from disk and begin execution. Proceed to Step 4.

Step 4 The tape install program will prompt you for information on what, where and how to load the FDR/UPSTREAM tape files, in a series of four user-friendly screens. **No action will take place until you give the final confirmation on the fourth screen.** Only then are the output data sets allocated and cataloged with the names you specified, and the loading of those data sets begins (either in the foreground or via a batch jobstream).

Note: all dataset names and index name references are specified and displayed as fully-qualified names: a TSO userid will not be prefixed to the names unless you key it in.

Screen 1 – Data Set Selection

```
WELCOME TO INNOVATION DATA PROCESSING FDR/UPSTREAM-MVS INSTALLATION    SCREEN 1

 PLEASE REPLY TO THE FOLLOWING PROMPTS. YOU WILL BE ABLE TO REVIEW AND
 CHANGE YOUR SPECIFICATIONS PRIOR TO THE ACTUAL LOADING OF THE TAPE.

 THE FOLLOWING DATA SETS MAY BE LOADED FROM THE INSTALLATION TAPE:

    1 - FDR UPSTREAM INSTALLATION CONTROL LIBRARY
    2 - FDR UPSTREAM LOAD MODULE LIBRARY
    3 - FDR UPSTREAM ISPF DIALOG CLIST LIBRARY
    4 - FDR UPSTREAM ISPF DIALOG PANEL LIBRARY
    5 - FDR UPSTREAM ISPF DIALOG MESSAGES LIBRARY
    6 - FDR UPSTREAM ISPF DIALOG SKELETON LIBRARY
    7 - FDR UPSTREAM ISPF DIALOG TABLE LIBRARY
 ------------------------------------------------------------------------------
 <PRESS>  "ENTER"    -  SELECT ALL OF THE ABOVE DATA SETS AND CONTINUE
 <TYPE>   "N,N,.."   -  SELECT THE SPECIFIED DATA SETS
 <TYPE>   "END"      -  EXIT IMMEDIATELY
 ------------------------------------------------------------------------------
            PLEASE SELECT ONE OF THE OPTIONS LISTED ABOVE
 SELECT ===>
```

This screen allows you to select which of the data sets are to be loaded from the FDR/UPSTREAM distribution tape. Normally, all data sets should be selected. When you are satisfied with the selection, press ENTER to continue to Screen 2.

CONTINUED . . .

2.3 CONTINUED

Screen 2 – Data Set Name Selection

```
------------------------ DATA SET NAME SELECTION SCREEN -------------- SCREEN 2

PLEASE REVIEW THE SELECTED DATA SET NAMES AND MAKE THE DESIRED MODIFICATIONS.

  1 - INSTALL CONTROL..... FDR.UPSTREAM.ICL30
  2 - DOCUMENTATION....... FDR.UPSTREAM.DOC30
  3 - ISPF CLISTS......... FDR.UPSTREAM.CLIST30
  4 - ISPF PANELS......... FDR.UPSTREAM.PANELS30
  5 - ISPF MESSAGES....... FDR.UPSTREAM.MSGS30
  6 - ISPF SKELETON....... FDR.UPSTREAM.SKELS30
  7 - ISPF TABLES......... FDR.UPSTREAM.TABLES30

--------------------------------------------------------------------------------
<PRESS>  "ENTER"      -  USE THE ABOVE SPECIFICATIONS AND CONTINUE
<TYPE>   "ALL,INDEX"  -  ASSIGN NEW INDEX(ES) TO ALL DATA SET NAMES
<TYPE>   "N,NEWNAME"  -  ASSIGN A NEWNAME TO THE DATA SET DESIGNATED BY "N"
<TYPE>   "BACK"       -  GO BACK TO THE DATA SET SELECTION SCREEN 1
<TYPE>   "END"        -  EXIT IMMEDIATELY
--------------------------------------------------------------------------------
            PLEASE SELECT ONE OF THE OPTIONS LISTED ABOVE
SELECT ===>
```

This screen allows you to specify the data set names which will be used for the data sets you have selected to load from the tape. These may be existing data sets to be updated, or they may be new datasets which will be allocated and cataloged.

The names shown above are the default names provided with the Tape Install program. You may change these names in one of 2 ways:

1) to change the current high-level index of all of the data sets to a different index (or indexes), enter "ALL,newindex(s)". For example,
   ALL,UP300 will change the names to UP300.UPSTREAM.ICL30, etc.
   ALL,SYS3.UPS30 will change the names to SYS3.UPS30.UPSTREAM.ICL30, etc.

2) to completely change the name of any one data set, enter that data set's number followed by the replacement name. For example,
   2,SYS2.UPSTREAM.LOAD will change the name of the load library.

You can use either or both of these techniques repeatedly until you are satisfied with the names.

If you intend to update an existing library, be sure that library name is correctly specified. However, we recommend that you always install into newly created libraries to avoid X37 abends due to insufficient space in existing libraries. For new data sets, the install program will allocate them with sufficient space.

The FDR/UPSTREAM load library **must** be defined to MVS as an authorized library. If it is not already defined as authorized, you (or your MVS system programmer) must do so by:

- For MVS releases prior to ESA V4, update the IEAAPFxx member in PARMLIB. An IPL will be required to activate the updated authorized library list.
- For ESA V4 and above and OS/390, if your installation has converted to the use of the PROGxx member in PARMLIB to define authorized libraries, you can update the PROGxx member and activate the updated list with the MVS console command:
  SET PROG=xx
  If your installation has specified that the authorized program list is in dynamic format, you can also temporarily authorize the FDR/UPSTREAM library with the MVS console command:
  SETPROG APF,ADD,DSNAME=*upstream.load.library*,VOL=*volser*
- You may also have another means of temporarily authorizing the FDR/UPSTREAM load library for testing. Remember that temporary authorization will vanish after the next IPL unless the appropriate PARMLIB member is updated.

CONTINUED . . .

2.3 CONTINUED

Screen 3 – Volume Serial Selection

```
------------------------ VOLUME SERIAL SELECTION SCREEN -------------- SCREEN 3

 THE FOLLOWING NEW DATA SETS WILL BE ALLOCATED AND CATALOGED:

                      DISP  VOLUME  DATA SET NAME
  1 - INSTALL CONTROL. NEW          FDR.UPSTREAM.ICL30
  2 - LOAD LIBRARY.... NEW          FDR.UPSTREAM.LOAD30
  3 - ISPF CLISTS..... NEW          FDR.UPSTREAM.CLIST30
  4 - ISPF PANELS..... NEW          FDR.UPSTREAM.PANELS30
  5 - ISPF MESSAGES... NEW          FDR.UPSTREAM.MSGS30
  6 - ISPF SKELETON... NEW          FDR.UPSTREAM.SKELS30
  7 - ISPF TABLES..... NEW          FDR.UPSTREAM.TABLES30
 ------------------------------------------------------------------------------
 <PRESS>  "ENTER"      -  USE THE ABOVE SPECIFICATIONS AND CONTINUE
 <TYPE>   "ALL,VOLUME" -  ASSIGN A VOLUME TO ALL NEWLY ALLOCATED DATA SETS
 <TYPE>   "N,VOLUME"   -  ASSIGN A VOLUME TO THE DATA SET DESIGNATED BY "N"
 <TYPE>   "SMS"        -  DISPLAY SMS SPECIFICATIONS
 <TYPE>   "BACK"       -  GO BACK TO THE DATA SET NAME SELECTION SCREEN 2
 <TYPE>   "END"        -  EXIT IMMEDIATELY
 ------------------------------------------------------------------------------
             PLEASE SELECT ONE OF THE OPTIONS LISTED ABOVE
 SELECT ===>
```

On this screen, the DISP column shows whether the install program found that the indicated data set already exists (OLD) or does not exist (NEW). For NEW data sets, you can specify volume and/or SMS information to be used for the allocation of the data sets. For OLD datasets, the VOLUME column shows the volume serial of the existing data set.

Similar to Screen 2, you can specify the target disk volume serial for all or any one of the data sets to be allocated. For example,

ALL,SYSLB2 will change the target volume serial for all the data sets.
1,SYSP01 will change the target volume serial for the ICL library.

You can use either or both of these techniques repeatedly until you are satisfied with the names. The volume serial can be omitted if the data set will be SMS-managed or if your system will allocate such data sets on non-specific storage volumes.

If SMS is active on your system, you may enter "SMS" which will take you to variations of Screen 3 which will allow you to specify the SMS storage class, management class, and/or data class to be assigned to each data set. However, this is not necessary if your installation's SMS ACS routines will assign proper classes to these data sets.

CONTINUED . . .

2.3 CONTINUED

Screen 4 – Installation Processing Option

```
-------------------- INSTALLATION PROCESSING OPTION SCREEN ----------- SCREEN 4

PLEASE VERIFY THE FOLLOWING SPECIFICATIONS AND SELECT THE PROCESSING OPTION:

                     DISP  VOLUME  DATA SET NAME
 1 - INSTALL CONTROL. NEW          FDR.UPSTREAM.ICL30
 2 - LOAD LIBRARY.... NEW          FDR.UPSTREAM.LOAD30
 3 - ISPF CLISTS..... NEW          FDR.UPSTREAM.CLIST30
 4 - ISPF PANELS..... NEW          FDR.UPSTREAM.PANELS30
 5 - ISPF MESSAGES... NEW          FDR.UPSTREAM.MSGS30
 6 - ISPF SKELETON... NEW          FDR.UPSTREAM.SKELS30
 7 - ISPF TABLES..... NEW          FDR.UPSTREAM.TABLES30
-------------------------------------------------------------------------------
<TYPE>   “FG”       -  START LOADING THE ABOVE DATA SETS IMMEDIATELY
<TYPE>   “BG”       -  CREATE THE JCL TO LOAD THE ABOVE DATA SETS
<TYPE>   “BACK”     -  GO BACK TO THE DATA SET SELECTION SCREEN 1
<TYPE>   “END”      -  EXIT IMMEDIATELY
-------------------------------------------------------------------------------
            PLEASE SELECT ONE OF THE OPTIONS LISTED ABOVE
SELECT ===>
```

On this screen, you can review all of the decisions you have made before starting the actual loading of the libraries from the distribution tape. Entering “BACK” on this screen (or any of the others) will allow you to go back and change options before installation.

If **FG** (foreground) installation is chosen, all the data sets indicated as NEW will be allocated, then IEBCOPY or other utilities are invoked under TSO to load each of the selected libraries from tape. This option appears only if you loaded the Tape Install program directly from tape (Step 2). FG is recommended since the tape is already mounted.

If **BG** (background) installation is chosen, the NEW data sets will be allocated under TSO (same as FG) but then batch JCL will be created to actually load the libraries from the tape. This JCL will be stored as member USTLOAD in the ICL (Installation Control Library) you specified, or, if you did not select the ICL, in a dataset named “userid.UPSTREAM.JCL”. You must review this jobstream, make any changes necessary for your installation, and submit it for execution.

2.4 INVOKING THE FDR/UPSTREAM ISPF DIALOG

INVOKING THE DIALOG

Once the FDR/UPSTREAM libraries (including the ISPF dialog libraries) have been loaded, you must invoke the dialog to complete the installation of FDR/UPSTREAM.

From ISPF Option 6 (TSO COMMANDS), issue this command:

EXEC '*upstream.clist.library*(USTALLOC)'

This will display the FDR/UPSTREAM main menu:

Note: during the interactive install in the previous section, several members in the CLIST library are customized with the names of the FDR/UPSTREAM libraries you have chosen. If you later rename those libraries, you will need to change the name of those libraries wherever they appear in the CLIST library.

UPSTREAM ISPF MAIN MENU

```
------------------------------- FDR/UPSTREAM ---------------------------------
COMMAND ===>                                                          V 3.0.0

    1  USTBATCH    - Host Initiated Services
    2  STATUS      - Current Status Information
    3  DEFINE      - Define Control Files
    4  CONFIGURE   - Main Options
    5  PROFILE     - Workstation Profile Names
    6  OPER        - Operator Commands
    7  REPORT      - Report
    8  REGISTRY    - Name Registry
    9  DUPAUDIT    - Duplicate File Audit
   10  SCHEDULE    - Command Scheduler
   11  MANAGEMENT  - Backup Management
```

Options 3, 4, and 5 are used to continue the installation. Option 3, used to define the FDR/UPSTREAM data sets, is described in Section 2.5 immediately following. Options 4 and 5, used to define and maintain the FDR/UPSTREAM configuration, are described in Section 6.

2.5 DEFINE THE FDR/UPSTREAM DATA SETS

Selecting **option 3** on the FDR/UPSTREAM main menu takes you to a menu where you can define any or all of the data sets required by FDR/UPSTREAM-MVS. If you are upgrading from an earlier version of FDR/UPSTREAM and plan to use the existing data sets, you can skip this step.

OPTION 3 – DEFINE MENU

```
-------------------------- FDR/UPSTREAM - Define ----------------------------
COMMAND ===>

 Please select the desired file(s) to define, one at a time, then
 press the END key (PF3) to generate the define statements.

   1  CONFIG      - Define the Configuration file
   2  CATALOG     - Define the Catalog cluster
   3  FILEINFO    - Define the File-Information cluster
   4  FILEDATA    - Define the File-Data cluster
```

Select the data sets that you wish to define by selecting the proper numbers (1 to 4), one at a time. Each will take you to another panel where you can specify the parameters to be used for allocating that data set. Only those data sets that you select will be defined. Once you have selected all the desired data sets, press END (PF3) and a batch jobstream will be generated to create those data sets. You may modify the jobstream before submitting it.

THE CONFIGURATION DATA SET

The configuration data set is a sequential or partitioned data set where the FDR/UPSTREAM configuration (or multiple configurations) is stored. The data set must have RECFM=FB,LRECL=120 and a blocksize which is a multiple of 120. If you select **option 1** on the DEFINE menu, you will get a panel where you can define the parameters for the allocation of the configuration data set. You may allocate it manually if you like (See Section 3).

OPTION 3.1 – CONFIGURATION FILE

```
---------------- FDR/UPSTREAM - Define the Configuration file -----------------
Command ===>

Please enter the necessary information to allocate a new Configuration file

  Data Set Name      ===> 'UPSTREAM.CONFIG.FILE'

  Management Class   ===>             (blank for default)
  Storage Class      ===>             (blank for default)
  Data Class         ===>             (blank for default)

  Volume Serial      ===>             (blank for default)

  Space Units        ===> TRACK       (TRACK, CYLINDER)
  Primary Quantity   ===> 10
  Secondary Quantity ===> 1
  Directory Blocks   ===> 10          (0 for sequential)
```

If the configuration data set is to be SMS-managed, you can specify the SMS classes to be assigned; these may be omitted if your installation's ACS routines will assign appropriate classes, or if the data set is NOT to be SMS-managed. Press ENTER when you are satisfied with the values displayed.

THE ONLINE REPOSITORY DATA SETS

FDR/UPSTREAM-MVS uses three MVS data sets, collectively referred to as the *"on-line repository"*, to store Backup data and control information. Two of these (CATALOG and FILE-INFORMATION) are defined like VSAM KSDS clusters but are internally a proprietary Innovation data structure (note that they can be defined as true VSAM KSDS clusters, but for performance reasons Innovation does not recommend it). The third (FILE-DATA) is a true VSAM KSDS cluster.

The proprietary Innovation format data sets can optionally be in an enhanced format (selected by ENHANCED - YES on the definition panels). The enhanced format is recommended since it allows for dynamic expansion of overflow areas and decreases dependance on precalculation of overflow sizes. Installations which defined their repository files with releases prior to FDR/UPSTREAM-MVS V2.5.3 may want to define new files in enhanced format and copy them.

More information about the use, allocation and maintenance of the repository files is in Section 9.2.

2.5 CONTINUED

REPOSITORY CATALOG DATA SET

This data set retains information about the backups recorded by FDR/UPSTREAM. There will be a small set of records for each Backup version ("VERSIONDATE") recorded for each Workstation. The catalog also optionally contains history records detailing FDR/UPSTREAM operations; these history records are retained for a number of days specified in the FDR/UPSTREAM configuration. The catalog is a relatively small data set.

Selecting **option 2** on the FDR/UPSTREAM DEFINE menu will display a panel where you can specify parameters which allow FDR/UPSTREAM to calculate the size of the data set:

OPTION 3.2 – CATALOG DATA SET

```
---------------- FDR/UPSTREAM - Define the Catalog cluster --------------------
Command ===>

Please enter the necessary information to allocate a new Catalog cluster

  Data Set Name      ===> 'UPSTREAM.CATALOG.$UST.CLUSTER'
   (include the index level $UST in the dsname for best performance)

  Management Class   ===>             (blank for default)
  Storage Class      ===>             (blank for default)
  Data Class         ===>             (blank for default)

  Volume Serial      ===>             (required unless defaulted)

  Enhanced Format    ===> YES         (yes|no)

Storage Estimates:
  Number of backups to keep track of.... ===> 17500
  or
  Number of cylinders to allocate....... ===> 50

To copy the contents of an existing Catalog cluster into the new file, specify:
  Repro from dsname   ===>
```

If the data set is to be SMS-managed, you can specify the SMS classes to be assigned; these may be omitted if your installation's ACS routines will assign appropriate classes, or if the data set is NOT to be SMS-managed.

You can ask FDR/UPSTREAM to estimate the required size of the data set by entering the number of backups ("versiondates") for all workstations that will be recorded by FDR/UPSTREAM at any one time, or you may specify a data set size in cylinders; if you fill in one value and press ENTER, FDR/UPSTREAM will display its calculated value for the other. Press ENTER when you are satisfied with the values displayed.

For example, if you plan to backup 10 servers, and each server will retain (on average):

10 weekly full MERGE backups
5 incremental MERGE backups between each full backup (6 backups total each week)

then

backups/server = (6 backups/week) ∗ (10 weeks) = 60
total backups = 60 backups/server ∗ 10 servers = 600

FDR/UPSTREAM's calculations already include a generous factor for expansion and for history records, but since the catalog file is small, we suggest that you add your own factor to ensure sufficient space (e.g., specify 2000 instead of 600 in the example above).

If you are redefining the catalog cluster to make it larger or to copy to enhanced format, specify the name of the existing cluster at the bottom, and a REPRO step will be generated to copy the existing data. If this is omitted, the cluster will be initialized with a dummy record; in this case a subsequent REPRO will cause INSERTs which is considerably less efficient.

CONTINUED . . .

2.5 CONTINUED

FILE-INFORMATION DATA SET

This data set will contain one record for every file saved by FDR/UPSTREAM. It contains information such as the Workstation file/path name, file/path attributes, and the physical location of the data on the repository, Archive volume, or sequential backup. This data set may be quite large if you keep a large number of backups or backup a large number of files.

Selecting **option 3** on the FDR/UPSTREAM DEFINE menu will display a panel where you can specify parameters which allow FDR/UPSTREAM to calculate the size of the data set:

OPTION 3.3 – FILE-INFORMATION DATA SET

```
---------------- FDR/UPSTREAM - Define the File-Information cluster -----------
 Command ===>

 Please enter the necessary information to allocate a new File-Info cluster

   Data Set Name      ===> 'UPSTREAM.FILEINFO.$UST.CLUSTER'
    (include the index level $UST in the dsname for best performance)

   Management Class   ===>             (blank for default)
   Storage Class      ===>             (blank for default)
   Data Class         ===>             (blank for default)
   Volume Serial      ===>             (required unless defaulted)
   Enhanced Format    ===> YES         (yes|no)

 Storage Estimates
   Number of File Servers..................... ===> 5
   Average number of files per server......... ===> 30000
   Number of incrementals between full backups ===> 10
   Number of full backup cycles kept.......... ===> 7
   or
   Number of cylinders to allocate............ ===> 424

To copy the contents of an existing File-info cluster to the new file, specify:
  Repro from dsname   ===>
```

If the data set is to be SMS-managed, you can specify the SMS classes to be assigned; these may be omitted if your installation's ACS routines will assign appropriate classes, or if the data set is NOT to be SMS-managed.

You can ask FDR/UPSTREAM to estimate the required size of the data set by entering the number of different file servers (workstations) for which backups will be done, the average number of files on each workstation, the number of incremental backup and full backups per workstation, or you may specify a data set size in cylinders; if you change one or more or the first 4 values, FDR/UPSTREAM will display its calculated value for the size in cylinders. Press ENTER when you are satisfied with the values displayed.

Note: You can make the File-Information data set small when you are testing FDR/UPSTREAM, but Innovation suggests that you reallocate it with a generous amount of space for production.

If you are redefining the File-Information cluster to make it larger or to copy to enhanced format, specify the name of the existing cluster at the bottom, and a REPRO step will be generated to copy the existing data. If this is omitted, the cluster will be initialized with a dummy record; in this case a subsequent REPRO will cause INSERTs which is considerably less efficient.

CONTINUED . . .

2.5 CONTINUED

FILE-DATA CLUSTER

This VSAM KSDS will contain the data sent from the workstations **only** for *keyed* (on-line) or *non-keyed* (archive) backups are performed. The data is stored exactly as it was received, i.e. if the Backup was performed with compression, the data will be stored in the FILE-DATA CLUSTER in the compressed format. The data for a Backup with the *non-keyed* (Archive) attribute is temporarily stored in the FILE-DATA CLUSTER until the FDR/UPSTREAM Archive utility is run. In the case of *sequential tape* and *sequential disk* backups, no data will be written to the FILE-DATA CLUSTER.

The FILE-DATA CLUSTER will not be used if you only intend performing *sequential tape* and *sequential disk* backups and restores, including MERGE BACKUPS. If you do not plan to do any *keyed* or *non-keyed* backups, you may define this cluster as a small file.

If you plan to use the duplicate file support of MERGE BACKUPs (as described in Section 1.4 and 3.8), the backups of the duplicate files **will** be *keyed* backups, and you must estimate the number and size of the files that will be included in the special backup of the duplicate files when estimating the size of this cluster.

Selecting **option 4** on the FDR/UPSTREAM DEFINE menu will display a panel where you can specify parameters which allow FDR/UPSTREAM to calculate the size of the data set:

OPTION 3.4 – FILE-DATA CLUSTER

```
 ---------------- FDR/UPSTREAM - Define the File-Data cluster ------------------
Command ===>

Please enter the necessary information to allocate a new File-Data cluster

  Data Set Name      ===> 'UPSTREAM.FILEDATA.$UST.CLUSTER'
   (include the index level $UST in the dsname for best performance)

  Management Class   ===>             (blank for default)
  Storage Class      ===>             (blank for default)
  Data Class         ===>             (blank for default)

  Volume Serial      ===>             (required unless defaulted)

  Enhanced Format    ===>             (yes no)

  Storage Estimates
  Number of Keyed/Archive files......... ===> 5000
  Average number of bytes per file...... ===> 50000
  or
  Number of cylinders to allocate....... ===> 416

To copy the contents of an existing File-Data cluster to the new file, specify:
  Repro from dsname   ===>
```

If the data set is to be SMS-managed, you can specify the SMS classes to be assigned; these may be omitted if your installation's ACS routines will assign appropriate classes, or if the data set is NOT to be SMS-managed.

You can ask FDR/UPSTREAM to estimate the required size of the data set by entering the number of *keyed* and *non-keyed* backups that you expect will be stored here, or you may specify a data set size in cylinders; if you change either or the first 2 values, FDR/UPSTREAM will display its calculated value for the size in cylinders. Press ENTER when you are satisfied with the values displayed.

If you are redefining the File-Data cluster to make it larger, specify the name of the existing cluster at the bottom, and a REPRO step will be generated to copy the existing data. If this is omitted, the cluster will be initialized with a dummy record; in this case a subsequent REPRO will cause INSERTs which is considerably less efficient.

CONTINUED . . .

2.5 CONTINUED

GENERATING THE DEFINE JOBSTREAM

Once you have selected one or more of the data sets to define from the FDR/UPSTREAM DEFINE menu, that menu will display the text "* JCL GENERATED" next to each one you selected. On that menu, press END (PF3) to process that JCL. You will see:

DEFINE JCL PANEL

```
-------------------------- FDR/UPSTREAM - Define ------------------------------
COMMAND ===>

 Please select one of the following options or press the END key to cancel

   1 - Browse the generated JCL stream

   2 - Edit   the generated JCL stream

   3 - Submit the generated JCL stream

Upstream Program Library for STEPLIB DD (blank if LINKLIST) :
  Steplib  ===> 'FDR.UPSTREAM.LOAD24'

JCL Job statements:
 ( //useridA  JOB (ACCOUNT),'NAME',NOTIFY=userid                          )
 ( //*                                                                    )
 ( //*                                                                    )
 ( //*                                                                    )
```

Update the JOB statement JCL, if required. You can then browse the generated JCL, edit it, or submit it for execution. The data sets will not be defined until you execute the jobstream.

USTCAMS UTILITY

You will find that PGM=USTCAMS is used in the generated jobstream for definition of the repository data sets. USTCAMS is a front-end to the IBM IDCAMS utility and accepts all of the control statements of IDCAMS. However, USTCAMS allows the On-line Repository data sets to be defined as either VSAM KSDS clusters, or as data sets which use a Innovation proprietary format which can provide improved performance. If any of the cluster names in the 3 DEFINE statements have an index level of $UST (for example, UPSTREAM.CATALOG.$UST.CLUSTER), it will be defined with the proprietary format, otherwise they will be defined as normal VSAM. In any case, the data sets are used like normal VSAM once they are defined. For best performance, Innovation recommends that the catalog data set and the file-information data set be defined with $UST and that the file-data dataset be defined as a VSAM KSDS; this is the defaults presented by the ISPF panels just described. If you have defined any of the FDR/UPSTREAM data sets in the proprietary format, you **MUST** use USTCAMS instead of IDCAMS for all operations on those data sets, including REPROs and LISTCATs.

If you prefer to define the FDR/UPSTREAM repository files yourself instead of using the ISPF dialogs, you will find an example of the USTCAMS jobstream to do so in member USTDEFIN in the FDR/UPSTREAM ICL (Installation Control Library). However, we strongly recommend use of the dialogs.

CONTINUED . . .

2.6 COPY THE "USTAPPL" MEMBER INTO VTAMLST

If you plan to use strictly TCP/IP for communications between FDR/UPSTREAM-MVS (no SNA/APPC) and its client workstations, and do not plan to use mainframe-initiated FDR/UPSTREAM operations via USTBATCH, you can skip this step.

Tailor the ICL member "USTAPPL" and copy it into your SYS1.VTAMLST dataset to define to VTAM the application IDs that will be used by FDR/UPSTREAM. The member name in VTAMLST may be USTAPPL or any name of your choice. You can activate it with the console command "V NET,ACT,ID=membername". You will probably want to add the member name to the "ATCCONxx" member of VTAMLST in order that the FDR/UPSTREAM application names are automatically activated when VTAM is started.

VTAM APPLICATION IDS

The first application, UPSTREAM, is used by the FDR/UPSTREAM-MVS on-line task. If you change the application name, you must also change the name in your FDR/UPSTREAM configuration (the APPLID= parameter described in Section 3.4).

The other applications, UPSTRnnn, are used by the FDR/UPSTREAM batch initiation utility, USTBATCH. You may want to increase or decrease the number of these APPL definitions depending on how many USTBATCH jobs may be running concurrently. If you change the prefix, UPSTR, you will also have to specify the prefix on the APPLPREF= statement input to USTBATCH.

On the APPL statements, DLOGMOD= defines the default log mode table entry name that will be used when FDR/UPSTREAM establishes a session to a workstation, or when USTBATCH establishes a session to FDR/UPSTREAM. #INTER is a mode table entry provided by IBM in ACF/VTAM V3.4 and above; it is in the default mode table ISTINCLM and can be used successfully with FDR/UPSTREAM; actually, FDR/UPSTREAM will override the parameters in #INTER with those shown in the sample USTMODE table in the next section, allowing 4K RU sizes and pacing values of 24.

FDR/UPSTREAM does not require that you install the USTMODE mode table entry described in the next section unless you need to override the parameters shown; if you do install it, you will need to update the DLOGMOD= parameters in the USTAPPL member and add the MODETAB= parameter to specify the name of the mode table that contains it (unless you added it to ISTINCLM).

SAMPLE MEMBER USTAPPL

```
USTAPPL VBUILD TYPE=APPL
* ONLINE UPSTREAM MAIN APPL DEFINITION
UPSTREAM APPL    APPC=YES,                                          X
                 AUTH=VPACE,                                        X
                 AUTOSES=1,                                         X
                 DLOGMOD=#INTER,                                    X
                 DDRAINL=ALLOW,                                     X
                 PARSESS=YES,                                       X
                 SECACPT=NONE,                                      X
                 VPACING=24
* APPL #1 FOR MAINFRAME INITIATION
UPSTR001 APPL    APPC=YES,                                          X
                 AUTH=VPACE,                                        X
                 AUTOSES=1,                                         X
                 DLOGMOD=#INTER,                                    X
                 DDRAINL=ALLOW,                                     X
                 EAS=1                                              X
                 PARSESS=YES,                                       X
                 SECACPT=NONE,                                      X
                 VPACING=8
* APPL #2 FOR MAINFRAME INITIATION
UPSTR002 APPL    APPC=YES,                                          X
                 AUTH=VPACE,                                        X
                 AUTOSES=1,                                         X
                 DLOGMOD=#INTER,                                    X
                 DDRAINL=ALLOW,                                     X
                 EAS=1,                                             X
                 PARSESS=YES,                                       X
                 SECACPT=NONE,                                      X
                 VPACING=8
* APPL #3 FOR MAINFRAME INITIATION
UPSTR003 APPL    APPC=YES,                                          X
                 AUTH=VPACE,                                        X
                 AUTOSES=1,                                         X
                 DLOGMOD=#INTER,                                    X
                 DDRAINL=ALLOW,                                     X
                 EAS=1,                                             X
                 PARSESS=YES,                                       X
SECACPT=NONE,                                                       X
                 VPACING=8
```

Warning: you MUST include a VPACING value in the APPL definition to set the "primary receive" pacing count. Failure to do so could result in the UPSTREAM workstation overrunning the mainframe VTAM I/O buffers.

2.7 MODIFY AND ASSEMBLE THE VTAM MODE TABLE

If you plan to use strictly TCP/IP for communications between FDR/UPSTREAM-MVS and its client workstations (no SNA/APPC), and do not plan to use mainframe-initiated FDR/UPSTREAM operations via USTBATCH, you can skip this step.

This step is optional and usually unnecessary. As described in the previous section, the IBM-provided mode table entry #INTER can be successfully used by FDR/UPSTREAM; UPSTREAM will override the parameters in #INTER with default values that match the parameters shown in the sample USTMODE mode table entry below. There is no need to install and use USTMODE unless you desire or are directed by Innovation to override some of those values. If so, you will need to install the USTMODE mode table described below, with the desired modifications.

Tailor, assemble, and link-edit the "USTMODE" ICL member into your installation's SYS1.VTAMLIB dataset. (Depending on your installation's preferences, this may instead be link-edited into your system's LINKLIB dataset.) If you are unable to do this yourself, you may need to consult your VTAM System Programmer for assistance.

If Logical Units (LUs) running FDR/UPSTREAM will also be used for other applications (such as LU-2 3270-type sessions), you may copy the "USTMODE" entry into the existing VTAM mode tables used by those LUs, and reassemble, linkedit, and reload those tables; the USTMODE entry will be selected when the LU is used for FDR/UPSTREAM. You may also choose to add USTMODE to the IBM default mode table, ISTINCLM, where it will be available to all LUs and applications.

In the current releases of ACF/VTAM, this table may be activated and associated with workstation LUs using the "F NET,TABLE" command without requiring a restart of VTAM. Consult your VTAM documentation for the command syntax required. However, changes made by command are effective only until VTAM is shut down; you will still need to change the FDR/UPSTREAM application definitions and possibly the workstation definitions to use USTMODE.

SAMPLE MEMBER USTMODE

```
MODEUST  MODETAB
*
USTMODE  MODEENT LOGMODE=USTMODE,                                X
               TYPE=X'00',                                       X
               FMPROF=X'13',                                     X
               TSPROF=X'07',                                     X
               PRIPROT=X'B0',                                    X
               SECPROT=X'B0',                                    X
               COMPROT=X'50B1',                                  X
               RUSIZES=X'8989',                                  X
               SSNDPAC=24,                                       X
               SRCVPAC=24,                                       X
               PSNDPAC=24,                                       X
               PSERVIC=X'060200000000000000002F00'
         MODEEND
         END   MODEUST
```

In the table above, RUSIZES=X'8989' allows FDR/UPSTREAM to use 4K (4096 byte) transmission blocks (Request Units). The pacing parameters (SSNDPAC – secondary send pacing, SRCVPAC – secondary receive pacing, PSNDPAC – primary send pacing) allow for maximum pacing windows of 24 (these may be reduced during BIND negotiation when the APPC session is established). Do not change these values unless recommended by Innovation.

2.8 SET TCP/IP OPTIONS

If you are going to use TCP/IP for some or all of your workstations to communicate with FDR/UPSTREAM, you may need to change some TCP/IP parameters and get some TCP/IP information, as explained below.

ADDRESS AND WELL-KNOWN PORT

In order for workstations using TCP/IP to contact FDR/UPSTREAM-MVS, 2 pieces of information are required:

- The network address of the MVS host system, usually expressed as 4 decimal numbers separated by periods, e.g., 152.12.93.1. During FDR/UPSTREAM start-up the default TCP/IP host address is displayed (it is also displayed by the FDR/UPSTREAM ISPF status panel), but this address may not be correct for every workstation if you have multiple TCP/IP interfaces to the mainframe. When configuring FDR/UPSTREAM for TCP/IP on a workstation, verify this address with the system programmer or network administrator responsible for TCP/IP on your system.
- A “well-known port” number, within your TCP/IP MVS host system, on which FDR/UPSTREAM will listen for requests from workstations. By default, FDR/UPSTREAM uses port 1972, but this can be changed in the FDR/UPSTREAM configuration.

The address and port number will have to be supplied when FDR/UPSTREAM-PC is configured on a workstation using TCP/IP (but the port number there also defaults to 1972).

FDR/UPSTREAM will use the well-known port number you assign (or the default of 1972) as long as that port is not already in use by some other application. During FDR/UPSTREAM testing, that port will probably be available, so no TCP/IP changes are required, but when FDR/UPSTREAM is in production, you will probably want to reserve that port number to ensure it is always available when FDR/UPSTREAM is started.

For IBM's TCP/IP: edit the TCP/IP profile dataset. It may be called "TCPIP.PROFILE.TCPIP"; check with your TCP/IP systems programmer. Find the PORT statement in that profile, and add a line such as:

```
1972 TCP UPSTREAM          # well-known port for FDR/UPSTREAM-MVS
```

1972 is the port number, TCP is the protocol, and "UPSTREAM" is the name of the FDR/UPSTREAM online main task, usually the name of the cataloged procedure used to start FDR/UPSTREAM; this will usually be "UPSTREAM" but may vary if you have changed the startup procedure for UPSTREAM (See Sections 2.9 and 5.1). The text after the # is comments.

For Interlink's SNS/TCPaccess: edit the ACPCFGxx member in the TCP/IP PARM data set (it will be called something like TCPSNS.V410.PARM, check with your TCP/IP systems programmer). On the TIB statement, insure that the FDR/UPSTREAM port is included in the ports defined by the TADDRUSE parameter and not included in the ports defined by the TADDRASSIGN parameter; this specifies that the port will only be available to applications (such as UPSTREAM) which explicitly request it.

If the port number is in use by another task when FDR/UPSTREAM-MVS is started, or (for IBM TCP/IP) if the task name in the reserved port list does not match the actual FDR/UPSTREAM task name, you will receive a message from UPSTREAM indicating that the port is in use and TCP/IP access will not be available until the situation is corrected and FDR/UPSTREAM-MVS is restarted.

The "OS/390 eNetwork Communications Server" (the name of the IBM TCP/IP included with OS/390 V2R4 and above) uses Open Edition (UNIX services for OS/390) for the HPNS API; this requires that the security userid associated with the FDR/UPSTREAM started task have an OE segment (see the IBM "eNetwork" documentation for details).

2.9 INSTALL FDR/UPSTREAM ONLINE PROCEDURE

The ICL member “USTPROC” is a sample PROC to start and run the on-line task of FDR/UPSTREAM-MVS. It will need to be tailored to your installation specifications and copied into an appropriate system PROCLIB as member “UPSTREAM” (or another name of your choice). If you are unable to do this, consult your MVS System Programmer for assistance. See Section 5 “Operation” for details on this use of this proc.

ICL member "USTRDR" is another PROC which you may want to copy into a system PROCLIB. It allows batch jobs to be submitted from any PDS by entering a console command. It can be used with USTSCHED, the FDR/UPSTREAM automatic scheduler. See Section 6.9 for details on its use.

SAMPLE PROC USTPROC

```
//UPSTREAM   PROC  OUT=X
//*
//* RUN ONLINE UPSTREAM
//*
//MAIN      EXEC  PGM=USTMAIN,REGION=0M,TIME=1440 ,PARM='SCHEDULE'
//STEPLIB   DD    DSN=your.upstream.loadlib,DISP=SHR
//USTLOG    DD    SYSOUT=&OUT
//USTLOG2   DD    SYSOUT=&OUT
//USTSUMM   DD    SYSOUT=&OUT
//USTSUMM2  DD    SYSOUT=&OUT
//USTINFO   DD    SYSOUT=&OUT
//USTSNAP   DD    SYSOUT=&OUT
//SYSUDUMP  DD    SYSOUT=&OUT
//SYSOUT    DD    DUMMY         FOR TAPE RESTORES (SORT OUTPUT)
//SYSIN     DD    DUMMY,DCB=BLKSIZE=80  FOR OLDER XA SYSTEMS
//NOFASTC   DD    DUMMY         CIRCUMVENT PROBLEMS WITH PDSMAN
//INTRDR    DD    SYSOUT=(A,INTRDR),DCB=BLKSIZE=80  FOR SUBMIT
//USTCONFG  DD    DSN=your.upstream.config.file(member),DISP=SHR
//USTSCHED  DD    DSN=your.upstream.config.file(schedule),DISP=SHR
//USTCATLG  DD    DSN=your.upstream.catalog.cluster,DISP=SHR
//USTFILEI  DD    DSN=your.upstream.fileinfo.cluster,DISP=SHR
//USTFILEC  DD    DSN=your.upstream.filedata.cluster,DISP=SHR
```

EXEC STATEMENT

Specifies the FDR/UPSTREAM main online program, PGM=USTMAIN. REGION=0M is recommended to allow FDR/UPSTREAM to acquire whatever virtual storage is required to perform the requested operations. Certain startup parameters can be specified via the PARM= operand on the EXEC statement (remove the blank before ",PARM" in the sample proc) or via a PARM= override on the console START command used to start FDR/UPSTREAM-MVS (See Section 5 "Operation"). If multiple values must be specified, separate them by commas. Some supported parms are:

- SCHEDULE – will automatically start USTSCHED (the FDR/UPSTREAM automatic scheduler) at FDR/UPSTREAM startup. If specified, the optional USTSCHED DD must be included.
- NOMAINT – will bypass the automatic execution of the USTMAINT utility during FDR/UPSTREAM-MVS startup. However, since USTMAINT must be run periodically in order to cleanup any obsolete entries in the online repository, Innovation does not recommend that you run this way normally.
- TCPHPNS – If you are using IBM TCP/IP V3R2, both the IUCV and HPNS APIs are supported by FDR/UPSTREAM-MVS. If this parm is omitted, IUCV will be used (for compatibility with earlier releases). To use HPNS (High Performance Native Sockets), specify PARM=TCPHPNS. For TCP/IP V3R3 and beyond, HPNS is automatically used.

STEPLIB DD STATEMENT

This is the FDR/UPSTREAM-MVS load library created earlier in this installation process. It must be an APF-authorized library.

2.9 CONTINUED

USTLOG DD STATEMENT

This dataset will contain all the messages from FDR/UPSTREAM-MVS. Its format is DSORG=PS, RECFM=VB, LRECL=134. The blocksize defaults to 6233 if the data set is on disk, but you can specify a larger value (smaller values are ignored); BLKSIZE=138 is forced if it is a SYSOUT data set. See Section 10 for details on its contents.

USTLOG2 DD STATEMENT

This optional data set is the alternate log for FDR/UPSTREAM-MVS. Its format and contents are the same as USTLOG. You can switch between USTLOG and USTLOG2 as the active log data set with the

F UPSTREAM,SWITCHLOG

console command (See Section 5). This should be used **only** when the log data sets are on disk and you use a program to process the log for reporting; you can close and process the log without shutting FDR/UPSTREAM down (be sure and specify DISP=SHR on the USTLOG and USTLOG2 DD statements). Note that on subsequent SWITCHLOG commands FDR/UPSTREAM will write over the log dataset just opened; any data which has not been saved or reported upon will be lost.

USTSUMM DD STATEMENT

This optional dataset will contain a one-line summary of each operation performed by FDR/UPSTREAM. Its format is DSORG=PS,RECFM=FB,LRECL=133. The blocksize defaults to 1330 if the data set is on disk, but you can specify any value which is a multiple of 133; BLKSIZE=133 is forced if it is a SYSOUT data set. See Section 10 for details on its contents.

USTSUMM2 DD STATEMENT

This optional data set is the alternate summary for FDR/UPSTREAM-MVS. Its format and contents are the same as USTSUMM. You can switch between USTSUMM and USTSUMM2 as the active summary data set with the “F UPSTREAM,SWITCHLOG” console command (See Section 5), but **only** if there is also a USTLOG2 alternate log data set. This should be used **only** when the summary data sets are on disk and you use a program to process them for reporting; you can close and process them without shutting FDR/UPSTREAM down (be sure and specify DISP=SHR on the USTSUMM and USTSUMM2 DD statements). Note that on subsequent SWITCHLOG commands FDR/UPSTREAM will write over the summary dataset just opened; any data which has not been saved or reported upon will be lost.

USTINFO DD STATEMENT

If one or more of the FDR/UPSTREAM on-line repository data sets have been defined using Innovation's proprietary format (“$UST” as an index level in the name), this file will contain messages about their usage.

USTSNAP DD STATEMENT

Under certain error circumstances, FDR/UPSTREAM-MVS will take an MVS “SNAP” dump for problem diagnosis. This data set will contain the “SNAP” dump if one is taken. The format of this data set should be: DSORG=PS,LRECL=125,BLKSIZE=1632,RECFM=VBA.

INTRDR DD STATEMENT

This is used for submission of jobs by the scheduling utility USTSCHED. It should point to a JES internal reader. If omitted, USTSCHED will dynamically allocate an internal reader, so it can safely be omitted.

SYSUDUMP DD STATEMENT

In the event of a catastrophic error, this dataset will contain a system dump taken by MVS. This dump may prove invaluable in resolving the problem.

USTCONFG DD STATEMENT

This is the configuration table dataset created as output from the FDR/UPSTREAM-MVS Configurator run as part of these installation procedures. If the configuration dataset is a PDS, the member name of the current configuration must be specified. This configuration will be used during the start-up of FDR/UPSTREAM, but the configuration can be changed while FDR/UPSTREAM is running. The characteristics of this data set must be RECFM=FB and LRECL=120 (any blocksize which is a multiple of 120 is acceptable).

CONTINUED . . .

2.9 CONTINUED

USTSCHED DD STATEMENT

This optional DD statement must be included if you will be using the FDR/UPSTREAM-MVS automatic scheduler (USTSCHED). It points to the dataset where the schedule definitions, maintained by the FDR/UPSTREAM ISPF interface (See Section 6.9), are stored. This will usually be the same as the configuration dataset pointed to by USTCONFG, but it can be a separate dataset if it has the proper DCB characteristics of RECFM=FB and LRECL=120 (any blocksize which is a multiple of 120 is acceptable). The member name specified contains the schedule definition which will be used by default, but the member name can be overridden when USTSCHED is started, as described in Section 5.

USTCATLG DD STATEMENT

This dataset is the FDR/UPSTREAM-MVS Repository Catalog data set.

USTFILEI DD STATEMENT

This dataset is the FDR/UPSTREAM-MVS Repository File-Information data set.

USTFILEC DD STATEMENT

This dataset is the FDR/UPSTREAM-MVS Repository File-Data Cluster. If you have decided not to allocate this data set, because you intend only performing sequential tape and DASD backups using FDR/UPSTREAM, you should code this DD statement as “DUMMY”.

2.10 VERIFY THE NETWORK CONFIGURATION

Care must be taken in setting up the network configuration. If the workstations which will communicate with FDR/UPSTREAM already have a TCP/IP or VTAM SNA connection to the host, little or no change may be required, but you should review the notes below. If the workstation connection to the host is new, review the appropriate VTAM or TCP/IP documentation, and then review our notes.

Note that, by default, FDR/UPSTREAM uses a maximum transmission record size of 6000 bytes during backups. This record size can be changed at the workstation (part of the FDR/UPSTREAM PC backup parameters), but Innovation recommends that you use the default of 6000 for most operations. Restores will use whatever record size was used during the backup. This record may be segmented by VTAM or TCP/IP for transmission, depending on the largest transmission block supported by the link between the workstation and the host; this may impact FDR/UPSTREAM performance, as described below.

TCP/IP CONFIGURATION

If you intend to use TCP/IP for communication between any workstations and FDR/UPSTREAM, and you have already established a TCP/IP link between the workstation and your MVS host, there is nothing more that must be done to enable TCP/IP for FDR/UPSTREAM. As noted in Section 2.8, the TCP/IP host network address and the well-known port used by UPSTREAM must be supplied when FDR/UPSTREAM is configured on the workstation. If USTBATCH will be used to initiate operations on TCP/IP-attached workstations, the TCP/IP network address and FDR/UPSTREAM port number of the workstation will be needed as input to USTBATCH unless the Registered Name Facility of FDR/UPSTREAM is used (Section 8.8).

However, you may need to tune TCP/IP for best performance. You will get better performance and lower TCP/IP CPU overhead if the FDR/UPSTREAM transmission record can be transmitted to and from the workstation in a small number of packets (MTUs). The packet-size should be at least 2088 if this connection supports it (some ETHERNET connections require smaller values.) You may want to try larger MTU values to see if performance is improved and overhead reduced.

For IBM's TCP/IP: IBM manual SC31-7188 "IBM TCP/IP Performance Tuning Guide" is a good guide; it covers all current releases of IBM TCP/IP and gives tuning information for all parts of the TCP/IP network (MVS, OS/2, DOS, etc.). If you have a non-IBM TCP/IP product on your workstations, you may need to review vendor documentation for that product.

IBM TCP/IP

Find the GATEWAY statement in your TCP/IP profile data set (may be called "TCPIP.PROFILE.TCPIP"; check with you TCP/IP systems programmer) for the lines that describe the connections that will be used with FDR/UPSTREAM. The "packet-size" is the MTU size, as in this example:

```
GATEWAY
 *  Network     first-hop     driver     packet-size     subnet-mask
    130.50          =          TR1         2088              0
```

The TCP/IP command OBEYFILE can be used to reread the profile and update packet sizes while TCP/IP is running (see your IBM MVS TCP/IP documentation).

Note: in OS/390 V2R5 and above, IBM's TCP/IP (renamed "eNetwork Communiation Server for OS/390"), uses Open Edition services for HPNS. Because of this, the security userid under which the FDR/UPSTREAM/MVS started task is run must have an "OE Segment". See IBM documentation for "eNetwork" and your security system for more information.

If you will be running multiple concurrent FDR/UPSTREAM operations through TCP/IP, you may also have to increase the amount of bufferspace used by TCP/IP.

In TCP/IP prior to OS/390 V2R5, the profile parameters are DATABUFFERPOOLSIZE and LARGEENVELOPESIZE.

In OS/390 V2R5 and beyond, the profile parameters are TCPSENDBFRSIZE, TCPRCVBUFRSIZE, and (in OS/390 V2R6 and above only) TCPMAXRCVBUFSIZE. Innovation recommends 64K for the first two and 512K for the last.

INTERLINK SNS/TCPaccess

The "Administration Guide" has some notes on tuning. They suggest that you check the ACPCFGxx member in the TCP/IP PARM data set (it will be called something like TCPSNS.V310.PARM, check with your TCP/IP systems programmer) and find the NETWORK statements for the connections that will be used with FDR/UPSTREAM. The MTU parm specifies the MTU (packet) size; you may also need to specify the MSSDEF parm with the same value as MTU and MSSOPT(ALWAYS) so that the Maximum Segment Size (MSS) will be the MTU size.

Note that workstation configurations may have to be modified to take advantage of any changes in MTU size.

2.10 CONTINUED

VTAM CONFIGURATION

If you intend to use VTAM APPC for communication between any workstations and FDR/UPSTREAM-MVS, your VTAM Systems Programmer (or whoever maintains your VTAM configuration) must ensure that the workstations you intend to use are correctly configured for SNA LU Type-6.2 sessions within VTAM. This configuration may involve a new VTAM definition if the PC does not already have the same type of SNA connectivity (changing from a gateway connection to a direct connection, for example), or if this is a new SNA connection. Below are samples showing PU definitions for PCs. Inform the PC administrator of the PU name, the LU name, LU Local Address, and mode names; these will all be required to configure the SNA software on the workstation. The following is a sample worksheet containing the information required to configure the workstation.

Parameter	Your Value
PU name	
LU name	
LU Local Address	
Mode Name	
PC LAN Address (3174 only)	
Host device LAN Address (LAN direct connect only)	

SNA PC Administrator Worksheet

If you are configuring a new PU through a 3174 you must configure the 3174 with the CUADDR defined in the PU definition, and the Token-Ring address which is defined in the PC (question 941 in the 3174 configuration). Inform the PC administrator of the Token-Ring address which has been defined for him and the Token-Ring address of the 3174.

The necessary configuration and parameters vary greatly depending on the communication hardware and software in use, so consult the IBM VTAM manuals for your level of VTAM plus manuals for other hardware/software for guidance (but also see the notes below).

The VTAM mode table entry used when a workstation establishes a session to FDR/UPSTREAM-MVS is specified in the workstation customization. As described in Section 2.6 and 2.7, this may be #INTER or USTMODE. Whatever mode table entry name is used, it must be available in either the default IBM mode table ISTINCLM (#INTER is in this table) or in the mode table named by the MODETAB= operand in the VTAM workstation definition. The mode table entry defines parameters used for VTAM communication. However, depending on options set in your workstation communication software, your LAN software, or the control unit which attaches your LAN to the mainframe, those parameters may be overridden when the VTAM APPC session is established. If the FDR/UPSTREAM sessions will be established cross-domain (multiple VTAMs) the mode table entry must be available to all VTAMs involved.

FDR/UPSTREAM normally uses a 4K RU transmission size. Review your options for all parts of the communication link to ensure that 4K RUs can be handled, if possible. You may need to review your VTAM buffer sizes, and these VTAM/NCP parameters: MAXBFRU, MAXDATA, UNITSZ, TRANSFR, BFRS. Consult your VTAM and NCP documentation for guidance on setting these for best FDR/UPSTREAM performance, or contact Innovation Technical Support for assistance.FDR/UPSTREAM can work with both “dependent LUs” and “independent LUs”, but Innovation recommends dependent LUs; they are simpler to define and avoid problems with adaptive pacing in some releases of VTAM and NCP. Note that IBM’s NS/DOS and NS/Windows only support independent LUs.

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2.10 CONTINUED

For channel-attached SNA 3174 control units, be sure to specify VPACING=0 and DELAY=0 on the PU statements associated with LUs that will be used with FDR/UPSTREAM, for maximum performance. This is a typical VTAM major node definition for a workstation on a 3174:

```
WKS016   VBUILD TYPE=LOCAL
PUS016   PU     CUADDR=551,ISTATUS=ACTIVE,MAXBFRU=12,                X
                MODETAB=SNAMODE,USSTAB=USSSNA,VPACING=0,DELAY=0
* DEPENDENT LUS
LU2AS016 LU     LOCADDR=2
LU3AS016 LU     LOCADDR=3
* INDEPENDENT LUS
LU0AS016 LU     LOCADDR=0
LU0BS016 LU     LOCADDR=0
```

For channel-attached 3172 control units or 37x5 devices, be sure to specify a VPACING value (8 is recommended) instead of the default of VPACING=2. This is a typical VTAM major node definition for a workstation on a 3172 or 37x5:

```
WKS035   VBUILD TYPE=SWNET,MAXGRP=1,MAXNO=1
PUS035   PU     ADDR=23,DISCNT=NO,DYNLU=NO,                         X
                CPNAME=PUS035,IDBLK=050,PUTYPE=2,                   X
                IDNUM=00023,MAXPATH=1,MAXOUT=7,                     X
                MAXDATA=1929,              see note                 X
                MODETAB=SNAMODE,USSTAB=USSSNA
* DEPENDENT LUS
LU2AS035 LU     LOCADDR=2
LU3AS035 LU     LOCADDR=3,PACING=8,VPACING=8
```

Note: for best restore performance, MAXDATA= should be set to the maximum RU size supported by the APPC program on the workstation, plus 9. MAXDATA=1929 supports outbound RU sizes up to 1920, which are used by many APPC programs, without segmentation. If the RU (request unit) size exceeds MAXDATA-9, the RU will be segmented which will impact restore performance. If the documentation for your APPC program (or information in the FDR/UPSTREAM-PC manual about your program) indicates that a larger RU size is supported, a larger value can be used.

2.11 RUN THE FDR/UPSTREAM-MVS CONFIGURATOR

FDR/ UPSTREAM CONFIGU-RATION

You will now need to define the configuration to be used by FDR/UPSTREAM-MVS. This configuration defines options to be used by FDR/UPSTREAM as a whole, and also defines the workstation profiles to be used by the workstations which will communicate with FDR/UPSTREAM-MVS.

You should now review Section 3 to become familiar with the FDR/UPSTREAM-MVS Configurator used to define the workstations eligible to use the FDR/UPSTREAM product and their attributes. You may define or update the configuration using a batch execution of the Configurator (as shown in Section 3) or you may do so using the FDR/UPSTREAM ISPF dialog (as shown in Section 6).

2.12 INSTALL THE ISPF DIALOG

The FDR/UPSTREAM-MVS ISPF dialog can be invoked at any time, from any TSO userid that is authorized to read the UPSTREAM dialog libraries, by going to ISPF option 6 (TSO COMMAND) and entering:

EXEC '*upstream.clist.library*(USTALLOC)'

as shown in Section 2.4. However, this is awkward, so two shortcuts are available:

ADDING UPSTREAM TO A MENU

You may add FDR/UPSTREAM as an option on the ISPF main menu or any menu of your choice. In the FDR/UPSTREAM panel data set, there are two example panels showing how to add FDR/UPSTREAM to the ISPF main menu:

ISR@V3X - for ISPF V3.x
ISR@V4X - for ISPF V4.x

You can make similar modifications to your ISPF main menu (panel ISR@PRIM) or to any other ISPF menu.

ADDING UPSTREAM AS AN ISPF COMMAND

You can add the UPSTREAM command to an ISPF command table by entering the command "USTCMDS" on the FDR/UPSTREAM main menu.

The modified command table will be stored in the first library in the ISPTLIB concatenation for this TSO userid. If the user has a private table library, it will normally be the first one in that concatenation, so the updated command table will be available only to this user. If the user does not have a private library, but has update authority to the first public library in ISPTLIB, it will be updated, and will be available to any userid using that library. However, you will have an option to specify a different table library before it is actually stored. If you do choose a different table library, that library will have to be in the ISPTLIB concatenation, prior to any other library containing a table by the same name. The ISPF command table name consists of a prefix followed by the constant CMDS (ISPCMDS by default); for ISPF version 4.2 or higher, preferably update the site command table.

The FDR/UPSTREAM dialog can now be entered from almost any ISPF panel by entering "UPSTREAM" or just "UPS" on the command line.

AUTHORIZING DIALOG PROGRAMS

Several of the functions available in the FDR/UPSTREAM ISPF dialog (See Section 6) require that several program names be added to the TSO/E list of authorized programs:

USTATUS - for status displays (option 2)
USTCMD - for issuing commands to FDR/UPSTREAM (option 6)
USTRPORT - for generating dynamic reports (option 7)
USTDUPRT - for the duplicate file audit (option 9)
USTBATCH - if the USTBATCH security feature described in Section 4 is used (option 1)

If you don't intend to give TSO users access to one or more of the above facilities, you can omit the associated program name.

In TSO/E Version 2 Release 4 and above, programs are authorized by modifying member IKJTSOxx in SYS1.PARMLIB. The program names must be added to both the AUTHPGM and AUTHTSF lists in that member. If you have the proper authority, you may issue the TSO command:

PARMLIB UPDATE(xx)

to active the updated IKJTSOxx member immediately; otherwise it will be activated after the next IPL.

In versions of TSO/E prior to V2R4, you may be required to update a table in a program to authorize “USTATUS”; consult the TSO/E Customization manual for your level of TSO/E.

RESTRICTING USERS

If you like, you can restrict certain TSO userids from using some of the FDR/UPSTREAM ISPF functions, or authorize only certain userids for certain functions (such as the configuration options or commands). To do so, edit member USTPRIME in the FDR/UPSTREAM panel library and modify the sample authorization code shown there.

You can also restrict the ability to issue FDR/UPSTREAM commands from TSO or batch jobs by using the PROGRAM CONTROL option of RACF (or the equivalent facilities of other security products) to restrict the use of program USTCMD to certain userids.

2.13 EXTENDING AN FDR/UPSTREAM-MVS TRIAL

Production (licensed) users of FDR/UPSTREAM, and initial trial (evaluation) users do not have to perform this step. Trial users whose trial period is about to expire (see messages UST107W and UST111E in Section 10), may need to apply a zap provided by Innovation to extend the trial expiration; contact Innovation if you intend to continue evaluating FDR/UPSTREAM.

Member "USTZAP" in the ICL library contains a sample jobstream for extending the expiration date; replace the VER and REP statements with data provided by Innovation. Replace the "SYSLIB" DD statement with one pointing to your FDR/UPSTREAM-MVS load library and submit the "ZAP".

SAMPLE MEMBER USTZAP

```
//*
//* UPSTREAM MVS TRIAL EXTENSION ZAP
//*
//ZAP         EXEC  PGM=AMASPZAP
//SYSPRINT    DD    SYSOUT=*
//SYSLIB      DD    DSN=your.upstream.load.library,DISP=SHR
//SYSIN       DD    *
NAME UST020U
VER aaaa zzzz,zzzz,zzzz,zzzz
VER bbbb zzzz,zzzz
VER cccc zzzz,zzzz
REP aaaa xxxxxxxx,xxxxxxxx
REP bbbb xxxxxxxx
REP cccc xxxxxxxx
```

2.14 CONVERT ONLINE REPOSITORY DATA SETS TO PROPRIETARY FORMAT

Existing users of FDR/UPSTREAM may wish to convert the on-line Repository Catalog and File-Information data sets from VSAM to the Innovation proprietary format for improved performance, or to the enhanced proprietary format for improved space management.

To do so, simply define the new Catalog and File-Information data sets with the FDR/UPSTREAM ISPF dialog. You can use an option on those panels to copy existing data to the new data sets, or if you prefer, use the USTCAMS utility to REPRO from the old VSAM clusters to the new data sets, as shown in the sample jobstream below. If space limitations require that you delete the old VSAM clusters before defining the new data sets, you may REPRO the old data out to tape or disk, and then REPRO the data back after defining the new data sets. **You must use the USTCAMS utility instead of IDCAMS.**

If you wish to convert the files back to VSAM, simply reverse the process.

Of course, the DD statements in the UPSTREAM proc and all other FDR/UPSTREAM jobstreams must be updated to point to the new data set names.

SAMPLE CONVERT JOBSTREAM

```
//*
//* CONVERT VSAM REPOSITORY DATA SETS TO INNOVATION FORMAT
//*
//REPRO       EXEC  PGM=USTCAMS,REGION=4096K
//SYSPRINT    DD    SYSOUT=*
//USTINFO     DD    SYSOUT=*
//SYSIN       DD    *
    REPRO IDS(upstream.catalog.CLUSTER) -
      ODS(upstream.catalog.$UST.CLUSTER)
    REPRO IDS(upstream.fileinfo.CLUSTER) -
      ODS(upstream.fileinfo.$UST.CLUSTER)
/*
```

2.15 REORGANIZE ONLINE REPOSITORY DATA SETS

REORGANIZE REPOSITORY DATA SETS

Like all keyed files, the data sets of the FDR/UPSTREAM On-line Repository must be periodically reorganized, in order to recover space for deleted records, make room for new records, and improve performance.

A batch reorganization can be done anytime that the FDR/UPSTREAM on-line task is not running, and no other FDR/UPSTREAM utilities are executing.

If the data set to be reorganized was defined with the REUSE option, or was allocated in the Innovation proprietary format, the reorganization can be easily accomplished by using the USTCAMS utility to REPRO the file to be reorganized to tape or disk, and then REPROing the data back into the file. An example of this is shown below. If the data set is a VSAM KSDS without the REUSE option, it must be DELETEd and reDEFINEd between the REPROs.

Note: Innovation recommends that this reorganization be done by the USTREORG utility while FDR/UPSTREAM is operating. See Section 5.7 for details.

SAMPLE REORGANIZATION JOBSTREAM

```
//*
//* REORGANIZE THE FDR/UPSTREAM CATALOG DATA SET
//*
//REORG       EXEC  PGM=USTCAMS,REGION=4096K
//SYSPRINT     DD   SYSOUT=*
//USTINFO      DD   SYSOUT=*
//BACKUP       DD   DSN=upstream.catalog.backup,UNIT=tape,
//            DISP=(,CATLG),DCB=(RECFM=VB,LRECL=32756,
//            BLKSIZE=32760)
//CATALOG      DD   DSN=upstream.catalog.$UST.CLUSTER,DISP=OLD
//SYSIN        DD   *
    REPRO INFILE(CATALOG) OUTFILE(BACKUP)
    IF LASTCC = 0 THEN -
       REPRO INFILE(BACKUP) OUTFILE(CATALOG) REUSE
/*
```

2.16 LOAD SOFTCOPY DOCUMENTATION

A copy of this manual, for FDR/UPSTREAM-MVS, is provided on CD-ROM or diskette in softcopy format for use with IBM BOOKMANAGER products, including

- Bookmanager READ/MVS (a standard component of OS/390)
- Bookmanager READ/DOS
- Bookmanager READ/2 (for OS/2)
- Bookmanager READ for Windows
- Bookmanager READ/6000 for AIX/6000

The CD-ROM also contains a copy of the IBM Library Reader, which enables you to use the Bookmanager documents without being licensed for one of the IBM products.

In addition, the CD-ROM contains the manual in Adobe Acrobat PDF format, plus a copy of the Adobe Acrobat Reader, enabling you to view and print the manual in a format identical to the printed manual.

The manuals on the CD-ROM can be used directly on any of the supported systems except MVS. To use Bookmanager files on MVS, you must have READ/MVS and you must upload the Bookmanager files to MVS disk storage, following directions on the CD-ROM.

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3.1 OVERVIEW

CONFIGURATION COMPONENTS

The on-line task of FDR/UPSTREAM-MVS requires a configuration file as input. This configuration file contains records defining:

- general options for FDR/UPSTREAM-MVS
- a definition for *workstation profile names* to be used for backups and restores by workstations which communicate with FDR/UPSTREAM-MVS. There will usually be a unique *profile name* (and perhaps more than one) for every workstation. The name is used to identify backups taken by the workstation, and the profile defines options to be used for backups done under that profile.

The configuration file is maintained by the FDR/UPSTREAM-MVS Configuration utility, USTCONFG, which can be invoked via batch JCL, from the FDR/UPSTREAM ISPF dialog or (for profile maintenance only) from a workstation.

Note: Innovation recommends that the ISPF interface or the workstation interface be used for configuration maintenance, for ease of use. However, complete descriptions of the configuration parameters are contained in this section; you should review these descriptions before attempting to create or update the configuration.

CONFIGURATION FILE

The configuration file can be a PS (sequential) or PO (partitioned) dataset, and it must have DCB characteristics RECFM=FB and LRECL=120; any blocksize which is a multiple of 120 is acceptable.

You may have multiple configurations, stored either as multiple PS datasets or as multiple members in a partitioned dataset (PDS). Innovation recommends that a PDS be used for the configuration file, since this allows you to activate various configuration members dynamically during FDR/UPSTREAM operation.

The configuration file can be defined manually (through JCL or ISPF option 3.2) or it may be created using the FDR/UPSTREAM ISPF dialog (See Section 2.5).

INSTALLATION

As part of the installation process outlined in Section 2, new users must create a new configuration file by executing USTCONFG with a complete input defining the configuration, as described later in this Section, or by using the FDR/UPSTREAM ISPF dialog (described in Section 6, but the rest of Section 3 should be reviewed for an understanding of the configuration parameters before going to the dialog).

CONFIGURATION MAINTENANCE

Configuration needs will change as new workstations are added or the needs of existing workstations change, so the configuration can be modified at any time by executing USTCONFG in one of two modes:

- A complete new configuration can be built by providing input which completely describes it.
- An existing configuration can be modified by adding new profile definitions or modifying existing profiles with new options. The modified configuration can be written to a new member or configuration file, or it can overlay the input member or file.

The configuration file is read by the FDR/UPSTREAM-MVS on-line task during initialization. The configuration can be changed dynamically while the FDR/UPSTREAM-MVS on-line task is active using the

F UPSTREAM,REFRESH

console command (See Section 5.8) which will read an updated configuration from the configuration file.

Profile definitions can also be viewed, modified, added, or deleted from a workstation (PC) via a dialog provided as part of FDR/UPSTREAM PC, as described in Section 9 “Profile Management”. Requested modifications will be transmitted to the FDR/UPSTREAM-MVS main task, which will dynamically make the changes to the configuration file, in much the same way that a batch execution of USTCONFG operates. Modifications made from the PC do not affect the active configuration until the modified configuration file is activated (the workstation user can activate the new configuration from the workstation). UPSTREAM security may be used to control which workstation users can modify a given profile (See Section 4).

3.2 CONFIGURATOR JCL

These JCL statements are required to execute the Configurator as a batch job:

EXEC STATEMENT

Must specify PGM=USTCONFG, the name of the FDR/UPSTREAM Configurator program.

STEPLIB DD STATEMENT

Must specify the name of the FDR/UPSTREAM-MVS load library.

USTLOG DD STATEMENT

This is the output message dataset for USTCONFG, usually a SYSOUT dataset. It has DCB characteristics RECFM=FB, LRECL=80, BLKSIZE=any multiple of 80.

SYSUDUMP DD STATEMENT

In the event of a catastrophic error, MVS will take a diagnostic dump to this dataset, which may prove invaluable in resolving the problem.

USTCFGIN DD STATEMENT

If updating or printing an existing configuration, this specifies the configuration dataset or member containing that configuration.

The configuration file specified must have DCB characteristics RECFM=FB and LRECL=120. If a completely new configuration is being defined, USTCFGIN can be omitted or specified as DUMMY.

USTCONFG DD STATEMENT

Specifies the output configuration dataset or member. If updating an existing configuration, this can specify a dataset or member different from that specified on the USTCFGIN DD, in which case the modified configuration is written to the new location, or it can specify the same dataset or member, in which case the modified configuration will replace the original.

Innovation recommends that a new dataset or member name be specified when modifying a configuration, so that you can easily fall back to the original configuration if problems occur with the new one.

USTSRCE DD STATEMENT

This is the control statement input dataset for USTCONFG. It can be a input stream (DD *) dataset or can point to a dataset (sequential or PDS member) as long as the DCB characteristics of the dataset are RECFM=FB and LRECL=80.

If creating a new configuration, USTSRCE must contain a complete configuration definition, including a MAIN statement and one or more DEFINE statements. If updating an existing configuration, it need contain only the statements required to specify the modifications (an optional MAIN statement, and one or more MODIFY, DEFINE, DELETE or PRINT statements).

SAMPLE JCL MEMBER USTCONFG

This sample JCL is provided as member USTCONFG in the FDR/UPSTREAM ICL (Installation Control Library). It creates a new configuration from input in a control statement library:

```
//CONFIG     EXEC  PGM=USTCONFG
//STEPLIB     DD   DSN=upstream.load.library,DISP=SHR
//USTLOG      DD   SYSOUT=*
//USTSRCE     DD   DSN=config.source.file(member),DISP=SHR
//USTCONFG    DD   DSN=output.config.file(member),DISP=SHR
//SYSUDUMP    DD   SYSOUT=*
```

3.3 CONFIGURATOR INPUT STATEMENT FORMAT

STATEMENT TYPES

The FDR/UPSTREAM Configurator, USTCONFG, accepts these control statements:

- **MAIN** – defines general FDR/UPSTREAM options
- **DEFINE** – defines or replaces a *workstation profile* definition
- **MODIFY** – changes options on an existing profile definition
- **COPY** – copies an existing profile definition to create a new profile definition
- **PRINT** – prints part or all of the configuration definition
- **DELETE** – removes a profile definition from an existing configuration

SYNTAX RULES

The input control statements to USTCONFG (DD name USTSRCE) must be 80-byte fixed-length records. The control statements may be in the input stream (USTSRCE DD ∗) or may come from a dataset (such as a control statement PDS library).

On any control statement, the control statement name (e.g., MAIN) may be preceded and followed by any number of blank columns (at least one blank column must follow the name).

The operands on each control statement are separated by commas with no intervening blanks. The operands may appear in any order.

If the operands are too long to fit on one 80-byte input record, they may be continued onto another record by putting a blank after any comma, and then continuing the operands on the next record, starting in any column (with any number of preceding blanks).

Totally blank records and records with an asterisk ("∗") in column 1 are treated as comments.

3.4 THE CONFIGURATOR MAIN STATEMENT

The MAIN statement, if present, must be the first control statement in the USTSRCE input file. For a new configuration (the USTCFGIN DD omitted or dummy), the MAIN statement is required. When updating an existing configuration (USTCFGIN points to a configuration dataset or member), the MAIN statement can be omitted unless you need to change the general FDR/UPSTREAM-MVS options specified on the MAIN statement.

Note: if a MAIN statement is specified when updating a configuration, the options on that MAIN statement will completely replace those that were specified in the input configuration, including the values for any operands that are defaulted, so you should respecify all non-defaulted operands.

SYNTAX

```
MAIN     APPLID=applname|NONE

         ,DASDBLK=nnnnn|10752

         ,DESC=xxxx|1000
         ,ROUTCDE=xxxx|4020

         ,DUPLICATE=AUTO|NOAUTO

         ,DUPDAYS=nnn|30

         ,DUPSIZE=nnnn|1024

         ,MAXDUPL=nnn|30

         ,MAXHIST=nnnnn|30

         ,MAXTAPEBACKUP=nnn|0

         ,MAXTAPERESTORE=nnn|0

         ,MAXTASKS=nnnnn|100

         ,RACFUPD=BACKUP|RESTORE

         ,SECLVL=0|1|2|3

         ,SORTUNIT=unitname|SYSDA

         ,SUBSYS=subsysname|UPSTREAM

         ,TCPNAME=tcpiptask|TCPIP|LINKtask|NONE

         ,TCPPORT=tcpipport|1972

         ,WTOCOMP
```

OPERANDS These are the operands of the MAIN statement as shown above:

3.4 CONTINUED

APPLID=

Specifies the name of the VTAM application ID to be used by FDR/UPSTREAM-MVS. This is the name on the first APPL statement in the USTAPPL member of VTAMLST (See Section 2.7), or the ACBNAME= value on that APPL statement (if specified). This application name is normally UPSTREAM. This operand is required.

If you do not have VTAM installed on your MVS system or do not intend to use VTAM with FDR/UPSTREAM, you can specify APPLID=NONE and UPSTREAM will not attempt to open a VTAM connection. **With APPLID=NONE, only TCP/IP can be used for workstation communication, and mainframe-initiated operations (the USTBATCH utility) cannot be used at all (USTBATCH requires VTAM to communicate with the FDR/UPSTREAM online task).**

DASDBLK=

Specifies the default blocksize that FDR/UPSTREAM will use when allocating a *sequential disk* backup, it is no longer used as the actual blocksize of the backup data set so you generally do not need to change the default value. This value can be overridden on any or all individual profiles by the DASDBLK= operand on the DEFINE or MODIFY statement. The value specified for DASDBLK= may range from 1024 to 32760. The operand is optional and defaults to 10752.

DESC=

Specifies, in hex, the descriptor codes to be used for WTOs issued by the on-line UPSTREAM task. The descriptor codes allow you to control the processing of the UPSTREAM console messages by MVS. The bits in the 4-digit hex string represent, left to right, the descriptor codes 1 to 16. Descriptor codes are described in the IBM manual "Routing and Descriptor Codes". The default is 1000 (code 4 "system status").

DUPLICATE=

Controls the automatic recognition of duplicate files (file with the same content on multiple workstations) during MERGE BACKUPs. DUPLICATE=AUTO instructs FDR/UPSTREAM-MVS to monitor backups from various workstations looking for files which appear to be duplicates of one another; those duplicates may not need to be transmitted from other workstations (see Sections 1.4). Default is DUPLICATE=NOAUTO.

WARNING: do not enable DUPLICATE=AUTO unless every workstation is running FDR/UPSTREAM-PC V2.4.5 or above.

DUPDAYS=

is meaningful only if DUPLICATE=AUTO is enabled. It specifies the minimum days that must have elapsed since the last use of a workstation file (days since the "update date" associated with the file) before it will be considered for automatic duplicate processing. Its value can be from 0 (no minimum) to 255 and it defaults to 30 days.

DUPSIZE=

is meaningful only if DUPLICATE=AUTO is enabled. It specifies the minimum size in bytes that a workstation file must have before it will be considered for automatic duplicate processing. Its value can be from 0 (no minimum) to 4095 and it defaults to 1024 bytes.

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3.4 CONTINUED

MAXDUPL=

is meaningful only if DUPLICATE=AUTO is enabled. Whenever a workstation file that matches the DUPDAYS= and DUPSIZE= criteria is backed up, if it has not already been identified as a duplicate file, a special record is recorded in the FDR/UPSTREAM repository indicating that it is a potential duplicate file. If a matching file is not transmitted from any other workstation within the number of days specified by MAXDUPL=, the special record will be deleted. If a matching file **is** backed up from a second workstation, it will be identified as a duplicate and a copy of the file is written to the on-line repository for use in future backups; however, if the same file is not backed up from a third workstation with MAXDUPL days since the second backup, the duplicate file and all its records will be erased from the on-line repository. If it is backed up from a third workstation within MAXDUPL days, it will then be retained for duplicate processing until manually deleted.

Its value can be from 0 (interpreted as the default, 30) to 255 and it defaults to 30 days.

MAXHIST=

Specifies the number of days (0 to 365) that FDR/UPSTREAM-MVS will retain history records in the repository catalog data set. One history record will be created for each function (backup, restore, inquiry, etc.) that FDR/UPSTREAM is requested to perform. These history records can be reported on by USTRPORT, the FDR/UPSTREAM report program (See Section 7). Records older than the number of days specified will be purged when USTMAINT, the maintenance/cleanup program, is run. If MAXHIST=0, history records will not be created. The default is 30 days.

Note to users of previous versions of FDR/UPSTREAM: if you use a configuration created under a previous version with V2.4.0 or above, MAXHIST will default to 0; Innovation recommends you update your configuration with MAXHIST=30 or more.

MAXTAPEBACKUP=

Specifies the maximum number of tape drives (0 to 255) that FDR/UPSTREAM-MVS will permit to be in use for backups at any one time; this includes the output tapes required for the online utilities USTMIGRT, USTMERGE and USTVAULT. If this limit is exceeded, any new backup tasks requiring tape drives will wait until the number of backup tapes in use declines. If MAXTAPEBACKUP=0, no tape limit is enforced. The default is 0 (no limit).

A full MERGE BACKUP may require 2 tape drives (the second to read previous backups), but this cannot be determined until the backup is already in progress. If the MAXTAPEBACKUP limit has not been reached, the second drive will be acquired and will count against the limit. But if the limit has already been reached, the second drive will be acquired anyway, and **will not count** against the limit; as long as this MERGE BACKUP retains that second drive, the MAXTAPEBACKUP limit may be exceeded.

MAXTAPERESTORE=

Specifies the maximum number of tape drives (0 to 255) that FDR/UPSTREAM-MVS will permit to be in use for restores at any one time. If this limit is exceeded, any new restore tasks requiring tape drives will wait until the number of restore tapes in use declines. If MAXTAPERESTORE=0, no tape limit is enforced. The default is 0 (no limit).

MAXTASKS=

Specifies the maximum number of subtasks that FDR/UPSTREAM-MVS will permit to be active at any one time. This includes all backups, restores, inquiries, etc. If this limit is exceeded, UPSTREAM will reject any new requests for conversations until the number of tasks declines. The default is 100.

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3.4 CONTINUED

RACFUPD=

If SECLVL=2 or 3 and a userid has been granted UPDATE or READ access to a workstation profile name, this specifies what operation the user is authorized to perform:
RACFUPD=BACKUP allows users with UPDATE authority to do backups or restores, while users with only READ access can do only restores.
RACFUPD=RESTORE (the default) allows users with UPDATE authority to do backups or restores, while users with only READ access can do only backups.

Note that if SECLVL=3 is in effect, a userid which matches a profile name is automatically granted UPDATE authority.

ROUTCDE=

Specifies, in hex, the routing codes to be used for WTOs issued by the on-line UPSTREAM task. The routing codes allow you to control which consoles will receive the UPSTREAM console messages. The bits in the 4-digit hex string represent, left to right, the routing codes 1 to 16. Routing codes are described in the IBM manual "Routing and Descriptor Codes". The default is 4020 (code 2 "operator information" and code 11 "Programmer Information").

SECLVL=

0 – specifies that FDR/UPSTREAM is to do no security checking on the USERID and PASSWORD entered by the end user at the workstation. Specify this if you have no security system or prefer not to enforce userid security for UPSTREAM usage.
1 – specifies that FDR/UPSTREAM is to issue a security call to verify the USERID and PASSWORD entered by the end user at the workstation. No further security checking will be done.
2 – specifies that in addition to verifying the USERID and PASSWORD (as in SECLVL=1), FDR/UPSTREAM will issue additional security calls to verify that the userid is permitted to access the *workstation profile name* entered by the end user, and to verify that the userid is permitted to request restores from tape.
3 -- same as SECLVL=2, except that if the profile name and userid specified at the workstation are the same, the user is automatically considered to be authorized to that profile name.

This operand is optional and defaults to SECLVL=1. See Section 4 "Security" for more information.

SORTUNIT=

Specifies a MVS unit name (anything valid in the UNIT= operand in JCL) which will be used to allocate temporary sort work files when external sorts are required; FDR/UPSTREAM does internal sorts whenever possible. It defaults to SYSDA.

SUBSYS=

Specifies the subsystem and control point name that will be used on security system calls if SECLVL=1, 2 or 3 was specified. It is optional and defaults to **UPSTREAM**. See Section 4 "Security" for more details.

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3.4 CONTINUED

TCPNAME=

Identifies the TCP/IP system with which FDR/UPSTREAM-MVS will communicate.
The following table shows the values of TCPNAME to be used with various versions of IBM TCP/IP and Interlink SNS/TCPaccess. If the specified TCP/IP system is not active when FDR/UPSTREAM-MVS is started, a warning message is issued and TCP/IP access is disabled (you must restart the FDR/UPSTREAM-MVS online task to reestablish TCP/IP communication).

TCP/IP	API	TCPNAME=	Notes
IBM TCP/IP V2.x	IUCV	TCPNAME=taskname	name of TCP/IP started task
IBM TCP/IP V3.1	IUCV	TCPNAME=taskname	name of TCP/IP started task
IBM TCP/IP V3.2	HPNS or IUCV	TCPNAME=taskname	Name of TCP/IP started task. IUCV used unless JCL has PARM=TCPHPNS
IBM OS/390 2.4 and above	HPNS	TCPNAME=taskname	name of TCP/IP started task
SNS/TCPaccess	Interlink Native	TCPNAME=LINKtask TCPNAME=LINKACSS	"task" is SNS/TCPaccess task name, usually ACSS
SNS/TCPaccess V4 with IUCV support	IUCV	TCPNAME=taskname	name of IUCV started task, Interlink native API is recommend-ed
No TCP/IP support		TCPNAME=NONE	Only SNA APPC can be used

Default is TCPIP which is the usual name for the IBM TCP/IP task. The IUCV API will be used unless you are using OS390 2.4 or above. On TCP/IP V3R2, if you want to use HPNS instead of IUCV, specify PARM=TCPHPNS in the FDR/UPSTREAM-MVS startup JCL (see Section 2.9).

TCPPORT=

Specifies the TCP/IP port number which FDR/UPSTREAM-MVS will use as a "well-known" port number to listen for workstation connections. See Section 2.8 for details. Default is 1972.

WTOCOMP

Specifies that FDR/UPSTREAM-MVS will issue WTOs to the system console for all messages relating to backups starting and completing, in addition to writing them to the UPSTREAM log (USTLOG). The operand is optional; if omitted, these messages are written only to USTLOG. This feature may be useful for installations with mainframe automation and tracking facilities which monitor console messages.

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3.5 THE CONFIGURATOR DEFINE/MODIFY/COPY STATEMENTS

Workstation profiles are created or modified by DEFINE, MODIFY and COPY statements. These statements have the same operands.

DEFINE STATEMENT

The DEFINE statement is used to create or replace a *workstation profile*. When creating a new configuration, a DEFINE statement must be present for every profile to be defined. When updating an existing configuration, DEFINE statements are used to add new profiles or completely replace existing profiles. Operands which are not specified on the DEFINE statement will take their default values.

MODIFY STATEMENT

The MODIFY statement is used when updating a configuration, to change options on an existing profile. Operands which are NOT specified on the MODIFY statement will retain their previous values in the profile. If a MODIFY statement names a profile which does NOT exist in the configuration, it will be treated as a DEFINE (with a warning message); however, since defaults may have been taken for many operands, this may not result in an appropriate profile.

COPY STATEMENT

The COPY statement can be used when updating a configuration, to create a new profile or replace an existing profile, by copying the attributes associated with another existing profile. The WSNAME/WSPREF operands specify the input profile, while the NEWNAME/NEWPREF operands (valid ONLY on COPY) specify the profile to be created/replaced. You can also specify any of the other operands shown below to modify the profile as it is being copied.

SYNTAX

DEFINE
MODIFY
COPY

WSNAME=profname**|WSPREF**=profprefix

,ARCHIVE=nnnn

,COPYINCR|,NOCOPYINCR

,DASD

,DASDBLK=nnnnn

,DASDGDG|,NODASDGDG

,DASDPREF=prefix

,DASDMAXSIZE=nnnnnnnnn

,**DUNIT**=diskunit**|**,**VOL**=volser

,DUPLICATE=<u>**COPY**</u>**|NOCOPY**
,DUPLICATE=<u>**DELETE**</u>**|NODELETE**

,GROUPID=xx|,NOGROUPID

,MERGE=YES|<u>**NO**</u>**|DEFER|NODEFER**

,MGMTCLAS=mgmtclas**|,NOMGMTCLAS**

,MIGTHRESH=nn

,NEWNAME=newname**|**,**NEWPREF**=newprefix

,NEWTAPE=FULL|INCR
,NONEWTAPE=FULL|INCR

,ONLINE=nnnn

,PCMIGRATEONLY=YES|NO

,**RETPD=**nnnn**|,DRETPD=**nnnn**|,EXPDT=**yyddd

,STORCLAS=storclas**|,NOSTORCLAS**

,**TAPE|**,**TAPECOMP|,NOTAPECOMP**

,TAPEGDG|,NOTAPEGDG

,TAPEPREF=prefix

,TAPESTORCLAS=storclas

,TUNIT=tapeunit

,UNITCNT=<u>1</u>|2

,TRANSFER=YES|<u>**NO**</u>

,VAULT|,NOVAULT

3.5 CONTINUED

OPERANDS These are the operands of the DEFINE and MODIFY statements as shown above. Defaults for optional operands apply to the DEFINE statement; for a MODIFY or COPY of an existing profile the defaults are the values previously specified for the profile:

WSNAME= Specifies the *workstation profile name* to be defined, modified or copied. It may be 1-8 characters, and it must start with an alphabetic or national character (the remainder may be any alphanumeric or national characters). Every workstation which will communicate with FDR/UPSTREAM should be assigned a unique profile name; all backups and restores in FDR/UPSTREAM are keyed to this profile name. Under some circumstances, a workstation may be assigned more than one profile name; for example, on a server, separate profiles might be used for different disks or sets of directories. For MERGE BACKUPS, a given profile should be used with a consistent list of “file sets”, i.e., the list of files backed up under that profile should not change (except that new file sets can be added).

The configuration should include the special profile name **WSNAME=GLOBAL**. The GLOBAL profile specifies options to be used for any *workstation profile name* entered by a workstation which is NOT defined in the configuration. This allows end users to use any profile name (except where limited by security as defined in Section 4) even if it is not in the configuration. If the GLOBAL profile is not defined, then only profiles defined in the configuration can be used. A brand-new configuration which does not include a DEFINE for GLOBAL will have a GLOBAL profile automatically defined, but it will be disabled for all types of backups. Use of GLOBAL can reduce the amount of configuration maintenance required. The DEFINE for GLOBAL, if present, must follow the MAIN statement (if present) and must precede any other statements.

The configuration may contain a number of special “reserved” profiles with names **USTCATLG, USTFILEI, USTFILEC, USTARCH, USTMIGxx, USTMERxx** and **USTVLTxx.** They are used for the on-line execution of FDR/UPSTREAM utilities. **USTDUPFL** is another reserved profile name used for a special backup of files which may be duplicated on various workstations. **DUMMYxxx** profiles are used for testing and simulation. You may **not** create a profile whose name begins with **USTVLC**. See Section 3.8 for explanations of these reserved profiles.

WSPREF= May be specified instead of WSNAME=. It is 1 to 7 characters, same syntax rules as WSNAME=. It creates a configuration entry which specifies a workstation profile name prefix. Similar to the GLOBAL profile described under WSNAME=, the parameters in this profile will be used when the profile name entered at the workstation does not exist in the configuration, as long as the profile name starts with the characters specified by WSPREF=. For example, if there is a profile with WSNAME=TECHWS01 and another with WSPREF=TECH, the first will be used if the workstation enters TECHWS01, but the second will be used if TECHWS02 is entered.

WSPREF= is used to define a number of profiles with a single entry. This may be used to define a set of profiles for the use of a single workstation, for various purposes, or may be used to define profiles for a set of workstations. In any case, be sure that a given profile name is used only for a single purpose.

Either WSNAME= or WSPREF= must be entered on the DEFINE/MODIFY/COPY statement.

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3.5 CONTINUED

ARCHIVE=

Specifies the number of Archive (*non-keyed*) backups which will be retained for this workstation by FDR/UPSTREAM-MVS. It can have a value from 0 to 4096; 0 prohibits the workstation from performing Archive backups. During the backup, if this count is exceeded, the oldest archive version associated with this profile is flagged for deletion during the next execution of USTARCH, the archive utility. The operand is optional, with a default of 0 on a DEFINE.

COPYINCR
NOCOPYINCR

For profiles that specify the MERGE option (MERGE BACKUPS), COPYINCR specifies that when doing a FULL MERGE backup, any incremental backups that are stored in separate locations will be copied to the full backup dataset. Incremental backups that are already on the same tape as the full backup will not be copied, but incrementals that are on different tapes or on DASD will be copied. Once the incrementals are successfully copied, they will be scratched (if on DASD) and uncataloged, and the FDR/UPSTREAM records of their location will be updated to point to the new full backup dataset. This is particularly useful if incrementals were done to disk but the full backup is done to tape; the disk incrementals will be moved to the tape and the disk datasets deleted. COPYINCR is ignored for profiles that have MERGE=DEFER set (DEFERRED MERGE BACKUPs). NOCOPYINCR can be used on a MODIFY/COPY statement to turn off the option in an existing profile. NOCOPYINCR is the default on a DEFINE.

DASD

Specifies that this profile will be permitted to perform backups directly to MVS sequential disk (BSAM) datasets. When enabled for a given profile, the DASDPREF= and DUNIT= or VOL= or STORCLAS= options must also be enabled. On a DEFINE, by default, DASD is not enabled.

DASDBLK=

Applies only to profiles where DASD (*sequential disk*) backups are enabled, and specifies the blocksize to be used when allocating those backups; it is no longer used as the actual blocksize of the backup data set so you generally do not need override the default (except: in the special profile USTVAULT, it is used as the blocksize of the backup control file). Values from 1024 to 32760 are accepted; specify a value that would result in good track utilization on the DASD device type you use. The parameter is optional; on a DEFINE it has a default of the value of DASDBLK= specified on the MAIN statement in this configuration (10752 is the default if not on the MAIN statement; this provides good track utilization on both 3380 and 3390 disks).

Note: When creating DASD backups, FDR/UPSTREAM allocates the backup file in blocks; the total data bytes to be backed up is divided by DASDBLK=, and the resulting number of blocks of that size are requested (plus a few percent for safety). However, when opening the file a blocksize of 32760 is used; you will see this in the DSCB of the backup data sets. You may be concerned that FDR/UPSTREAM is not using the disk tracks efficiently; this is not true. Since the record format is variable (VB), FDR/UPSTREAM will write on each track one block that is close to 32760 in size, and a second block that use the remaining capacity of that track, resulting in extremely efficient utilization.

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3.5 CONTINUED

DASDGDG
NODASDGDG

DASDGDG applies only to profiles where DASD (*sequential disk*) backups are enabled, and specifies that the backup datasets are to be allocated as new generations of a GDG (see DASDPREF= for more details). DASDGDG is recommended for backups which will be on sequential disk, since GDG processing will automatically delete old generations. GDG bases must be predefined in your system catalogs before they can be used by FDR/UPSTREAM-MVS; *be sure you define sufficient generations in the GDG base to retain all required backups.* NODASDGDG can be used on a MODIFY/COPY statement to turn off the option in an existing profile. NODASDGDG is the default on a DEFINE.

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3.5 CONTINUED

DASDPREF= Is required for profiles where DASD *(sequential disk)* backups are enabled, and specifies the 1 to 35 character dataset name prefix that will be used to dynamically allocate the disk dataset for the backup. The prefix may include periods (".") to separate index levels and must meet MVS standards for dataset names (no more than 8 characters in an index level and the first character of an index must be an alphabetic or national character).

If you do not include the DASDGDG option in this profile, FDR/UPSTREAM will allocate the backup file as a non-GDG. The length of the value of DASDPREF= must not exceed 19 characters, and FDR/UPSTREAM will add 3 additional index levels at the end of the name to create a unique dataset name: profile name, the date as "Dyymmdd", and the time as "Thhmmss". Since FDR/UPSTREAM adds the profile name to the prefix, the same prefix may be specified in multiple profiles.

If the DASDGDG option is included in the profile, the backup datasets will be allocated as new generations of a GDG; DASDPREF= must specify the GDG base name, and may be up to 35 characters long. The GDG name used in each profile should be unique; Innovation recommends that it include the profile name. The GDG base must be predefined in the appropriate MVS catalog along with the number of generations to keep; the DELETE option should be specified when defining the GDG base so that old generations are scratched from disk.

If the DASDGDG option is used in a profile with WSPREF= or WSNAME=GLOBAL, and the LAST index level of DASDPREF= matches the profile prefix name (or GLOBAL), then FDR/UPSTREAM will substitute the actual profile name used by the workstation. For example, if the profile has WSPREF=ABC, DASDGDG, DASDPREF=BACKUP.ABC but the workstation uses profile name ABC123, the actual GDG name will be BACKUP.ABC123. This allows unique dataset names to be generated based on the actual profile name. The GDG bases for these modified names must be predefined, and the total length of the name with a maximum 8 character profile name cannot exceed 35 characters. If the last index does not match, the unmodified GDG name will be used for all actual profile names (in this case, GDG is not recommended).

DASDPREF= may optionally contain a single exclamation character (!) anywhere in the name. If it is present, it will be replaced at the time the backup is created with:

- **F** Full MERGE backup, first-time Full MERGE backup, or Full MERGE Migration
- **I** Incremental MERGE backup
- **N** non-MERGE backup of any kind or Simple Migration
- **E** MIGRATION End Set

This is especially useful when DASDGDG is used with MERGE backups; you can setup one GDG with the **F** character to specify the number of full backups to be kept, and a second with the **I** character for the number of incrementals to be retained. You must define GDG bases with each of the possible characters substituted. If the exclamation is used, you **must** also specify NEWTAPE=FULL. Note that FDR/UPSTREAM expects the ! character to be X'5A'; some international keyboards may generate a different hex code for !, in which case you must find the key that generates X'5A'.

DASDPREF= may also contain a single question mark character (?) anywhere in the name except as the first character of an index level. If present, that character will be replaced with a "1" when the backup is created. If the profile is enabled for vaulting (VAULT), the profile **must** contain the ? character; when USTVAULT is run to create a secondary vault copy, that copy will have another copy number (from 2 to 9) in that location. If DASDGDG is specified, you must define the GDG base with the "1" substituted, and additional GDG bases with whatever copy numbers you intend to use VAULT in this profile. See Section 7.8 for more details on USTVAULT.

For example, a profile with DASDPREF=TECH.SERVER1!.COPY?,DASDGDG will create backups:

TECH.SERVER1F.COPY1(+1) - for full merge backups
TECH.SERVER1I.COPY1(+1) - for incremental merge backups

and the COPY1 will be changed to COPY2 (or optionally COPY3 to COPY9) for the vault copies created by USTVAULT.

See Section 3.8 for details on data set name usage by the "reserved" profiles: USTCATLG, USTFILEI, USTFILEC, USTARCH, USTMIGRT, and USTVLTxx.

If the profile is enabled for DASD, but the DASDPREF= operand is NOT specified, and the TAPEPREF= operand IS specified, then the TAPEPREF= (and TAPEGDG if specified) will be used to form the backup data set names for both disk and tape backups.

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3.5 CONTINUED

DASDMAXSIZE=

Specifies a maximum size for sequential DASD backups, in kilobytes (DASDMAXSIZE=500 means 512,000 bytes). For incremental MERGE backups to DASD, if the estimated size of the backup exceeds this value, the backup will be redirected to sequential tape instead. Full MERGE backups will never be redirected to tape. If specified, the profile must be enabled for sequential tape backups as well as sequential DASD backups. However, the DASDPREF value will be used to name the backup, not the TAPEPREF value.

The default is 0 (do not redirect DASD backups to tape).

DUNIT=

Applies only to profiles where DASD (sequential disk) backups are enabled and specifies a MVS disk unit name (any value that will allocate a disk device when specified in a UNIT= parameter in JCL). This unit name will be used when dynamically allocating the backup dataset. The DASD volumes mounted on the devices included in that unit name must include one or more volumes with a mount attribute of STORAGE; if necessary, FDR/UPSTREAM will allocate the backup dataset on as many as 5 volumes (if that many STORAGE volumes are available). Either DUNIT=, VOL= or STORCLAS= is required when the DASD option is enabled. DUNIT= and VOL= cannot both be specified on the same profile.

DUPLICATE=

When MERGE BACKUPs are done and duplicate file support is invoked (See Sections 1.4 and 3.8), this controls whether the duplicate files will be copied into the backup file (DUPLICATE=COPY) or a pointer to the *keyed* backup in the "file-data" cluster is inserted into the backup file (DUPLICATE=NOCOPY). COPY is the default.

A special format of DUPLICATE= is used *only* in the special USTDUPFL profile. DUPLICATE=NODELETE will prevent inadvertent deletion of the *keyed* backups of the duplicate files. DUPLICATE=DELETE (the default) permits deletion of the duplicate backups.

GROUPID=
NOGROUPID

GROUPID=xx (any 2 alphanumeric characters) is used to group profiles for processing by the online utility programs USTMIGRT, USTMERGE and USTVAULT (See Section 7 for details on these online utilities). For example, when the operator enters a console command such as:

F UPSTREAM,MIGRT01 or MERGE01 or VAULT01

the utility will only select profiles which specify GROUPID=01 (plus any profiles which specify NOGROUPID). See Section 5.7 for details on the console commands for invoking these utilities.

NOGROUPID can be used to reset GROUPID=xx, and it allows the profile to be processed by *any* utility execution; because of this, if GROUPID is specified for any profile, it should be specified for all profiles. The use of GROUPID=xx is recommended since it automates the selection of backup profiles for utility processing instead of depending on the operator to specify profile names. The default is NOGROUPID.

For compatibility with earlier releases of FDR/UPSTREAM, VAULTID=xx and NOVAULT are accepted as aliases of GROUPID= and NOGROUPID.

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3.5 CONTINUED

MERGE

MERGE=YES specifies that this profile is enabled for MERGE BACKUP processing, as described in Section 1; the profile must also be enabled for DASD *(sequential disk)* or TAPE *(sequential tape)* backups.
MERGE=DEFER also enables the profile for MERGE BACKUPs, but in addition requests that those backups be done with "deferred merge" processing.
MERGE=NO can be used on a MODIFY/COPY statement to reset the MERGE option in an existing profile.
MERGE=NODEFER can be used on a MODIFY/COPY statement for a profile which is already enabled for MERGE=DEFER; it will reset the DEFER option leaving the profile enabled for MERGE=YES.
The default is MERGE=YES on a DEFINE.

MERGE BACKUP is the recommended backup technique for FDR/UPSTREAM-MVS V2.3.2 and above. It is more efficient than non-merge full and incremental backups, and allows for simpler restores. See Section 1.4 **for details.**

MGMTCLAS=
NOMGMTCLAS

MGMTCLAS applies only to profiles where DASD (*sequential disk*) backups are enabled if your MVS system has SMS (System Managed Storage) enabled. It specifies a 1-8 character management class name that will be passed to SMS during the dynamic allocation of the backup dataset; it will be used by SMS if the dataset becomes SMS-managed (see STORCLAS=). Consult your storage administrator or MVS system programmer for valid management class names. Note that SMS may override or ignore your management class name, and may assign a management class even if you do not specify one in the profile. NOMGMTCLAS can be used on a MODIFY/COPY statement to turn off the option in an existing profile. NOMGMTCLAS is the default on a DEFINE.

MIGTHRESH=

specifies a threshold for disk-to-tape migration. When the USTMIGRT utility is run (See Section 5.7), it will look for *sequential disk* backups recorded under each profile name. If the number of such backups equals or exceeds the MIGTHRESH=nn value, USTMIGRT will migrate the least recent backups to tape until the remaining number is nn-1. The default is 0 (which disables migration for this profile).

NEWNAME=
NEWPREF=

Are permitted and required ONLY on a COPY statement, to specify the new profile name or new profile prefix to be assigned to the copied profile (see WSNAME= and WSPROF= for an explanation of profile names and prefixes). WSNAME= or WSPREF= must also be specified to identify the existing profile to be copied. The existing profile will be modified by any other operands on the COPY statement (if any) and saved under the new name. If that name already exists, that profile will be replaced. Either NEWNAME= or NEWPROF= must be specified; not both.

NEWTAPE=
NONEWTAPE=

Can be specified only for a profile that is enabled for MERGE BACKUP (the MERGE option) and is used only when the backup is to *sequential tape*. It controls when MERGE BACKUP will call for a new output tape. **NEWTAPE=FULL** specifies that every full backup will call for a new output tape. **NEWTAPE=INCR** specifies that every incremental backup will call for a new tape. The two options are independent; either or both can be specified. The default is that neither option is set; **NONEWTAPE=FULL** and **NONEWTAPE=INCR** can be used on a MODIFY/COPY statement to reset these options in an existing profile. You can combine the options, e.g., NEWTAPE=(FULL,INCR).

By default, only the first incremental backup after a full backup will call for a new tape; the incrementals and the following full backup will all be written to the same tape. Innovation recommends that you do not change the defaults; this provides for the most efficient use of tape and minimizes data movement during full MERGE BACKUPs.

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3.5 CONTINUED

ONLINE=

Specifies the number of On-line (*keyed*) backups which will be retained for this workstation by FDR/UPSTREAM-MVS. It can have a value from 0 to 4096; 0 prohibits the workstation from performing *keyed* backups. During the backup, if this count is exceeded, the oldest backup version associated with this profile is deleted. The operand is optional, with a default of 0 on a DEFINE.

Note: *keyed* backups are not recommended except in special circumstances. However, ONLINE= **must** be specified for the **USTDUPFL** reserved profile if you include it in your configuration; this profile is used for the special backup of files which may be duplicated on various workstations as explained in Section 1.4 and 3.8.

PCMIGRATEONLY=

If PCMIGRATEONLY=YES is specified, this profile can be used only for the migration of files from a workstation; it cannot be used for normal backups. If set to NO, the profile can be used for normal backups (subject to other operands such as TRANSFER); these backups can include migrated files. Note that file migration is different from the backup migration performed by the USTMIGRT utility. See Section 1.6 for details on file migration

RETPD=
DRETPD=
EXPDT=

Applies only to profiles where DASD (*sequential disk*) or TAPE (*sequential tape*) backups are enabled, and specifies the retention period in days (0 to 9999) or Julian expiration date (yyddd) of the dynamically allocated backup dataset. The meanings are identical to the JCL parameters RETPD= and EXPDT=. However, EXPDT= only accepts a 2-digit year number; years less than 70 are assumed to be in the 21st century (20xx). Only one of the operands RETPD= or EXPDT= can be specified.

If the profile is enabled for both DASD and TAPE, you can optionally specify a retention period to be used only for disk with DRETPD=. If DRETPD= is specified (even as DRETPD=0), then the RETPD/EXPDT value will be used only for tape; if omitted, the RETPD value will apply to both disk and tape, but EXPDT will apply only to tape and no expiration will be used for disk. They are all optional; by default no retention or expiration is specified when the data set is allocated; however, your DASD or TAPE management system may apply a default retention.

FDR/UPSTREAM-MVS does not explicitly enforce these dates, but if you have a DASD or TAPE management system which does, FDR/UPSTREAM-MVS will recognize that the dataset has been scratched or uncataloged during USTMAINT execution. Special expirations, such as EXPDT=99000 for catalog control, can be specified if they are meaningful to your tape management system; catalog control is especially meaningful for tape GDGs, since older backups will expire as they roll out of the GDG (exceed the maximum generations defined in the GDG base).

Usage note: Users of the CA-1 tape management system, Version 5.1 or above, can use EXPDT=99000 for catalog control even if your installation has the CA-1 option TRUXPD=YES set (to treat expirations as real dates). FDR/UPSTREAM-MVS passes a dynamic allocation parameter to override that option if EXPDT=99000.

WARNING: Be sure that the retention period or expiration date you specify causes the backups to be retained for a sufficient period. Once the backups are scratched by tape or disk management systems, they are no longer available to FDR/ UPSTREAM-MVS and the next execution of USTMAINT will cause them to be deleted from UPSTREAM's records.

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3.5 CONTINUED

STORCLAS=
NOSTORCLAS

STORCLAS applies only to profiles where DASD (*sequential disk*) backups are enabled if your MVS system has SMS (System Managed Storage) enabled. It specifies a 1-8 character storage class name that will be passed to SMS during the dynamic allocation of the backup dataset and requests that the dataset be SMS-managed. Consult your storage administrator or MVS system programmer for valid storage class names. Note that SMS may override or ignore your storage class name, and may assign a storage class even if you do not specify one in the profile. NOSTORCLAS can be used on a MODIFY/COPY statement to turn off the option in an existing profile. NOSTORCLAS is the default on a DEFINE.

Note: if your ACS routines assign an appropriate SMS data class, the FDR/UPSTREAM backup may be allocated as an Extended Format (EF) data set which may be striped or compressed by MVS. Although FDR/UPSTREAM supports EF data sets, restores may perform poorly so they are not recommended. If compression is required, it would be better to use High Compression in FDR/UPSTREAM on the workstation.

TAPE
TAPECOMP
NOTAPECOMP

TAPE or TAPECOMP specifies that this profile will be permitted to perform backups directly to MVS sequential tape (BSAM) datasets. When enabled for a given profile, the TAPEPREF= and the TUNIT= or TAPESTORCLAS= options must also be enabled. The default, on a DEFINE, is that *sequential tape* backups are not permitted.

TAPECOMP applies only to 3480/3490 cartridge drives and causes FDR/UPSTREAM to specify the TRTCH=COMP parameter when dynamically allocating the tape backup to request hardware (IDRC) compaction of the tape dataset. IDRC compaction may be used even if TAPE is specified if compaction is your system default. You may specify either TAPE or TAPECOMP, not both. NOTAPECOMP may be specified on a MODIFY/COPY to convert the TAPECOMP option in an existing profile to TAPE.

TAPEGDG
NOTAPEGDG

TAPEGDG functions like the DASDGDG operand described earlier, except that it specifies that *sequential tape* backups are to be allocated as GDGs, and it affects the name specified by the TAPEPREF= operand (see DASDGDG and DASDPREF= for details). NOTAPEGDG may be specified on a MODIFY/COPY to turn off TAPEGDG in an existing profile.

Note that the GDG operand used by earlier versions of FDR/UPSTREAM will still be accepted, and will be treated like TAPEGDG.

TAPEPREF=

Specifies the prefix of the dataset name to be used for *sequential* tape backups if the TAPE or TAPECOMP options are enabled. See the DASDPREF= description for details of the dataset name that will be created by UPSTREAM for these backups. If the profile is enabled for *sequential disk* (DASD) backups, but DASDPREF= is not specified, then the data set name prefix specified by TAPEPREF= will also be used for DASD backups (and the TAPEGDG option will control whether they are GDGs).

See Section 3.8 for details on the data set name usage by the “reserved” profiles: USTCATLG, USTFILEI, USTFILEC, USTARCH, USTMIGRT, and USTVLTxx.

Note that the DSNPREF= operand used by earlier versions of FDR/UPSTREAM will still be accepted, and will be treated like TAPEPREF=.

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3.5 CONTINUED

TAPESTORCLAS= Applies only to profiles where TAPE (sequential tape) backups are enabled if your system has SMS (System Managed Storage) enabled and you also have SMS-managed tapes in your installation. TAPESTORCLAS= specifies a SMS storage class name which will allocate an appropriate SMS-managed scratch tape for tape backups. This storage class will be used when dynamically allocating the backup dataset. TUNIT= or TAPESTORCLAS= is required when the TAPE or TAPECOMP option is enabled.

TRANSFER= If TRANSFER=YES is specified, this profile can be used only for the transmission of individual files to or from a workstation and the MVS host; it cannot be used for normal FDR/UPSTREAM backups. The profile must be enabled for *sequential disk* and/or *sequential tape* backups; the backup specifications in the profile will be used for allocating the output file to receive files transmitted to MVS but the output data set name may be optionally overridden by the user at transmission time. See Section 1.5 for details. TRANSFER=NO may be used on a MODIFY statement to reset the TRANSFER attribute.

NO is the default.

TUNIT= Applies only to profiles where TAPE *(sequential tape)* backups are enabled and specifies a MVS tape unit name (any value that will allocate a tape device when specified in a UNIT= parameter in JCL). This unit name will be used when dynamically allocating the backup dataset. TUNIT= or TAPESTORCLAS= is required when the TAPE or TAPECOMP option is enabled.

UNITCNT= Applies only to profiles where TAPE (*sequential tape*) backups are enabled and specifies how many tape drives (1 or 2) will be allocated when doing tape backups under this profile. 2 tape drives may be requested to avoid the delays that occur while rewinding the tape and mounting a new output volume as each tape volume is filled. The default is 1 tape drive.

VAULT
NOVAULT Specifies if this profile is enabled for vaulting (VAULT) or not (NOVAULT). See Section 7.8 for details on vaulting (USTVAULT). The reserved profiles (See Section 3.8) may not be enabled for vaulting. The default is NOVAULT.

VOL= Applies only to profiles where DASD *(sequential disk)* backups are enabled and specifies a MVS disk volume serial where the backup data set will be allocated. One of DUNIT=, VOL= or STORCLAS= is required when the DASD option is enabled. DUNIT= and VOL= cannot both be specified on the same profile; if VOL= is specified a unit name of SYSALLDA will be used.

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3.6 THE CONFIGURATOR DELETE STATEMENT

DELETE STATEMENT

The DELETE statement is used to delete a *workstation profile* from an existing configuration. It can be input only when updating a configuration (USTCFGIN DD is present).

SYNTAX

DELETE WSNAME=profname

OPERANDS

WSNAME= Specifies the name of the profile (or profile prefix, if the profile was created with WSPREF=) to be deleted, 1-8 characters. It is required.

3.7 THE CONFIGURATOR PRINT STATEMENT

PRINT STATEMENT

The PRINT statement is used to print information about the configuration. It can print definitions of individual *workstation profiles*, about the FDR/UPSTREAM options, or about the entire configuration.

SYNTAX

PRINT ALL|WSNAME=profname

,LIST=LONG|PUNCH

OPERANDS

ALL Specifies that information about the entire configuration be printed, including FDR/UPSTREAM options from the MAIN statement and all profile definitions.

WSNAME= Specifies that only the definition of the specified profile (or profile prefix, if the profile was defined with WSPREF=) be printed. Multiple profiles can be printed by entering multiple PRINT statements. If neither ALL nor WSNAME= is specified, then only the options from the MAIN statement and the definition of the GLOBAL profile (if defined) will be printed.

LIST= **LONG** – lists the profiles in a format similar to the DEFINE statement.
PUNCH – lists the profiles in a format which duplicates the MAIN and DEFINE statements necessary to reproduce the configuration. With minor editing, the output can be turned into a dataset which can be read back in by USTCONFG.

The operand is optional; the default is LONG.

3.8 RESERVED PROFILES

There are several special “reserved” profile names which are used by FDR/UPSTREAM for special purposes. They cannot be used as actual profile name by workstations. When creating a new configuration, USTCONFG will add these special profiles automatically, with default values. If you intend to use the special utilities associated with each reserved profile, you will probably want to review and change those defaults.

GLOBAL PROFILE

The configuration may optionally include a profile with a WSNAME of GLOBAL. The GLOBAL profile specifies options to be used for any workstation profile name which is NOT defined in the configuration. This allows end users to use any profile name (except where limited by security as defined in Section 4) even if it is not in the configuration. If the GLOBAL profile is not defined, then only profiles defined in the configuration can be used. A brand-new configuration which does not include a DEFINE for GLOBAL will have a GLOBAL profile automatically defined, but it will be disabled for all types of backups.

USTREORG PROFILES

Three reserved profiles, with the WSNAMEs of **USTCATLG, USTFILEI,** and **USTFILEC**, must be defined if you are going to use the USTREORG utility to dynamically reorganize the 3 data sets which make up the FDR/UPSTREAM on-line repository. Those 3 profile names correspond to the DD names of the 3 data sets. Each profile must be enabled for *sequential disk* or *sequential tape* backups (but not both, if both are enabled, the disk backup parameters will be used). The backup parameters will be used to dynamically allocate a backup data set used to hold a copy of the contents of the data set being reorganized. For safety, the backup data set will be retained even if the reorganization is successful. If the DASDGDG or TAPEGDG option is not specified, the DASDPREF=/TAPEPREF= value can be up to 26 characters long; USTREORG will add the date and time as ".Dmmyydd.Thhmmss" at the end to form a unique name. See Section 5.7 for more details.

GDGs are recommended so that older backups will automatically be uncataloged as new reorganizations are done. The GDG base should be defined with 2 or more generations, keeping several copies of the backup for safety. **Do not let the backup expire immediately after the reorganization**. If you do not use a GDG, you are responsible for deleting unneeded backups.

USTARCH PROFILE

The reserved profile **USTARCH** must be defined if you are going to execute the USTARCH utility under the FDR/UPSTREAM main task, to move *non-keyed* backups to tape (USTARCH can also be executed in batch when the on-line task is down). The profile must be enabled for *sequential tape* backups; the tape backup parameters will be used to dynamically allocate an output Archive tape data set. If the TAPEGDG option is not specified, the TAPEPREF= value can be up to 26 characters long; USTARCH will add the date and time as ".Dmmyydd.Thhmmss" at the end to form a unique name. See Section 7.5 for more details.

3.8 CONTINUED

USTMIGxx PROFILES

The reserved profiles **USTMIGxx** (xx is any 2 alphanumeric characters) must be defined if you are going to execute the USTMIGRT utility to migrate *sequential disk* backup data sets to tape. You must have at least one USTMIGxx profile (usually USTMIGRT) if you plan to use USTMIGRT; additional USTMIGxx profiles can be used to segregate migration processing for various workstation profiles to provide more control over migration and allow multiple migration tasks to run concurrently; assignment of a workstation profile to a migration profile can be done with the GROUPID=xx operand in the configuration or can be assigned dynamically at vault time. Each USTMIGxx profile must be enabled for *sequential tape* backups; the tape backup parameters will be used to dynamically allocate an output tape to which the disk backups will be migrated. The TAPEPREF= value will be used to create a dummy (empty) data set as the first file on the tape; additional files will be added to the tape to contain the migrated backups using their original names. If the TAPEGDG option is not specified, the TAPEPREF= value can be up to 26 characters long; USTMIGRT will add the date and time as ".Dmmyydd.Thhmmss" at the end to form a unique name.

Note that if the NEWTAPE option is specified on the console command which invokes USTMIGRT (See Section 5.7), the USTMIGxx profile will be checked to be sure it is enabled for *sequential tape* backups, but the parameters in the profile will not actually be used, since each backup is written to a unique tape according to the tape parameters in the workstation profile; no dummy file is written. The FORWARD option also causes no dummy file to be written. See Section 7.7 for more details.

If you use the FDR/UPSTREAM ISPF dialogs or the FDR/UPSTREAM-PC screens to manage the USTMIGxx profiles, they are automatically enabled for tape backups, and the parameters for tape backup are labeled "Migrate Tape" to clearly indicate their function. Other profile parameters which do not apply to this special profile are inhibited.

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3.8 CONTINUED

USTMERxx PROFILES

The reserved profiles **USTMERxx** (xx is any 2 alphanumeric characters) must be defined if you are going to take DEFERRED MERGE BACKUPs (MERGE BACKUPS for profiles with the MERGE=DEFER option set in the configuration); they are used during the execution of the USTMERGE utility which completes the MERGE BACKUPs. You must have at least one USTMERxx profile (usually USTMERGE) if you do DEFERRED MERGE BACKUPs; additional USTMERxx profiles can be used to segregate merge processing for various workstation profiles to provide more control over merging and allow multiple merge tasks to run concurrently; assignment of a workstation profile to a merge profile can be done with the GROUPID=xx operand in the configuration or can be assigned dynamically at vault time. Each USTMERxx profile must be enabled for *sequential tape* backups; the tape backup parameters will be used to dynamically allocate an output tape to which the completed MERGE BACKUPs will be written. The TAPEPREF= value will be used to create a dummy (empty) data set as the first file on the tape; additional files will be added to the tape to contain the completed MERGE BACKUPs. If the TAPEGDG option is not specified, the TAPEPREF= value can be up to 26 characters long; USTMERGE will add the date and time as ".Dmmyydd.Thhmmss" at the end to form a unique name.

Note that if the NEWTAPE option is specified on the console command which invokes USTMERGE (See Section 5.7), the USTMERxx profile will be checked to be sure it is enabled for *sequential tape* backups, but the parameters in the profile will not actually be used, since each backup is written to a unique tape according to the tape parameters in the workstation profile; no dummy file is written. See Section 7.9 for more details.

If you use the FDR/UPSTREAM ISPF dialogs or the FDR/UPSTREAM-PC screens to manage the USTMERxx profiles, they are automatically enabled for tape backups, and the parameters for tape backup are labeled "Merge Tape" to clearly indicate their function. Other profile parameters which do not apply to this special profile are inhibited.

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3.8 CONTINUED

USTVLTxx PROFILES

The reserved profiles **USTVLTxx** (xx is any 2 characters) must be defined if you are going to execute the USTVAULT utility to create secondary copies of sequential backups on tape for disaster recovery. You must have at least one USTVLTxx profile (usually USTVLT01) if you plan to use USTVAULT; additional USTVLTxx profiles can be used to segregate vault processing for various workstation profiles to provide more control over vaulting and allow multiple vaulting tasks to run concurrently; assignment of a workstation profile to a vault profile can be done with the GROUPID=xx operand in the configuration or can be assigned dynamically at vault time. Each USTVLTxx profile must be enabled for **both** *sequential disk* and *sequential tape* backups. The tape backup parameters will be used to dynamically allocate an output tape on which the secondary backups will be created. The TAPEPREF= value will be used to create a dummy (empty) data set as the first file on the tape. TAPEPREF= **must** have a value different from the prefix used to create the backups it is vaulting, i.e., it must be different from the TAPEPREF= or DASDPREF= in the original profiles.

Additional files will be added to the tape to contain the secondary backups using their original names (except that the copy number, specified by a ? in the DASDPREF=/TAPEPREF= in the workstation profile) is changed from '1' to another copy number from '2' to ‘9’ (2 is used by default).

The DASDPREF= value in the USTVLTxx profile is used to create a “control” file which is temporarily stored on disk and is copied as the last file on the tape at the end of USTVAULT processing. If the DASDGDG/TAPEGDG option is not specified, the DASDPREF=/TAPEPREF= value can be up to 26 characters long; USTVAULT will add the date and time as "Dmmyydd.Thhmmss" at the end to form a unique name. However, GDGs are recommended for USTVLTxx profiles. DASDPREF= and TAPEPREF= cannot specify the same value.

The TAPEPREF= and DASDPREF= values in the USTVLTxx profile may also contain a ? within the name, just like the PREF= values in the workstation profiles processed by vaulting. It is optional, but if present, USTVAULT will substitute the copy number (2 to 9) in the name of the dummy file and the control file. This is strongly recommended if you plan to create vault copies other than the default of copy 2.

If you use the FDR/UPSTREAM ISPF dialogs or the FDR/UPSTREAM-PC screens to manage the USTVLTxx profiles, they are automatically enabled for tape and disk backups, and the parameters for backups are labeled "Vault Tape" for the dummy file and "Vault Control File" for the control file to clearly indicate their function. Other profile parameters which do not apply to this special profile are inhibited.

See Section 7.8 for details.

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3.8 CONTINUED

USTDUPFL PROFILE

The reserved profile **USTDUPFL** can optionally be used with MERGE BACKUPs to reduce the overhead of backing up files which are duplicated on many workstations, such as those associated with operating systems (DOS, WINDOWS, etc.), word processors, and other software packages. If you include USTDUPFL in your configuration, it must be enabled for *keyed* backups (ONLINE=1 or more) and should not be enabled for any other type of backup. A USTDUPFL profile, enabled for *keyed* with DUPLICATE=NOCOPY set, will be automatically included in any new or updated configuration by USTCONFG.

When software as described above is installed on various workstations, most of the files (executable programs, graphics, screen layouts, etc.) will be identical on **each** workstation; only configuration and data files are usually unique. Although FDR/UPSTREAM has no problem backing them up from each workstation, the additional overhead when a new version is installed on many workstations may be considerable.

To avoid this problem, you can do a special *keyed* backup of the directories containing the duplicate files (e.g., the DOS, WINDOWS, MSWORD directories) using the special USTDUPFL profile name. This backup can be done from any workstation on which the software is installed. Alternately, if DUPLICATE=AUTO is enabled in the MAIN options, FDR/UPSTREAM will automatically monitor all MERGE BACKUPs for files which appear to be duplicates, and will store the duplicates as *keyed* backups under USTDUPFL. The backups are stored in the FDR/UPSTREAM-MVS “file-data” cluster (like any *keyed* backup).

During a full or incremental MERGE BACKUP, the workstation will automatically send all files that are flagged as having been updated since the last backup (the “archive” flag) but can optionally not send those that have an update timestamp in the last (30 days by default); this includes most files installed as part of a software package. For any files that have not been sent by the workstation, the MERGE BACKUP will copy them from previous incremental or full MERGE BACKUPs if they exist there. Finally, files that were not found on the previous backups will be requested from the workstation.

It is in this last step that the duplicate file support is invoked. Before requesting the unmatched files from the workstation, FDR/UPSTREAM-MVS will check to see if there is a backup of a file with a matching name, update timestamp, and file size under the USTDUPFL profile. The name comparison does not include drive/directory information, so it will match even it if is on a different drive or directory from the USTDUPFL backup. If a match is found, it will be copied to the output backup, or a pointer to it included in the backup (depending on the DUPLICATE= operand in the configuration) instead of requesting it from the workstation, avoiding considerable overhead.

With this duplicate file support, directories containing files that may be duplicated on many other workstations must be backed up once under the USTDUPFL profile, from any workstation, before the next MERGE BACKUP of any of those workstations.

The normal rolloff of old *keyed* backups (based on the ONLINE= value) will **not** be done for backups under USTDUPFL; obsolete versions of duplicate files stored under USTDUPFL must be done manually from a workstation using the *profile management* function of FDR/UPSTREAM-PC. Even this manual deletion will be inhibited if the DUPLICATE=NOCOPY option is set in the USTDUPFL profile; this option is recommended if any backup profiles also have DUPLICATE=NOCOPY to prevent inadvertent deletion of duplicate files still in use.

See Section 1.4 for additional information.

DUMMYxxx PROFILES

Profiles starting with “DUMMY” can be defined for backup simulation and testing. You must not create profiles beginning with DUMMY for any other purpose.

When a backup is done under a DUMMYxxx profile name, FDR/UPSTREAM-PC will recognize this special profile name and go into simulation mode. FDR/UPSTREAM will perform all of the normal actions for whatever type of backup you have requested, except that no file data will be transmitted. File descriptions will be transmitted to the host, and FDR/UPSTREAM-MVS will create backup files, but none of the actual data will be included.

These DUMMY profiles can be used to test the operation of FDR/UPSTREAM, to verify that the correct files are being selected, and to verify that the correct backups will be created on the host. You can inquire on these backups, but any attempt to actually restore from them will fail.

We suggest that you use them by creating a DUMMYxxx profile with the exact same parameters as the profile you intend to use for production (the COPY command of USTCONFG can be used for this), then run simulated backups with the DUMMYxxx profile in the same sequence that you will run the production backups. Once you are satisfied that the process is working, you can delete the backups under DUMMYxxx and begin production backups under the real profile.

CONTINUED . . .

3.9 SAMPLE CONFIGURATION

SAMPLE CONFIGURATION MEMBER USTCFG01

The following sample configuration is provided as member USTCFG01 in the FDR/UPSTREAM ICL (Installation Control Library). It serves as a sample of a simple configuration. However, Innovation recommends that the actual definition and maintenance of the configuration be done with the FDR/UPSTREAM ISPF dialog (See Section 6); profile definitions can also be maintained from a workstation using FDR/UPSTREAM-PC.

```
* DEFINE ENVIRONMENT TO FDR/UPSTREAM-MVS
MAIN APPLID=UPSTREAM,SECLVL=0,SUBSYS=UPSTREAM,
SORTUNIT=SYSDA,WTOCOMP,MAXTASKS=200
*-------------------------------------------------------------------
* DEFINE BACKUP PROFILES (WORKSTATION ID'S)
*-------------------------------------------------------------------
* PC8: ALLOW FULL AND INCREMENTAL "MERGE" BACKUPS TO TAPE
* FDR/UPSTREAM-MVS WILL COMPLETE THE DSNAME WITH THE PROFILE NAME AND
* VERSION DATE. TAPES WILL BE SCRATCHED BY TAPE MANAGEMENT SYSTEMS
* AFTER 30 DAYS.
*-------------------------------------------------------------------
DEFINE WSNAME=PC8,ONLINE=0,ARCHIVE=0,MERGE,
       TAPECOMP,TUNIT=CART,RETPD=30,
       TAPEPREF=USER8.BACKUPS
*-------------------------------------------------------------------
*-------------------------------------------------------------------
* WSTECH: IS A GROUP ENTRY DEFINING A SET OF PROFILES WITH
* IDENTICAL CHARACTERISTICS. AT THE WORKSTATION, ANY PROFILE NAME
* THAT STARTS WITH "WSTECH" CAN BE USED.
* IT ALLOWS FULL AND INCREMENTAL "MERGE" BACKUPS TO TAPE.
* USING GDG DATASET NAMES. SINCE THE LAST INDEX IN THE TAPEPREF
* IS THE NAME OF THE PROFILE PREFIX (WSTECH), UPSTREAM WILL REPLACE
* THAT INDEX WITH THE ACTUAL PROFILE NAME USED (E.G., WSTECH12).
* GDG BASES MUST BE PREBUILT FOR EACH FULL PROFILE NAME TO BE USED.
* TAPE MANAGEMENT SYSTEMS WILL SCRATCH THE TAPES WHEN THEY ROLL OFF
* OF THE GDG BASE.
*-------------------------------------------------------------------
DEFINE WSPREF=WSTECH,ONLINE=0,ARCHIVE=0,MERGE,
       TAPECOMP,TUNIT=CART,EXPDT=99000,
       TAPEPREF=USER.BACKUP.WSTECH,TAPEGDG
*-------------------------------------------------------------------
*-------------------------------------------------------------------
* PC7: ALLOW FULL AND INCREMENTAL "MERGE" BACKUPS TO TAPE AND DISK,
* USING A PREDEFINED GDG. FDR/UPSTREAM-MVS WILL ALLOCATE THE NEXT
* GDG GENERATION. DISK BACKUPS WILL BE SMS-MANAGED. "DEFERRED MERGE"
* BACKUPS WILL BE USED. THE PROFILE IS ASSIGNED TO GROUP "01" FOR
* ONLINE UTILITY EXECUTION.
*-------------------------------------------------------------------
DEFINE WSNAME=PC7,ONLINE=0,ARCHIVE=0,MERGE=DEFER,GROUPID=01,
       TAPECOMP,TUNIT=CART,EXPDT=99000,
       TAPEPREF=USER7.BACKUPS.ONTAPE,TAPEGDG,
       DASD,DUNIT=SYSDA,
       STORCLAS=BACKUP,MGMTCLAS=LANBKUP,
       DASDPREF=USER7.BACKUPS.ONDISK,DASDGDG
*-------------------------------------------------------------------
```

3.9 CONTINUED

```
*-----------------------------------------------------------------
* ADDITIONAL SAMPLE ENTRIES
*-----------------------------------------------------------------
* PC#1 ALLOW 4 NON-KEYED BACKUPS
DEFINE WSNAME=PC1,ARCHIVE=4
*-----------------------------------------------------------------
* PC#2 ALLOW NO KEYED AND 1 SEQUENTIAL TAPE BACKUP
*      FDR/UPSTREAM-MVS WILL CONSTRUCT THE FULL DATASET NAME
DEFINE WSNAME=PC2,ONLINE=0,TAPE,
       TUNIT=TAPE,TAPEPREF=USER1.BACKUP
*-----------------------------------------------------------------
* PC#3 ALLOW SEQUENTIAL SMS-MANAGED DISK BACKUPS ONLY
*      FDR/UPSTREAM-MVS WILL CONSTRUCT THE FULL DATASET NAME
DEFINE WSNAME=PC3,ONLINE=0,ARCHIVE=0,DASD,DASDPREF=USER2.BACKUP,
       MGMTCLAS=BATCH,STORCLAS=CACHED,DUNIT=SYSDA
*-----------------------------------------------------------------
* PC#4 ALLOW SEQUENTIAL TAPE AND DASD BACKUPS
*      FDR/UPSTREAM-MVS WILL CONSTRUCT THE FULL DATASET NAME
DEFINE WSNAME=PC4,ONLINE=0,ARCHIVE=0,TAPE,DASD,TAPEPREF=USER3.BACKUP,
       TUNIT=3480,DUNIT=SYSDA,MGMTCLAS=BATCH
*-----------------------------------------------------------------
* PC#5 ALLOW 5 NON-KEYED AND TAPE BACKUPS
*      FDR/UPSTREAM-MVS WILL CONSTRUCT THE FULL DATASET NAME
DEFINE WSNAME=PC5,ARCHIVE=5,TAPE,
TUNIT=CART,TAPEPREF=USER4.BACKUP
*-----------------------------------------------------------------
* PC#6 ALLOW DASD BACKUPS TO A PRE-DEFINED GDG
*      FDR/UPSTREAM-MVS WILL ALLOCATE THE NEXT GDG GENERATION
DEFINE WSNAME=PC6,ONLINE=0,ARCHIVE=0,DASDGDG,DASD,DUNIT=SYSDA,
       DASDPREF=USER6.DAILY.BACKUPS.DASDGDG
*-----------------------------------------------------------------
*-----------------------------------------------------------------
* PRINT THE CONFIGURATION
*-----------------------------------------------------------------
 PRINT ALL
```

CONTINUED . . .

4.1 OVERVIEW

FDR/UPSTREAM-MVS interacts with your mainframe security system, if you have one, to provide workstation and dataset security.

WORK-STATION SECURITY

UPSTREAM/MVS provides 4 levels of workstation security from which to choose. Specify the desired level in the configuration source file “MAIN” record (See Section 3, “CONFIGURATION” for a description of the “MAIN” configuration record.).

Briefly, the 4 security levels are:

Level-0: No security.

Level-1: Verify the entered Userid and Password only. (This is the default value.)

Level-2: Verify the entered Userid and Password, and additionally verify that the Userid has authority to use the entered *workstation profile name*. Level-2 security can also restrict certain Userids from restoring files from tape (Archive backups and *sequential tape* backups).

Level-3: Same as level-2, except that if the profile name specified at the workstation is the same as the userid specified, the userid is automatically authorized to that profile.

If you specify (or default to) level-1, level-2 or level-3 security, you will need to configure your security system as described later in this section.

If you wish to limit tape mounts, level-2 or 3 security allows you to permit certain users to restore from backups on disk, but not from backups on tape.

DATASET SECURITY

FDR/UPSTREAM-MVS is also subject to dataset security rules for the datasets it accesses, just like any other job or started task. Data set access is not done under the authority of the Userid entered by the workstation; rather it is done under the authority of whatever security Userid ID which you have assigned to the FDR/UPSTREAM-MVS started task. Consult the documentation of your security system for details on assigning security IDs to started tasks.

FDR/UPSTREAM-MVS batch jobs (such as USTARCH) are subject to the authority of the Userid assigned to that batch job (probably by the USER= operand on the JOB statement).

FDR/UPSTREAM-MVS should be given CREATE and UPDATE authority to its On-line Repository data sets, and also to any dataset names which will be created by *sequential disk* or *sequential tape* backups, as specified by the DASDPREF= and TAPEPREF= operands on DEFINE/MODIFY statements in the FDR/UPSTREAM configuration (See Section 3 “Configuration”).

If the File Transfer option of FDR/UPSTREAM is used (See Section 1.4), the output data sets created by file transfer are subject to the security of the userid under which the transfer is run. In other words, that userid must be authorized to create the output data sets used by the file transfer.

4.2 SECURITY PARAMETERS

THE "SECLVL" PARAMETER

The **"SECLVL="** parameter in the configuration "MAIN" record specifies the level of security FDR/UPSTREAM-MVS is to employ for all requests from any workstation. For SECLVL=1, 2, or 3, a valid security Userid and Password must be entered as part of the MVS/UPSTREAM request; the Userid/Password will be validated as shown below.

The permissible levels and their meanings are:

SECLVL=0 This level will cause FDR/UPSTREAM-MVS to perform **NO** security checking whatsoever. FDR/UPSTREAM-MVS will still verify that the *Workstation Profile Name* exists in the FDR/UPSTREAM Configuration and that the profile allows the type of backup requested, but no calls will be made to your security system. Note that if the configuration contains a GLOBAL profile, this profile will be used for any profile name which does not exist in the configuration, effectively allowing **any** profile name to be used by any workstation.

SECLVL=1 Specifying this level will cause FDR/UPSTREAM-MVS to issue a security call to verify that the entered Userid is defined to your security system and that the entered Password is correct for that Userid. The Userids used with FDR/UPSTREAM may be those already existing in your security system, or special Userids established just for UPSTREAM, or a combination of both. As with SECLVL=0, the Profile Name and backup type will also be verified against the FDR/UPSTREAM configuration. No authorization check will be made against the Profile Name. This means a User with a valid Userid and Password is permitted to backup or restore data using any valid Profile Name.

SECLVL=1 is the default

SECLVL=2 This is the most restrictive level available. In addition to the checks done for SECLVL=0 and 1, a security call will be issued to verify that the Userid is authorized to use the Profile Name entered. Employing SECLVL=2 will prevent a User with a valid Userid and Password from backing up or restoring data under an unauthorized workstation Profile Name. Users may be granted full backup and restore authority, or they may be authorized to perform only backups or only restores. For restores, another security call will be done to determine the Userid's authority to request restore from tape; if *archive* or *sequential tape* backups have been done under the Profile Name, some Userids can be restricted from mounting tape. Users can also be granted the authority to modify the definition of certain profiles, using the configuration modification facility under FDR/UPSTREAM at the PC. Special security rules must be established to define authority to the Profile Names.

SECLVL=3 This is the same as SECLVL=2 with one difference. If the Profile Name entered at the workstation is the same as the Userid entered, FDR/UPSTREAM will assume that the userid is authorized to do backups and restores under that Profile Name without further checking. This reduces overhead and also simplifies the security rule definition; if you create a security Userid with the same name as every workstation Profile Name, you do not need to explicitly authorize the Userid to the Profile.

THE "SUBSYS" PARAMETER

The "SUBSYS=" parameter on the configuration "MAIN" record specifies a value that will be used on security calls (if SECLVL=1, 2 or 3) to identify the "subsystem" and "requester" of the security request. It is optional; if not specified, the value **"UPSTREAM"** will be used. For some security systems, as described later in this section, this name may need to be defined to the system to permit these requests.

4.3 IMPLEMENTATION

Security checks are implemented in FDR/UPSTREAM-MVS by issuing RACROUTE macros, which call the MVS SAF (Security Access Facility) Router. SAF will route the security check to your security system. So, FDR/UPSTREAM supports any security system that supports SAF. This includes RACF from IBM, TOP SECRET and ACF2 from Computer Associates, and others. Specific notes about these three security systems appear later in this section.

LEVEL-0 SECURITY

Implementing SECLVL=0 security within FDR/UPSTREAM-MVS requires no modifications to your mainframe security system. FDR/UPSTREAM-MVS will perform **NO** calls to the MVS SAF Router.

LEVEL-1 SECURITY

Implementing SECLVL=1 security within FDR/UPSTREAM-MVS requires only minor modifications to your mainframe security system. Level-1 security issues RACROUTE TYPE=VERIFY to verify the Userid and Password.

LEVEL-2 AND LEVEL-3 SECURITY

SECLVL=2 and 3 allow you to define security rules so that only certain Userids can use certain profile names; they also allow you to grant certain Userids the authority to do only backups or only restores.

In addition to those authorization checks done for Level-1 security above, SECLVL=2 or 3 causes FDR/UPSTREAM-MVS to issue a

RACROUTE TYPE=AUTH,CLASS='$UPSTRM',ENTITY='profilename',ATTR=type

to verify that the Userid is authorized to use the *Workstation Profile Name* sent from the Workstation. For compatibility with earlier releases, if class $UPSTRM is not found, an additional check will be done with class WSIDENT. If the Userid is not authorized to the Profile Name, but the profile definition was provided in the FDR/UPSTREAM configuration by a PREFIX= entry instead of an explicit PROFILE=entry (See Section 3.5), a second check is done to see if the Userid is authorized for the prefix name; this allows one Userid to be authorized for all profile names that begin with the specified prefix.

However, if SECLVL=3 is in effect, and the Userid specified at the workstation matches the Profile Name entered (or the name of the PREFIX= profile entry in the FDR/UPSTREAM configuration which matches the Profile Name), the Userid is automatically considered to be authorized for UPDATE to that Profile Name; the RACROUTE for the Profile Name will not be done. This can greatly simplify the setup of the security rules, since the profile names do not have to defined, only the userids.

"type" is the type of authority requested. You must give the userid UPDATE authority if it is permitted to do backups and restores. Give it ALTER authority if the userid is authorized to modify the profile definition from the PC (ALTER also allows backups and restores).

You may also give users the authority to perform only one type of operation by granting them only READ access. The type of access granted is defined by the RACFUPD= option in the global FDR/UPSTREAM-MVS configuration (See Section 3.4). RACFUPD=BACKUP means that READ users can only do restores; it should be used when you want to protect against unauthorized backup while allowing some users to do restores at will. RACFUPD=RESTORE (the default) grants READ users the authority to do backups only and protects against unauthorized or ill-considered restores.

4.3 CONTINUED

TAPE MOUNT AUTHORITY

By default, any authorized user can do restores from either tape or disk backups. But if you want to limit tape mounts by allowing only certain users to restore from tape backups, you can do so under SECLVL=2 and 3.

For a restore request, a RACROUTE will be issued:

RACROUTE TYPE=AUTH,CLASS='$UPSTRM',ENTITY='TAPEMOUNT',ATTR=UPDATE

If the Userid is authorized to this name, then the Workstation will be permitted to request restores that require tape mounts (restore from Archive and from sequential tape). If not, only disk restores will be permitted. TAPEMOUNT allows you to give global tape restore authority to selected users.

However, if TAPEMOUNT has not been defined as a resource to your security system (resource not found), MVS/UPSTREAM will repeat the check using a entity name of "Rprofilename", i.e., the profile name with an R in front of it. This allows you to give a Userid tape restore authority for certain profiles and not for others.

If neither resource (TAPEMOUNT and Rprofilename) is defined to your security system, all tape restores will be allowed.

If you are using SECLVL=3, the check for tape mount authority will still be done for restores, as described above.

You can use either the TAPEMOUNT or Rprofilename resource names to control tape mounts, but not both. TAPEMOUNT is much simpler, you simply define that one resource and give the appropriate Userids UPDATE acess to it.

IMPLEMENT-ATION

To implement Level-1 security, you will need to:

- verify that the SAF interface is enabled for your security system (RACF and TOP SECRET always support SAF).
- modify security tables to allow security calls from the subsystem named by the SUBSYS= parameter (default UPSTREAM). This may not be necessary for some security systems, as described later in this section.
- define any Userids for use with FDR/UPSTREAM which are not already defined to your security system.

To implement Level-2/3 security, perform these additional steps:

- define a resource class of $UPSTRM (a class of WSIDENT is also acceptable if already in use with an earlier release, but Innovation recommends you convert to $UPSTRM for compliance with IBM recommendations for user-defined resource classes).
- define resource names under that class corresponding to the workstation profile names which will be used with FDR/UPSTREAM; generic resource names are acceptable. If you have defined PREFIX= profiles in the FDR/UPSTREAM configuration, you can either define resource names equal to the prefix names (to give a Userid authority to all of the profiles under that prefix), or you may define the actual profile names to be used, or both. If SECLVL=3 is enabled, you do not need to define the profile names (or prefixes) if the Userids themselves match the profile names or prefixes. Be sure to specify that the universal (default) access is NONE (for RACF, UACC(NONE)).
- authorize appropriate Userids to have READ, UPDATE or ALTER access to those profile names they are permitted to use.
- if you wish to restrict restores from tape for certain userids (described above), you must define a resource of TAPEMOUNT under the $UPSTRM (or WSIDENT) class, to grant global tape restore authority, and/or define resources of "Rprofilename" (profile name preceded by letter R) to grant tape restore authority for specific profiles. If you use this facility, Innovation recommends the use of the TAPEMOUNT resource. Then you must authorize appropriate Userids to those profiles with UPDATE authority.

A special profile name of "USTRGSTR" must be security authorized for UPDATE for any userid that is allowed to display or update the FDR/UPSTREAM Registered Name table from ISPF or from the equivalent FDR/UPSTREAM-WORKSTATION display; USTRGSTR does not need to be defined in the FDR/UPSTREAM configuration. The Registered Name Service is described in Section 8.8. The ISPF dialog for display and update of the table is described in Section 6.7; use of the ISPF dialog or the equivalent workstation service requires authority to profile USTRGSTR if SECLVL=2 is in effect.

4.3 CONTINUED

There are no special security requirements for a workstation to register its own name.

USTBATCH SECURITY CHECKING

There is a special security check done for FDR/UPSTREAM functions requested via USTBATCH, which is completely documented in Section 8.

This special check simplifies security requirements when running USTBATCH. When a security system is active, a security userid must be associated with every batch job. This userid can be specified by the USER= parameter on the JOB statement, or can be the userid of the TSO user or other job which submitted the batch job. Since this userid and its password have already been validated, if the same userid is being used for the FDR/UPSTREAM operation, there is no need to revalidate it or respecify the password.

When USTBATCH initiates its conversation with the FDR/UPSTREAM online task, the online task will extract the userid of the USTBATCH job; several validation techniques are used to ensure that the calling program is actually a USTBATCH job. This is done only if CONV=KEEP or WAIT was specified to USTBATCH and only if USTBATCH is executing as a APF authorized program (under TSO, USTBATCH must be defined as an authorized program as described in Section 2.12).

Later, when the function request has been sent to the workstation and is being initiated by the workstation, FDR/UPSTREAM will compare the security userid associated with the request with the userid extracted from the USTBATCH job; if they match, FDR/UPSTREAM will **not** require or validate a password. It will use the userid for security checking as though a valid password had been provided. Note that if SECLVL=2 or 3 is in use, that userid must still be authorized to the profile associated with the request, as described earlier.

To summarize, if the security userid associated with a request from USTBATCH matches the userid of the USTBATCH job, FDR/UPSTREAM assumes that the password of that userid has already passed validation. For installations that change passwords regularly, this means that the password need be changed only in the TSO logon or USTBATCH JCL and does not need to be changed (or even specified) in the USTBATCH parameters or FDR/UPSTREAM-PC parameters.

If the userid does **not** match, then normal validation will be done on the userid associated with the UPSTREAM request and a password will be required. This is also true if the userid cannot be extracted from the job or the USTBATCH job does not pass the FDR/UPSTREAM validation checks.

To simplify use of this feature, USTBATCH accepts a statement: `USERID &JOB` which automatically copies the userid associated with the USTBATCH job and makes it the userid associated with the USTBATCH-initiated request.

Warning: for ULTra users only, the USERID &JOB statement is honored only for the first backup requested in the USTBATCH job.

When USTBATCH is used to submit FDR/UPSTREAM-MVS console commands, there are two classes of commands for security purposes:

- **All** commands will check for READ authority to a dummy profile name of USTCMD. This profile does not need to exist in the FDR/UPSTREAM configuration, but you can define a security rule for that profile name to control the ability to execute UPSTREAM console commands through USTBATCH.
- Commands which execute in a subtask and have an associated profile name will do normal security checking against that profile. These are listed in Section 5.7 *Online Utility Execution* and the profile names associated with each are listed in Section 3.8 *Reserved Profiles*. For example, a command of VAULT03 requires authority to the profile USTVLT03. This allows you to restrict certain subtask-type commands to certain userids.

CONTINUED . . .

4.4 RACF CONSIDERATIONS

These are considerations for implementing FDR/UPSTREAM-MVS security under RACF from IBM. These notes and procedures should be verified in the appropriate manuals for your level of RACF.

RACF ROUTER TABLE

If you are using Level-1, Level-2 or Level-3 security, you will need to update the installation-defined RACF Router Table ICHRFR01 to include the subsystem name and resource class used by FDR/UPSTREAM, so that SAF will pass those requests to RACF.

This is a sample of the ICHRFRTB macro required to define FDR/UPSTREAM. This should be added to the entries you already have in this table, if any. Consult your RACF documentation for details on assembling this table.

```
$UPSTRM ICHRFRTB CLASS=$UPSTRM,                                    X
                 REQSTOR=UPSTREAM,      <== omit if RACF 1.9+      X
                 SUBSYS=UPSTREAM,       <== omit if RACF 1.9+      X
                 ACTION=RACF
```

If you have specified the SUBSYS= parameter in the FDR/UPSTREAM configuration with a value other than UPSTREAM, change the REQSTOR= and SUBSYS values to match.

If you are using RACF 1.9 or above, the REQSTOR= and SUBSYS= parameters should be omitted; if you are using only Level-1 security, this table update is not required at all for RACF 1.9+.

ACTIVATING THE CLASS

If you are using Level-2 or Level-3 security, you must define the $UPSTRM class by updating the installation-defined class-descriptor table ICHRRCDE.

This is a sample of the ICHERCDE macro required to define class $UPSTRM. This should be added to the entries you already have in this table, if any. Consult your RACF documentation for details on assembling this table.

```
$UPSTRM ICHERCDE CLASS=$UPSTRM,                                    X
                 ID=129, <=value of your choice, see RACF doc      X
                 POSIT=23, <=value of your choice, see RACF doc    X
                 MAXLNTH=9,                                        X
                 FIRST=ALPHANUM,                                   X
                 OTHER=ANY,                                        X
                 DFTUACC=NONE,                                     X
                 OPER=NO
```

Once the Class Descriptor Table has been updated and activated, resource checking for the $UPSTRM class must be activated by a security administrator using the command:

SETROPTS CLASSACT($UPSTRM)

Now you can begin defining *workstation profile names* under the $UPSTRM class with the RDEFINE command, and granting the appropriate access to them by specified Userids with the PERMIT command.

4.5 TOP SECRET CONSIDERATIONS

These are considerations for implementing FDR/UPSTREAM-MVS security under TOP SECRET from Computer Associates. These notes and procedures should be verified in the appropriate manuals for your level of TOP SECRET.

Note that the security subsystem name (defined by the SUBSYS= operand on the MAIN statement in the FDR/UPSTREAM-MVS configuration) is not used for security calls to TOP SECRET.

FACILITY DEFINITION

In order that FDR/UPSTREAM-MVS be able to verify Userids and Passwords, it must be defined as a “facility” to TOP SECRET. The following is a sample of the input required to do this definition. It replaces “USER10”, one of the user-defined facility names provided by TOP SECRET; if this name has already been used, choose another available name. You should verify in TOP SECRET documentation that the options shown are correct for your installation.

```
*
* Sample Top Secret facility definition for UPSTREAM
*
FAC(USER10=NAME=UPSTREAM)
FAC(UPSTREAM=PGM=UST)
FAC(UPSTREAM=NOSTMSG,SIGNs,NOINSTDATA)
FAC(UPSTREAM=NORNDPW,NOASUBM)
FAC(UPSTREAM=MODE=FAIL)
FAC(UPSTREAM=LOG(INIT,MSG))
FAC(UPSTREAM=UIDACID=8,LOCKTIME=0)
FAC(UPSTREAM=DEFACID(*NONE*),KEY=8)
```

RESOURCE DEFINITION

If you are using level-2 security, the resource class $UPSTRM must be defined to TOP SECRET using a command similar to that shown below.

```
*   Sample Top Secret resource class definition (RDT) for the
*   "$UPSTRM" resource class used by UPSTREAM
*
TSS ADD(RDT) RESCLASS($UPSTRM) RESCODE(01) ATTR(DEFPROT,MERGE,LONG) -
        ACLST(NONE,ALTER=0400,READ,UPDATE,ALL) DEFACC(UPDATE)
```

Note that the RESCODE is any value from 01 to 3F which is not already in use; use the TSS LIST(RDT) command to display the in-use codes. Also, the DEFPROT attribute is optional; if specified, all FDR/UPSTREAM profiles will be protected by default, even if no specific rule has been defined for them.

Now you can begin defining *workstation profile names* under the $UPSTRM class, and granting the appropriate access to them by specified Userids.

4.6 ACF2 CONSIDERATIONS

These are considerations for implementing FDR/UPSTREAM-MVS security under ACF2 from Computer Associates. These notes and procedures should be verified in the appropriate manuals for your level of ACF2.

SAF INTERFACE

The security checks done by FDR/UPSTREAM-MVS can only be processed by ACF2 if the ACF2 SAF interface is enabled. Consult the appropriate ACF2 manuals for details on enabling this interface if you do not already use it.

Depending on your level of ACF2, you may need to define a rule for the SAF interface in order to process level-2 security calls. This rule is not required in ACF2 V6. An example of such a rule is:

SAFPROT.UST SUBSYS(UPSTREAM) CNTLPT(UPSTREAM) CLASS($UPSTRM,VERIFY)

If you have specified the SUBSYS= parameter in the FDR/UPSTREAM configuration with a value other than UPSTREAM, change the CNTLPT and SUBSYS values to match.

OTHER CONSIDERA-TIONS

FDR/UPSTREAM-MVS must be defined to ACF2 as a “MUSASS” (multi-user) application subsystem.

Consult ACF2 documentation for details on defining the FDR/UPSTREAM application, and for defining the $UPSTRM class and workstation profile names, and authorizing Userids to use them.

5.1 OVERVIEW

FDR/UPSTREAM-MVS provides communication with the MVS System console via the MVS STOP and MODIFY commands. The STOP command will cause a “quiesce” stop, while a MODIFY command is used when an immediate termination is necessary. The MODIFY command is also used to dynamically change FDR/UPSTREAM options, to dynamically invoke certain utility functions, and to invoke internal tracing.

Note: all of the commands described in this section can be issued by an authorized TSO user using the FDR/UPSTREAM ISPF dialog, described in Section 6, or from an authorized batch job using the USTCMD utility (See Section 7.12).

All of the following sections assume you have not renamed the supplied PROC member name; it is still named “UPSTREAM”. If the PROC member name was renamed, you will have to substitute the new PROC name in place of “UPSTREAM” in the commands and examples.

5.2 STARTING FDR/UPSTREAM-MVS

The normal MVS START command is used to start FDR/UPSTREAM-MVS:

S UPSTREAM

The name, UPSTREAM, is the name of the proc installed in your system procedure library as part of FDR/UPSTREAM installation in Section 2.9. This name will also become the name of the FDR/UPSTREAM-MVS on-line task, and will be used in all of the console commands described in this section (as well as the TCP/IP reserved port list described in Section 2.8). If you have changed this name to something other than UPSTREAM, you must use that alternate name in all the commands and the TCP/IP list as well. If you like, you can assign a name, different from the proc name, to the task, e.g.,

S UPS240.UPSTREAM

which will invoke proc UPS240 but will name the on-line task UPSTREAM.

When FDR/UPSTREAM/MVS has completed it's initialization without error, it will issue message:

UST035 FDR/UPSTREAM V*n.n.n* INIT COMPLETE-CONFIG=member, APPLID=applid,SECLVL=n

This shows the member name of the configuration file (if it is a PDS), the VTAM application ID, and the security level (0-3) in use.

If any errors were encountered during the initialization phase, they are reported to the System console as well as the FDR/UPSTREAM-MVS Log file whenever possible. If you encounter any problems in FDR/UPSTREAM-MVS initialization, be sure to check **both** sources for information.

There are some startup options that may be specified via the PARM= on the START command, e.g,

S UPSTREAM,PARM=‘NOMAINT,SCHEDULE’

Note that the options specified will *completely* override any PARM= options specified in the UPSTREAM proc JCL. The supported options are:

- SCHEDULE – will automatically start USTSCHED (the FDR/UPSTREAM automatic scheduler) at FDR/UPSTREAM startup. See Section 5.10 for details.
- NOMAINT – will bypass the automatic execution of the USTMAINT utility during FDR/UPSTREAM-MVS startup. However, since USTMAINT must be run periodically in order to cleanup any obsolete entries in the online repository, Innovation does not recommend that you run this way normally. You may execute USTMAINT at anytime during FDR/UPSTREAM operation as described in Section 5.7.
- TCPHPNS – If you are using IBM TCP/IP V3R2, both the IUCV and HPNS APIs are supported by FDR/UPSTREAM-MVS. If this parm is omitted, IUCV will be used (for compatibility with earlier releases). To use HPNS (High Performance Native Sockets), specify PARM=TCPHPNS. For TCP/IP V3R3 and beyond, HPNS is automatically used.

5.3 STOPPING FDR/UPSTREAM-MVS

There are two methods available to stop FDR/UPSTREAM-MVS. The first, the MVS STOP command, will cause FDR/UPSTREAM-MVS to perform an orderly “quiesce” stop. In those instances when an immediate termination is required, an MVS MODIFY command is used.

QUIESCE STOP

The MVS STOP command will cause FDR/UPSTREAM-MVS to perform a “quiesce” stop. All tasks in progress at the time the command is received will continue until completion; however, no new conversations will be permitted to begin. The format of the STOP command is:

P UPSTREAM

FDR/UPSTREAM-MVS will issue the acknowledgment message:

UST008 FDR/UPSTREAM STOP ACCEPTED – SHUTDOWN IN PROGRESS

If any BACKUP/RESTORE tasks are active, FDR/UPSTREAM will issue:

UST240W ACTIVE TASK FOUND – SHUTDOWN AWAITING TASK TERMINATION

When all subtasks have terminated, the Main Task will then end.

QUICK STOP

An MVS MODIFY command is used when an immediate shutdown of FDR/UPSTREAM-MVS is required:

F UPSTREAM,TERM
or
F UPSTREAM,QUIT

FDR/UPSTREAM-MVS will issue the acknowledgment message:

UST242 QUIT ACCEPTED – SHUTDOWN IN PROGRESS

This command will cause the FDR/UPSTREAM-MVS Main task to notify all currently processing subtasks to terminate (backups in progress will be suspended). When all subtasks have performed orderly termination procedures, the Main task will be notified, and it will end.

5.3 CONTINUED

CONTROL TASK EXECUTION

A FDR/UPSTREAM-MVS internal task is started for every backup and restore, most other workstation functions, and for FDR/UPSTREAM-MVS utilities such as USTVAULT. Console commands are available to terminate a task, to temporarily suspend task execute, and to restart a suspended task. This might be used when a task is hung, or when it is using so much resource that other tasks don't perform well. You can use the FDR/UPSTREAM status display in Section 5.4 or Section 6 to verify the status of a session; if several displays show that the CPU time used for the subtask has not changed, it is probably hung or being locked out by another task. From the status display get the unique task ID or the LU name (it will be either the VTAM LU name, the TCP/IP workstation network address in hex, or an internal utility name).

To terminate a task, enter:

F UPSTREAM,TERM ID=task (specify all 4 digits)
or
F UPSTREAM,TERM LU=luname

To suspend execution of a task until restarted or terminated, enter:

F UPSTREAM,SUSPEND ID=task (specify all 4 digits)
or
F UPSTREAM,SUSPEND LU=luname

To resume execution of a task that was suspended, enter:

F UPSTREAM,RESTART ID=task (specify all 4 digits)
or
F UPSTREAM,RESTART LU=luname

The ID= form is preferred since it uniquely identifies the task to be terminated; there may be several tasks associated with a given LU, and tasks may change while you are entering the command; if there are several tasks running with the same LU name, the LU= form will terminate the first such task. For utility tasks (such as USTMIGRT and USTVAULT) the LU name will be the utility name. If the subtask does not terminate within a few minutes, it may have hung again during termination; issue the command again to force termination.

CANCEL PROTECTION

Because a MVS CANCEL of FDR/UPSTREAM may cause loss of integrity in the FDR/UPSTREAM repository data sets, the UPSTREAM on-line task protects itself against operator CANCEL commands.

If a CANCEL is issued, FDR/UPSTREAM will intercept the CANCEL and:

- If no BACKUP/RESTORE/UTILITY tasks are active, the repository and log data sets are closed before allowing the CANCEL to proceed. This may take up to one minute.
- If a shutdown is already in progress (because of a previous STOP or CANCEL command), all subtasks are stopped, the repository data sets are closed, and the CANCEL is allowed to proceed.
- If BACKUP/RESTORE/UTILITY tasks are active, a status display is done (as shown in Section 5.4) and message UST240W is issued to give the operator several options:
  – ignore the CANCEL and continue with normal operations.
  – wait for an orderly shutdown of FDR/UPSTREAM (an internal STOP command is issued).
  – terminate a specific subtask and ignore the CANCEL (continue with normal operations)
  – redisplay the status
  – accept the CANCEL (closing the repository and log data sets first).

If FDR/UPSTREAM does not come to a normal termination in a reasonable amount of time, another CANCEL can be issued to terminate it.

If FDR/UPSTREAM will not respond to the STOP commands documented in this section and must be cancelled, Innovation recommends that you use the MVS console DUMP command to get a SVC dump of the FDR/UPSTREAM address space before issuing the CANCEL. This will provide the maximum amount of information for problem determination.

CONTINUED . . .

5.4 ACTIVITY INQUIRY

FDR/UPSTREAM-MVS supports an activity inquiry command as follows:

F UPSTREAM,STATUS

“STATUS” may be abbreviated “STA”.

FDR/UPSTREAM-MVS will respond to the System console with messages indicating the Workstation Profile Name, SNA LU Name or TCP/IP network address (in hex), type of operation, cpu time, number of files processed (if applicable), and internal task ID for each conversation (or internal utility, such as USTMAINT) currently in progress. For example,

```
UST013  STATUS REQUEST  --- ACTIVE TASKS ---
UST013  PROFILE  LUNAME - # FILES CPU TIME OPERATION ID
UST014  US02     LU4AS030      15    0.308 BACKUP   0013
UST014  US01     LU3AS030       2    0.289 BACKUP   0017
UST014  NTTEST   LU0AS039       0    0.123 RESTORE  0022
UST014  *        LU0AS03A      17    0.075 INQUIREV 0032
UST015      4 TASKS CURRENTLY ACTIVE - END OF DISPLAY
```

If no conversations are currently active, message UST016 will be issued indicating **“NO TASKS CURRENTLY ACTIVE”**.

The internal task ID can be used with the TERM ID= command shown in Section 5.3.

The FDR/UPSTREAM ISPF dialog provides a more detailed status display (See Section 6), and supports line commands for termination of tasks. A similar status display is available from FDR/UPSTREAM on the workstation.

5.5 INTERNAL DIAGNOSTICS

INTERNAL TRACE

The internal trace facility is intended to be used when requested by Innovation Technical Support for problem diagnosis. You may be requested to run the internal trace when reporting a problem. The trace records are written to the USTLOG dataset which should be retained for review. To start the internal trace enter:

F UPSTREAM,TRACE ON	(for all workstations)
or	
F UPSTREAM,TRACE ON LU=luname	(for one workstation, VTAM LU name or TCP/IP address)
or	
F UPSTREAM,TRACE ON ID=task	(for the 4-digit task ID as shown in the status display)

If LU= or ID= was specified, only one workstation can be traced at a time; if multiple TRACE commands are entered, only the last one entered will be honored. To subsequently stop the internal trace, enter:

F UPSTREAM,TRACE OFF

Since the internal trace processing will add significant overhead, FDR/UPSTREAM-MVS normally initializes it to the off state during it's start-up. However, you can initiate tracing during FDR/UPSTREAM start-up by adding “PARM=‘TRACE’” to the EXEC statement in the UPSTREAM start-up proc. It is recommended that the trace only be run upon request from Innovation.

COMMUNI-CATIONS TRACE

There is also a communications-only trace, which traces VTAM and TCP/IP activity within FDR/UPSTREAM, which is much less overhead than the full trace. To start the communications trace enter:

F UPSTREAM,COMTRACE ON,nnnnn

"nnnnn" (1-5 digits) is the maximum bytes of data to print for each trace entry; the default, if omitted, is 20 bytes.

To subsequently stop the communications trace, enter:

F UPSTREAM,COMTRACE OFF

The communications trace processing is also initialized to the off state during start-up. However, you can initiate communications tracing during FDR/UPSTREAM start-up by adding “PARM=‘COMTRACE’” to the EXEC statement in the UPSTREAM start-up proc. It is recommended that the trace only be run upon request from Innovation.

ABEND ON MESSAGE

In order to diagnose certain errors, FDR/UPSTREAM has the option to abend when a specific message is generated, or alternately on the Nth occurrence of the message. Since this will cause the subtask generating the message (or sometimes the entire FDR/UPSTREAM address space) to abnormally terminate, this should be used only on request of Innovation Technical Support.

To invoke the Abend on Message, enter:

F UPSTREAM,ABENDM=mmm
or
F UPSTREAM,ABENDM=mmm,ccc

where “mmm” is the 3-digit FDR/UPSTREAM message number (e.g., ABENDM=012 for message UST012) and “ccc” is the 3-digit count of occurrences of the message required before the abend will occur (e.g., ABENDM=234,005 for the fifth occurrence of message UST234).

5.6 LOG HANDLING

During its operation, FDR/UPSTREAM records messages into a log file and optionally to a summary file (See Section 10 for details on the messages). These files may be SYSOUT, or DASD data sets. In either case, you may wish to see the messages on the log while FDR/UPSTREAM is still active. It is often impossible to see the most recent messages, which are probably those of most interest, because they are still in a buffer and have not yet been written. FDR/UPSTREAM offers two methods of making these messages available.

FLUSHING THE LOG

You can request that FDR/UPSTREAM-MVS flush the log and summary buffers by closing the files and reopening them (with EXTEND if on DASD so that new messages will still be added to the end). This will make all messages visible. To request this, enter:

F UPSTREAM,FLUSHLOG

SWITCHING THE LOG

FDR/UPSTREAM also optionally supports a second log file, specified by DDNAME “USTLOG2” in the FDR/UPSTREAM-MVS start-up proc. You can request that FDR/UPSTREAM close the current log file and switch to the other, switching between USTLOG and USTLOG2 whenever the command is entered. Note that the new log file is opened for OUTPUT; for DASD log files this means that the file will be overwritten, so you should save the contents of the inactive log file whenever this is used. If DDNAMEs USTSUMM and USTSUMM2 are also present, FDR/UPSTREAM will switch to the alternate summary file as well. To request switching of the log files, enter:

F UPSTREAM,SWITCHLOG

5.7 ONLINE UTILITY EXECUTION

USTMAINT EXECUTION

The FDR/UPSTREAM maintenance utility, USTMAINT deletes obsolete backups from the UPSTREAM repository (because either the backup is no longer cataloged in the system catalog, or because the number of backups specified by ONLINE= or ARCHIVE= in the associated profile has been exceeded); it also deletes history records which are older than the specified retention period (MAXHIST in the configuration). It is normally executed automatically during the start-up of the FDR/UPSTREAM on-line task (See Section 5.1); if the on-line task is active for a long period of time, or if a great deal of backup processing has occurred, you may wish to execute USTMAINT during FDR/UPSTREAM operation. To do so, enter:

F UPSTREAM,MAINT

If you wish to delete the records of one backup from the repository, you can enter this command:

F UPSTREAM,REMOVEDSN=dsname

"dsname" must be a cataloged FDR/UPSTREAM backup. If it is a GDG, a relative generation number may be specified, e.g., REMOVEDSN=UPSTREAM.BACKUP(-1). REMOVEDSN will delete the repository records but it will not delete or uncatalog the backup file itself. If you want to discard the backup as well, it is easier to delete or uncatalog the backup file manually (the TSO or IDCAMS "DELETE" command is a convenient way to do so) and let the next execution of USTMAINT delete the repository records automatically.

If a vault copy of a deleted backup has been created by USTVAULT, USTMAINT will also delete the records of the vault copy. However, if more than one copy was created (e.g., copy 2, copy 3, etc.) only the lowest numbered vault copy will be automatically deleted. For example, if copies 3 and 4 exist, only copy 3 will be deleted.

The FDR/UPSTREAM ISPF panels offer a convenient interface in the backup management function (See Section 6.10) for issuing the REMOVEDSN command, a TSO DELETE command, or both.

USTREGEN EXECUTION

You may dynamically invoke the FDR/UPSTREAM REGEN utility, USTREGEN, while FDR/UPSTREAM-MVS is operating. USTREGEN reads secondary copies of Archive and vault tapes and sequential backups, in order to update UPSTREAM's records and make them the primary copy; it may also be used to rebuild records for backups that have been deleted. It is described in more detail in Section 7.6. The USTREGEN batch jobstream described in that section may only be run when the FDR/UPSTREAM on-line task is not active.

USTREGEN is also used to read the "control files" produced by USTVAULT, in order to make the secondary backup tapes created by USTVAULT the primary copies for restore purposes. The names of the vault control files which must be used as input to USTREGEN are recorded under profile names USTVLCxx. If USTVAULT was used to create offsite copies of your backups, this would be done at a disaster recovery site to "activate" the offsite vault copies of the backups. Vaulting is described in detail in Section 7.8.

To run USTREGEN while the FDR/UPSTREAM on-line task is active, enter:

F UPSTREAM,REGEN DSN=dsname

"dsname" must be the name of a cataloged secondary copy of a UPSTREAM Archive, vault control file or sequential backup. The data set will be dynamically allocated to the UPSTREAM task, and USTREGEN will be executed as a subtask to read the backup and update the FDR/UPSTREAM records. This can be done concurrently with other UPSTREAM activities, such as backups and restores, and multiple REGEN commands may be active concurrently as well.

The FDR/UPSTREAM ISPF panels offer a convenient interface in the backup management function (See Section 6.10) for issuing the REGEN command.

5.7 CONTINUED

USTREORG EXECUTION

The 3 data sets used by the FDR/UPSTREAM-MVS on-line task, namely:

- USTCATLG – the on-line repository catalog
- USTFILEI – the on-line repository file-information data set
- USTFILEC – the file-data data set

are all keyed files, and will need periodic reorganization. Reorganization will be required whenever the data set becomes too badly fragmented for the insert of new records, or, in the case of USTCATLG and USTFILEI in the Innovation proprietary format, whenever the overflow area becomes full from the insertion of many new records. You can do this with a batch jobstream (See Section 2.15), but Innovation recommends that you do the reorganization dynamically while the FDR/UPSTREAM task is running with the USTREORG utility.

Dynamic reorganization of the FDR/UPSTREAM data sets can be done only when there are no other active tasks running. Reorganization requests will wait if there are other active tasks, and attempts to initiate other tasks, including backups and restores, will wait while any reorganization is running or waiting to run; if you want to abandon a waiting reorganization and allow other tasks to run, use the TERM command (See Section 5.3). The amount of time required to do the reorganization depends on the amount of data in the file .

To request the reorganization of one of the FDR/UPSTREAM data sets, enter:

F UPSTREAM,REORG DD=ddname
or
F UPSTREAM,REORG DD=ddname %F=nn

where “ddname” is one of the 3 DD names shown above. You may enter requests for 2 or all 3 data sets to be reorganized concurrently.

If the optional %F=nn was included, “nn” is a percentage of free space. If the data set has more than nn% free space, the REORG request will be bypassed; this allows you to issue automatic REORG commands that will execute only when necessary to increase free space. For those data sets which are allocated as VSAM and those in the "enhanced" Innovation proprietary format, the free space is calculated from the “free bytes” maintained by those access methods; for those in the unenhanced proprietary format, this is the percentage of free space in the independent overflow area.

The reorganization will dynamically allocate a backup file, copy the contents of the data set into that backup, and then reload the file from the backup. No harm will be done if the reorganization fails during the backup, but **the data set will be unusable and FDR/UPSTREAM will fail if the reload fails** (you will probably have to manually reload the data set from the backup in this case). Messages will be written to the UPSTREAM log to indicate the name of the backup data set and the success of the reorganization (the latter also appears on the console).

So that USTREORG knows where to allocate the backup file, there must be a special profile in the FDR/UPSTREAM configuration for each DD name that you wish to reorganize (i.e., USTCATLG, USTFILEI, and USTFILEC). In each of these profiles, the options which specify sequential DASD and TAPE backups will be used to allocate the backup files. The profile must be enabled for DASD or TAPE (TAPECOMP) backups; if both are enabled, DASD is used. If the DASDGDG/TAPEGDG option is not specified, the DASDPREF/TAPEPREF value will be appended with the date and time of the backup to create a unique name. This backup file will **not** be deleted even if the reorganization is successful; if it is not a GDG, you should take steps to delete them after a reasonable period. See Section 3 for more details on the Configurator.

GDGs are recommended so that older backups will automatically be uncataloged as new reorganizations are done. The GDG base should be defined with 2 or more generations, keeping several copies of the backup for safety. **Do not let the backup expire immediately after the reorganization**. If you do not use a GDG, you are responsible for deleting unneeded backups.

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5.7 CONTINUED

An option is available to close and reopen any of the FDR/UPSTREAM data sets without reorganizing them. You may want to do this to set the last reference date and update flags periodically (so that DASD management systems such as FDR/ABR will back them up) or to update statistics. The command to do so is:

F UPSTREAM,CLOSE DD=ddname

Like REORG, CLOSE will wait if other tasks are running.

USTARCH EXECUTION

You may dynamically invoke the FDR/UPSTREAM Archive utility, USTARCH, while FDR/UPSTREAM-MVS is operating. USTARCH locates *non-keyed* backups of files which have been temporarily stored on the on-line repository and moves them to tape; it is described in more detail in Section 7.5. The USTARCH batch jobstream described in that section may only be run when the FDR/UPSTREAM on-line task is not active.

To run USTARCH while the FDR/UPSTREAM on-line task is active, enter:

F UPSTREAM,ARCHIVE

There must be a special profile name of USTARCH in the FDR/UPSTREAM configuration with options which will be used to allocate the Archive tape. The profile must be enabled for TAPE or TAPECOMP backups. If the TAPEGDG option is not specified, the TAPEPREF value will be appended with the date and time of the archive to create a unique name. See Section 3 for more details on the Configurator.

The on-line execution of USTARCH will be run with the NOMERGE and DELETE options. It will create an archive tape containing only the files that were waiting in the on-line repository to be archived at the time of the run and will delete them from the repository.

USTMIGRT EXECUTION

You can execute the FDR/UPSTREAM-MVS migration utility, USTMIGRT, under the FDR/UPSTREAM on-line task; it cannot be executed as a separate batch job. It will “migrate” recently created *sequential disk* backups to tape. When USTMIGRT is run, it scans the FDR/UPSTREAM-MVS on-line repository for *sequential disk* backups recorded under each profile name and compares the number of such backups to the MIGTHRESH=nn parameter in the associated profile definition in the FDR/UPSTREAM-MVS configuration; if it is equal or higher, the least recent disk backups will be “migrated” to tape until the number of disk backups is nn-1 (one less than the threshold). MIGTHRESH=0 (which is the default) disables migration for the associated profile, while MIGTHRESH=1 will migrate **all** sequential backups under the profile (except that, if the latest backup is a restartable-interrupted backup, it will not be migrated).

To run USTMIGRT, enter:

F UPSTREAM,MIGRTxx PROFILE=profile,NEWTAPE,FORWARD

The PROFILE=, NEWTAPE and FORWARD operands are optional. See "Notes on Utility Execution" below for details.

USTMIGRT requires that the FDR/UPSTREAM-MVS configuration contain special profiles with a profile name of USTMIGxx. The "xx" specified in the F UPSTREAM,MIGRTxx command must match one of the USTMIGxx profile names; the matching profile will be used for this migration task.

For compatibility with earlier releases of FDR/UPSTREAM, you may also specify MIGRATE instead of MIGRTxx in the command, e.g., F UPSTREAM,MIGRATE PROFILE=profile. In this case, the special profile name USTMIGRT will be used and it may process any workstation profile (ignoring GROUPID).

If you are using migration, you will probably want to run USTMIGRT once a day to migrate that day's disk backups to tape; it can be run more or less frequently depending on your backup workload.

See Section 7.7 for more information on the use of USTMIGRT. If vaulting (USTVAULT) is also used, be sure to run USTVAULT **before** running USTMIGRT to avoid extra tape mounts to read the migrated backups.

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5.7 CONTINUED

USTMERGE EXECUTION

You can execute the FDR/UPSTREAM-MVS deferred MERGE BACKUP utility, USTMERGE, under the FDR/UPSTREAM online task; it cannot be executed as a separate batch job. It completes processing for FULL MERGE BACKUPs that were taken with MERGE=DEFER enabled in their profile (See Sections 1.4 and 7.9). When USTMERGE is run, it scans the FDR/UPSTREAM-MVS online repository for MERGE BACKUPs with pending deferred MERGE processing and completes the backups.

To run USTMERGE, enter:

F UPSTREAM,MERGExx PROFILE=profile,NEWTAPE,FORCE

The PROFILE= , NEWTAPE and FORCE operands are optional. See "Notes on Utility Execution" below for details.

USTMERGE requires that the FDR/UPSTREAM-MVS configuration contain special profiles with a profile name of USTMERxx. The "xx" specified in the F UPSTREAM,MERGExx command must match one of the USTMERxx profile names; the matching profile will be used for this merge task.

USTMERGE will only process workstation profiles which are enabled for DEFERRED MERGE BACKUPs (MERGE=DEFER in the profile definition). It will identify such profiles and find those whose most recent full backup contains unresolved deferred workstation files. It will copy those backups to tape if necessary and will also mount any required previous backups as input to copy the deferred files to the new tape data set.

Note: USTMERGE will usually require 2 or 3 tape drives for each execution.

See Sections 1.4 and 7.9 for more information on DEFERRED MERGE BACKUPs and USTMERGE.

USTVAULT EXECUTION

You can execute the FDR/UPSTREAM-MVS vaulting utility, USTVAULT, under the FDR/UPSTREAM on-line task; it cannot be executed as a separate batch job. It will create secondary (vault) copies on tape for recently created *sequential disk* and *sequential tape* backups. When USTVAULT is run, it scans the FDR/UPSTREAM-MVS on-line repository for sequential backups recorded under each profile name which do not already have a vault copy. Duplicate copies of those backups will be made on tape for storage in an offsite vault for disaster recovery. Only workstation profiles which are enabled for vaulting (the VAULT option in the profile configuration) will be processed for vaulting. MERGE BACKUPs in deferred status will automatically bypassed since they are not complete until they are processed by USTMERGE.

To run USTVAULT, enter:

F UPSTREAM,VAULTxx PROFILE=profile,NOINCR,NOVCHK,COPY=n

The PROFILE=, NOINCR, NOVCHK and COPY= operands are optional. See "Notes on Utility Execution" below for details.

USTVAULT requires that the FDR/UPSTREAM-MVS configuration contain special profiles with a profile name of USTVLTxx. The "xx" specified in the F UPSTREAM,VAULTxx command must match one of the USTVLTxx profile names; the matching profile will be used for this vault task. USTVAULT will call for a scratch output tape and create a dummy data set as the first file on that tape using the *sequential tape* parameters in that profile; the secondary vault backups will be created as additional files on the same tape, using the tape retention specified in the USTVLTxx profile. The *sequential disk* parameters in the profile are used to create a "control file" temporarily stored on disk to contain the updated FDR/UPSTREAM control records; at the end of the vault process that control file is moved to become the last file on the output tape.

Warning: USTVAULT will make vault copies of sequential tape backups, as well as sequential disk. This may require mounting many input tapes during the vault process. Innovation recommends that, if possible, incremental backups be done to disk, then USTVAULT be executed to create the vault tape, then USTMIGRT be run to migrate the primary backups to tape (if required). If USTMIGRT is run before USTVAULT for the same backups, USTVAULT may need to mount the migrate tape MANY times.

See Section 7.8 for more information on the use of USTVAULT.

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5.7 CONTINUED

NOTES ON UTILITY EXECUTION

These notes all apply to USTMIGRT, USTMERGE and USTVAULT just described.

On the FDR/UPSTREAM ISPF panel which allows you to enter UPSTREAM commands (See Section 6.5), the xx parameter is specified as ID=xx. The other options are check boxes on the panel.

There are two ways that you can specify which workstation profiles are to be processed by a given utility execution:

- You may specify the PROFILE= operand on the command, as shown in the command syntax for the individual utilities above. The parameter may specify an individual profile name (e.g., PROFILE=SERV01) or a profile name prefix ending in an asterisk (e.g., PROFILE=FIN*) which will select all profiles starting with that prefix.
- A more convenient way is to assign the workstation profiles to groups with the GROUPID=xx operand in the workstation profile definition (See Section 3.5). Each utility will only process profiles whose GROUPID matches the "xx" specified in the command which invoked the utility. For example, F UPSTREAM,VAULT03 will only process profiles with GROUPID=03. However, they will also process any profiles which do not have any GROUPID specified. For this reason, we recommend that if GROUPID is used, *all* workstation profiles have a GROUPID assigned.
- With GROUPID you usually do not have to specify the PROFILE= operand, but if you do, the two options will work in combination. From within the profiles specified by PROFILE=, only those with a matching GROUPID (or no GROUPID) will be processed.

You may start multiple executions of these utilities concurrently, by issuing multiple F commands. Concurrent executions of the same utility must use different values for "xx" and must process different groups of workstation profiles (as specified by the PROFILE= operand, or by the GROUPID= configuration option). The appropriate USTMERxx, USTVLTxx, or USTMIGxx special profile will be used for each utility execution. In the configuration for those profiles, the TAPEPREF= value (and the DASDPREF= value for USTVLTxx) must be unique so that each execution will create unique file names.

For USTMIGRT and USTMERGE only:

If the optional parameter NEWTAPE or FORWARD(USTMIGRAT only) are *not* specified on the F command for USTMERGE or USTMIGRT, these utilities will call for a scratch output tape and create a dummy data set as the first file on that tape using the *sequential tape* parameters in the associated USTMIGxx or USTMERxx profile. The backups to be migrated or merged will be created as additional files on the same tape, using the tape retention specified in the associated profile. For USTMERGE, this will be done *even* if the full backup to be completed is already on tape; it will be copied to the new tape and the deferred files added to it.

If NEWTAPE *is* specified, the USTMERxx or USTMIGxx profile must exist, but the parameters in it are not used. Each backup processed by USTMERGE or USTMIGRT will be copied as file 1 on a new scratch tape, using the *sequential tape* parameters in the workstation profile for the data set name and retention.

Note: For MERGE only, if the deferred full backup is already on tape, NEWTAPE will cause the deferred files to simply be copied to the end of the existing backup tape instead of mounting a scratch tape.

For USTMIGRT only, the optional parameter FORWARD requests additional processing during the migration process; during the migration of backups from disk to tape, USTMIGRT will recognize that previous incremental backups have already been moved to tape; it will request that those tapes be mounted and will merge those previous incremental backups with the current incremental into one file on the new output tape. Also, the "dummy" file will not be created as file 1 on the output tape, but the TAPEUNIT= and RETPD/EXPDT= parameters in the USTMIGxx profile will be used to allocate the output tape drive and determine the expiration date of the tape.

CONTINUED . . .

5.7 CONTINUED

NOTES ON UTILITY EXECUTION (continued)

For USTVAULT only, the optional parameter NOINCR causing vaulting to occur only for full backups, bypassing any incremental backups. The optional parameter NOVCHK will cause backups to be vaulted even if they are flagged as already having been vaulting, allowing you to recreate vault tapes or, in conjunction with COPY=, create additional vault copies. The optional parameter COPY=n controls the copy number that will replace the ? in the backup file names created on the vault (2 through 9, 2 is the default).
See Section 7.8 for more details on these options.

For USTMERGE only, if you do multiple Deferred Full MERGE backups without running USTMERGE, resulting in multiple uncompleted full MERGE backups, USTMERGE will normally only process the most recently created Deferred MERGE backup. If you need to retain the other backups, specify the optional FORCE parameter; this will cause USTMERGE to select the oldest Deferred MERGE backup instead. If there are multiple such uncompleted backups, you will have to execute with FORCE multiple times until they are all processed.

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5.8 DYNAMIC CONFIGURATION MAINTENANCE

You can change the FDR/UPSTREAM-MVS configuration dynamically while the FDR/UPSTREAM on-line task is running. To do so, execute USTCONFG (See Section 3) to modify the configuration in the FDR/UPSTREAM configuration file pointed to by the USTCONFG DD statement in the UPSTREAM on-line JCL procedure. If the configuration file is a PDS, you may save the new configuration in a new member in the file, so that both the old and new configurations will be available. Authorized administrators can also update the configuration from a workstation using the Profile Management dialog provided as part of FDR/UPSTREAM PC.

This procedure will also cause many of the FDR/UPSTREAM modules which have had fixes applied (via zaps) to be activated. Most FDR/UPSTREAM-MVS modules are loaded once during start-up, so fixes applied to the load library are not immediately available. The REFRESH commands below will cause current copies of all loaded modules to be deleted (as soon as they are no longer in use) and refreshed with the modified copies.

CONFIGURATION REACTIVATION

To reactivate the configuration file or member that was last activated successfully (which may be the configuration activated at start-up), enter:

F UPSTREAM,REFRESH

This will reload the last successfully loaded configuration (which may have been changed by USTCONFG). This is the only option available if the USTCONFG DD statement points to a sequential configuration file.

CONFIGURATION ACTIVATION

If your configuration file is a PDS, you may activate a configuration stored in a new member by entering:

F UPSTREAM,REFRESH MEMBER=membername

If the activation is successful, the new membername will be saved as the current configuration name and used if a REFRESH is later entered without a membername.

WARNING: If a new configuration member is activated, you must also change the start-up JCL for the FDR/UPSTREAM-MVS on-line task to specify the new member name on the USTCONFG DD statement. Otherwise, the old configuration member will be activated the next time that UPSTREAM is started.

5.9 DYNAMICALLY MODIFYING FDR/UPSTREAM OPTIONS

You may dynamically modify several FDR/UPSTREAM options while UPSTREAM is executing. The normal values for these options are set in the FDR/UPSTREAM-MVS configuration, on the MAIN statement (See Section 3.4 for more details). These changes remain in effect until you change them again, or until FDR/UPSTREAM is shut down.

CHANGING TASK LIMIT

You can change the maximum number of backup/restore/inquiry tasks that FDR/UPSTREAM will permit to operate concurrently by the command:

F UPSTREAM,MAXTASKS=nnnn (0 inhibits all new tasks)

CHANGING MAXIMUM BACKUP TAPES

You can change the maximum number of tape drives that FDR/UPSTREAM will use for concurrent backups by the command:

F UPSTREAM,MAXTAPEB=nnn (0 means nolimit, 255 max)

CHANGING MAXIMUM RESTORE TAPES

You can change the maximum number of tape drives that FDR/UPSTREAM will use for concurrent restores by the command:

F UPSTREAM,MAXTAPER=nnn (0 means nolimit, 255 max)

CHANGING VTAM TIMEOUT

You can change the maximum number of seconds that FDR/UPSTREAM will wait for most VTAM commands to complete by the command:

F UPSTREAM,TIMEOUT=nnn (1 to 100 seconds)

CHANGING LOG BUFFERS

You can change the number of 64K internal buffers used to save USTLOG messages for display at a workstation by the command:

F UPSTREAM,LOGBLKN=nnn (1 to 255 buffers)

At FDR/UPSTREAM-MVS startup, the buffer count is 2.

5.10 AUTOMATIC SCHEDULER

FDR/UPSTREAM-MVS includes a scheduler program (USTSCHED) which can schedule the automatic execution of any MVS console command based on a very flexible schedule. The scheduler operates as a subtask of the FDR/UPSTREAM online task.

The schedule itself is stored as one or more members of a PDS. Usually they are stored in the FDR/UPSTREAM configuration dataset, but another PDS with the same characteristics can be used if desired. The name of the schedule PDS and the default schedule member name are specified in the FDR/UPSTREAM-MVS startup JCL as shown in Section 2.9. The schedule members are defined and maintained using the FDR/UPSTREAM ISPF dialog; details and examples of the schedule options are shown in Section 6.9.

The MVS commands in the schedule are usually used to control FDR/UPSTREAM operations. They can include any of the commands shown in Section 5 (except the START command, since the USTSCHED cannot be executing until FDR/UPSTREAM is started). It can also include START commands to start USTBATCH tasks. But it is not limited to FDR/UPSTREAM functions; any console command which can be entered on the MVS master console can be scheduled.

USTSCHED can be automatically started whenever the FDR/UPSTREAM-MVS online task is started (See Section 5.1 and 2.9), but you can also start, stop, or modify USTSCHED operation at any time.

To start USTSCHED, enter the command:

F UPSTREAM,SCHEDULE MEMBER=membername **LIST**

Both the MEMBER= and LIST operands are optional (if both are present, they must be in that order). MEMBER= specifies the member name containing the schedule to be activated; it must be a member in the PDS pointed to by the USTSCHED DD statement in the FDR/UPSTREAM-MVS startup JCL (See Section 2.9). If MEMBER= is omitted, the member name specified in the USTSCHED DD will be used. LIST, if specified, causes the schedule to be listed in the FDR/UPSTREAM log as it is activated.

If a USTSCHED task is already active for the member name specified, it will simply refresh the schedule and continue; this allows you to update the schedule from the ISPF panels and activate the modified schedule. If there is no USTSCHED task active for that member name, a new schedule task is activated. There may be multiple USTSCHED tasks active, each using a unique schedule member.

USTSCHED tasks may be terminated at any time, using the TERM command on the FDR/UPSTREAM ISPF status display, or the terminate option of the status display at a FDR/UPSTREAM workstation, or the TERM command in Section 5.3. On the status displays, the member name in use will appear in the USERID field, so that you can choose among multiple USTSCHED tasks if necessary.

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6.1 INTRODUCTION

FDR/UPSTREAM-MVS includes an ISPF dialog which allows you to interactively:

- display the status of FDR/UPSTREAM operations, and terminate hung operations
- initiate mainframe-initiated FDR/UPSTREAM operations, via USTBATCH
- maintain the FDR/UPSTREAM configuration, including global options and workstation profile definitions
- define the FDR/UPSTREAM configuration file and on-line repository files
- issue commands to control the operation of FDR/UPSTREAM
- generate history and backup reports with USTRPORT
- display and maintain the Registered Name Table
- identify files that qualify for Duplicate Name Support
- create and maintain schedules for the Automatic Command Scheduler
- view, regenerate, and delete backups

The ISPF dialog is installed as part of the FDR/UPSTREAM installation; details on permanently installing the dialog are in Section 2.12. Depending on which of the installation options you have chosen, the dialog is invoked in one of 3 ways:

- it may be an option on your ISPF main menu or a submenu.
- it may be invoked by entering “UPSTREAM” or just “UPS” on any command line
- it may be invoked from ISPF option 6 by entering:

EXEC ‘*upstream.clist.library*(USTALLOC)’

Any of these will display the FDR/UPSTREAM main menu:

UPSTREAM ISPF MAIN MENU

```
-------------------------------- FDR/UPSTREAM ---------------------------------
COMMAND ===>                                                          V 3.1.0

   1  USTBATCH    - Host Initiated Services
   2  STATUS      - Current Status Information
   3  DEFINE      - Define Control Files
   4  CONFIGURE   - Main Options
   5  PROFILE     - Workstation Profile Names
   6  OPER        - Operator Commands
   7  REPORT      - Report
   8  REGISTRY    - Name Registry
   9  DUPAUDIT    - Duplicate File Audit
  10  SCHEDULE    - Command Scheduler
  11  MANAGEMENT  - Backup Management
```

Option 3 (DEFINE) is used only during installation of FDR/UPSTREAM or when the on-line repository files must be redefined or enlarged; it is described in Section 2. Other options are described in the following sections.

PF1/PF13 will display detailed HELP for the panel currently displayed.

Normally, the ISPF variables associated with this dialog are stored in your ISPF profile data set under an application name of "UST". If you have a need to keep several sets of UPSTREAM profiles, or when testing new versions of UPSTREAM, you can use other application name. On this panel, type "USTID" on the command line. The panel will then display a field where you can enter a new application prefix, and will also display all of the prefixes you have used previously to make selection easier.

6.2 ISPF MAINFRAME INITIATED SERVICES

Option 1 on the FDR/UPSTREAM main menu takes you to a dialog where you can define and submit requests for mainframe-initiated operations via the program USTBATCH. USTBATCH instructs FDR/UPSTREAM to contact designated workstations and initiate backups or restores without operator intervention. The operation of USTBATCH is described in more detail in Section 8. The dialog allows you to:

- define the parameters to be used for backup and restore operations, using panels which are very similar to those used on the workstation for FDR/UPSTREAM-PC.
- save the parameters in an ISPF table library, and retrieve them for later use.
- generate USTBATCH jobstreams which may be immediately submitted or saved for later submission or for scheduled execution by a job scheduling system.
- invoke USTBATCH in the foreground under TSO for immediate processing of your request.

OPTION 1 – USTBATCH

```
------------------------------ FDR/UPSTREAM - USTBATCH ------- * --------------
 COMMAND ===>

    GEN - Generate statements   READ/SAVE/DELETE parameter set

 APPLPREF ===> UPTPR                    |    TARGNAME     ===> DANTE
 USAPPL   ===> USTPROD1                 | or TARGLU       ===>
 TPNAME   ===> UPSTREAM                 | or TCP/IP  addr ===>
 LOGMODE  ===> USTMODE                  |            port ===>
 QUEUE    ===>        (yes no)          |    MAXRETRY     ===> 0
 CONV     ===> WAIT   (none keep wait)  |    TMAXRETRY    ===>
 WTOCOMP  ===>        (yes no)          |    APPLRETRY    ===>
 RESTART  ===> 2,3    (count,minutes)
 WSPARM   ===>

 Workstation Override Parameters:
 USERID   ===> USER1
 PASSWORD ===>

 Action   ===> 3       (specify to display related parameters and press enter)
    1 - Backup                 5 - Restart Backup           9 - FDRSOS Backup
    2 - Restore and Inquiry    6 - Restart Restore         10 - FDRSOS Restore
    3 - Run a PC Job           7 - Kill Restart Backup     11 - PC Migration
    4 - File Transfer          8 - Kill Restart Restore    12 - Operator Commands
```

On this panel you can define the major parameters to USTBATCH, including the VTAM application prefix to be used by USTBATCH, the VTAM application name used by FDR/UPSTREAM, the name of the workstation for which the operation is to be initiated (either VTAM LU name, TCP/IP network address and port, or FDR/UPSTREAM workstation name), and other options, described in more detail in Section 8.

The parameters which describe the FDR/UPSTREAM operation to be performed may be stored entirely at the workstation in a parameter file, allowing the operation to be defined at the workstation but initiated by the mainframe. The WSPARM option allows you to specify the name of the parameter file at the workstation. If you do not enter a value next to “Action”, then only the parameters pre-stored in the specified parameter file will be used to control the operation at the workstation.

6.2 CONTINUED

If necessary, you can specify the security userid and password to be used for the request. If omitted, the userid and password are taken from the parameter file at the workstation, if specified. If you specify "&JOB" for the userid, your TSO userid or the security userid of the USTBATCH job will be used and the password may be omitted since it has already been validated; for foreground execution, this will work only if USTBATCH is executing as a TSO authorized program (See Section 2.12).

Optionally, you can specify a value for "Action" from the list displayed. For some of the Action codes, when you press ENTER, additional panels requesting additional information are displayed.

For Action codes 1-4 and 11, the panels are similar to those used by FDR/UPSTREAM-PC and define parameters for the equivalent operation; these parameters will be used to modify or override the parameters in the workstation parameter file. Actually, if you do not specify a WSPARM value, these parameters must completely define the operation to be performed. The initial panels displayed for each of these actions are shown on the following pages.

For Action codes 9 and 10 (FDRSOS backup and restore), the additional panels allow you to create batch jobstreams. FDRSOS is an additional cost product from Innovation; it implements backup and restore of Open System (SCSI) data stored in a EMC Symmetrix ESP storage subsystem directly from MVS, to MVS tape or disk.

On the command line, you can enter SAVE, READ, or GEN; these commands allow you to save the parameters currently displayed, read stored parameters back, or generate a USTBATCH batch job (or execute USTBATCH directly under TSO) using the currently displayed parameters or any set of saved parameters. The panels that result from these commands are also shown on the following pages.

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6.2 CONTINUED

ACTION 1 BACKUP

```
-------------------------- FDR/UPSTREAM - USTBATCH Backup ---------------------
COMMAND ===>

Backup Parameters:            --------Backup Type-------     ----Storage Type---
Backup Profile.(          )   |(   ) First-time full   |     |(   ) Seq. Tape  |
                              |(   ) Full merge        |     |(   ) Seq. Disk  |
                              |( X ) Incremental Merge |     |(   ) Archive    |
                              |(   ) Non-merge         |     |(   ) Keyed/Dup. |
                              --------------------------     -------------------
                                                            Spec
                    Files Selected for Backup               Detail
          ------------------------------------------------ -------
          | ________________________________________________ ( 7 )|
          | ________________________________________________ (   )|
          | ________________________________________________ (   )|
          | ________________________________________________ (   )|
          | ________________________________________________ (   )|
          | ________________________________________________ (   )|
          | ________________________________________________ (   )|
          -------------------------------------------------------
(   ) StreetTalk name

          OK <enter>        (   ) More...      Prior panel <PF3>
```

This panel appears when a “1” (backup) is entered for “Action” on the USTBATCH main panel. It is similar to the FDR/UPSTREAM PC backup screen, with one significant difference. The ISPF interface has no way of querying the files that exist on the workstation, so it is unable to display a list of such file for you to choose from. You must know what files are to be included in the backup, and enter the file specifications required to select them. Since ISPF does not support buttons in the same way as FDR/UPSTREAM PC does on most workstations, you will have to move or TAB to the required field and enter a character in the box before it.

ACTION 2 RESTORE/ INQUIRY

```
-------------------------- FDR/UPSTREAM - USTBATCH Restore --------------------
COMMAND ===>

Backup Profile.( MERGE 1 )             --Inquire and Restore Files From...-------
                                       |(   ) Only Version Specified            |
   <   > Display Migrated Files         |( X ) Spec. Version Back to Full        |
   <   > Only                          |(   ) Spec. Version Back to Oldest      |
                                       |(   ) Spec. Version Back to FDRSOS Full |
  (   ) Inquire Backups                ------------------------------------------

      Profile  Backup Date/Time  Type      Comp Stor Est. Kb    # Files Lcl
-------------------------------------------------------------------------------
| Default to Latest Backup                                                    |
|                                                                             |
|                                                                             |
|                                                                             |
-------------------------------------------------------------------------------

(   ) File Inquiry (   ) Details  (   ) More...

                   OK <enter>           Prior panel <PF3>
```

This panel appears when a “2” (restore and inquiry) is entered for “Action” on the USTBATCH main panel. It is very similar to the FDR/UPSTREAM PC restore screen. The panel supports the INQUIRE and VIEW A VERSION functions (a subsequent panel supports INQUIRE FILES); if requested, it will establish a APPC session with the FDR/UPSTREAM main task, similar to the way that FDR/UPSTREAM PC handles inquiries, and display the results. Selecting some options will take you to additional panels which are also very similar to the FDR/UPSTREAM PC screens.

If you do a file inquiry which results in more than 1000 entries, it will display the first 1000 with a MORE button at the bottom of the list. Selecting MORE will display the next 1000 until the list is done.

CONTINUED . . .

6.2 CONTINUED

ACTION 3
RUN A JOB

```
-------------------------- FDR/UPSTREAM - USTBATCH Run a Job ------------------
COMMAND ===>

---Optional ULTra Workstation Options-----  --LAN Interface-----
|                                        |  |                  |
| LAN WS Name...(                       )|  | ( X ) IPX/SPX    |
|               (          )             |  | (   ) NetBIOS    |
| LAN WS Pwd....(          )             |  | (   ) TCP/IP     |
|                                        |  |                  |
-----------------------------------------  --------------------

Command Line....(                                                        )

Return Code Map ( 0:0 ?:8                                                )

-----------------------------------------------------------------------------
-
| (   ) Do not run job, terminate UPSTREAM or ULTra immediatelly             |
| ( X ) Run job from UPSTREAM or ULTra and:                                  |
|       <   > Wait for job completion                                        |
|       < X > Terminate UPSTREAM or ULTra after job start/completion         |
|----------------------------------------------------------------------------
-

                    OK <enter>       Prior panel <PF3>
```

This panel appears when a "3" (run a job) is entered for "Action" on the USTBATCH main panel. It allows you to execute a "job" (any executable program or batch/script file) on a workstation. Specify the name of the program or file in the "Command Line" area. The "Return Code Map" allows you to map return codes from the program to the return code returned to USTBATCH: the default shown maps 0 to 0 and all other program return codes to 8. You can optionally use ULTra to execute the job on a different workstation.

ACTION 4
FILE TRANSFER

```
-------------------------- FDR/UPSTREAM - USTBATCH File Transfer --------------
 COMMAND ===>

 ( X ) Send to Host   (   ) Receive from Host

 Backup Profile..(          )

 Record Size.....( 6000   )

 PC File Name....(                                                        )

 Host File Name..(                                                      )

 ( X ) To Disk
 (   ) To Tape


 ( X ) Translate to EBCDIC             ( X ) Attended
 ( X ) Each Line is a Separate Record  ( X ) Record on host
       (   ) Remove Trailing Blanks    (   ) Delete local file after transfer
       (   ) Truncate

                     OK <enter>       Prior panel <PF3>
```

This panel appears when a "4" (file transfer) is entered for "Action" on the USTBATCH main panel. It allows you to transfer a single file from the workstation to the MVS host, or vice versa. Special profile names must be used; they must be enabled for the FILETRAN (TRANSFER) option. You must specify the name of the workstation file and the host file.

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6.2 CONTINUED

ACTION 9 FDRSOS BACKUP

```
------------------------------- FDRSOS Backup ---------------- Row 1 to 1 of 1
COMMAND ===>                                                    SCROLL ===> PAGE

   OPT  Backup Options    GEN  Generate statements    STA  Status Report

   Q  - Specify "PC Job" to Quiesce volume processing before backup
   R  - Specify "PC Job" to Resume volume processing after backup

     Unit  Volume  -COPY1 TAPE--  -COPY2 TAPE--
     Addr  Serial  Logical Piggy  Logical Piggy
CMD  Mask   Mask    Drive  -back   Drive  -back
---  ----  ------  ------- -----  ------- -----
'''                   1     YES      2     YES
```

This panel appears when "9" (FDRSOS Backup) is entered for "Action" on the USTBATCH main panel. It is used to create batch backup jobstreams for FDRSOS, a separate cost product from Innovation which does backup and restore of Open System (SCSI) data stored in a EMC Symmetrix ESP storage subsystem directly from MVS. FDRSOS is not actually a USTBATCH function, but USTBATCH steps can be incorporated into the FDRSOS jobstreams.

Note: The FDRSOS Restore panel (Action code 10) is similar but is not shown here.

Under UNIT ADDR MASK or VOLUME SERIAL MASK, enter either the MVS unit address or pseudo volume serial of a EMC Open System volume to be backed up; either a fully qualified address or volser or a mask (followed by an asterisk) may be entered. When you press ENTER, all of the EMC Open System volumes matching the value entered are displayed, one per line. You can use ISPF line commands (D - delete, I - insert, R - repeat) to customize the list to display all the volumes to be backed up.

On the line for each volume, you can control how the backup is to be created:

- The "Logical Drive" value controls the total number of physical tape drives that will be used by the FDRSOS backup jobstep. The number of physical tape drives is equal to the number of unique "Logical Drive" values. Duplicate "Logical Drive" values specify that the same physical tape drive used for a backup of a volume will be used for the backup of another volume. For example, if all the values in the "COPY1 Logical Drive" column are the same, only one tape drive will be used for the backup of all the volumes. 3 unique values cause 3 different tape drives to be used.
- The "Piggyback" column controls whether multiple backup files will be stacked on tape or not. If NO is specified, a fresh tape will be used to output the backup of this volume; if the "Drive Number" is the same as for a previous volume, it will use the same tape drive (UNIT=AFF=TAPEx). If YES is given, the backup will be created as the next sequential file on the last tape used by the previous volume with the same "Drive Number" (VOL=REF=*.TAPEx). In other words, PIGGYBACK YES will create files 1, 2, 3, etc. on one or more tapes on one drive; PIGGYBACK NO creates separate backup tapes using the same drive.
- The "COPY2 TAPE" fields control creation of a second copy (COPY2) of each backup. If the "COPY2 Drive Number" column is not blank, a second backup copy is created. Like for COPY1, the "Drive Number" and "PIGGYBACK" values control the number of drives used and file stacking. Note that even if the same values are used for "COPY1 Drive Number" and "COPY2 Drive Number" they are treated separately and use separate tape drives. "COPY1 Drive Number" cannot be blank.

CONTINUED . . .

6.2 CONTINUED

For example, entering "01E*" for the Unit Address Mask produces a display similar to this, displaying EMC Symmetrix SCSI volumes:

```
     Unit  Volume  -COPY1 TAPE--  -COPY2 TAPE--
     Addr  Serial  Logical Piggy  Logical Piggy
CMD  Mask   Mask    Drive  -back   Drive  -back
---  ----  ------  ------- -----  ------- -----
     01EF  E#01EF     1     YES      2     YES
     01EE  E#01EE     1     YES      2     YES
     01ED  E#01ED     1     YES      2     YES
     01EC  E#01EC     2     YES      3     YES
     01EB  E#01EB     2     YES      3     YES
     01EA  E#01EA     4     YES      P     YES
     01E9  E#01E9     3     YES      4     YES
     01E8  E#01E8     4     YES      P     YES
     01E7  E#01E7     4     YES      P     YES
     01E6  E#01E6     7     YES            YES
     01E5  E#01E5     7     YES            YES
     01E3  E#01E3     A     NO             YES
     01E2  E#01E2     A     NO             YES
```

However, the drive columns have been modified by the user, with these results:

- For volumes E#01EF, E#01EE, and E#01ED, they all have logical drive 1 for COPY1, and 2 for COPY2. Their backups will use one tape drive for COPY1 and another for COPY2. Since PIGGYBACK is YES for both copies, FDRSOS will stack the backups, creating files 1, 2 and 3 on each tape.
- For volumes E#01EC and E#01EB, they both have logical drive 2 for COPY1, and 3 for COPY2. Their backups will use one tape drive for COPY1 and another for COPY2. Since PIGGYBACK is YES,for both copies, FDRSOS will stack the backups, creating files 1 and 2 on each tape.
- For volumes E#01EA, E#01E8, and E#01E7, they all have logical drive 4 for COPY1, and P for COPY2. Their backups will use one tape drive for COPY1 and another for COPY2. Since PIGGYBACK is YES for both copies, FDRSOS will stack the backups, creating files 1, 2 and 3 on each tape.
- For volume E#01E9, it has logical drive 3 for COPY1, and 4 for COPY2. Their backups will use one tape drive for COPY1 and another for COPY2. Since this is the only disk with those logical tape values, PIGGYBACK is ignored.
- For volumes E#01E6 and E#01E5, they all have logical drive 7 for COPY1, and blank for COPY2. Their backups will use one tape drive for COPY1 only. Since PIGGYBACK is YES, FDRSOS will stack the backups, creating files 1, 2 and 3 on the tape.
- For volumes E#01E3 and E#01E2, they all have logical drive A for COPY1, and blank for COPY2. Their backups will use one tape drive for COPY1 only. Since PIGGYBACK is NO, FDRSOS will call for a fresh scratch tape for each backup, creating file 1 on each.

On the command line, you may enter:

OPT - to specify backup options, such as the backup data set names, tape units, and retentions.

STA - to immediately create and browse a FDRSOS status report (PRINT=STATUS) for the displayed volumes.

GEN - to generate batch JCL for the backup of the displayed volumes.

Q or R - to generate USTBATCH steps to execute a procedure on the workstation in preparation or after the backup (for example, to quiesce and reopen databases).

A line command of **S** will generate a FDRSOS status report (PRINT=STATUS) for only those volumes selected.

CONTINUED . . .

6.2 CONTINUED

SAVE OPTION The SAVE option allows you to save the current USTBATCH parameters you have entered (including all backup or restore parameters) in a ISPF table library. The library must be allocated as DDNAME USTTABL (by default, the FDR/UPSTREAM table library installed from the distribution tape will be allocated by the FDR/UPSTREAM dialog). You must enter a descriptive name for the table; the name cannot contain blanks, but other special characters are allowed, as shown below.

```
-------------------------- FDR/UPSTREAM - USTBATCH Save Parameters ------------
Command ===>

Specify the name to save the current set of parameter values:

   Name  ( Server1-full_merge  )

         (   ) Replace if already exists


To CANCEL save operation, PRESS the END KEY (PF3).
```

Press ENTER to save the parameters under the name shown. If the descriptive name has previously been used, place any character in the box next to “Replace if already exists” to cause it to be updated.

READ OPTION The READ option allows you to restore a set of USTBATCH parameters that you saved with the SAVE command. It displays the available table entries as found in DDNAME USTTABL.

```
 Place cursor on parameter set to be read
  Server1-Full_Merge
  Server1-Incr_Merge
  Server1-Restore
```

Move the cursor on top of the parameter list name to be restore and press ENTER. If you have modified any USTBATCH parameters in this dialog, READ will replace all of those parameters, causing your modifications to be lost unless you SAVE them first.

DEL OPTION The DEL option allows you to delete a set of USTBATCH parameters that you saved with the SAVE command. It displays the available table entries as found in DDNAME USTTABL.

```
 Place cursor on parameter set to delete
  Server1-Full_Merge
  Server1-Incr_Merge
  Server1-Restore
```

Move the cursor on top of the parameter list name to be deleted and press ENTER. It will be deleted from the ISPF table dataset in which it was stored.

CONTINUED . . .

6.2 CONTINUED

GEN OPTION The GEN option will generate a USTBATCH jobstream or invoke USTBATCH in the foreground under TSO. It can use the parameters currently displayed (entered by you or restored from a saved set by the READ command), or it can read a saved parameter set directly. If you wish to initiate several different operations with USTBATCH, you may select several sets of parameters; they will be combined into one USTBATCH invocation.

```
       Select the parameter set(s) to generate
 ( X ) * - CURRENT PARAMETER VALUES
 (   ) Server1-Full_Merge
 (   ) Server1-Incr_Merge
 (   ) Server1-Restore
```

Place any character next to the parameter set(s) that you wish included in the USTBATCH request, and press ENTER.

```
------------------------------ FDR/UPSTREAM - USTBATCH --------------------------
 COMMAND ===>

  Please select one of the following options or press the END key to cancel

    1 - Browse the generated JCL stream
    2 - Edit   the generated JCL stream
    3 - Submit the generated JCL stream
    4 - Save   the generated JCL in a data set
    5 - Run    the generated USTBATCH statements in the TSO foreground

 JCL statements:
  ( //userA  JOB (ACCOUNT),'NAME',NOTIFY=user                              )
  ( //*                                                                    )
  ( //*                                                                    )
  ( //*                                                                    )
  ( //USTBATCH EXEC PGM=USTBATCH                                           )
  ( //STEPLIB  DD DISP=SHR,DSN=FDR.UPSTREAM.LOAD30                         )
  ( //SYSUDUMP DD SYSOUT=*                                                 )
  ( //USTLOG   DD SYSOUT=*                                                 )
```

On this panel, you can browse, edit, submit, or save the generated USTBATCH jobstream. If necessary, tailor the JCL statements shown (any changes you make will be remembered for future use). Option 5 will invoke USTBATCH directly in the foreground under TSO.

CONTINUED . . .

6.3 ISPF STATUS DISPLAY

ISPF STATUS DISPLAY

Option 2 on the FDR/UPSTREAM main menu invokes a panel which can display the status of all currently executing FDR/UPSTREAM operations (subtasks). This panel will not function unless program USTATUS is defined as a ISPF authorized program (See Section 2.12).

```
------------------------- UPSTREAM Status Display -----------  ROW 1 TO 4 OF 4
Command ===>                                                   Scroll ===> PAGE

UPSTREAM started task name: UPSTREAM

For automatic mode, specify refresh rate: 0  seconds

Config. member: CONFIG02   USTCATLG: 53%  TCP/IP started task.: TCPIP
VTAM APPLID...: UPSTREAM   USTFILEI: 95%  TCP/IP Host address.: 130.50.75.1
Security level: 1          USTFILEC: 25%  TCP/IP Host port....: 1972

COMMAND PROFILE  LUNAME   USERID  ELAPS  CPU  #FILE #BYTES(KB) OPERATION BY/SEC
------- -------- -------- -------- ---- ---- ------ ---------- -------- -------
        SERV1MRG LU6AS006 USER1     1.3  0.6     22        674 BACKUP     45123
        WS1      LU4AS005 USER2     0.1  0.0      7          0 INQUIREF
        USTMAINT USTMAINT           0.0  0.1      0          0 MAINT
           3 TASKS CURRENTLY ACTIVE
```

If the name of your FDR/UPSTREAM on-line task is not UPSTREAM, or if you have multiple FDR/UPSTREAM tasks, overtype the task name (See Section 5.1 for information on the task name). Note that the panel displays some basic information about the FDR/UPSTREAM tasks, such as the configuration member name, VTAM application ID, and TCP/IP connection information. Note that the TCP/IP Host address is the default host address and may not be the address used by all workstations in your networks to contact FDR/UPSTREAM.

The values displayed next to USTCATLG, USTFILEI, USTFILEC are percentages of free space available in those FDR/UPSTREAM online repository files. For those defined as native VSAM and those in the "enhanced" Innovation proprietary format , the free space is calculated from the “free bytes” maintained by those access methods; for those in the unenhanced proprietary format, this is the percentage of free records in the independent overflow. If the free space in any file gets low, you may wish to schedule a reorganization of that file to avoid FDR/UPSTREAM failures. These statistics are updated only once per minute.

The display is refreshed every time you press ENTER. If you would like to have the subtask list automatically refreshed at intervals, so that you can watch it change without pressing ENTER, overtype the refresh rate with the interval (in seconds) that you want between updates. Once in automatic mode, you must press PA1 or ATTN to return to manual updating or to exit from STATUS.

For each task, the workstation profile name, VTAM LUNAME or TCP/IP network address (in hex), userid, and operation type are displayed. Some of these may be blank if not applicable or not specified. The elapsed time and CPU time accumulated by the task are displayed. If appropriate, the number of files and KB of data processed by the task are displayed, and the bytes/second processed by the task (since the last time the display was refreshed) is shown. For some types of operations the file count may actually display other quantities (such as the number of backup-versions for version inquiries). Utility tasks, such as USTMAINT, will have special profile, LU and operation names (as shown in the example above).

More complete descriptions of these fields (especially the OPERATION field) can be found in Section 10.

In the COMMAND column, you may type a command which will affect the subtask displayed on that line. This command can be TERM (terminate task), SUSPEND (suspend task execution) or RESTART (resume task execution), as documented in Section 5.3.

6.4 ISPF CONFIGURATION MAINTENANCE

Options 4 and 5 on the FDR/UPSTREAM main menu invoke dialogs which allow you to display and modify FDR/UPSTREAM global (main) options and workstation profile definitions. Display will required that the TSO userid have at least READ authority to the FDR/UPSTREAM configuration data set; modification requires at least UPDATE authority.

WARNING: changes to the configuration will not go unto effect until:

- **the FDR/UPSTREAM online task is restarted with a USTCONFG DD statement pointing to the changed configuration member, or**
- **the REFRESH console command is issued with name of the changed configuration member** (See Section 5.8 and 6.5)**.**

GLOBAL (MAIN) OPTIONS

Select option 4 to display/modify the global FDR/UPSTREAM options, those that would go on the MAIN statement in the configuration utility, USTCONFG (See Section 3.4).

OPTION 4 – CONFIGURE MAIN OPTIONS

```
------------------- FDR/UPSTREAM - Configure Main Options ---------
 COMMAND ===>

 Input Configuration data set: (optional - blank for default values)
    Data set name  ===>
    Member name    ===>

 Output Configuration data set:
    Data set name  ===>
    Member name    ===>

 Press enter to display the main options.
```

This screen allows you to specify:

- the optional input configuration data set, if you want to update the global options in an existing configuration. If the configuration is stored in a PDS, specify the input member name. Leave these blank if you want to start with all of the FDR/UPSTREAM defaults.
- the optional output configuration data set. This may be the same as the input data set. If it is a PDS, specify the output member name for the updated configuration; this may be the same member name as the input (to update it) or a new member name. If you omit the output data set name, but enter SAVE on the following screen to save the updated options, you will be prompted for a name. If you specify the output member name without the data set name, the output data set name will be assumed to be the same as the input (but you will be prompted to confirm it at SAVE time).

Put the data set names in single quotes if they do not start with your TSO userid. Note that even if you do not specify the input data set/member, the output data set/member will be used as input, except that all of the global options will be reset to their default values (except for those you update on the next screen). If the output configuration exists, any workstation profiles in it will be preserved. The names specified here will be remembered and redisplayed when you reenter this dialog.

Press ENTER to display/update the global options on the next screen.

6.4 CONTINUED

DISPLAY/ UPDATE GLOBAL OPTIONS

```
------------------- FDR/UPSTREAM - Configure Main Options --------------------
COMMAND ===>

  SAVE main options in a configuration data set    CANCEL changes

APPLID... ===>           (VTAM APPLID)

Optional values:
DASDBLK.. ===> 10752     (allocation blocksize for sequential disk backup)
DESC..... ===> 1000      (hexadecimal descriptor codes for WTOs)
DUPLICATE ===> NOAUTO    (Auto=automatic duplicate backup  Noauto=no automatic)
DUPDAYS.. ===> 0         (minimum days since last modified - duplicate backup)
DUPSIZE.. ===> 0         (minimum file size (in bytes) for duplicate backup)
MAXDUPL.. ===> 30        (number of days to keep duplicate placeholders)
MAXHIST.. ===> 30        (number of days that history records are kept)
MAXTAPEB. ===> 0         (maximum number of tape units used for backups)
MAXTAPER. ===> 0         (maximum number of tape units used for restores)
MAXTASKS. ===> 100       (maximum number of concurrent subtasks)
RACFUPD.. ===> RESTORE   (require RACF update authority on: Backup or Restore)
ROUTCDE.. ===> 4020      (hexadecimal routing codes for WTOs)
SECLVL... ===> 1         (0=none 1=userid/password 2=userid/password/wsprofile)
SORTUNIT. ===> SYSDA     (unitname for sort work files)
SUBSYS... ===> UPSTREAM  (Subsystem name to use on security calls)
TCPNAME.. ===> TCPIP     (TCP/IP started task name)
TCPPORT.. ===> 1972      (UPSTREAM's TCP/IP port number)
WTOCOMP.. ===> NO        (Yes=issue operation start/end WTOs No=no WTOs)
ATBCOUNT. ===> 10        (starting control block count - internal use only)
```

This screen displays all of the FDR/UPSTREAM global options (from the MAIN statement of USTCONFG). See Section 3.4 for detailed descriptions of each of them. If you did not specify an input configuration data set then these are all set to their default values (except for APPLID which has no default). Otherwise they display the option values current set in the input configuration.

If you make no changes to the options, PF3/PF15 (END) will exit from this display. If you do change any options, you must enter (on the command line) SAVE to save the updated options or CANCEL to discard the changes and exit. SAVE will prompt you for the output configuration data set name and member if you did not specify them on the previous screen.

CONTINUED . . .

6.4 CONTINUED

WORK-STATION PROFILES

Select option 5 to display/modify workstation profiles in the FDR/UPSTREAM configuration.

OPTION 5 – CONFIGURE PROFILES

```
--------------------- FDR/UPSTREAM - Configure Profiles -----------------------
COMMAND ===>

Input Configuration data set:
  Data set name  ===>
  Member name    ===>

  Profile name   ===> *          ( * for all profiles )

Output Configuration data set:
  Data set name  ===>
  Member name    ===>

Press enter to display the profiles.
```

This screen allows you to specify:

- the input configuration data set. If the configuration is stored in a PDS, specify the input member name. This is required; if you are creating a new configuration, you must first create a configuration with the global options set, as described on the preceding pages, then update it with profiles.
- the name (up to 8 characters) or prefix (up to 7 characters followed by an asterisk, e.g., PROD*) of the existing profiles to be displayed or modified. An asterisk or blank selects all profiles in the input configuration.
- the optional output configuration data set. This may be the same as the input data set. If it is a PDS, specify the output member name for the updated configuration; this may be the same member name as the input (to update it) or a new member name. If you omit the output data set name, but later enter SAVE to save the profile changes, you will be prompted for a name. If you specify the output member name without the data set name, the output data set name will be assumed to be the same as the input (but you will be prompted to confirm it at SAVE time).

Put the data set names in single quotes if they do not start with your TSO userid. The names specified here will be remembered and redisplayed when you reenter this dialog.

Press ENTER to display/update the selected workstation profiles on the next screen.

CONTINUED . . .

6.4 CONTINUED

WORK-STATION PROFILE TABLE

```
--------------------- FDR/UPSTREAM - Configure Profiles -------  ROW 1 FROM 6
COMMAND ===>                                                     SCROLL ===> PAGE
                                                               COL 1 TO 7 OF 25
             ADD a new profile   COMPRESS configuration data set
Please specify one of the following row commands: Edit, Browse, Add or Delete.

Command  Profile  Prefix Tape IDRC Tapegdg Tapepref
-------  -------- ------ ---- ---- ------- -----------------------------------
         GLOBAL    NO    YES  YES   NO     UST.DAILY.BACKUPS
EDIT     SERV1MGR  NO    YES  YES   YES    PROD.UPSTREAM.SERVER1.TAPE
         USTARCH   NO    YES  NO    YES    UPSTREAM.ARCHIVE.DATA
         USTCATLG  NO    NO
         USTFILEC  NO    NO
         USTFILEI  NO    NO
```

This displays the selected profile(s) as a scrollable table, one profile per line. If the number of profiles exceeds one screen, you can scroll with PF7/PF19 (UP) and PF8/PF20 (DOWN). The table is wider than can be displayed on one screen (notice the COL 1 to 7 of 25 in the example above, indicating there are more columns to the right); you can scroll with PF10/PF22 (LEFT) and PF11/PF23 (RIGHT) to view all the options associated with each profile (the Command and Profile columns will not scroll).

You have several options on this screen:

- in the command column next to a displayed profile, you may enter:
  Edit – to modify a profile (with an option to save under a different name)
  Browse – to view a profile
  Add – to create a new profile using the existing profile as a model
  Delete – to delete the profile from the configuration.
  Only the first character is required. All except Delete take you to the next screen where the profile is displayed all on one screen. Edit and Add allow you to modify options in the profile including the profile name.
- on the command line at the top of the screen, you may enter ADD (no abbreviation) which will allow you to enter a new profile; all default values will be displayed on the profile panel. Or enter COMPRESS to compress the configuration PDS.

CONTINUED . . .

6.4 CONTINUED

PROFILE DISPLAY/ UPDATE

```
--------------------- FDR/UPSTREAM - Configure Profile ------------------------
COMMAND ===>                                                   SCROLL ===> PAGE

      SAVE profile         REPLACE profile         CANCEL changes

PROFILE.. ===> SERV1MGR  (Profile name or prefix)
PREFIX... ===> NO        (Yes- profile name is a prefix  No- not a prefix)

Tape Backup options:
TAPE..... ===> YES       (Yes- allow sequential tape backups  No- disallow)
IDRC..... ===> YES       (Yes- use IDRC compression No- no IDRC compression)
TAPEGDG.. ===> YES       (Yes- Use GDG for sequential tape backups No- non-GDG)
TAPEPREF. ===> PROD.UPSTREAM.SERVER1.TAPE           (dsname prefix)
TUNIT.... ===> 3480      (tape unit name)
 or TSTOR ===>           (tape SMS storage class)
UNITCNT.. ===> 1         (tape unit count: 1 or 2)
RETPD.... ===> 10        (retention period)
or EXPDT. ===>           (yyddd - expiration date)
NEWTAPEF. ===> NO        (Yes- mount new tape for full merge bkp  No-piggyback)
NEWTAPEI. ===> YES       (Yes- mount new tape for incr. merge bkp No-piggyback)

DASD Backup options:
DASD..... ===> YES       (Yes- allow sequential disk backups  No- disallow)
DASDBLK.. ===> 16384     (Blocksize for sequential disk backups)
DASDGDG.. ===> YES       (Yes- Use GDG for sequential disk backups No- non-GDG)
DASDPREF. ===> PROD.UPSTREAM.SERVER1.DISK           (dsname prefix)
DUNIT.... ===> SYSDA     (disk unit name)
or VOL... ===>           (volume serial)
MGMTCLAS. ===>           (SMS management class)
STORCLAS. ===>           (SMS storage class)
DRETPD... ===> 10        (retention period)
MAXSIZE.. ===>           (Maximum size in kb of disk backup)

File Data Backup options:
KEYED.... ===> 0         (Number of keyed backups retained)
ARCHIVE.. ===> 0         (Number of Archived (non-keyed) backups retained)

Other options:
MERGE.... ===> YES       (Yes- allow Merge Backup  No- disallow Merge Backup)
COPYINCR. ===> YES       (Yes- copy incrementals to full merge No- do not copy)
MIGTHRESH ===>           (Number of sequential disk backups to retain on disk)
VAULT.... ===> NO        (Yes- allow vaulting  No-disallow vaulting)
GROUPID.. ===>           (nn - 2 digit group id for utility execution)
DUPLICATE ===> COPY      (Copy- copy duplicate files  Nocopy- do not copy dups)
TRANSFER. ===> NO        (Profile is for PC file transfer only: Yes, No)
PCMIGRATE ===> NO        (Profile is for PC file migration: Yes, No)
```

This panel is displayed when the Edit, Add, or Browse command is entered on the Profile Table screen. For Browse, the fields are all display-only and the SAVE command is disabled. For Edit and Add, you may update any fields you desire. See Section 3.5 for more details on the profile parameters. If this panel is too large to fit on your TSO screen, it can be scrolled up and down with PF7/PF19 and PF8/PF20.

If you want to update the configuration with the changes displayed for Edit/Add, enter SAVE on the command line. If you are doing an Edit, and you do not change the Profile Name field, the profile will be updated; if you change the Profile Name, the newly named profile will be created (or replaced if it already exists). If you are doing an Add, you must specify a new profile name before entering SAVE.

Enter CANCEL if you change your mind and want to discard the changes.

The configuration is updated **immediately** when you enter SAVE; this may take a few moments. If you specified different configuration data set names or members for the input and output configurations, the first such SAVE you do (or the first DELETE on the previous screen), will read the input configuration, make the desired change, and then replace the output configuration in its entirety, including all profile definitions from the input (even if they were not displayed) but preserving the global (MAIN) options from the output configuration if it exists. Subsequent SAVEs or DELETEs will simply update the output configuration.

CONTINUED . . .

6.5 ISPF OPERATOR COMMANDS

OPERATOR COMMANDS

Option 6 on the FDR/UPSTREAM main menu invokes a panel which allows authorized users to issue “console” commands to control FDR/UPSTREAM-MVS operation without actually being at a MVS console. These commands and their parameters are described in Section 5. This panel will not function unless program USTCMD is defined as a ISPF authorized program (See Section 2.12). Installations wishing to further control who may issue commands to FDR/UPSTREAM may use the “program control” option of RACF or the equivalent function of other security systems to restrict access to program USTCMD.

```
----------------------- FDR/UPSTREAM Operator Commands ------------------------
Command ===>                                                   Scroll ===> PAGE

UPSTREAM started task name: UPSTREAM

 SEL   OPERATION
     Startup/Termination Commands
(   )  START..........................start the UPSTREAM started task
(   )  STOP...........................terminate UPSTREAM gracefully
(   )  QUIT...........................terminate UPSTREAM immediately

     Log Commands
(   )  FLUSHLOG.......................flush the log and summary buffers
(   )  SWITCHLOG......................switch the log and summary files

     Utility Commands
(   )  ARCHIVE........................start the USTARCH maintenance utility
(   )  MAINT..........................start the USTMAINT maintenance utility
(   )  REFRESH MEMBER=(          )....refresh the configuration parameters

(   )  REGEN DSN=(                                              )

(   )  REORG DD=USTCATLG %FREE=(    ).reorganize the online repository catalog
(   )  REORG DD=USTFILEI %FREE=(    ).reorganize the file-information data set
(   )  REORG DD=USTFILEC %FREE=(    ).reorganize the file-data data set

(   )  MIGRATE ID=    PROFILE=(          ) FORWARD(   )...start MIGRATE utility
(   )  MERGE   ID=    PROFILE=(          ) NEWTAPE(   )...start MERGE utility
(   )  VAULT   ID=    PROFILE=(          ) COPY(   ) NOVCHK(   ) NOINCR(   )
                                                     ...start VAULT utility

(   )  SCHEDULE MEMBER=(          ) LIST(   )...start/refresh SCHEDULE utility

       Debugging Commands
(   )  TRACE ON LU=(          ).......start internal trace for a given task
(   )  TRACE ON.......................start internal trace for all tasks
(   )  TRACE OFF......................stop internal trace for all tasks
(   )  COMTRACE ON,   ................start internal communications-only trace
(   )  COMTRACE OFF...................stop internal communications-only trace

(   )  ABENDM=(     ) COUNT=(     )...abend when message is issued
(   )  LOGBLKN=(     )................abend when message is issued

     Change Options
(   )  MAXTASKS=(     ).............max number of concurrent tasks
(   )  MAXTAPEB=(     ).............max number of tape drives for backups
(   )  MAXTAPER=(     ).............max number of tape drives for restores

(   )  TIMEOUT=(     ).............max number of minutes before timeout

     Miscellaneous Commands
(   )  CLOSE DD=USTCATLG.............close the online repository catalog
(   )  CLOSE DD=USTFILEI.............close the file-information data set
(   )  CLOSE DD=USTFILEC.............close the file-data data set
```

If this panel is too large to fit on your TSO screen, it can be scrolled up and down with PF7/PF19 and PF8/PF20. Place an “S” next to the command to be issued (only one at a time), and fill in any needed parameters on the command line (parameters may be required or optional, see Section 5). You will get a confirmation that the command was issued; check the MVS SYSLOG and/or the FDR/UPSTREAM log for results.

NOTE: If you have a security system, READ authority is required to the backup data set name to issue a REGEN command, and ALTER authority is required to issue a REMOVEDSN command.

6.6 ISPF ONLINE REPORTING

ONLINE REPORTING

Option 7 on the FDR/UPSTREAM main menu invokes a panel which allows users to invoke the FDR/UPSTREAM-MVS generalized report writer, USTRPORT, to generate reports. The output may be browsed on-line, printed, or written to a pre-allocated data set.

```
---------------------------- FDR/UPSTREAM Report ------------------------------
Command ===>

Profile name   ===> *          ( * for all profiles )

Report Type    ===> HISTORY    ( History Backup Vault Config Registry Duplicate )

File Name Mask ===>

Output Destination:
SYSOUT Class   ===>            ( blank to browse output )
Data Set Name  ===>                                                ( optional )

Configuration data set:
Data set name  ===> 'UPSTREAM.CONFIG'
Member name    ===> CONFIG33   (if partitioned)

Catalog data set:
Data set name  ===> 'UPSTREAM.CATALOG.$UST.CLUSTER'

Fileinfo data set:
Data set name  ===> 'UPSTREAM.FILEINFO.$UST.CLUSTER'

Optional USTRPORT DEFAULT statement:
===>
```

USTRPORT requires the configuration data set for the CONFIG report, and the catalog and fileinfo data sets for the HISTORY, BACKUP and VAULT reports; the dialog will dynamically allocate the appropriate data sets from the information given on this panel.

For Report Type BACKUP and VAULT, you may optionally specify the “File Name Mask”. Specifying any value here will cause information about the workstation files included in each backup data set to be included in the report. Specify “*” to print **all** workstation files, or specify a prefix (including the complete path name) followed by an asterisk to print selected files, e.g., “C:\WINDOWS*”.

See Section 7 for more information on the reports generated by USTRPORT.

6.7 WORKSTATION NAME REGISTRY

OPTION 8 — NAME REGISTRY

Option 8 on the FDR/UPSTREAM main menu invokes a panel which allows users to display and update the Registered Name table in FDR/UPSTREAM. The Registered Name table associates arbitrary workstation names with network addresses and allows batch initiation of UPSTREAM functions with USTBATCH without having to know the network address of the workstation. It is described in more detail in Section 8.8.

```
-------------------------- FDR/UPSTREAM - Name Registry -----  ROW 1 TO 3 OF 3
COMMAND ===>                                                   SCROLL ===> PAGE
                                                              COL 1 to 6 of 11

Upstream communication parameters:
USERID   ===>                          APPLPREF ===> UPSTR
PASSWORD ===>                          USAPPL   ===> UPSTREAM

Mode     ===> BROWSE (Edit Browse)    (CMD values: Insert, Delete and Repeat)

CMD  Registered Name   LUNAME or TCP/IP address..port    Last Access    PC Version
---  ----------------  --------  ----------------------  -------------- ----------
     SR1SNA            LU5AS011                          98/07/28 11:46 WIN 3.0.0
     SR1TCP                      130.50.75.11..1972      98/07/28 13:03 W95 3.0.0
     ENGINEERING 1     LU4AS035                          98/07/28 18:26 NT  3.0.0
```

To accomplish this, the FDR/UPSTREAM ISPF dialog will actually establish a VTAM APPC session with the FDR/UPSTREAM online task, using the same interface used by USTBATCH. In the fields at the top of the screen, you must specify the VTAM APPLID of the FDR/UPSTREAM main task (USAPPL) and the VTAM APPLID prefix used for USTBATCH (APPLPREF); these are the same options used for USTBATCH as described in Section 8.

If your FDR/UPSTREAM-MVS system operates with security checking (SECLVL=1 or 2), you must also specify a valid userid and password which will be checked by your security system. If SECLVL=1 is used, any valid userid and password can be specified, but if SECLVL=2 or 3 is in effect that userid must have UPDATE authority to the profile name USTRGSTR (this profile does not have to exist in the FDR/UPSTREAM configuration, but it must be authorized as described in Section 4). If either of these checks fails, you will not be able to display or modify the Registered Name table.

If the Mode is BROWSE, the current table will be displayed. If Mode is EDIT, the current table will still be displayed but the first 3 fields in the table can be updated; you can make changes to anything in those columns and the changes will be sent to FDR/UPSTREAM. In EDIT mode, you can type 3 commands in the CMD column:

D - deletes an entry from the table

I - inserts a blank line in the table for creation of a new entry

R - replicates the current line with a blank name column, which can then be updated

If you overtype the "Registered Name" column, it effectively acts as an "add" for the new name, the old name will not be disturbed.

Each Registered Name must be associated with either a VTAM LUNAME or a TCP/IP address, not both. The TCP/IP address must be entered in "dotted decimal" format, 4 decimal numbers, up to 255, separated by periods. This must then be followed by 2 periods and the TCP/IP port number on which FDR/UPSTREAM-PC will listen for conversations (specified in the FDR/UPSTREAM-PC configuration).

The "Last Access" column shows the last time that the entry was updated or was used by USTBATCH (entries not used for 90 days may be deleted by the USTMAINT utility). "PC Version" shows which type and release of FDR/UPSTREAM is being used on the workstation (this is filled in only if the registration is done from the workstation). These columns are for information only; you cannot update them.

There are additional columns of information available if you scroll to the right (PF11). These are used with the FDR/UPSTREAM feature for the automatic updating of FDR/UPSTREAM software on the workstation, described in more detail in Section 8.8.

6.8 DUPLICATE FILE AUDIT

OPTION 9 DUPLICATE FILE AUDIT

```
--------------------- FDR/UPSTREAM Duplicate File Audit -----------------------
Command ===>

Profile name/prefix to be included:    Profile name/prefix to be excluded:
===> *           ===>                  ===>             ===>
===>             ===>                  ===>             ===>

MINCOUNT ===>                  ( Minimum file duplication count to include )
MINDAYS  ===>                  ( Minimum number of days since last modified )
MINSIZE  ===>                  ( Minimum file size (in KB) to include )
MAXSIZE  ===>                  ( Maximum file size (in KB) to include )
DETAIL   ===> NO               ( Yes- detail and summary  No- summary only )

Output Destination:
SYSOUT Class   ===>            ( blank to browse output )
Data Set Name  ===>                                                (optional)

Catalog data set:
Data set name  ===> 'UPSTREAM.CATALOG.$UST.CLUSTER'

Fileinfo data set:
Data set name  ===> 'UPSTREAM.FILEINFO.$UST.CLUSTER'


SORTUNIT ===> SYSALLDA      ( Temporary sortwork unit name)
```

This panel executes the USTDUPRT utility, used to audit existing backup records to identify workstation files which may be duplicated on multiple workstations. Please read Section 1.4 for details on the Duplicate File Support in FDR/UPSTREAM and how it can be used to reduce the time required for MERGE BACKUPs. Section 7.11 gives more details about USTDUPRT and how it is used.

At the top of the panel, specify the names of the FDR/UPSTREAM workstation profiles whose records are to be searched. On the left you can specify up to 4 profile names or prefixes; a prefix is indicated by a trailing asterisk (ABC∗). An asterisk by itself as shown above indicates all profiles. On the right, you can specify profile names or prefixes which will be excluded from the list of included profiles. For example, if ABC∗ is included, the excluded list might contain ABC3 and ABCD∗.

The next set of options specifies the criteria that USTDUPRT will use to identify potential duplicate files. See Section 7.11 for details on their usage. DETAIL controls whether the utility will print details on every occurrence of each potential duplicate file, or just a summary.

If you leave the "Output Destination" fields blank, the report is written to a temporary file and browsed. If you specify a data set name, the report will be written to that dataset and browse (if the data set does not exist, it will be allocated for you). You can also send the report to a specified SYSOUT class for printing.

At the bottom of the panel you must fill in the dsnames of the FDR/UPSTREAM-MVS Catalog and File-information data sets to be searched. They may already be filled in if you have used them on other panels.

6.9 AUTOMATIC SCHEDULER

FDR/UPSTREAM-MVS includes a scheduler program (USTSCHED) which can schedule the automatic execution of any MVS console command based on a very flexible schedule. The scheduler operates as a subtask of the FDR/UPSTREAM online task. See Section 5.10 for details on executing USTSCHED.

The schedule itself is stored as one or more members of a PDS. The name of the schedule PDS and the default schedule member name are specified in the FDR/UPSTREAM-MVS startup JCL as shown in Section 2.9. The schedule members are defined and maintained using the dialog invoked by option 10.

The MVS commands in the schedule are usually used to control FDR/UPSTREAM operations. They can include any of the commands shown in Section 5 (except the START UPSTREAM command, since the USTSCHED cannot be executing unless FDR/UPSTREAM is already started). It can also include commands to submit batch jobs, such as USTBATCH tasks. But it is not limited to FDR/UPSTREAM functions; any console command which can be entered on the MVS master console can be scheduled.

Warning: USTSCHED is a simple scheduler, and is not designed to replace other console automation and job scheduling software. If you have such software, Innovation recommends that you use it instead, since it may be able to do more sophisticated scheduling such as checking the results of a command or job.

OPTION 10 SCHEDULER

```
--------------------- FDR/UPSTREAM - Command Scheduler ------------------------
COMMAND ===>

Schedule data set:

  Data set name  ===>
  Member name    ===>


Press enter to view the schedule. To test the schedule, use the fields below:


Test schedule    ===> NO     (yes no)

  Test date:  03 / 29 / 96   (MM/DD/YY OR MM/DD/YYYY)


Note:  Changes to the active schedule do not take effect until the operator
       command F UPSTREAM,SCHEDULE is issued from a system console or by the
        OPER dialog (option 6).
```

On this panel, specify the name of the PDS where the schedules will be stored; this is usually the FDR/UPSTREAM configuration dataset, but you can store the schedules in another dataset if you wish. Put the data set name in single quotes (unless it begins with your TSO userid). Also specify the member name of the schedule that you wish to create, display, or modify. You can use any member name as long as that name is not already in use as a configuration member.

If NO is specified for "Test Schedule" and the specified member does not exist, it will be created; if it does exist, it will be displayed and you may modify it.

Once the schedule member has been created or modified, you can test the schedule by specifying YES for "Test Schedule". If necessary, update the test date shown (the current date will be filled in by default). The dialog will then display all the commands that will be issued on that date, with the time of day, under the schedule member shown.

6.9 CONTINUED

SPECIFYING THE SCHEDULE

When a schedule member is being created or an existing member displayed/modified, you will get a display similar to this:

```
--------------------- FDR/UPSTREAM - Command Scheduler ------- Row 1 to 2 of 2
COMMAND ===>                                                   SCROLL ===> PAGE

      SAVE changes           CANCEL exit immediately          HELP tutorials

CMD    Display :( X )Selection Entries  (   )Exclusion Entries      Time 15:30
--- ---------------------------------------------------------------------------
001 Selection ID: REORGANIZE CATALOG_____________________________________________
    MVS Command : F UPSTREAM,REORG DD=USTCATLG___________________________________
    Time(s)    :( 0200_____________________________________________ )  HHMM,HHMM,...
    Date(s)    :( _____________________________________________ )  MM/DD/YYYY,..
    Monthday(s):( _____________________________________________ )  Numeric, LAST
    Weekday(s) :( _ )Mon ( X )Tue ( _ )Wed ( _ )Thu ( X )Fri ( _ )Sat ( _ )Sun
     Occurrence:( _ )1st ( _ )2nd ( _ )3rd ( _ )4th ( _ )5th ( _ )Last
                 or every ( _ ) weeks starting on __ / __ / ____
002 Selection ID: BACKUP SERVER 1________________________________________________
    MVS Command : SUB 'PROD.JCL.CNTL(SERVER1)'_______________________
    Time(s)    :( 2200_____________________________________________ )  HHMM,HHMM,...
    Date(s)    :( _____________________________________________ )  MM/DD/YYYY,..
    Monthday(s):( _____________________________________________ )  Numeric, LAST
    Weekday(s) :( X )Mon ( _ )Tue ( _ )Wed ( _ )Thu ( _ )Fri ( _ )Sat ( _ )Sun
     Occurrence:( _ )1st ( _ )2nd ( _ )3rd ( _ )4th ( _ )5th ( _ )Last
                 or every ( 2 ) weeks starting on 04 / 01 / 1996
```

This shows an existing schedule with 2 entries. If you were creating a new schedule member, it would display one entry with nothing filled in. If the schedule is too large to display on your screen, you can scroll UP (PF7) and DOWN (PF8). The CMD field is normally filled in with the sequence number of the schedule entry; you can overtype this with simple ISPF-type editing codes: **I** (insert a new entry after this one), **D** (delete this entry), **R** (replicate this entry).

On each entry, complete the fields shown:

Selection ID – specify a meaningful name for the scheduled command (required)
MVS Command – enter the actual MVS console command to be issued (required)
Time(s) – enter one or more times (in 24-hour clock format) (required)
Date(s) – optionally enter one or more actual dates (mm/dd/yy or mm/dd/yyyy)
Monthday(s) – optionally enter one or more days of the month (nn or LAST)
Weekday(s) – optionally place any character in the boxes before one or more of the days listed.
Although Date(s), Monthday(s) and Weekday(s) are all optional, you must specify at least one of them. If you specify more than one, they will all be honored.
If one or more Weekday(s) are checked, you may optionally modify that selection with data on one of the two **Occurrence** lines. Place any character in one or more of the boxes on the first line to limit execution to the first, second, last, etc. occurrence of the selected weekdays, **or** enter values on the second line to limit execution to selected weekdays on every Nth week starting on the indicated date (the current date by default).

The Time(s), Date(s) and Monthday(s) lines are limited in size. If you run out of room before you enter all required values, you can simply replicate the entry (R in the CMD field) and add the additional values on the new entry. Normally the Selection ID should be unique for each entry, but it may be the same for entries replicated for this purpose.

If you want to schedule the execution of batch jobs you can use the SUB command as shown in the example schedule above. Alternately, you can copy the USTRDR member from the FDR/UPSTREAM ICL (Installation Control Library) to a system PROCLIB. It can be used in the UPSTREAM schedule or as an actual console command to submit jobstreams from any library using the syntax:

```
S USTRDR,DSN=PROD.JCL.CNTL(SERVER1)
```

Security note: with the SUB command, the submitted job will inherit the security userid under which the FDR/UPSTREAM-MVS on-line task itself runs, while with USTRDR the security userid will probably have to be specified in the submitted jobstream.

In this example, the FDR/UPSTREAM-MVS catalog is reorganized every Tuesday and Friday at 2 AM, and a USTBATCH job is submitted every other Monday at 10 PM to backup "Server 1".

CONTINUED . . .

6.9 CONTINUED

SCHEDULE EXCLUSIONS

Near the top of the screen are two check boxes. "Selection Entries" will display the actual schedule entries, while "Exclusion Entries" allows you to specify special exceptions to the schedule (such as special dates on which schedules are *not* to be executed). There will be an X in the box before the list currently displayed. Place any character in the empty box to switch to that display. "Exclusion Entries" optionally allow you to exclude certain commands (or all commands) from executing at certain times. When you select "Exclusion Entries" you get a display similar to:

```
--------------------- FDR/UPSTREAM - Command Scheduler ------- Row 1 to 2 of 2
COMMAND ===>                                                   SCROLL ===> PAGE

      SAVE changes           CANCEL exit immediately          HELP tutorials

CMD    Display :(   )Selection Entries  ( X )Exclusion Entries      Time 16:45
--- ---------------------------------------------------------------------------
001 Exclusion ID: GLOBAL EXCLUSION ENTRY_____________________________________
    Time(s)    :( ____________________________________________ )  HHMM,HHMM,...
    Date(s)    :( 01/01/97,01/01/98_________________________ )  MM/DD/YYYY,..
    Monthday(s):( ____________________________________________ )  numeric, Last
    Weekday(s) :( _ )Mon ( _ )Tue ( _ )Wed ( _ )Thu ( _ )Fri ( _ )Sat ( _ )Sun
     Occurrence:( _ )1st ( _ )2nd ( _ )3rd ( _ )4th ( _ )5th ( _ )Last
                or every ( _ ) weeks starting on __ / __ / ____
--- ---------------------------------------------------------------------------
002 Exclusion ID: BACKUP SERVER 1____________________________________________
    Time(s)    :( ____________________________________________ )  HHMM,HHMM,...
    Date(s)    :( ____________________________________________ )  MM/DD/YYYY,..
    Monthday(s):( LAST_________________________________________ )  numeric, Last
    Weekday(s) :( _ )Mon ( _ )Tue ( _ )Wed ( _ )Thu ( _ )Fri ( _ )Sat ( _ )Sun
     Occurrence:( _ )1st ( _ )2nd ( _ )3rd ( _ )4th ( _ )5th ( _ )Last
                or every ( _ ) weeks starting on __ / __ / ____
--- ---------------------------------------------------------------------------
```

The exclusion entries are specified the same as the selection entries (except that the MVS command is omitted). However, the values specify times and dates that the equivalent selection entries are **not** to be executed. Obviously, the exclusion is meaningful only if the selection entry would have normally matched on the time and/or date specified in the exclusion.

The GLOBAL EXCLUSION ENTRY will apply to all "Selection Entries". In this example, the entire schedule will be bypassed on January 1 in 1997 and 1998.

To specify an exclusion that applies only to a particular selection, specify **Exclusion ID** with the same name as the Selection ID to which it applies. If there are multiple Selection IDs with the same name, the exclusion will apply to all of them. Conversely, if there are multiple Exclusion IDs with the same names, they will all apply to all the matching Selection IDs. In this example, the backup of "Server 1" is bypassed if it falls on the last day of any month.

SAVING THE SCHEDULE

The schedule member is not modified until you are satisfied that you have specified all the required schedule rules. Enter **SAVE** to update the member, or **CANCEL** to discard the changes and exit.

CONTINUED . . .

6.10 BACKUP MANAGEMENT

Option 11 invokes a dialog where you can display the backups that are currently recorded in FDR/UPSTREAM for any profile, or set of profiles, or all profiles. You can also display vault copies of backups currently recorded. Once displayed, you can execute certain maintenance commands against those backups.

OPTION 11 BACKUP MANAGEMENT

```
----------------------- FDR/UPSTREAM Backup Management ------------------------
Command ===>

Profile name   ===> *          ( * for all profiles )

Record Type    ===> BACKUP     ( Backup Vault )

Catalog data set:
Data set name  ===> 'UPSTREAM.CATALOG.$UST.CLUSTER'

Fileinfo data set:
Data set name  ===> 'UPSTREAM.FILEINFO.$UST.CLUSTER'
```

For "Profile Name" specify a single profile name, a profile name prefix (e.g., SERV∗) or an asterisk (∗) for all profiles. If you enter workstation profile names, the actual backups will be displayed. You may also enter USTVLT∗ to see the dummy files recorded for vault tape, USTVLC∗ to see the vault control files, or USTVL∗ to see both.

For "Record Type", enter

- BACKUP to see backups which are recorded for the specified profile(s).
- VAULT to see vault copies which have been created with USTVAULT for the specified profile(s); see Section 7.8 for details on vaulting. Depending on what profile name you enter, you will see either the actual "copy x" backup names for workstation profiles that were created by USTVAULT, or you will see the "dummy" and/or "control" file names under the USTVLTxx and USTVLCxx profiles, or both.

The name of the FDR/UPSTREAM-MVS repository Catalog and Fileinfo data sets are also required, but they will probably be carried over from other panels in the dialog.

6.10 CONTINUED

If you entered profile SERVER1 and type BACKUP and pressed ENTER, the backup list displayed will look similar to:

```
----------------------- FDR/UPSTREAM Backup Management ------- Row 1 to 3 of 3
COMMAND ===>                                                   SCROLL ===> PAGE

UPSTREAM started task name: UPSTREAM

Available row commands: REGen, REMovdsn, DELete, DNR, Browse


Sel Profile  Date/Time      Comp Backup Data Set Name
--- -------- -------------- ---- --------------------------------------------
    SERVER1  96/03/28 20:12 INTR PROD.SERVER1.COPY1.G0067V00
    SERVER1  96/03/28 20:13    0 PROD.SERVER1.COPY1.G0068V00
    SERVER1  96/03/29 11:15    0 PROD.SERVER1.COPY1.G0069V00
```

For each backup, it shows the profile name, date and time ("versiondate"), completion code (INTR means interrupted), and backup data set name.

In the "Sel" column you can specify an action:

REG – issue a REGEN command for the backup (See Section 5.7)
REM – issue a REMOVEDSN command for the backup (See Section 5.7)
DEL – issue a TSO "DELETE" command for the backup, followed by a REMOVEDSN command
DNR – issue a TSO "DELETE" command for the backup without the REMOVEDSN.
B – do an ISPF BROWSE of the backup data set (if on disk).

If you have a security system active, the dialog will ensure that you have READ authority to the backup data set for a REGEN, and ALTER authority for all other actions.

If type VAULT is specified, the display will be similar to this (this example shows both vault backups and vault dummy/control files):

```
----------------------- FDR/UPSTREAM Backup Management ------- Row 1 to 3 of 3
COMMAND ===>                                                   SCROLL ===> PAGE

UPSTREAM started task name: UPSTREAM

Available row commands: REGen, REMovdsn, DELete, DNR, Browse


Sel Profile  Date/Time      Comp Backup Data Set Name
--- -------- -------------- ---- --------------------------------------------
    SERVER1  96/03/28 20:13    0 PROD.SERVER1.COPY2.G0069V00
    SERVER1  96/03/29 11:15    0 PROD.SERVER1.COPY2.G0069V00
reg USTVLC01 96/03/31 17:20    0 UPSTREAM.USTVLC01.D960331.T172007
    USTVLT01 96/03/31 17:20    0 UPSTREAM.USTVLT01.D960331.T172007
```

This shows that the 2 indicated backups for SERVER1 were combined into 1 vault backup dataset.

The backup listed for USTVLT01 is actually the dummy file written as the first file on a vault tape; you will not be able to enter row commands against that file.

The backup listed for USTVLC01 is the control file written as the last file on a vault tape. You may enter the REGEN command (as shown) to read that control file and update the FDR/UPSTREAM repository to point to the vault copies of the backups. At a disaster site, you may want to use profile name USTVLC∗ to display all the control files, and issue REGEN against each of them to activate all of the vaulted backups. More details on this are found in Section 7.8.

CONTINUED . . .

7.1 REPORT PROGRAM (USTRPORT)

USTRPORT UTILITY

FDR/UPSTREAM includes a generalized report program, USTRPORT, which can generate a number of customized reports about FDR/UPSTREAM status and activity, including:

- recent activity in FDR/UPSTREAM, from history records. History records are created for every operation performed by FDR/UPSTREAM, and are kept in the FDR/UPSTREAM Catalog data set, if the MAXHIST= operand was specified in the FDR/UPSTREAM configuration to specify the number of days such records are to be kept.
- FDR/UPSTREAM Configuration data
- information about sequential backups currently recorded by FDR/UPSTREAM
- information about archive backups currently recorded by FDR/UPSTREAM
- information about secondary (vault) copies of backups created by USTVAULT

USTRPORT COMMANDS

The USTRPORT statements are used to specify the format of the REPORT and what data is selected. The statements are:

TITLE	Specifies a user defined title line.
HEADING	Specifies user-replacement column heading lines.
DEFAULT	Sets processing DEFAULTS.
CANCEL	Cancels preceding specifications, when producing multiple reports in one execution.
SELECT	Specifies selection criteria for the data values to be included in the report.
EXCLUDE	Specifies criteria for excluding certain data values to be excluded from the report.
REPORT	Customizes the report, specifying the fields to be printed.
PRINT	Generates the report.

7.2 USTRPORT JCL REQUIREMENTS

The following Job Control Statements are required to execute the FDR/UPSTREAM Report Utility; you will find some sample USTRPORT jobstreams in the FDR/UPSTREAM ICL (Installation Control Library) in member names starting with “RPT”:

EXEC STATEMENT

Must specify the name of the FDR/Upstream report writer program, USTRPORT. The EXEC statement should also specify REGION=0M to make the maximum region available. It may optionally contain a PARM= operand to pass options to the USTRPORT program. Any PARM= data passed to the USTRPORT program is interpreted as control statements input. Command lines may be separated by a slash (/) character.

JOBLIB or STEPLIB DD STATEMENT

Specifies the library in which USTRPORT resides (usually the FDR/UPSTREAM program library). This must be an APF authorized library.

SYSPRINT DD STATEMENT

Specifies the primary output message data set. This is a required DD statement and is usually a SYSOUT data set. The LRECL may be specified from a minimum of 133 to a maximum of 241; 133 is the default if not specified. If BLKSIZE is not specified, the system determined blocksize (SDB) will be used on systems that support it, and 64 times the LRECL will be used on other systems.

SYSUDUMP DD STATEMENT

Recommended in all USTRPORT jobs in order to more easily diagnose error conditions which make USTRPORT abend. Usually a SYSOUT data set.

USTCATLG DD STATEMENT

Specifies the FDR/UPSTREAM Catalog data set, for example,

```
//USTCATLG  DD  DSN=UPSTREAM.CATALOG.$UST.CLUSTER,DISP=SHR
```

This DD is required for all report types except RPTYPE=CONFIG.

USTFILEI DD STATEMENT

Specifies the FDR/UPSTREAM File-Information data set, for example,

```
//USTFILEI  DD  DSN=UPSTREAM.FILEINFO.$UST.CLUSTER,DISP=SHR
```

This DD is required only when you are doing RPTYPE=ARCHIVE, SQBACKUP, BACKUP, VAULT or CUSTOM (if backup fields are included in the REPORT fields).

USTCONFG DD STATEMENT

Specifies the current FDR/UPSTREAM configuration data set (and member, if a PDS) of the configuration to be reported upon, for example:

```
//USTCONFG  DD  DSN=UPSTREAM.CONFIG.FILE(CONFIG02),DISP=SHR
```

This DD is required only when you are doing RPTYPE=CONFIG. If the configuration data set is a PDS, member name can be omitted if the MEMBER= operand is specified on the PRINT statement.

SYSIN DD STATEMENT

Specifies the control statement data set. Usually a DD * data set or control card PDS member.

7.3 USTRPORT CONTROL STATEMENTS

TITLE STATEMENT

TITLE LINE='text'

,SKIP=n

The TITLE statement is used to define a user-specified TITLE LINE to be displayed between the INNOVATION header identification and the data header lines, to identify the report. A maximum of one line may be specified. A two line data header will automatically be generated identify the fields being reported (the columns).

OPERANDS

LINE= Specifies the text to be printed or displayed. Must be enclosed in quotes. The number of characters specified must not exceed the page width. If the TITLE cannot be contained on one control statement (Column 1 to 71), you can continue the text by specifying a '+' or '–' after the last character on this line. If '+' is specified, USTRPORT will scan for the first non-blank character on the next statement. If '–' is specified USTRPORT will start with column 1 of the next statement. For example:

```
TITLE LINE='BACKUP +
                    REPORT'
```

SKIP= Specifies the number of lines to be left blank between the TITLE LINE and the data heading line. A value of 1 to 3 lines may be specified. Default is that 1 line will be skipped.

HEADING STATEMENT

HEADING LINE(1)='first heading line text'

,LINE(2)='second heading line text'

,LINE(3)='third heading line text'

By default, USTRPORT provides column headings with text which is descriptive of the field(s) in each column (e.g., LUNAME, PROFILE). The HEADING statement allows you to specify replacement text of your choosing. It is your responsibility to line up the heading text with the actual columns generated by USTRPORT.

OPERANDS

LINE(n)= Specifies the replacement heading text for heading line n (n=1, 2, or 3). If the heading text cannot be contained in one control statement (columns 1 to 71), it may be continued using the same conventions described for the TITLE statement. Only LINE(1)= is required, the others are optional. A 1, 2, or 3-line heading will be generated depending on the number of lines specified.

7.3 CONTINUED

DEFAULT STATEMENT

DEFAULT BYTEFORMAT=BYTE|KILOBYTE|MEGABYTE
SET

,CLOCK12|CLOCK24

,EXNOBKDSN|SLNOBKDSN

,EXNOCATLG|SLNOCATLG

,FORMAT=NORMAL|VERIFY|DUMP

,FULLNAME

,LINECNT=nn|58

,MAXCC=nnnn

,NOCLOCK

,NOABEND

,**PAGEWIDTH=**nnnn

,PROFSTACK|NOPROFSTACK

,SELTERR=YES|NO

,SHOWATTR|NOSHOWATTR

,SUMDIR=(YES|NO|ONLY,FULLNAME|SHORTNAME,INCLSUB|EXCLSUB)

,UPPERCASE|LOWERCASE

The purpose of the DEFAULT statement is to change USTRPORT's default values for various options used when generating a report. Most of the operands on the DEFAULT statement are also operands of the PRINT statement, and can be specified there. The DEFAULT statement can be used when more than one report (more than one PRINT statement) is to be generated in one USTRPORT run; the DEFAULT statement avoids having to specify options used in more than one report more than once. Only the operands which are unique to the DEFAULT statement are described below; others are described under the PRINT command. The alias SET can be used in place of DEFAULT.

OPERANDS

CLOCK12
CLOCK24

Specifies how the time-of-day should be printed in a report including BKFILES (information about workstation files included in a backup); the time is the “last update” time recorded for the workstation file. CLOCK12 (the default) displays it in AM/PM format; CLOCK24 displays in 24-hour clock format.

FULLNAME

Specifies that in a report including BKFILES (information about workstation files included in a backup), all file names should be printed with the full path name. The default is that the full path name will be included only with the first file under a given directory; additional files under that directory will have blanks up to the last backslash (\) in the name.

CONTINUED . . .

7.3 CONTINUED

LINECNT=
LC=
Specifies the maximum number of lines each report page can contain. The number can be any value from 10 to 99, inclusive. The default is each page will contain a maximum of 58 lines.

MAXCC=
Overrides the maximum completion code from all USTRPORT statements that preceded this DEFAULT or SET statement. This will be the completion (return) code returned to MVS at the end of this USTRPORT step unless some following statement causes a higher code. This might be used to set the maximum code to zero (SET MAXCC=0) when you don't care about the successful completion of the preceding operations.

NOABEND
Directs USTRPORT to exit with an error return code instead of a User Abend for the rare unusual conditions that would normally cause a User Abend to be taken.

NOCLOCK
NOCL
USTRPORT generates the Innovation title line with the time, date, and page number as the first line of every page. This option directs USTRPORT to only get the time and date at the beginning of the report and always repeat that value on each page. Normally without this option, USTRPORT will refresh the time and date at the beginning of each new page.

PAGEWIDTH=
When creating custom reports with the REPORT statement, USTRPORT calculates the width of the report using the length of all requested fields, plus spaces between the fields. An error will occur if the report width exceeds the current page width. PAGEWIDTH= has a minimum of 132 and maximum of the LRECL of SYSPRINT minus 1 (which is also the default).

PROFSTACK
NOPROFSTACK
When creating custom reports with the REPORT statement, USTRPORT normally builds the report in the same manner that it builds the report for RPTYPE=HISTORY or BACKUP, by printing the profile name and then reporting all records for that profile name indented one space; this is the PROFSTACK option. If FIELD operand on the REPORT statement includes PROFILENAME, this is not done; this is the NOPROFSTACK option. The PROFSTACK and NOPROFSTACK operands can be used to override this default operation. NOPROFSTACK will NOT list the profile name, even though it is not included in the FIELD list. PROFSTACK will list the profile name and indent the following records even though the profile name is printed on each line.

SHOWATTR
NOSHOWATTR
Specifies whether a report including BKFILES (information about workstation files included in a backup) should include the attribute flags associated with each file. The default is NOSHOWATTR, do not display attributes.

UPPERCASE
LOWERCASE
UPPERCASE forces all output to be generated in only uppercase characters. LOWERCASE allows USTRPORT to use both upper and lower case characters in reports. The default is LOWERCASE.

CONTINUED . . .

7.3 CONTINUED

SELECT/ EXCLUDE STATEMENTS

	Operand	Valid Operators (op)
SELECT|EXCLUDE	**,PROFILE op (profname1,profname2,..)**	**= .EQ. ¬ = .NE.**
	,BKFILES op filemask	**= .EQ.**
	,DAYS op nnn	**all**
	,DATE op yy/mm/dd	**all**
	,TIME op hh:mm:ss	**all**
	,CONDCODE op (comp1,comp2,..)	**= .EQ. ¬ = .NE.**
	,ELAPSEDTIME op nnnnn	**all**
	,CPUTIME op nnnnn	**all**
	,LUNAME op (luname1,luname2,..)	**= .EQ. ¬ = .NE.**
	,USERID op (userid1,userid2,...)	**= .EQ. ¬ = .NE.**
	,OPERNAME op (oper1,oper2,..)	**= .EQ. ¬ = .NE.**
	,OPERTYPE op (type1,type2,..)	**= EQ. ¬ = .NE.**
	,BKTYPE op (bktype1,bktype2,...)	**= EQ. ¬ = .NE.**
	,BLOCKS op nnnnnnnn	**all**
	,FILES op nnnnnnnn	**all**
	,BYTES op nnnnnnnn	**all**
	,MERGEFILES op nnnnnnnn	**all**
	,MERGEBYTES op nnnnnnnn	**all**
	,MERGEBLOCKS op nnnnnnnn	**all**
	,MIGRATEFILES op nnnnnnnn	**all**
	,TRACKS op nnnnnnnn	**all**
	,TAPES op nnnnnnnn	**all**

Note: when you are using RPTYPE=ARCHIVE, SQBACKUP, or CONFIG, only the PROFILE= operand will be honored; all others are ignored. The others can be used only with RPTYPE=HISTORY, BACKUP or VAULT.

The SELECT/EXCLUDE statements act as a filter for the data sets to be processed by USTRPORT, comparing the values you specify against the values in the records to be processed. The operands on SELECT/EXCLUDE may be followed by one of a number of comparison operators. Since one form of those operators involve special characters (such as the not(¬) and less-than(<)), alternate forms of each operator without special characters are provided. The operators are:

= or .EQ.	equal	¬ = or .NE.	not equal
< or .LT.	less than	> or .GT.	greater than
<= or .LE.	less than or equal to	>= or .GE	greater than or equal to

CONTINUED . . .

7.3 CONTINUED

Some operands only accept an equal test, some equal and not-equal, and some accept all 6 comparisons, as shown in the operand table above. USTRPORT will test each SELECT/EXCLUDE against the values in each input record. The test implied by each operand will be true if the indicated comparison of the FIELD value and the value you provide is true. For example, COMPCODE.NE.0 selects all records for operations which did not complete successfully.

Some operands allow you to specify multiple values in parenthesis for equal and not-equal (as shown in the table above) or single values without parenthesis. If multiple values are specified, USTRPORT will compare the input record to each of those values. For equal, the test is true if ANY of the comparisons are equal. For not-equal, the test is true if ALL of the comparisons are not-equal. For example, COMPCODE=(0,SUSPEND) will select those entries whose completion code was either zero or whose operation was suspended. Also, a given field name may be specified more than once with several different operators.

Examples:

```
SELECT PROFILE=PROD*,FILES>100,DAYS<5
SELECT OPERTYPE=(BACKUP,'BACKUP M'),BYTES>100000,BYTES<500000
```

If there are no SELECT or EXCLUDE statements present then all records relevant to the Report Type, RPTYPE=, will be reported. If only EXCLUDE statements are present, then all records not EXCLUDEd are reported; likewise if only SELECT statements are present, only selected records are reported. If both types are used, EXCLUDE statements should precede SELECT statements to EXCLUDE a subset of the records SELECTed; other than that, the order of the SELECT/EXCLUDE statements is not significant.

OPERANDS

PROFILE
PROFI

Specifies one or more workstation profile names. A prefix can be specified by using the * as the last character of the operand. For example to list all of the entries for all workstation profiles that begin with SYS and OPER specify PROFILE=(SYS*,OPER*)

BKFILES

Is only valid with RPTYPE=BACKUP and VAULT. If present, the report will display details of workstation files which were included in each FDR/UPSTREAM backup file reported. The length of the filename printed is limited by the page width currently in effect (see PAGEWIDTH= under the DEFAULT statement); the usual page width can display the first 88 characters of file names (including the complete pathname). BKFILES=* will display all workstation files in the backup, or you may specify a prefix to limit the display (the prefix must match on the beginning characters of the complete path name of the file), for example, BKFILES=C:\WINDOWS*

DAYS

Calculates a date “n” days (0 to 999) previous to the current date; that date is compared to the starting date recorded in each history record. For example to select records for the last ten days, specify DAYS.LE.10 or DAYS<=10. To select records over 30 days old specify DAYS>30.

DATE

Specifies date, in the format “yy/mm/dd”, which is compared to the starting date recorded in each history record. For backups, this is the date part of the “version-date”.

TIME

Specifies a time, in the format “hh:mm:ss”, which is compared to the starting time recorded in each history record. For backups, this is the time part of the “version-date”.

CONTINUED . . .

7.3 CONTINUED

CONDCODE
COND

Specifies the completion codes status of the operation recorded by the history record. One or more values can be specified. The following are the valid options:

ABEND	The operation received a System or User abend
SUSPEND	The operation was suspended
CANCEL	The operation was cancelled
SYSTEM	The operation received a SYSTEM Abend
USER	The operation received a USER Abend
0 or ZERO	The operation completed successfully
4	The operation completed with warning messages
8	The operation was terminated with error messages
12	The operation was terminated with severe errors
16	The operation was terminated by the operator

ELAPSEDTIME
ELAPS

Specifies the elapsed time, in tenths of minutes, recorded for the operation to complete. For example to select records that took over 2 and 1/2 minutes you would specify ELAPS.GE.25 or ELAPS>=25.

CPUTIME
CPU

Specifies CPU time used, in thousands of a second or milliseconds, to complete this operation. For example to report all of the events that took less than one second of cpu time you would specify CPUTIME.LE.1000 or CPU<=1000.

LUNAME
LU

Specifies one or more Workstation IDs (up to 8 characters) or ID prefixes (followed by an asterisk (*)). For SNA APPC workstations, this is the VTAM LUNAME. For TCP/IP workstations, this is the network address coded as a 8-digit hexadecimal value (each pair of digits corresponds to one of the 4 values in the address, converted to hex).

USERID
US

Specifies one or more userids (up to 8 characters) or userid prefixes (followed by an asterisk (*)). Userids will be recorded in history records if the userid was specified at the workstation. If the SECLVL=0 configuration option was specified for FDR/UPSTREAM-MVS, userids are optional.

OPERNAME
OPNAME

Specifies one or more FDR/UPSTREAM operations. Valid values are:
- utility operations – ARCHIVE, DELETE, MAINT, MAINTF, REGEN, REORG
- FDR/UPSTREAM termination – SHUTDOWN
- workstation operations – BACKUP, 'BACKUP M', RESTORE, RESTARTB, INQUIREV, INQUIREF, 'REMOVE F', 'REMOVE B', 'COMM MVS', 'COMM PC', 'VSAM TST', 'NON I/O'
- mainframe-initiated operations – HOSTINIT

Values shown with quotes must be entered that way since they contain blanks; other can be entered with or without quotes. More detail on the meaning of these names can be found in Section 10.

OPERTYPE
OPTYPE

Specifies one or more FDR/UPSTREAM operation types. Operation types are used with certain operation names to qualify the type of operation.
Valid values are:
- for BACKUP - INCR, FULL, MERG, ARCH, KEYD
- for RESTORE - TAPE, DASD
- for HOSTINIT - MVS, PC

CONTINUED . . .

7.3 CONTINUED

BKTYPE	For backups, indicates the type of backup. Valid values are: KEYD, ARCH, DASD, TAPE.
BLOCKS **BLK**	Specifies the number of blocks transmitted to/from the workstation.
BYTES **BYT**	Specifies the number of bytes transmitted to/from the workstation.
FILES **FIL**	Specifies the number of files transmitted to/from the workstation.
MERGEFILES **MFIL**	Specifies the number of files which were merged forward from previous backups during a full merge backup. Not valid for other operations.
MERGEBYTES **MBYT**	Specifies the number of bytes which were merged forward from previous backups during a full merge backup. Not valid for other operations.
MERGEBLOCKS **MBLK**	Specifies the number of blocks which were merged forward from previous backups during a full merge backup. Not valid for other operations.
MIGRATEFILES **MIGFIL**	Specifies the number of migrated files which were merged forward from previous backups during a full merge backup. Not valid for other operations.
TRACKS **TRK**	Specifies the number of DASD tracks that were used for a sequential DASD backup. Not valid for other operations.
TAPES **TAP**	Specifies the number of tape volumes that were used for a *sequential tape* backup. Not valid for other operations.

CONTINUED . . .

7.3 CONTINUED

REPORT STATEMENT

REPORT FIELD=(field1,field2,...)

The REPORT statement is used to customize reports by specifying the fields to be printed, and the order in which to print them; it will be honored if RPTYPE=CUSTOM is specified, or if RPTYPE= is omitted. The report generated by REPORT will use the same input data as RPTYPE=HISTORY or BACKUP. If the fields do not include any fields related to the backup data sets, the report will report on history records only; if backup fields are included, it will report on history and backup data (including backup data that has no matching history records). The data reported will be filtered by SELECT/EXCLUDE statements if present, of course.

OPERANDS

FIELD= specifies the names of one or more FIELDs to be printed in the custom report. The available field names are in the following table. The fields will be printed in the order specified. There will be one space between fields, except that you can include field names of SPn (where “n” is 0 to 9) which will cause the specified number of spaces to appear between the preceding and following fields. For example,

```
REPORT FIELD=(VERSION,SP3,BKDSN,BKVOL)
```

will insert 3 spaces between VERSION and BKDSN, but only one space between BKDSN and BKVOL.

FIELD NAME TABLE

This table lists the field names which are available for inclusion in the FIELD operand of the REPORT statement (many of these can also be used on SELECT/EXCLUDE statements). For each field, the table shows:

NAME	The field name as used in the FIELD= operand.
DESCRIPTION	A brief description
LEN	The number of print positions it will occupy in the report
ATTR	How the field will be displayed: CHAR - character NUM - numeric HEX - hexadecimal (binary)

Name	Description	Attr	Len
BKDSN	Backup dataset name for Backups	CHAR	44
BKDS1	1st half of Split backup data set name	CHAR	27
BKDS2	2nd half of Split backup data set name	CHAR	27
BKSPLDSN	Backup data set name split two lines	CHAR	27
BKTYPE	Backup type: DASD, TAPE, NONE, ARCH, KEYD	CHAR	4
BKVOLS	Three volsers per line of backup DSN	CHAR	21
BLK	Alias for BLOCKS	NUM	8
BLOCKS	Number of Blocks transmitted.	NUM	8
BYT	Alias for BYTES	NUM	8
BYTES	Number of Bytes transmitted	NUM	8
COMPCODE	Alias for CONDCODE.	CHAR	9
COMPRESSTYPE	Compression type used. HI-1/2/3 FAST	CHAR	4
COMPTYPE	Alias for COMPRESSTYPE	CHAR	4
COND	Abbreviation for CONDCODE.	CHAR	9
CONDCODE	Completion code of event	CHAR	9
CPU	Abbreviation for CPUTIME	NUM	8

CONTINUED . . .

7.3 CONTINUED

Name	Description	Attr	Len
CPUTIME	CPU time in Seconds used for event	NUM	8
DATE	Date in YY/MM/DD of event	NUM	8
ELAPS	Abbreviation for ELAPSEDTIME	NUM	6
ELAPSEDTIME	Elapsed time for event in minutes.	NUM	6
FIL	Abbreviation for FILES	NUM	8
FILES	Number of FILES transmitted.	NUM	8
FLAGS	Alias for HFLAGS	HEX	5
HFLAGS	History Flags HISTSFL1 and HISTSFL2	HEX	5
HISTSFL0	History TYPE flag	HEX	2
HISTSFL1	History Flag 1	HEX	2
HISTSLF2	History Flag 2	HEX	2
LU	Abbreviation for LUNAME	CHAR	8
LUNAME	LUNAME of origination of event	CHAR	8
MBLK	Alias for MERGEBLOCKS	NUM	8
MBYT	Alias for MERGEBYTES	NUM	8
MERGEBLOCKS	Number of BLOCKS merged by event	NUM	8
MERGEBYTES	Number of BYTES merged by event	NUM	8
MERGEFILES	Number of FILES merged by event	NUM	8
MFIL	Alias for MERGEFILES	NUM	8
MIGFIL	Alias for MIGRATEFILES	NUM	8
MIGRATEFILES	Number of Files Migrated	NUM	8
MINS	Alias for ELAPSEDTIME	NUM	6
OPERNAME	Operation NAME of event	CHAR	8
OPERTYPE	Operation TYPE of event	CHAR	4
OPNAME	Alias for OPERNAME	CHAR	8
OPTYPE	Alias for OPERTYPE	CHAR	4
PROFI	Abbreviation for PROFILENAME	CHAR	8
PROFILE	Abbreviation for PROFILENAME	CHAR	8
PROFILENAME	Name of PROFILE used for event	CHAR	8
SFL0	Alias for HISTSFL0	HEX	2
SFL1	Alias for HISTSFL1	HEX	2
SFL2	Alias for HISTSLF2	HEX	2
TAP	Abbreviation for TAPES	NUM	7
TAPES	Number of TAPES used for Backup	NUM	7
TIME	TIME of event	NUM	8
TRACKS	Number of TRACKS used for backup on DASD	NUM	7
TRK	Alias for TRACKS	NUM	7
US	Abbreviation for userid	CHAR	8
USERID	User ID recorded for event.	CHAR	8
VERSION	Combination of DATE+TIME	CHAR	17

CONTINUED . . .

7.3 CONTINUED

PRINT STATEMENT

PRINT BYTEFORMAT=BYTE|KILOBYTE|MEGABYTE

,EXNOBKDSN|SLNOBKDSN

,EXNOCATLG|SLNOCATLG

,FORMAT=NORMAL|VERIFY|DUMP

,LINECNT=nn|58

,MEMBER=membername

,RPTYPE=HISTORY|BACKUP|VAULT|CONFIG|ARCHIVE|SQBACKUP|CUSTOM|REGISTRY|DUPLICATE

,SELTERR=YES|NO

,SUMDIR=(YES|NO|ONLY,FULLNAME|SHORTNAME,INCLSUB|EXCLSUB)

The PRINT statement instructs USTRPORT to generate the report, using the characteristics specified by the preceding control statements (SELECT, EXCLUDE, DEFAULT, TITLE, HEADING, REPORT) that are currently in effect (they remain in effect until canceled by a CANCEL statement or superseded by new TITLE/HEADING statements). A PRINT statement **must** be entered or no report will be generated (all other statements are optional). Multiple PRINT statements may be given to produce various reports in one execution of USTRPORT.

OPERANDS

BYTEFORMAT= Specifies the format of those print fields which report a number of bytes.
BYTE - values are always reported in bytes; if the value exceeds 8 digits, asterisks will be displayed.
KILOBYTE - values are always reported in kilobytes (bytes/1024); commas will usually be inserted to improve readability but may be omitted if the value exceeds 6 digits.
MEGABYTE - values are always reported in megabytes and tenths (e.g., 120.5).
The default is that byte fields are displayed in bytes, but if the value is too large it will automatically convert the display to kilobytes or megabytes, as required, with a "K" or "M" to the right to indicate the conversion.

EXNOCATLG
SLNOCATLG For RPTYPE=BACKUP or a custom report which includes field BKDSN, EXNOCATLG specifies that report lines for backup data sets which are no longer cataloged in the MVS catalog will not be generated, while SLNOCATLG indicates that they will be generated (with “not catlg” in the BKVOLS field). The default is EXNOCATLG.

CONTINUED . . .

7.3 CONTINUED

EXNOBKDSN
SLNOBKDSN

For RPTYPE=BACKUP or a custom report which includes field BKDSN or BKVOLS, EXNOBKDSN specifies that report lines for history records whose backup data set is no longer recorded in the FDR/UPSTREAM catalog (probably because they have expired) will not be reported upon, while SLNOBKDSN indicates that they will be reported (with “DSN not available” in the BKDSN field). The default is EXNOBKDSN.

FORMAT=

Specifies formatting options for the records selected.

VERIFY - Indicates that the record selected to be reported is dumped in hexadecimal dump format immediately following the formatted record.

DUMP - Indicates that the record selected to be reported is dumped in hexadecimal dump format only.

NORMAL - Indicates records are formatted as title headings display.

The default is NORMAL

LINECNT=
LC=

Specifies the maximum number of lines each report page can contain. The number can be any value from 10 to 99, inclusive. The default is each page will contain a maximum of 58 lines.

MEMBER=

Used with RPTYPE=CONFIG only, specifies the PDS member name with the configuration data set on which to report. Must be omitted if the configuration data set is a sequential file and can also be omitted if the member name is specified on the USTCONFG DD statement.

CONTINUED . . .

7.3 CONTINUED

RPTYPE= Specifies the format of the report to be generated, as well as implying the data source for the report. The values for RPTYPE are:

HISTORY – Generates a report from history records stored in the FDR/UPSTREAM Catalog file.

BACKUP – Generates a report from history records, but includes information on backup data set names and volumes in place of other fields in the HISTORY report, and also reports on backups recorded by FDR/UPSTREAM which have not matching history record.

VAULT – Generates a report identical to RPTYPE=BACKUP, but it will only select backup records which are flagged as having a vault (secondary) copy created by USTVAULT, and the backup data sets shown will be the vault (copy 2) backups.

CONFIG – Generates a report listing information from the FDR/UPSTREAM-MVS configuration file. A USTCONFG DD statement pointing to the configuration file or member must be present.

SQBACKUP – Generates a report on sequential backups from information in the
FDR/UPSTREAM Catalog and File-Information data files. It is similar to the previous utility program USTUTIL3.

ARCHIVE – Generates a report on archive backups from information in the FDR/UPSTREAM Catalog and File-Information data files. It is similar to the previous utility program USTDLOC2.

CUSTOM – Generates a customized report using the field names specified by the REPORT statement (which must precede the PRINT statement). It uses the same data as the HISTORY report (if no backup fields are requested) or the BACKUP report (if backup fields are requested), but the report content and layout are specified by REPORT.

REGISTRY - Generates a report listing the current contents of the FDR/UPSTREAM "Registered Name Service" table, a table which relates network addresses to user-assigned workstation names for use with USTBATCH (See Section 8.8).

DUPLICATE - Generates a report listing the duplicate files currently recorded under the special profile USTDUPFL (See Sections 1.4 and 3.8).

The default is HISTORY, except that if a REPORT statement is in effect the default is CUSTOM.

SELTERR= Specifies if USTRPORT should end with a condition code if no records were selected for reporting by a PRINT statement. SELTERR=YES indicates that you want to be notified that no records were selected (probably due to an error in your SELECT/EXCLUDE statements). SELTERR=NO causes a zero condition code if the only error was that no records were selected. The default is YES.

7.3 CONTINUED

SUMDIR= For RPTYPE=BACKUP or VAULT with BKFILES= specified on the SELECT statement, controls the printing of summaries of the number of files and data bytes in each directory. As shown above, it has 3 sets of parameters. You can specify one from each set, enclosing the values in parenthesis, e.g., SUMDIR=(ONLY,FULLNAME) or you can specify only one parameter without parenthesis, e.g., SUMDIR=INCLSUB.

YES - requests that the summary by directory be printed at the end of the report.

NO - suppresses the summary (all other SUMDIR options are ignored).

ONLY - requests that only the summary be printed, suppressing the detail report.

FULLNAME - prints the full path name for each directory summarized.

SHORTNAME - uses an indenting scheme to show the structure of subdirectories.

INCLSUB - the summary for each directory will include all files in that directory, plus all subdirectories beneath that directory. This also means that the directory at the very top of the summary will summarize all files in all directories listed.

EXCLSUB - the summary for each directory includes only those files that actually exist in that directory, not including those in subdirectories beneath that directory.

The defaults are YES, SHORTNAME, EXCLSUB.

CONTINUED . . .

7.3 CONTINUED

CANCEL STATEMENT

CANCEL EXCLUDE

,HEADING

,REPORT

,SELECT

,TITLE

The CANCEL statement is used to negate the effects of all or some prior statements except DEFAULT. By default, the options specified on all preceding statements (except PRINT) remain in effect until you cancel them (or, in the case of TITLE/HEADING/REPORT, override them); additional SELECT/EXCLUDE statements will be added to those already in effect. CANCEL can be used between PRINT statements to cancel options in effect so that they can be respecified (or the defaults used).

If no operands are specified, CANCEL will cancel the effect of all of the prior commands except DEFAULT.

OPERANDS

EXCLUDE	Cancel the current exclusion criteria table as created by preceding EXCLUDE statements.
HEADING	Cancel the current HEADING line(s), reinstating the defaults.
REPORT	Cancel the current REPORT field specifications.
SELECT	Cancel the current selection criteria table as created by preceding SELECT statements.
TITLE	Cancel the current TITLE line(s), reinstating the defaults.

7.4 USTRPORT EXAMPLES

This section shows several examples of USTRPORT jobstreams, and the reports that they generate.

RECENT ACTIVITY REPORT

This report shows all FDR/UPSTREAM activity in the past 7 days.

```
//USTRPORT  EXEC  PGM=USTRPORT,REGION=4M
//STEPLIB    DD   DISP=SHR,DSN=your.upstream.program.library
//SYSPRINT   DD   SYSOUT=*
//SYSUDUMP   DD   SYSOUT=*
//USTCATLG   DD   DISP=SHR,DSN=your.upstream.catalog.file
//SYSIN      DD   *
  TITLE LINE='XYZ CORPORATION - RECENT UPSTREAM ACTIVITY'
  SELECT DAYS<7
  PRINT RPTYPE=HISTORY
```

The report will be similar to:

```
                                    XYZ CORPORATION - RECENT UPSTREAM ACTIVITY
Profile /                CondCode  Elapse    CPU                      Operation    No. of  No. of   Merged  Merged  Migrate Tracks/
 Start Date+Time   Flags Sys User   Mins.  Seconds  Luname   UserId  Name     Type   Files   Bytes    Files   Bytes    Files # Tapes
------------------ ----- --------  ------  ------- -------- -------- -------------  ------ -------  ------- -------  ------- -------
SERVER1
 98/02/06 15:55:23 70 80        0     0.1    0.297 LU3AS018         BACKUP          0       0        0       0        0      2D
 98/02/06 15:57:08 00 00        0     0.1    0.039 LU3AS018         INQUIREV        1       0        0       0        0       0
 98/02/06 15:57:48 70 80        0     0.6    0.635 LU3AS018         BACKUP         23   1,184K       0       0        0     29D
 98/02/06 15:58:34 00 00        0     0.1    0.037 LU3AS018         INQUIRE         1       0        0       0        0       0
 98/02/06 16:02:32 00 00        0     0.1    0.055 LU3AS018         INQUIRE        23       0        0       0        0       0
SERVER2
 98/02/06 09:32:48 70 80        0     0.1    0.287 LU4AS035         BACKUP          2     593        0       0        0      2D
 98/02/06 09:32:54 00 00        0     0.1    0.038 LU4AS035         INQUIREV        1       0        0       0        0       0
```

HEAVY AFTERNOON ACTIVITY REPORT

This report shows all FDR/UPSTREAM backups of more than 5MB which take place in the afternoon, perhaps for the purpose of shifting them to off-hours.

```
//USTRPORT  EXEC  PGM=USTRPORT,REGION=4M
//STEPLIB    DD   DISP=SHR,DSN=your.upstream.program.library
//SYSPRINT   DD   SYSOUT=*
//SYSUDUMP   DD   SYSOUT=*
//USTCATLG   DD   DISP=SHR,DSN=your.upstream.catalog.file
//SYSIN      DD   *
  TITLE LINE='XYZ CORPORATION - HEAVY AFTERNOON BACKUPS'
  SELECT BYTES>5000000,TIME.GE.13:00:00,TIME.LE.17:00:00
  PRINT RPTYPE=HISTORY
```

The report will be similar to:

```
                                    XYZ CORPORATION - HEAVY AFTERNOON BACKUPS
Profile /                CondCode  Elapse    CPU                      Operation    No. of  No. of   Merged  Merged  Migrate Tracks/
 Start Date+Time   Flags Sys User   Mins.  Seconds  Luname   UserId  Name     Type   Files   Bytes    Files   Bytes    Files # Tapes
------------------ ----- --------  ------  ------- -------- -------- -------------  ------ -------  ------- -------  ------- -------
SERVER3
 98/01/02 15:32:07 20 80        0     3.4    1.930 LU4AS030         BACKUP            227   5,133K       0       0        0     75D
SERVER5
 98/01/13 13:25:00 20 00        0     5.7    8.911 LU2AS045         BACKUP            288   9,390K       0       0        0      1T
```

7.4 CONTINUED

CUSTOMIZED REPORT

This reports on only backups which did not complete normally, and the report is customized with the REPORT statement to only show selected fields.

```
//USTRPORT  EXEC  PGM=USTRPORT,REGION=4M
//STEPLIB    DD   DISP=SHR,DSN=your.upstream.program.library
//SYSPRINT   DD   SYSOUT=*
//SYSUDUMP   DD   SYSOUT=*
//USTCATLG   DD   DISP=SHR,DSN=your.upstream.catalog.file
//USTFILEI   DD   DISP=SHR,DSN=your.upstream.file-information.file
//SYSIN      DD   *
  TITLE LINE='XYZ CORPORATION - FAILED BACKUPS'
  SELECT CONDCODE.NE.0, OPERNAME=BACKUP
  REPORT FIELD=(DATE,TIME,CONDCODE,PROFILE,
                LUNAME,USERID,BYTES)
  PRINT RPTYPE=CUSTOM
```

The report will be similar to:

```
                    XYZ CORPORATION - FAILED BACKUPS
  Date     Time   CondCode  Profile   Luname   UserId  # Bytes
-------- -------- --------- -------- -------- -------- --------
98/01/30 15:07:27        4* SERVER1  LU4AS035 PROD01   304,317
98/02/02 12:30:03        8* SERVER1  LU4AS035 PROD01         0
98/02/03 16:45:37  SUSPEND* SERVER1  LU4AS035 PROD01    59,520
98/02/03 17:28:25        4* SERVER1  LU4AS035 PROD01    97,927
```

BACKUP REPORT

This reports on backups for profiles starting with FIN (finance department). It contains most of the information from the RPTYPE=HISTORY report, but it only selects backups and also includes the dsname and volume serials where the corresponding backup currently resides. It will also display information on backups in the FDR/UPSTREAM catalog whose history records no longer exist.

```
//USTRPORT  EXEC  PGM=USTRPORT,REGION=4M
//STEPLIB    DD   DISP=SHR,DSN=your.upstream.program.library
//SYSPRINT   DD   SYSOUT=*
//SYSUDUMP   DD   SYSOUT=*
//USTCATLG   DD   DISP=SHR,DSN=your.upstream.catalog.file
//USTFILEI   DD   DISP=SHR,DSN=your.upstream.file-information.file
//SYSIN      DD   *
  TITLE LINE='XYZ CORPORATION - FINANCE DEPARTMENT BACKUPS'
  SELECT PROFILE=FIN*
  PRINT RPTYPE=BACKUP
```

The report will be similar to:

```
                                   XYZ CORPORATION - FINANCE DEPARTMENT BACKUPS
Profile name /     CondCode  CPU Secs  LuName  Op Name  # Files  Mrg File MIG File
 Version Date.Time           ElpsMins  UserId  Op Type  # Bytes  Mrg Byts  Tracks   Backup Data Set Name        Backup Volumes
----------------- --------- -------- -------- -------- -------- -------- --------  --------------------------- ------ ------ ------
FINSERV1
 98/01/10.15:58:40        0   17.351 LU3AS030 BACKUP      8705        0        0   FIN.UPSTREAM.FINSERV1.      001103 001104
                             29.2   FT1032   FULL         197M        0        -     G0005V00
 98/01/11.16:10:07        0    0.332 LU3AS030 BACKUP         1        0        0   FIN.UPSTREAM.FINSERV1.      001022
                              0.2   FT1032   INCR          24        0        -     G0008V00
 98/01/12.16:18:15        0    0.335 LU3AS030 BACKUP        20        0        0   FIN.UPSTREAM.FINSERV1.      001022
                              0.2   FT1032   INCR         224K        0        -     G0008V00
 98/01/16.16:22:45        0   12.757 LU3AS030 BACKUP      8707     8612        0   FIN.UPSTREAM.FINSERV1.      001022 001023
                              6.5   FT1032   MERG         199M     196M        -     G0008V00
FINWS001
 98/01/12.09:28:40        0    5.101 LU3AS030 BACKUP       925        0        0   FIN.UPSTREAM.FINWS001.      000925
                             12.2   FT1013   FULL        4510K        0        -     G0001V00
```

CONTINUED . . .

7.4 CONTINUED

BACKUP FILE REPORT

This is the same as the preceding report, except that BKFILES=* is added to the SELECT, which causes details on all workstation files included in each backup to be printed, and the DEFAULT SHOWATTR statement was added to display workstation file attributes.

```
//USTRPORT  EXEC  PGM=USTRPORT,REGION=4M
//STEPLIB    DD   DISP=SHR,DSN=your.upstream.program.library
//SYSPRINT   DD   SYSOUT=*
//SYSUDUMP   DD   SYSOUT=*
//USTCATLG   DD   DISP=SHR,DSN=your.upstream.catalog.file
//USTFILEI   DD   DISP=SHR,DSN=your.upstream.file-information.file
//SYSIN      DD   *
  TITLE LINE='XYZ CORPORATION - FINANCE DEPARTMENT BACKUPS'
  DEFAULT SHOWATTR
  SELECT PROFILE=FIN*,BKFILES=*
  PRINT RPTYPE=BACKUP
```

The report will be similar to:

```
                                        XYZ CORPORATION - FINANCE DEPARTMENT BACKUPS
Profile name /     CondCode  CPU Secs  LuName  Op Name  # Files  Mrg File MIG File
 Version Date.Time           ElpsMins  UserId  Op Type  # Bytes  Mrg Byts  Tracks   Backup Data Set Name        Backup Volumes
------------------ --------- -------- -------- -------- -------- -------- --------  ---------------------------- ------ ------ -
-----
FINSERV1
 98/01/10.15:58:40        0    17.351 LU3AS030 BACKUP      8705        0        0   FIN.UPSTREAM.FINSERV1.      001103 001104
          0  94/06/05 12:02:08pm <Dir> c:\CSERVE
         12  89/10/04 11:26:50am  ---- C:\CSERVE\ADLIB.BAT
    454,059  93/12/13 02:32:36pm  ----          \ALMANAC.HLP
        766  90/09/08 10:26:26pm  ----          \C-SERV.ICO
        108  93/10/14 00:03:44am  ----          \CHKLIST.MS
      2,265  94/06/14 04:23:30pm  ----          \CIS.INI
      2,537  89/12/06 11:57:04am  ----          \COP.FRM
          0  94/06/05 12:02:36pm <Dir> c:\CSERVE\DOWNLOAD
     11,467  94/05/31 06:59:42am  ---- C:\CSERVE\DOWNLOAD\APR94.PCX
     13,024  94/05/31 07:04:28am  ----                   \AUG94.PCX
```

CONFIGURATION REPORT

This reports on the main (global) options in the FDR/UPSTREAM configuration, plus a selected subset of profiles.

```
//USTRPORT  EXEC  PGM=USTRPORT,REGION=4M
//STEPLIB    DD   DISP=SHR,DSN=your.upstream.program.library
//SYSPRINT   DD   SYSOUT=*
//SYSUDUMP   DD   SYSOUT=*
//USTCONFG   DD   DISP=SHR,DSN=your.upstream.configuration.file
//SYSIN      DD   *
  TITLE LINE='XYZ CORPORATION - FINANCE DEPARTMENT PROFILES'
  SELECT PROFILE=FIN*
  PRINT RPTYPE=CONFIG,MEMBER=CONFIG02
```

The report will be similar to:

```
                                        XYZ CORPORATION - FINANCE DEPARTMENT PROFILES
 Config                                                          Route    TCPIP   TCPIP  Max   Max  Max   MaxTape MaxTape
 Member   Applid  Subsystm Dasdblk Seclvl SortUnit ATB# WTOCOMP Desc Code Stcname  Port# Tasks Rests Hist  Backup  Restore WSCnt
-------- -------- -------- ------- ------ -------- ---- ------- ---- ---- -------- ----- ----- ----- ----- ------- ------- -----
CONFIG02 USTPROD1 UPSTREAM   16384    0   SYSDA      10   Yes   1000 4020 TCPIP     1972   100   100    30     0       0      69

Profile       TAPE GDG Tapepref                              Tunit   Tape Expdt/   Newtape  Storclas              Merge Copy Migr
WSname   Pref DASD GDG Dasdpref                              Dunit   Comp Retpd    DasdBLK  Mgmtclas Keyed Arch. Vault Incr Thrsh
-------- ---- ---- --- ---------------------------------- -------- ---- ------  --------- -------- ----- ----- ----- ---- -----
FINSERV1  No  Tape No  FIN.FINSERV1.BACKT                  CART      Yes                                5     2  No    No     0
              DASD No  FIN.FINSERV1.BACKD                  TEMPDA                   16384                          No
FINSERV2  No  Tape Yes FIN.FINSERV2.GDGT                   CART      No                                 5     5  Yes   No     0
              DASD Yes FIN.FINSERV2.GDGD                   TEMPDA                   16384                          No
```

CONTINUED . . .

7.4 CONTINUED

SEQUENTIAL BACKUP REPORT

This reports on all sequential (disk and tape) backups which are recorded in the FDR/UPSTREAM repository. You may use a SELECT PROFILE= to report only on selected workstation profile names.

```
//USTRPORT  EXEC  PGM=USTRPORT,REGION=4M
//STEPLIB    DD   DISP=SHR,DSN=your.upstream.program.library
//SYSPRINT   DD   SYSOUT=*
//SYSUDUMP   DD   SYSOUT=*
//USTCATLG   DD   DISP=SHR,DSN=your.upstream.catalog.file
//USTFILEI   DD   DISP=SHR,DSN=your.upstream.file-information.file
//SYSIN      DD   *
  TITLE LINE='XYZ CORPORATION - SEQUENTIAL BACKUPS'
  PRINT RPTYPE=SQBACKUP
```

The report will be similar to:

```
                                XYZ CORPORATION - SEQUENTIAL BACKUPS
                            (FLAGS: "I"=INTERRUPTED, "R"=RESTARTABLE)
PROFILE   VERSIONDATE   TYPE   FILE-COUNT   DATA-BLK-CNT  FLAG  COMPRESS-LVL          DATASET NAME
-----------------------------------------------------------------------------------------------------------------------
--
PRDMERGE 940811 165946  TAPE          158          375     R      HI-1          PROD.UPSTREAM.MERGE.TAPE.G0002V00
PRDMERGE 940811 170328  TAPE           81           66     R      HI-1          PROD.UPSTREAM.MERGE.TAPE.G0003V00
PRDMERGE 940811 170434  TAPE        1,939       14,284     R      HI-1          PROD.UPSTREAM.MERGE.TAPE.G0004V00
```

ARCHIVE REPORT

This reports on all archive backups recorded in the FDR/UPSTREAM repository. You may use a SELECT PROFILE= to report only on selected workstation profile names.

```
//USTRPORT  EXEC  PGM=USTRPORT,REGION=4M
//STEPLIB    DD   DISP=SHR,DSN=your.upstream.program.library
//SYSPRINT   DD   SYSOUT=*
//SYSUDUMP   DD   SYSOUT=*
//USTCATLG   DD   DISP=SHR,DSN=your.upstream.catalog.file
//USTFILEI   DD   DISP=SHR,DSN=your.upstream.file-information.file
//SYSIN      DD   *
  PRINT RPTYPE=ARCHIVE
```

The report will be similar to:

```
PROFILE   DATE  TIME      FILE-COUNT  LO-LOC    HI-LOC    FLAGS  DATA-BLK-CNT          DATASET NAME
-----------------------------------------------------------------------------------------------------------------------
---
PC1      941109 161142            2  2780F3E4  2780F9F6                 45
PC1      941109 161202            2  27810705  27812698                450
PC1      941114 145248            2  2DB8A486  2DB8A7B4                 45
PC1      941116 133316            2  302A98A0  302A998F                 45
```

CONTINUED . . .

7.5 ARCHIVING

OVERVIEW

FDR/UPSTREAM-MVS supports four types of backups: *keyed*, *non-keyed*, *sequential tape*, and *sequential disk*. This section refers only to *non-keyed* backups. See Section 1.4 for more details on backup types.

Note: Innovation does not recommend *non-keyed* backups for most purposes. MERGE backups, with their ability to include migrated workstation files as part of the backup, is usually superior. You may ignore this section if your installation does not plan to use *non-keyed* backups.

Non-keyed backups, also called Archive Backups, are temporarily stored in the on-line repository until they are moved to Archive tape volumes. This migration to the Archive tape is performed by the FDR/UPSTREAM-MVS Archive utility, “USTARCH”. If you are using *non-keyed* backups, you should schedule regular executions of USTARCH, with the interval depending on the amount of Archive data you anticipate. Use of *non-keyed* backups by a given workstation is controlled by the ARCHIVE=nn parameter in the configuration profile used by the workstation.

USTARCH may be run as a batch job as shown on the following pages, but can only be run when the FDR/UPSTREAM-MVS on-line task is not running. Alternately, USTARCH can be executed as a subtask of the on-line task, but only in NOMERGE and DELETE modes (See Section 5.7 for details).

MODES OF OPERATION

There are several ways of operating USTARCH:

MERGE MODE maintains one set of Archive tape volumes. Every time you run USTARCH, those Archived workstation files which are still active are copied from the previous Archive tape set to a new Archive tape, along with any newly Archived files. When this is complete, the previous tape set is no longer needed and can be scratched. Merge mode makes the most efficient use of Archive tapes, but does require more tape mounting during the USTARCH run. It is best suited for installations that expect to have a small to moderate amount of Archived data.

NOMERGE MODE creates a new set of Archive tape volumes every time USTARCH is run, containing only those workstation files that are newly Archived. Previously created Archive tape volumes are not read, and must be retained. So, there will be many current sets of Archive tapes, each containing the files moved by one execution of USTARCH. The USTMAINT utility (which is normally run automatically during the start-up of the UPSTREAM on-line task) will check for Archive tape sets which no longer contain any active workstation files, and will uncatalog them, at which point they can be scratched (this can be automated in your tape management system by placing the tapes under “catalog control”). This is best suited for installations which Archive a moderate to large amount of data, since it will speed up execution of USTARCH.

WARNING: Once you execute USTARCH in NOMERGE mode, you can never return to executing in MERGE mode, since no single “previous” Archive tape exists.

DELETE MODE is the normal mode of USTARCH. In Delete Mode, after the *non-keyed* (Archive) backups of the workstation files have been moved to the output Archive tape volumes, they will be deleted from the UPSTREAM on-line repository and the records in the UPSTREAM catalog will be updated to point to their new location on tape.

NODELETE MODE bypasses the steps described for Delete Mode. The *non-keyed* backups will still be moved to the output Archive tape volumes, but they will not be deleted nor will the catalog be updated. If a NODELETE Mode execution of USTARCH is run before the DELETE mode execution, this will create a *secondary* (backup) copy of the Archive tapes. However, a secondary copy can also be made by copying the primary Archive tapes with IEBGENER or another copy utility. Since the UPSTREAM catalog points only to the primary copy, the USTREGEN utility (See Section 7) must be run if a secondary copy is to replace a primary copy.

MERGE/NOMERGE Mode and DELETE/NODELETE Mode are independent. For example, you can run MERGE with NODELETE, NOMERGE with DELETE, etc. See Section 7 for details on controlling the mode.

7.5 CONTINUED

OPERATION NOTES

Some important points to note regarding the function of the USTARCH utility are:

- USTARCH cannot be run as a batch job while the on-line portion of UPSTREAM/MVS (USTMAIN) is executing.
- The *non-keyed* Backup data temporarily residing in the on-line repository, awaiting USTARCH processing, is always available for a Restore request.
- Data written to the Archive tape volumes is always available for a Restore request. However, this Restore will require a volume mount and is subject to additional security considerations outlined in Section 4, “SECURITY”.
- Data from the Workstation is stored just as it is received. If “COMPRESSION” was requested during the Backup process, the data is stored in compressed format on the Archive volumes.

PASS 1

USTARCH uses a “two-pass” approach to maintain the integrity of the on-line repository in case of a failure during the Archive process.

In the first pass, USTARCH scans the on-line Repository catalog records for *non-keyed* (Archive) backup versions. If none are found, Pass 2 is entered. For each *non-keyed* version found, its attributes are checked.

- If it has the attribute “INTERRUPTED”, the backup was not completed, so it is left on the on-line repository anticipating a subsequent Restart attempt.
- If it has the attribute “DELETE VERSION”, set because the number of Archive backups of this file exceeds the value specified for “ARCHIVE=” in the FDR/UPSTREAM configuration for the workstation profile, it is bypassed until Pass 2.
- If it has the attribute “ARCHIVED”, it has already been moved to tape by a previous execution of USTARCH. If operating in **MERGE** mode, then the “old” Archive dataset is positioned to the records for this backup and it is copied to the “new” Archive dataset. If **NOMERGE** mode, the backup is bypassed.
- If none of the above is indicated, the data still resides in the on-line repository. The data blocks will be read from the repository and written to the “new” (output) Archive dataset.

PASS 2

The second pass is bypassed if operating in **NODELETE** mode. In this pass, the on-line repository is cleaned up, and the catalog records are updated.

USTARCH again scans the repository catalog for *non-keyed* backup versions. If none are found, final statistics are logged and execution terminates.

If versions were found that were just moved to tape, the file data records are erased from the on-line repository and the catalog records for those versions are updated to point to the “new” Archive dataset. For any versions that were copied from the “old” to “new” Archive dataset (because of MERGE MODE), their records are also updated to point to the new location.

For any versions marked “VERSION DELETE”, their records are erased from the catalog.

CONTINUED . . .

7.5 CONTINUED

ARCHIVE UTILITY JCL

These are the MVS JCL statements required to run the Archive Utility, USTARCH as a batch job. This can only be done when the FDR/UPSTREAM on-line task is not active. Remember that USTARCH can be executed as a subtask of the on-line task.

EXEC STATEMENT

Must specify the Archive Utility program name, PGM=USTARCH. A REGION=0M parameter is recommended to make the maximum region available. You may optionally specify a "PARM=" to control the operating mode of USTARCH; acceptable values are:

	Operating Mode
PARM= omitted	NODELETE, MERGE
PARM='DELETE'	DELETE, MERGE
PARM='NOMERGE'	NODELETE, NOMERGE
PARM='DELETE,NOMERGE'	DELETE,NOMERGE

STEPLIB DD STATEMENT

If FDR/UPSTREAM has not been placed into the system linklist, this DD will be required to point to the FDR/UPSTREAM load library. This library must be APF-authorized.

USTLOG DD STATEMENT

This is the USTARCH log file and contains informational and error messages. It is usually a SYSOUT dataset and has characteristics RECFM=V, LRECL=134, BLKSIZE=138.

USTSNAP DD STATEMENT

In the event of a recoverable error, USTARCH may take an MVS "SNAP" dump to this DD to aid in problem resolution. It is usually a SYSOUT dataset and has characteristics RECFM=VBA, LRECL=125, BLKSIZE=1632.

SYSUDUMP DD STATEMENT

In the event of a catastrophic error, MVS will take a diagnostic dump to this dataset, which may be invaluable in resolving the problem. Usually a SYSOUT dataset.

ARCHNEW DD STATEMENT

This is the "new" Archive dataset, which must be on tape. If operating in **NODELETE** mode, this should be the name of the secondary copy of the "new" Archive dataset. Required parameters include:

DSN= specifies the dataset name which will be created and cataloged. This may be any valid MVS dsname, but it will be simpler if you specify this as a Generation Data Group (GDG) name, e.g., DSN=UST.ARCHIVE(+1). To do so, you must have previously defined the GDG base name in your MVS catalog with a IDCAMS "DEFINE GENERATIONDATAGROUP" command specifying the number of generations you wish to keep (usually 1 or 2 if **MERGE** mode or a large number if **NOMERGE** mode).
UNIT= specifies the type of tape drive on which to create the dataset, e.g., UNIT=TAPE or UNIT=3490.
DISP=(,CATLG) to catalog the new dataset or GDG generation.
VOL=(,,,nnn) is required if more than 5 tape volumes may be required to contain the entire "new" Archive dataset; "nnn" specifies the maximum number of volumes.
LABEL= may be required to specify the retention period in days (LABEL=RETPD=nnn) or expiration date (LABEL=EXPDT=yyddd) of the dataset. If you have a tape management system, you may wish to specify catalog control (usually LABEL=EXPDT=99000).

CONTINUED . . .

7.5 CONTINUED

ARCHOLD DD STATEMENT

Specifies the “old” (input) Archive dataset, from which previously Archived workstation files may be copied to the “new” dataset if operating in **MERGE** mode. If in **NOMERGE** mode, this DD should be omitted. Usually the only required parameters are DSN= and DISP=(OLD,KEEP) or DISP=(OLD,DELETE). If your Archive dataset is a GDG, this should specify the current generation, DSN=gdgname(0).

The first time you run USTARCH in MERGE mode, ARCHOLD must be specified as a DUMMY dataset, e.g.,

```
//ARCHOLD DD DUMMY
```

since there is no old Archive file. It cannot be omitted.

USTCATLG DD STATEMENT

Specifies the FDR/UPSTREAM-MVS Repository Catalog data set. Usually the only required parameters are DSN= and DISP=SHR.

USTFILEI DD STATEMENT

Specifies the FDR/UPSTREAM-MVS Repository File-Information data set. Usually the only required parameters are DSN= and DISP=SHR.

USTFILEC DD STATEMENT

Specifies the FDR/UPSTREAM-MVS Repository File-Data Cluster. Usually the only required parameters are DSN= and DISP=SHR.

CONTINUED . . .

7.5 CONTINUED

SAMPLE JCL

A sample JCL member, “USTARCH”, can be found in the ICL (Installation Control LIbrary) loaded during the installation of FDR/UPSTREAM-MVS. It shows USTARCH run in **MERGE** mode. This JCL should be tailored to your installation.

When running the USTARCH utility in **MERGE** mode for the first time, you will have to specify the “ARCHOLD” DD statement as “DUMMY”. It will not be read by the Archive utility; but, it will be opened. This will result in an Abend if the DD statement is not present.

```
//jobname     JOB   (pgmr info...)
//*
//*           CREATE BACKUP COPY OF ARCHIVE TAPEs
//*           (NO "PARM='DELETE"' SPECIFIED ON EXEC)
//*
//ARCHIVE1    EXEC  PGM=USTARCH,REGION=0M
//STEPLIB      DD   DSN=upstream.load.library,DISP=SHR
//USTLOG       DD   SYSOUT=*
//USTSNAP      DD   SYSOUT=*
//ARCHNEW      DD   DSN=backup.copy.new.archive.dataset,UNIT=TAPE,
//           LABEL=(RETPD=nn),DISP=(,CATLG),VOL=(,,,8)
//ARCHOLD      DD   DSN=old.archive.dataset,DISP=(OLD,KEEP)
//USTCATLG     DD   DSN=upstream.catalog.cluster,DISP=SHR
//USTFILEI     DD   DSN=upstream.fileinfo.cluster,DISP=SHR
//USTFILEC     DD   DSN=upstream.filedata.cluster,DISP=SHR
//SYSUDUMP     DD   SYSOUT=*
//*
//*           CREATE ARCHIVE TAPE SET
//*           ("PARM='DELETE"' SPECIFIED ON EXEC)
//*
//ARCHIVE2    EXEC  PGM=USTARCH,REGION=0M,PARM='DELETE'
//STEPLIB      DD   DSN=upstream.load.library,DISP=SHR
//USTLOG       DD   SYSOUT=*
//USTSNAP      DD   SYSOUT=*
//ARCHNEW      DD   DSN=new.archive.dataset,UNIT=TAPE,
//           LABEL=(RETPD=nn),DISP=(,CATLG),VOL=(,,,8)
//ARCHOLD      DD   DSN=old.archive.dataset,DISP=(OLD,KEEP)
//USTCATLG     DD   DSN=upstream.catalog.cluster,DISP=SHR
//USTFILEI     DD   DSN=upstream.fileinfo.cluster,DISP=SHR
//USTFILEC     DD   DSN=upstream.filedata.cluster,DISP=SHR
//SYSUDUMP     DD   SYSOUT=*
```

Note that in the above example the Archive utility, USTARCH, is run twice. The first execution in the step “ARCHIVE1” is run without “PARM=DELETE” to create a backup copy of the Archive tape. Step “ARCHIVE2” contains the “PARM=DELETE” parameter to cause full execution of the Archive facilities, i.e., the appropriate File-Data records will be erased during it's phase-2 operation, and the repository will be updated to reflect the new Archive tape volumes.

In order to use the backup copy of the Archive tape set created in the “ARCHIVE1” step to perform any Restore processing, you would first need to run the USTREGEN utility documented the next section.

To run this example in **NOMERGE** mode, omit the ARCHOLD DD statements and add **PARM='NOMERGE'** to the ARCHIVE1 step, and change to **PARM='DELETE,NOMERGE'** in ARCHIVE2.

7.6 THE REGEN UTILITY, "USTREGEN"

WHEN TO USE THE REGEN UTILITY

The FDR/UPSTREAM "REGEN" utility, USTREGEN, is used to update backup information in the FDR/UPSTREAM on-line repository with information from an UPSTREAM backup or vault file. It can be used when backup information has been lost or is incorrect in the repository, or when secondary or vault copies of FDR/UPSTREAM backups are to be used in place of the primary backups.

When secondary vault copies of backups have been created with the USTVAULT utility, as described in Section 7.8, USTVAULT also creates a control file which contains copies of the repository records for the backups on the vault tape; these records have already been updated to point to the backups on the vault tape. These control files are copied to the end of the vault tape and are recorded in the repository under the USTVLCxx profile name (more details on this are in Section 7.8 under "Vaulting Records".) If you want to use the vault backups instead of the primary backups (at a disaster/recovery site, for example), you must run USTREGEN against each of the control files; USTREGEN will update the repository records so that future restores will be done from the vault tapes.

USTREGEN can also be run against the secondary copy of any backup file, including secondary copies of Archive (non-keyed) backups created with the NODELETE mode of USTARCH (described in Section 7.5) and copies of any backup created with IEBGENER or some other sequential copy utility. Every FDR/UPSTREAM backup contains copies of the repository records which describe it; when reading a backup, USTREGEN will update the repository records to point to the backup it is reading.

FDRSOS is a separately priced product from Innovation, and it enables channel speed MVS backup and restore of disks used by Open Systems and servers (See Section 1.4 for details). USTREGEN may be executed against FDRSOS backups, recording the date/time of the backup in the FDR/UPSTREAM respository. Although FDRSOS backups and restores are executed independant of FDR/UPSTREAM, REGENing them will allow them to appear in a FDR/UPSTREAM backup query, and also allows them to be restored by FDR/UPSTREAM when necessary. Since there is no profile associated with FDRSOS backups, USTREGEN will record these backups under the generated profile name of "F#volser" where "volser" is the FDRSOS volume serial of the Open System disk; these profile names do not need to be defined in the FDR/UPSTREAM-MVS configuration.

USTREGEN may be run as a batch job (shown below) while the FDR/UPSTREAM-MVS on-line task is not active, or it may be run as a subtask of the on-line task (See Section 5.7); the latter is recommended.

USTREGEN JCL

These are the MVS JCL statements required to run the REGEN Utility, USTREGEN, as a batch job:

EXEC STATEMENT

Must specify the REGEN Utility program name, PGM=USTREGEN. REGION=0M is recommended.

STEPLIB DD STATEMENT

If FDR/UPSTREAM has not been placed into the system linklist, this DD will be required to point to the FDR/UPSTREAM load library. This library must be APF-authorized.

USTLOG DD STATEMENT

This is the USTREGEN log file and contains informational and error messages. It is usually a SYSOUT dataset and has characteristics RECFM=V, LRECL=134, BLKSIZE=138.

USTSNAP DD STATEMENT

In the event of a recoverable error, USTREGEN may take an MVS "SNAP" dump to this DD to aid in problem resolution. It is usually a SYSOUT dataset and has characteristics RECFM=VBA LRECL=125, BLKSIZE=1632.

SYSUDUMP DD STATEMENT

In the event of a catastrophic error, MVS will take a diagnostic dump to this dataset, which may be invaluable in resolving the problem. Usually a SYSOUT dataset.

7.6 CONTINUED

USTARCH DD STATEMENT

Specifies the input backup data set whose records are to be "regenned" back into the FDR/UPSTREAM on-line repository. For vault copies of backups created by USTVAULT, this is the control file created during the vaulting process (See Section 7.8). For other secondary copies of backups, this is the actual backup file. It must be a cataloged dataset (if an uncataloged backup is used, the next execution of USTMAINT will delete it again). Usually the only required parameters are DSN= and DISP=OLD.

WARNING: the USTARCH DD statement must not be a concatenated data set; if it is, results will be incorrect. If you have multiple backups to REGEN, create a separate REGEN step for each backup.

USTCATLG DD STATEMENT

Specifies the FDR/UPSTREAM-MVS Repository Catalog data set. Usually the only required parameters are DSN= and DISP=SHR.

USTFILEI DD STATEMENT

Specifies the FDR/UPSTREAM-MVS Repository File-Information data set. Usually the only required parameters are DSN= and DISP=SHR.

SAMPLE JCL

A sample JCL member, "USTREGEN", can be found in the ICL (Installation Control LIbrary) loaded during the installation of FDR/UPSTREAM-MVS. This JCL should be tailored to your installation. The supplied sample execution JCL is shown below.

```
//jobname     JOB   (pgmr info)
//*
//*           EXECUTE THE USTREGEN MODULE
//*
//REGEN       EXEC  PGM=USTREGEN,REGION=0M
//STEPLIB      DD   DSN=your.upstream.loadlib,DISP=SHR
//USTLOG       DD   SYSOUT=*
//USTSNAP      DD   SYSOUT=*
//USTCATLG     DD   DSN=upstream.catalog.cluster,DISP=SHR
//USTFILEI     DD   DSN=upstream.fileinfo.cluster,DISP=SHR
//USTARCH      DD   DSN=your.tape.dataset,DISP=OLD
//SYSUDUMP     DD   SYSOUT=*
```

7.7 MIGRATION UTILITY "USTMIGRT"

MIGRATION OVERVIEW

USTMIGRT is a utility program that will "migrate" recently created *sequential disk* backups to tape. It can be invoked only as a subtask of USTMAIN, in response to a console command (See Section 5.7). There is no batch JCL for USTMIGRT.

Using USTMIGRT, you can allow workstations to do backups to disk instead of tape. This improves their efficiency since many of them can operate simultaneously and they are not limited by tape mount requirements or available tape drives.

Periodically you collect those disk backups with USTMIGRT and move them to tape, freeing up disk space. This may be especially useful if you want to do daily incremental backups to disk but do not have enough available disk space to hold the entire set of incrementals between full backups (note that the COPYINCR option of MERGE backups will also move incrementals from disk to tape, but not until the FULL MERGE backup is taken). USTMIGRT can move many backups, for many workstations, to the same tape, reducing the number of tape volumes compared to direct backups to tape. If you elect to use migration, you should execute USTMIGRT on a regular schedule, probably at least once a day.

Note: once a backup has been migrated to tape, a restore from that backup will operate exactly as if the original backup had been done directly to tape. The FDR/UPSTREAM control records are updated to point directly to the new location of the backups on tape.

Although it is possible to allow FDR/UPSTREAM *sequential disk* backup data sets to be archived by FDR/ABR, or IBM's HSM, or other DASD management software products, Innovation recommends that you use USTMIGRT for migration to tape rather than DASD management. Recall of the disk data sets by DASD management may be time-consuming and may require multiple tape mounts when several backups must be read to complete a restore. FDR/UPSTREAM can do the restore from tapes created by USTMIGRT in a much more efficient operation.

MIGRATION THRESHOLD

Every workstation profile in the FDR/UPSTREAM configuration contains a parameter MIGTHRESH=nn, where "nn" indicates a threshold for migration processing. The default value of MIGTHRESH is 0, which disables migration processing for the profile; migration will be performed only for those profiles where you have specified another value.

When USTMIGRT is run, it scans the FDR/UPSTREAM-MVS on-line repository for *sequential disk* backups recorded for each profile name whose MIGTHRESH value is greater than 0. If the number of such backups is equal to or higher than the threshold, the least recent disk backups will be "migrated" to tape until the number of disk backups remaining is nn-1 (one less than the threshold). For example, MIGTHRESH=1 will cause **all** disk backups to migrate, but MIGTHRESH=3 will leave the most recent 2 disk backups for that profile on disk. However, if the latest backup is a restartable-interrupted backup, it will not migrate.

If the configuration entry is a prefix (WSPREF=), its MIGTHRESH value will be used for each real profile created under that prefix, individually. For example, if WSPREF=PROD has a MIGTHRESH of 2, that value will be used for profile PROD1, PROD2A, and any other PRODxxxx profiles.

7.7 CONTINUED

MIGRATION TAPE PROCESSING

USTMIGRT requires that the FDR/UPSTREAM-MVS configuration contain special profiles with a profile name of USTMIGxx; these profiles must be enabled for *sequential tape* backups. A USTMIGRT profile will be created automatically by the FDR/UPSTREAM Configurator, USTCONFG, for a new configuration, but it will have default values that are probably not appropriate, so you will want to update it (or add it for existing configurations from earlier releases of FDR/UPSTREAM) with appropriate tape backup parameters. You will probably want to add additional USTMIGxx profiles to allow for concurrent execution of multiple migration tasks for various profiles. The USTMIGxx profile used for a given execution of USTMIGRT is controlled by the "MIGRTxx" on the console command used to invoke it, for example, F MIGRT03. See Section 5.7 for details on the command syntax.

If the configuration definitions for the workstation profiles contain the GROUPID=xx attribute, then only those profiles whose group ID matches the "xx" is the USTMIGxx profile will be processed by USTMIGRT. This allows you to easily group profiles for migration processing. The profiles to be processed by a given USTMIGRT execution can also be selected by the PROFILE= operand on the console command as described in Section 5.7.

If the optional NEWTAPE operand is not specified on the F MIGRTxx console command, each execution of USTMIGRT will call for a new (scratch) output tape, using one output tape drive. The tape backup name in the USTMIGxx profile will be used to create a dummy (empty) file as the first file on that tape; if necessary, you can use that name in your tape management system for vaulting and/or retention processing (controlling data set). The RETPD/EXPDT in the profile will be used for ALL tape files created by the USTMIGRT operation, so it must provide adequate retention for all the migrated files.

Note that the FDR/UPSTREAM control records contain no direct record of this dummy tape file. No action will be taken by FDR/UPSTREAM to uncatalog it. If the profile contains the TAPEGDG option, the dummy file will be created as a GDG; this is recommended so that normal GDG processing will uncatalog the dummy file as new generations are created; if you use tape management catalog control (EXPDT=99000 for some tape management systems), the migration tapes will be retained for the number of generations specified by the GDG base created for this GDG.

As backup files are selected for migration from disk, USTMIGRT will add a new file to the output tape to contain the backup. The new tape file will have the same data set name as the disk backup, except that if multiple backups are migrated under the same profile name, they will be combined into one tape file (using the name of the most-recently-created backup migrated under that profile). The tape will be a multi-file tape volume. If the amount of data being migrated exceeds the capacity of the tape volume, more scratch tapes will be requested, making this a multi-file, multi-volume tape aggregate. As each disk backup is migrated, the appropriate FDR/UPSTREAM records will be updated to point to the new location of the backups.

NEWTAPE: If the NEWTAPE operand is specified, USTMIGRT will call for a new scratch tape for each backup migrated to tape, using the *sequential tape* parameters in the associated workstation profile to allocate the tape (the profile must be enabled for tape backups). The TAPEPREF= value in the workstation profile will be used for the output data set unless the TAPEPREF= and DASDPREF= values are identical; in that case, the original backup data set name will be used. No dummy file will be created at the beginning of each tape.

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7.7 CONTINUED

MIGRATION TAPE PROCESSING *(Continued)*

FORWARD: If the optional FORWARD operand is specified on the F MIGRTxx console command, USTMIGRT will do additional processing to "forward merge" incremental backups which have previously been migrated to tape, copying them to the current output tape. During normal MERGE BACKUPs direct to tape, all of the incrementals and the full backup end up on the same tape set, which makes restores and USTMERGE operation very efficient since a minimum number of tapes must be mounted. But if incrementals to disk are used with daily USTMIGRT processing to move them to tape, those backups will end up scattered across a number of tape volumes, which will complicate and elongate restore and USTMERGE processing as it mounts those tapes to locate the required workstation files.

The FORWARD option requests that USTMIGRT do a "forward merge" of any incremental backups previously moved to tape by USTMIGRT (back to the last full backup) by reading those backups and merging the data with the current file being written to tape. It will require a second tape drive for the input tapes. This will create one file on the output tape for each profile processed, containing data from all of the preceding incremental backups. When USTMIGRT is migrating several backups for the same profile from disk in one execution, it already combines them into one file on the output tape. The FORWARD option simply enhances this to add backups that were previous migrated to this merge. No dummy file will be created at the beginning of each tape.

If the next tape input data set required by FORWARD processing is in another file on the input tape already mounted, even if it is for a different profile than the one just processed, USTMERGE will simply reposition to that file and read it without dismounting the tape. If you do FORWARD migration on the same set of workstation profiles every day, all of the data required for each day's migration will usually be on the previous day's migration tape. Since the profiles will be processed in the same order, USTMIGRT will usually be able to process that input tape efficiently, without dismounting it.

Once the previous tape backups have been moved, the input tape data sets are uncataloged. If you have them under tape management "catalog control" they will be automatically eligible for scratch.

USTMIGRT EXECUTION

USTMIGRT can only be executed as a subtask of the FDR/UPSTREAM on-line task, in response to a MVS console F (MODIFY) command; see Section 5.7 for details. The command can also be issued via the FDR/UPSTREAM ISPF interface (see Section 6), or from a batch job via the USTCMD utility (see Section 7.12)

USTMIGRT cannot operate concurrently with a USTVAULT execution using the same groupid. In other words, If you issue a F UPSTREAM,MIGRT01 command, you cannot start vaulting with a F UPSTREAM,VAULT01. Any attempt to start one when the other is operating will cause the requested operation to wait until the contending task completes.

You may terminate an active migration subtask, if you cannot wait for it to complete for some reason. To do so, issue the console command (see Section 5.3):

F UPSTREAM,TERM LU=USTMIGxx

or use the TERM line command on the FDR/UPSTREAM ISPF status display (see Section 6.3). USTMIGRT will complete processing whatever backup it is in progress before ending; this may take a few minutes. If you restart the migration at a later time, it will process only the backups that were not completed earlier. A console STOP (P) command to shutdown FDR/UPSTREAM will have the same effect as TERM on USTMIGRT. TERM should not be issued while USTMIGRT has an outstanding tape mount; this may cause premature termination of the utility. If you cannot wait for the orderly completion of the current backup, issue the TERM a second time to force the termination.

7.8 VAULTING UTILITY "USTVAULT"

VAULTING OVERVIEW

USTVAULT is a FDR/UPSTREAM utility which automates the creation of duplicate copies of *sequential disk* and *sequential tape* backup files. There are several reasons that you may want to do this:

- For disaster recovery: the secondary copies can be stored in an offsite vault.
- For onsite recovery: in case the primary backups are damaged or become unusable.
- For long term recovery: the duplicates are not recorded in the FDR/UPSTREAM on-line repository, so they may be retained for much longer than the primary backups without requiring record space in the repository.

USTVAULT will create secondary (vault) copies on tape of sequential backups for selected workstation profiles, or all of your profiles if you choose. USTVAULT keeps track of the backups which already have vault copies and will only create secondary copies for those which have not yet been processed. So, when you run USTVAULT, it will only process the backups created since the last time you ran it. Also, it will only duplicate backups back to the last full backup taken under each profile. MERGE BACKUPs in deferred status (See Section 1.4 and 7.9) will be automatically bypassed since they are not yet complete; once they have been completed by USTMERGE, they will be eligible for vaulting.

Optionally, you can:

- Vault only the most recent full backup for the profiles selected, bypassing any recent incrementals.
- Create vault copies even for backups which already have vault copies, allowing you to create extra copies for additional safety, or to create copies to be kept for a longer period.
- Specify the copy number to be created (2 through 9, default: 2).

Since you may want to treat the vault copies differently for different sets of workstations, USTVAULT allows you to specify many different sets of vaulting parameters (different vault tape data set names and different retentions). You may wish to specify different retentions for vault copies of full backups versus incrementals. You can invoke vaulting for varying subsets of your workstation profiles at different times, and you can vault several of those subsets concurrently for efficiency.

Your tape management system may be used to automatically send these secondary copies to offsite vaults.

USTVAULT cannot operate concurrently with USTMIGRT. Any attempt to start one when the other is operating will cause the requested operation to wait until the contending task(s) completes. If a USTMIGRT task is waiting to start, new USTVAULT tasks will also wait.

VAULTING CONFIG-URATION

To use vaulting, several things must be set in the FDR/UPSTREAM configuration.

- Each workstation profile for which you intend to create vault copies must be enabled for vaulting – the VAULT option must be set in the profile. In the DASDPREF= and/or TAPEPREF= parameters for those profiles, one character must be a question mark (?). That question mark will be replaced by a "1" (copy 1) during the actual backup, and the tape vault copy of those backups will have it changed to another copy number (2 through 9, default: 2), so that all copies can be cataloged. If the workstation profile specified DASDGDG and/or TAPEGDG, you will have to be sure that GDG bases are created for the copy 1 and data set name and all additional copy numbers you intend to use.
- You must create one or more reserved profiles with the name USTVLTxx (xx is any 2-character groupid). You may want to create more than one so that subsets of your workstation profiles can be vaulted under control of different USTVLTxx profiles; this allows these subsets to be vaulted concurrently, or at different times of day; it also allows different vault data set names and retentions to be used if vault processing requirements differ.

In the USTVLTxx profiles, the parameters for *sequential tape* backups will be used to allocate an output tape on which to create the vault backup copies, and to create the first file on that tape as a dummy (empty) file. The TAPEPREF= value in the configuration should define a name which can be recognized by your tape management system for offsite vaulting (or by whoever picks tapes for offsite storage). The RETPD/EXPDT parameters will be used to set the expiration of that dummy file and of all the other vault files which will be placed on the tape. In the ISPF dialogs and FDR/UPSTREAM-PC screens used to maintain configurations, these parameters will be headed "Vault Tape" to clearly indicate their function.

The parameters for *sequential disk* backups will be used to allocate a data set on disk for the storage of updated FDR/UPSTREAM control records which describe the vault copies; this control data set will actually be moved as the last file on the vault tape when USTVAULT finishes. The ISPF and PC dialogs will head these parameters with "Vault Control File".

The prefix values in the USTVLTxx for the "Vault Tape" and "Vault Control File" may optionally contain a ?, just like the values in the workstation profiles; if they do, the copy number (2 through 9) of the copy being created will be substituted in the names of the dummy file and control file. This is strongly recommended if you plan to create vault copies other than the default copy 2.

Optionally, those workstation profiles enabled for vaulting (VAULT) can also include the GROUPID=xx option in their configuration. This specifies that the profile can only be vaulted under control of the matching USTVLTxx vault profile. GROUPID=xx allows you to prespecify which workstations will be vaulted under which vault profiles, rather than depending on runtime specification. Profiles enabled for vaulting that do not specify GROUPID can be processed under any USTVLTxx profile. It is recommended that if any profile includes GROUPID then all profiles include it, to avoid confusion on vaulting assignments.

Section 3 "Configuration" describes in more detail how to make these changes to your configuration.

7.8 CONTINUED

VAULTING OPERATION

USTVAULT can only be executed as a subtask of the FDR/UPSTREAM on-line task, in response to a MVS console command (see Section 5.7 for details). The command can also be issued via the FDR/UPSTREAM ISPF interface (see Section 6), or from a batch job via the USTCMD utility (see Section 7.12).

USTVAULT will scan the selected profiles (or all profiles if PROFILE= is omitted). Only those profiles enabled for vaulting (the VAULT option in the configuration) will be selected. In addition, if any of those profiles include the GROUPID=xx configuration option, only those matching the USTVLTxx profile name will be chosen, plus any that do not specify any GROUPID. The most convenient way to run USTVAULT is to assign a GROUPID=xx in *every* profile enabled for vaulting, and then execute USTVAULT without the PROFILE= parameter, allowing USTVAULT to select all profiles that you have preassigned to the given USTVLTxx profile.

You may start multiple concurrent vaulting operations, using different VAULTxx parameters (an attempt to start a second vault with the same xx value will wait until the active one completes). It is your responsibility to ensure that different sets of workstation profiles (PROFILE= or GROUPID=xx) are processed by each vault request.

USTVAULT cannot operate concurrently with a USTMIGRT execution using the same groupid. In other words, If you issue a F UPSTREAM,VAULT01 command, you cannot start migration with a F UPSTREAM,MIGRT01. Any attempt to start one when the other is operating will cause the requested operation to wait until the contending task completes.

Using the *sequential tape* parameters in the USTVLTxx profile, USTVAULT will allocate an output tape and create/catalog the first file as a dummy (empty) data set. Using the *sequential disk* parameters, it will allocate a "temporary" control file on disk; for safety, this is allocated with SPACE=(CYL,(200,20),RLSE).

Now, USTVAULT scans the sequential backups recorded under the indicated profiles (only those profiles that are enabled for vaulting). Any backups that have already been processed for vaulting are bypassed since they already have an offsite copy. Backups which have not been vaulted are selected (for MERGE backups, only backups up to and including the most recent FULL backup are selected).

If the optional NOINCR operand is specified, then ONLY the most recent full backup will be selected, bypassing any incremental backups even if they have not been vaulted. If the optional NOVCHK operand is included, the check to see if a backups has already been vaulted is bypassed, allowing you to recreate a vault copy or to create an additional vault copy (using the optional COPY=n operand to specify the copy number to be created).

For each selected sequential backup, USTVAULT will allocate that backup, and create a copy of it as the next sequential file on the vault tape. The data set name created on the vault tape will be the same as that of the original backup, except that the copy number (specified by the question mark (?) in TAPEPREF= or DASDPREF= in the workstation profile) is changed from "1" to the copy number of vault copy, specified by the COPY=n operand (from 2 to 9 but defaults to 2). This tape file is cataloged.

A copy of the FDR/UPSTREAM records which describe the original copy 1 backup are updated to point to the vault file copy on tape, and are written to the vault control file. The actual FDR/UPSTREAM control records are **not** updated; they continue to point to the original copy 1 backup and will be used for any restore requests.

When vaulting has been completed for all selected profiles, USTVAULT copies the vault control file on disk, containing all of the updated control records, as the last file on the vault tape (under the same data set name). The tape file is cataloged, and the disk file is deleted.

You may terminate an active vaulting subtask, if you cannot wait for it to complete for some reason. To do so, issue the console command (see Section 5.3):

F UPSTREAM,TERM LU=USTVLTxx

or use the TERM line command on the FDR/UPSTREAM ISPF status display (see Section 6.3). USTVAULT will complete copying whatever backup it is currently processing, and will copy the control file to the tape before terminating; this may take a few minutes. If you restart the vaulting operation at a later time, it will process only the backups that were not completed earlier. A console STOP (P) command to shutdown FDR/UPSTREAM will have the same effect as TERM on a USTVAULT task. TERM should not be issued while USTVAULT has an outstanding tape mount; this may cause premature termination of the utility. If you cannot wait for the orderly completion of the current backup, issue the TERM a second time to force the termination.

If USTVAULT copies an interrupted backup, and that backup is later restarted, the next execution of USTVAULT which processes that profile will copy the backup again, uncataloging the earlier copy.

Warning: USTVAULT will make vault copies of sequential tape backups, as well as sequential disk. This may require mounting many input tapes during the vault process. Innovation recommends that, if possible, incremental backups be done to disk, then USTVAULT be executed to create the vault tape, then USTMIGRT be run to migrate the primary backups to tape (if required). If USTMIGRT is run before USTVAULT for the same backups, USTVAULT may need to mount the migrate tape MANY times.

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7.8 CONTINUED

VAULTING RECORDS

Although the actual FDR/UPSTREAM control records, in the on-line repository, are not updated to point to the vault tape, records are made of the vaulting operation so that you can report on them and make disaster recovery easier.

Each time USTVAULT is run, 2 records are added to the on-line repository:

- a record is added under the USTVLTxx profile name, showing a sequential tape backup with the name of the dummy data set created as the first file on the vault tape (from the *sequential tape* backup parameters in the profile). This will document when this vaulting operation began.
- a record is added under the profile name USTVLCxx (xx is the same as in the associated USTV-LTxx profile), showing a sequential tape backup with the name of the control file (last file on the vault tape) containing the updated control records. This USTVLCxx profile does **not** have to exist in the configuration (in fact, you cannot create it). It is only for reporting purposes.

These records will remain for as long as the data sets they point to are still cataloged (USTMAINT will deleted them when they are no longer cataloged).

VAULT REPORTING

You may report on the USTVLTxx and/or USTVLCxx profile names, in order to display when vaulting was done under each USTVLTxx profile. You can inquire on these profile names from a workstation, or you can display them with USTRPORT (See Section 7.1).

A USTRPORT TYPE=BACKUP report which includes the USTVLTxx and/or USTVLCxx profiles, will display the data set names and tape volume serials of the dummy data sets and the control files. If the vaulting tape is multi-volume, the USTVLTxx profile will show the first tape volser in the set, and the USTVLCxx will show the last tape.

A USTRPORT with RPTYPE=VAULT display only workstation records for versiondates that have vault copies. The report will show the data set name and tape volume serials of the vault copy (copies 2 through 9). This is a simple example of the report after a F UPSTREAM,VAULT01 PROFILE=SERVER1 was run:

```
Profile name /     CondCode  CPU Secs  LuName  Oper Name # Files  Mrg File MIG File
 Version Date.Time           Elps Min  UserId  Opty Devt # Bytes  Mrg Byte Trks/Lbl Backup Data Set Name        Backup Volumes
------------------ --------- -------- -------- --------- -------- -------- -------- ---------------------------- ------ ------ ------
SERVER1
 98/02/08.22:57:52        0     1.189 82324B0B BACKUP         45        0        0  PROD.SERVER1.COPY2.         001020
                               0.2            INCR TAPE  52,120        0        2    G0003V00
 98/02/09.22:48:41        0     7.134 82324B0B BACKUP      1,251    1,033        0  PROD.SERVER1.COPY2.         001021 001022 001023
                              20.3            MERG TAPE     650M     625M        1    G0004V00
USTVLC01
 98/02/10.00:51:53        0     0.000          VAULT     -- No History Available -- PROD.SERVER1.VAULT.CNTL.    001052
                               0.0                  TAPE                          4    G0002V00
USTVLT01
 98/02/10.00:51:53        0     3.102 USTVLT01 VAULT       1,296        0        0  PROD.SERVER1.VAULT.BACKUP.  001045
                              17.4                  TAPE     651M        0        1    G0002V00
```

The entries under SERVER1 shows that a vault copy has been made for those backups. The backup name is the vault copy data set name.

The entry under USTVLC01 is the name of the vault control file. This is the name which will be input to USTREGEN if you need to make the vault copy the primary copy. The tape volser shown will be the last volser of the tape set if more than one tape volume was used.

The entry under USTVLT01 is the name of the dummy file at the start of the vault tape. It shows the first volser in the tape set. However, its statistics reflect all the data processed by that USTVAULT execution.

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7.8 CONTINUED

VAULTING RECOVERY

If a disaster occurs, and you must use the offsite vault copies of the FDR/UPSTREAM backups, the control records of the on-line repository must be updated to point to the vault backup (if you have created multiple copies of the vault backups, you must choose one of them for the recovery). This can easily be done. However, you must first recover copies of the FDR/UPSTREAM on-line repository data sets, and copies of the MVS catalogs in which the vault control files were cataloged, using your normal DASD disaster recovery procedures.

The FDR/UPSTREAM "regen" utility, USTREGEN (described in Section 7.6) is used to read the control files written as the last file of each vault tape. These control files contain copies of the appropriate FDR/UPSTREAM control records **already updated** to point to the vault tape files. USTREGEN will simply read them from the tape and update the on-line repository records. Any subsequent restore requests will call for the appropriate vault tape.

USTREGEN can be executed in batch, as shown in Section 7.6, or via a console command as shown in Section 5.7. It must be executed once for each vault tape whose records are to be updated. The names of the control files on the vault tapes are recorded under the USTVLCxx profile names (as just described) and can be obtained with USTRPORT.

Warning: the control file written to the end of the vault tape contains physical blocks on the vault tape. If the vault tape is copied by IEBGENER or any other tape utility, these pointers may become invalid, making the tape useless for recovery unless you do a USTREGEN on every duplicate backup file on the tape. Innovation strongly recommends against duplicating the vault tape.

If USTVAULT does not complete for some reason (perhaps an abend, or a forced termination), the control file will remain on disk. However, all backups which were successfully copied to tape have been flagged as being vaulted, so a later execution of USTVAULT will not select them. That control file is cataloged to disk and can be used to recover the associated tape at a disaster site, but you must recover the control file at the disaster site using other means (such as DASD disaster recovery).

It is possible that your vault copies will contain multiple copies of the same data. For example, incremental MERGE BACKUPs will normally append each day's incremental to the back of the first incremental created after the last full backup; the incremental backup file is cumulative. However, if you vault that backup every day, USTVAULT will copy the entire backup file, so each copy is also cumulative, each containing one more day's data. When you need to recover from those vault copies, you only need to run USTREGEN against the latest copy of those backups. To prevent accidental regen from a back-level copy, USTREGEN compares the volume serial in its input records with the system catalog; if the volser in the catalog does not match, it will reject those records with a warning message reminding you that you should do the regen only against the latest version.

Also, if the backup dataset in the control records is not cataloged at all, USTREGEN will not update those records in the repository. For FDR/UPSTREAM to successfully restore from the vault copies, the vault datasets must be cataloged in the system catalog.

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7.8 CONTINUED

LONG TERM RETENTION

Another use of vaulting is long-term retention of backups. Normal FDR/UPSTREAM backups may require considerable space in the FDR/UPSTREAM repository datasets (the "catalog" and "file-info" clusters). In particular, the file-info cluster contains a record for **every workstation file** that is backed up; multiple records exist for files that have been backed up multiple times. For large servers or many servers, this can be a great deal of data. Because of this, older backups are normally kept only for a limited amount of time or for a limited number of versions, allowing the USTMAINT utility to delete the repository records for backups that have expired and become uncataloged.

If you need to keep older backups for an extended period for long-term recovery or legal reasons, you can do so without requiring valuable space in the on-line repository by using USTVAULT.

The ability of USTVAULT to create vault copies with differing names (different copy numbers) for a given backup also allows you to create vault copies that will be kept for longer periods than your normal vault copies. For example, you might run a special USTVAULT execution once a quarter in place of your normal vaulting to create backups to be kept for several years. The console command to do so might look like:

F UPSTREAM,VAULT01 COPY=4

This will create copy 4 vault names (a "4" in place of the "?" in the file names created on the tape). This will work best if the prefix names in the USTVLTxx profile are GDGs, so that you can build the GDG bases with the proper number of generations to keep the number of versions you need. For example, 12 generations of a quarterly backup will be kept for 3 years; tape management catalog control (EXPDT=99000) should also be used.

As explained in the overview above, the repository does **not** contain records for the individual workstation files contained on the vault tapes; it only contains one record that documents the existence and versiondate of the vault copy. The vault tapes may be kept for an extended period while using only a trivial amount of space in the repository.

If you need to restore any files from the vault backups, you must REGEN the necessary vault control files as described above; this will put the file records back in the repository so that inquiries and restores can be done. Once the necessary restores are complete, you can remove those records and recover the repository space using the REMOVEDSN= console command (see Section 5.7).

7.9 DEFERRED MERGE UTILITY "USTMERGE"

DEFERRED MERGE BACKUP OVERVIEW

USTMERGE is used to complete the backup processing for FULL MERGE BACKUPs which have the MERGE=DEFER option set in their profile. See Section 1.4 for a full description of MERGE BACKUPs and the MERGE=DEFER option.

Typically, a FULL MERGE BACKUP is output to tape, and it must mount the previous full backup tape (and possibly other incremental backup tapes) to complete the backup processing. This requires several tape drives, and may need the assistance of an operator to mount the input tapes. In some installations, sufficient tape drives may not be available at the time that the workstation backups must be run, or operators are not available.

MERGE=DEFER allows you to do the FULL MERGE BACKUPs at any time, but to defer the completion of the backup (copying files from previous backups) until a time when the resources are available. The output of the MERGE=DEFER backup can be directed to disk instead of tape, if you prefer, so that no tapes are required at all during the actual backup.

USTMERGE will identify workstation profiles whose most recent FULL MERGE BACKUP was done with MERGE=DEFER in effect, for which deferred processing is still required to complete the backup. It will complete those backups by:

- copying the full backup data set from disk to tape, if the initial FULL MERGE BACKUP was taken to sequential disk. The profile must be enabled for both sequential disk and sequential tape backups.
- locating the previous backup tapes which contain the most recent copy of the workstation files that were deferred, mounting them, and copying the deferred files to the new tape backup to create a completed backup.

Warning: although the FULL MERGE BACKUP with MERGE=DEFER will appear to be complete at the workstation, it will not be truly complete until USTMERGE has been run for that profile.

It is possible to put off execution of USTMERGE if you prefer. The FDR/UPSTREAM restore programs have been enhanced so that if files in defer status are found, the required previous full and/or incremental backups will be mounted and read to restore those files. In fact, you could put off USTMERGE for quite a while; the result would be that a restore might need to read many previous backups, possibly including several full backups, to find all the files required for the restore. The danger with this technique is that the older backups may expire, losing the latest backups of some deferred files. It will also increase the elapsed time of any restore. **For these reasons, Innovation strongly recommends that you run USTMERGE regularly.** However, if the backups of files are lost in this way, those files will be automatically requested from the workstation during the next FULL MERGE BACKUP.

By default, USTMERGE will only attempt to complete the most recent FULL MERGE BACKUP that has deferred files. If you take several FULL MERGE BACKUPs with MERGE=DEFER without running USTMERGE between them, only the latest will be processed; the others will remain in deferred status. However, if you specify the optional operand FORCE (See Section 5.7) it will instead process the oldest FULL MERGE BACKUP found. If you have multiple such backups, you must execute USTMERGE with FORCE repeatedly until they are all processed.

Any attempt to run USTMIGRT (Section 7.7) or USTVAULT (Section 7.8) for any backups that have pending deferred merges will be rejected. You may not run those utilities against the backups until the deferred merges have been completed by USTMERGE.

7.9 CONTINUED

USTMERGE TAPE PROCESSING

USTMERGE requires that the FDR/UPSTREAM-MVS configuration contain special profiles with a profile name of USTMERxx; these profiles must be enabled for *sequential tape* backups. A USTMERGE profile will be created automatically by the FDR/UPSTREAM Configurator, USTCONFG, for a new configuration, but it will have default values that are probably not appropriate, so you will want to update it (or add it for existing configurations from earlier releases of FDR/UPSTREAM) with appropriate tape backup parameters. You will probably want to add additional USTMERxx profiles to allow for concurrent execution of multiple USTMERGE tasks for various profiles. The USTMERxx profile used for a given execution of USTMERGE is controlled by the "MERGExx" on the console command used to invoke it, for example, F MERGE03. See Section 5.7 for details on the command syntax.

If the configuration definitions for the workstation profiles contain the GROUPID=xx attribute, then only those profiles whose group ID matches the "xx" is the USTMERxx profile will be processed by USTMERGE. This allows you to easily group profiles for DEFERRED MERGE processing. The profiles to be processed by a given USTMERGE execution can also be selected by the PROFILE= operand on the console command as described in Section 5.7.

In addition to its output tape drive, USTMERGE will need 1 or 2 tape drives for input. One drive is required to read the previous full backup tape, but if USTMERGE must also read incremental backups on tape to find all of the deferred files, it will allocate a second input tape drive for that purpose.

If the optional NEWTAPE operand is *not* specified on the F MERGExx console command, each execution of USTMERGE will call for a new (scratch) output tape, using one output tape drive; *all* backups processed by USTMERGE will be written to this tape. The tape backup name in the USTMERxx profile will be used to create a dummy (empty) file as the first file on that tape; if necessary, you can use that name in your tape management system for vaulting and/or retention processing (controlling data set). The RETPD/EXPDT in the profile will be used for ALL tape files created by the USTMERGE operation, so it must provide adequate retention for all the backups.

Note that the FDR/UPSTREAM control records contain no direct record of this dummy tape file. No action will be taken by FDR/UPSTREAM to uncatalog it. If the profile contains the TAPEGDG option, the dummy file will be created as a GDG; this is recommended so that normal GDG processing will uncatalog the dummy file as new generations are created; if you use tape management catalog control (EXPDT=99000 for some tape management systems), the backup tapes will be retained for the number of generations specified by the GDG base created for this GDG.

As FULL MERGE BACKUP files are selected for deferred merge processing, USTMERGE will add a new file to the output tape to contain the backup. The new tape file will have the same data set name as the original backup. Even if the original deferred FULL MERGE BACKUP is already on tape (the original backup was taken directly to tape), it will be moved to the new output tape. The tape will be a multi-file tape volume. If the amount of data being moved exceeds the capacity of the tape volume, more scratch tapes will be requested, making this a multi-file, multi-volume tape aggregate. As each disk backup is migrated, the appropriate FDR/UPSTREAM records will be updated to point to the new location of the backups.

If the NEWTAPE operand *is* specified, USTMERGE will call for a new scratch tape for *each* backup being moved from disk to tape, using the *sequential tape* parameters in the associated workstation profile to allocate the tape (the profile must be enabled for tape backups). Only one file will be written to each tape. The tape dataset name in the workstation profile will be used for the output data set unless the TAPEPREF= and DASDPREF= values in the profile are identical; in that case, the original backup data set name will be used. However, if the DEFERRED FULL MERGE BACKUP is already on tape, that backup will *not* be copied to a new tape; rather, the deferred files will simply be added to the end of the existing backup tape.

7.9 CONTINUED

USTMERGE EFFICIENCY

USTMERGE will need to mount previous backups associated with each profile being processed, in order to find and copy the backups of the workstation files that had been deferred. If multiple backups on various tape volumes are required, USTMERGE may need to deallocate and reallocate the input tapes, which may result in various tape drives being used to read those inputs. However, if USTMERGE detects that the next backup that it requires is in another tape file on the tape volume that is already mounted, it will reposition the tape and read the file without dismounting it. This processing takes place on both the drive used for reading the previous full backups and the optional drive used for reading the previous incremental backups.

This leads to a suggestion for efficient USTMERGE processing. For the set of workstation profiles processed by a given USTMERGE execution (specified by the groupid and/or PROFILE= operand), it will always process them in the same order (reverse alphabetical order). If USTMERGE is run *without* the NEWTAPE operand, it will create a multi-file tape set containing all of the FULL MERGE BACKUPs for those profiles, in that order (at least for all those that had DEFERRED backups). When USTMERGE is run again for the same set of profiles, it will do the same again, but it will be able to read the backups on the previous tape, in order, to get the deferred files with a minimum of tape mounting.

However, if USTMERGE must read workstation files from several sources in order to copy all of the deferred files, it may be necessary for it to mount several different tapes during the processing of one backup. It this is required, it will be forced to dismount the currently mounted tape and mount another, losing the positioning on that tape. If that tape is required for processing of the next backup, it will be remounted and repositioned. This is most likely to occur if daily incremental backups were taken to *sequential disk*, then USTMIGRT was used on those incrementals to move them to tape on a daily basis without using the FORWARD option of MIGRT.

The FORWARD option of USTMIGRT (See Section 7.7) can be used to "forward merge" the incremental backups for a given profile onto one tape. If FORWARD is used every time USTMIGRT is run, there will be one tape set containing all of the recent incrementals for those profiles. Since USTMERGE uses a separate tape drive for reading any required incremental backups, it will also be able to read those backups, in order, without dismounting the tape.

USTMERGE OPERATION

USTMERGE can only be executed as a subtask of the FDR/UPSTREAM online task, in response to a MVS console command (See Section 5.7 for details). The command can also be issued via the FDR/UPSTREAM ISPF interface (See Section 6), or from a batch job via the USTCMD utility (see Section 7.12).

USTMERGE will select profiles based on the groupid and/or the PROFILE= operand on the console command which invoked it and will identify those whose most recent FULL MERGE BACKUP has deferred files. For each, it will complete the MERGE BACKUP as described above.

You may terminate an active USTMERGE subtask, if you cannot wait for it to complete for some reason. To do so, issue the console command (see Section 5.3):

F UPSTREAM,TERM LU=USTMERxx

or use the TERM line command on the FDR/UPSTREAM ISPF status display (see Section 6.3). USTMERGE will complete merging whatever backup it is currently processing; this may take a few minutes. A console STOP (P) command to shutdown FDR/UPSTREAM will have the same effect as TERM on a USTMERGE task. TERM should not be issued while USTMERGE has an outstanding tape mount; this may cause premature termination of the utility. If you cannot wait for the orderly completion of the current backup, issue the TERM a second time to force the termination.

CONTINUED . . .

7.10 DUPLICATE FILE AUDIT UTILITY "USTDUPRT"

USTDUPRT is a utility that can be used to search the FDR/UPSTREAM-MVS backup records looking for backups of workstation files which may be duplicates; the same contents on multiple workstations (or even in multiple directories on the same workstation). Within the criteria you specify, USTDUPRT will search for files that have the same name, update date, and size. It will show you how many times they appear, and, if requested, all of the locations of each such file.

USTDUPRT is used in conjunction with the FDR/UPSTREAM Automatic Duplicate File Support, described in detail in Section 1.4. Using the reports from USTDUPRT, you can identify files that are candidates to be backed up under the special USTDUPFL profile, and to identify files that will be picked up by the DUPLICATE=AUTO option if enabled. USTDUPRT can be executed as a batch job as shown below, or can be executed from the FDR/UPSTREAM ISPF panels (see Section 6).

USTDUPRT JCL These are the MVS JCL statements required to run USTDUPRT as a batch job:

EXEC STATEMENT Must specify the program name, PGM=USTDUPRT.

STEPLIB DD STATEMENT If FDR/UPSTREAM has not been placed into the system linklist, this DD will be required to point to the FDR/UPSTREAM load library. This library must be APF-authorized.

SYSPRINT DD STATEMENT This is the USTDUPRT report file. It is usually a SYSOUT dataset and has characteristics RECFM=FBA, LRECL=133.

USTCATLG DD STATEMENT Specifies the FDR/UPSTREAM-MVS Repository Catalog data set. Usually the only required parameters are DSN= and DISP=SHR.

USTFILEI DD STATEMENT Specifies the FDR/UPSTREAM-MVS Repository File-Information data set. Usually the only required parameters are DSN= and DISP=SHR.

SYSIN DD STATEMENT Contains control statements for USTDUPRT. Usually a DD * file. If not, the file must have characteristics RECFM=FB and LRECL=80. It is optional, if omitted all defaults are assumed.

CONTROL STATEMENTS USTDUPRT supports 3 control statements: PRINT, INCLUDE, EXCLUDE. If the SYSIN DD is omitted, or if it has no control statements other than comments, USTDUPRT assumes:

PRINT NODETAIL and INCLUDE *

Comment statements may be included, they must have an asterisk (*) in column 1. Statements must be contained in one record, no continuation is permitted.

PRINT STATEMENT You should have only one PRINT statement

PRINT DETAIL|NODETAIL

,MINCOUNT=nnnn

,MINDAYS=nnnn

,MINSIZE=nnnn

,MAXSIZE=nnnn

,SORTUNIT=uuuu|**SYSALLDA**

7.10 CONTINUED

OPERANDS

DETAIL
NODETAIL

If DETAIL is specified, the report will include details about the profile and directory under which each copy of the potential duplicate file was found. NODETAIL (the default) simply reports on the file characteristics, the number of times it was found and the profile under which it was first found. The sample report below shows a NODETAIL report.

MINCOUNT=

specifies the minimum number of times that a given file must be found in the FDR/UPSTREAM backup records for it to be included in the report. If omitted, the default is 1, which will include all files even if they appear only once (are not really duplicates). However, you may want to use MINCOUNT=1 with the MINDAYS and MINSIZE parameters to identify files which may later be identificated as duplicate files if DUPLICATE=AUTO is enabled.

MINDAYS=

specifies the minimum number of days that must have elapsed since the "update date" associated with the file for it to be included in the report. Automatic Duplicate File Support in FDR/UPSTREAM normally will only identify files with update dates selected by the DUPDAYS= operand in the FDR/UPSTREAM configuration (see Section 3.4). If omitted, all files will be included regardless of their update date.

MINSIZE=

specifies the minimum size, in KB (kilobytes), for files to be included in the report. Automatic Duplicate File Support in FDR/UPSTREAM normally will only identify files with sizes larger than the DUPSIZE= operand (which is in bytes) in the FDR/UPSTREAM configuration (see Section 3.4) so you may want to specifiy a MINSIZE= value matching DUPSIZE=. If omitted, minimum size will not be used to filter the files.

MAXSIZE=

specifies the maximum size, in KB (kilobytes), for files to be included in the report. If omitted, maximum size will not be used to filter the files.

SORTUNIT=

specifies the unit name (any value which will allocate disk devices when used as UNIT= in JCL) which will be used for the dynamic allocation of SORT work area. This unit name should include some volumes mounted as STORAGE or PUBLIC for the allocation of temporary data sets. The default is SYSALLDA.

7.10 CONTINUED

INCLUDE/ EXCLUDE STATEMENTS

You may have one or more INCLUDE and/or EXCLUDE statements to specify the profile names which USTDUPRT is to scan.

INCLUDE|EXCLUDE profile1,profile2,...

You may have as many profile names, separated by commas as will fit on one 80-byte record. The profile names may be a single profile name, a profile name prefix followed by an asterisk (*) such as PROD*, or just an asterisk (which means "all profiles". If no INCLUDE statements are present, "INCLUDE *" will be assumed. EXCLUDE statements may be used to exclude a subset of the profiles selected by the INCLUDE statements.

SAMPLE BATCH JOB

```
//USTDUPRT  EXEC  PGM=USTDUPRT
//SYSPRINT   DD   SYSOUT=*
//USTCATLG   DD   DISP=SHR,DSN=your.upstream.catalog
//USTFILEI   DD   DISP=SHR,DSN=your.upstream.fileinfo
//SYSIN      DD   *
   PRINT  NODETAIL,MINCOUNT=2,MINSIZE=4
   INCLUDE SERVER*
   EXCLUDE SERVER4,SERVER6
```

SAMPLE REPORT

```
DUPLICATED-FILE     FILE-SIZE  LAST-MODIFIED  PROFILE
COUNT   KILOBYTES     (BYTES)    DATE / TIME    NAME    FILE NAME
----------------    ---------  ------------- --------  -------------
    2         15         7,590  941205/135350 SERVER1   AASERVCS.XLS
    2        151        77,513  940311/020000 SERVER1   AAU.HLP
    2         27        14,009  920514/164336 SERVER1   ACDETHER.MET
    2         24        12,099  920514/165052 SERVER1   ACDIASYN.MET
```

7.11 BACKUP FILE REPORT UTILITY "USTBKPRT"

USTBKPRT is a simple utility which can display the contents of any FDR/UPSTREAM-MVS sequential disk or tape backup data set, even if that backup is not currently recorded in the FDR/UPSTREAM-MVS on-line repository. This may be useful for determining the contents of duplicate backup or a backup which has been deleted from the on-line repository.

USTBKPRT JCL

The JCL required for USTBKPRT is very simple.

EXEC STATEMENT

Must specify the program name, PGM=USTBKPRT.

STEPLIB DD STATEMENT

If FDR/UPSTREAM has not been placed into the system linklist, this DD will be required to point to the FDR/UPSTREAM load library.

USTRPRT DD STATEMENT

This is the USTBKPRT report file. It is usually a SYSOUT dataset and has characteristics RECFM=VBA,LRECL=136. If it is directed to other than SYSOUT, any blocksize of 140 or more is acceptable.

SYSUDUMP DD STATEMENT

In the event of a catastrophic error, MVS will take a diagnostic dump to this dataset, which may be invaluable in resolving the problem. Usually a SYSOUT dataset.

USTBKUP DD STATEMENT

Points to any FDR/UPSTREAM-MVS sequential backup data set on disk or tape (including tapes produced by USTARCH and USTMIGRT). For tapes which contain multiple backup data sets (such as tapes created by MERGE BACKUPS or USTMIGRT), USTBKPRT will report on one backup data set at a time; to report on multiple files you must have multiple USTBKPRT steps pointing to one backup data set each.

SAMPLE JCL

```
//BKPRT    EXEC PGM=USTBKPRT
//STEPLIB  DD   DISP=SHR,DSN=your.upstream.load.library
//USTBKUP  DD   DSN=PROD.UPSTREAM.BACKUP(0),DISP=SHR
//USTRPRT  DD   SYSOUT=*
//SYSUDUMP DD   SYSOUT=*
```

SAMPLE REPORT

```
  WORKSTATION FILE PATH NAME                        MOD.DATE/TIME   FILE-BYTES   BLK-COUNT  NOTES INCR.DATE/TIME  DLOCATOR
-----------------------------------------------------------------------------------------------------------------------------
PRDARCH1 950201 110820
 C:\LAN\BNETX.EXE                                   930217 134756       85,170          16                        90D9D1DE
 C:\LAN\DOSNP.EXE                                   920526 110036        9,971           3                        90D9D25C
 C:\LAN\DOSUP7.DOC                                  930408 134448        9,195           2                        90D9D277
     .
     .
 C:\LAN\TRXNET.COM                                  921221 142750       18,765           5                        90D9F877
 C:\LAN\XMSNETX.EXE                                 930217 134552       86,064          16                        90D9F88F
==> IN THIS BACKUP VERSION THERE WERE:          42 FILES, AND         0 DIRECTORIES:
-----------------------------------------------------------------------------------------------------------------------------
PRDARCH3 950201 110913
 C:\LAN\DOSNP.EXE                                   920526 110036        9,971           3                        90DA0414
     .
     .
 C:\LAN\XMSNETX.EXE                                 930217 134552       86,064          16                        90DA08DA
==> IN THIS BACKUP VERSION THERE WERE:          41 FILES, AND         0 DIRECTORIES:
-----------------------------------------------------------------------------------------------------------------------------
==> IN THIS BACKUP DATASET THERE WERE:         126 FILES, AND         0 DIRECTORIES
```

7.12 COMMAND UTILITY "USTCMD"

USTCMD is a utility program which can be used to issue "console" MODIFY (F) commands to FDR/UPSTREAM. It is used internally by the FDR/UPSTREAM ISPF dialog (See Section 6.5) but it can also be used directly by authorized batch jobs. You may wish to use it for automation of certain FDR/UPSTREAM operations. For example, a scheduling program might be used to submit USTCMD jobs at specified times to invoke certain FDR/UPSTREAM operations (such as migration, vaulting, reorganization, etc.).

Section 5 lists all the considerations and syntax for MODIFY commands that may be issued to FDR/UPSTREAM. The text "UPSTREAM" shown in the example below should be replaced with the actual FDR/UPSTREAM on-line task name, if different. USTCMD will issue an internal MODIFY command for that task; it will not verify that the command was accepted or display any results of the command. Messages from the command will be sent to the system console and/or the FDR/UPSTREAM log.

You will probably want to limit the ability to issue FDR/UPSTREAM commands by using the PROGRAM CONTROL option of RACF (or the equivalent facilities of other security products) to restrict the use of program USTCMD to certain userids.

NOTE: If you have a security system, READ authority is required to the backup data set name to issue a REGEN command, and ALTER authority is required to issue a REMOVEDSN command.

COMMANDS FROM BATCH

In a batch job, you can use USTCMD to issue commands to FDR/UPSTREAM:

```
//USTCMD   EXEC  PGM=USTCMD
//STEPLIB   DD   DISP=SHR,DSN=your.upstream.load.library
//SYSPRINT  DD   SYSOUT=*
//SYSIN     DD   *
F UPSTREAM,cmd
  ..  additional commands if desired  ..
/*
```

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8.1 OVERVIEW

You can initiate workstation and LAN backup and restore operations from your mainframe computer simply by submitting a batch job to execute the “USTBATCH” utility program. The batch job may be submitted manually or might be automated using your existing mainframe scheduling system.

The FDR/UPSTREAM ISPF interface (See Section 6) can be used to generate and submit or save USTBATCH jobstreams, using panels that are very much like those used for similar operations at the workstation. When using the ISPF interface, you will not have to be concerned about the parameters and coding rules described in this section, since all parameter generation will be done for you. **Use of the ISPF interface to generate and/or submit USTBATCH requests is recommended.**

A more sophisticated approach to automating the backup and restore processes may be implemented by enabling the “WTOCOMP” facility in the FDR/UPSTREAM-MVS configuration. This will cause the on-line UPSTREAM task to issue WTO messages to the system log regarding the process completion status. These messages could be intercepted by your scheduling system and used to control subsequent UPSTREAM request submission. A similar result can be obtained using the CONV=WAIT option of USTBATCH along with it's WTOCOMP option, which will cause USTBATCH to display the results of workstation operations by console messages.

USTBATCH now allows you to invoke the execution of a "job" at a workstation. This "job" can be any executable program, batch file or script. This facility might be used to prepare for FDR/UPSTREAM backups, performing functions such as closing data bases or stopping other applications. See the FDR/UPSTREAM Workstation/Server manual for more information.

USTBATCH may also be used to initiate the file transfer feature of FDR/UPSTREAM, causing the transfer of one file from a workstation to a MVS data set or vice versa.

USTBATCH may be used to submit FDR/UPSTREAM-MVS console commands (the F commands documented in Section 5) for execution.

USTBATCH has a feature which simplifies security checking for workstation operations initiated by USTBATCH. More details are in Section 4, "Security".

With careful planning and design, you can fully automate all your backup and distribution facilities using your current mainframe scheduling system.

8.2 HOW IT WORKS

COMPONENTS

From the mainframe perspective, the “remote initiation” facilities consist of two components:

- The USTBATCH utility submitted on the mainframe
- additional functionality in the FDR/UPSTREAM-MVS on-line component to perform the initiation to the target workstation.

FUNCTIONAL FLOW

- The USTBATCH utility is submitted as a batch job on the mainframe (either manually, or automatically using your mainframe scheduling system). The USTBATCH job can be submitted from the FDR/UPSTREAM ISPF dialog (See Section 6).
- USTBATCH allocates a VTAM APPC (LU 6.2) conversation to the FDR/UPSTREAM-MVS on-line task. Unless CONV=WAIT is specified, they need not be running on the same MVS system image as long as there is a VTAM connection between the images.
- USTBATCH forwards the backup or restore request to the FDR/UPSTREAM-MVS on-line component, including the parameters you have specified, to cause the actual initiation to the target workstation.
- The FDR/UPSTREAM-MVS “on-line initiator” component stores the received request and parameters (for potential retry attempts), and allocates an LU 6.2 or TCP/IP conversation to the target workstation.
- The request and specified parameters are sent to the workstation along with a “confirm” request by the on-line initiator. **If no response is received from the target workstation to the initiation request within three minutes, the on-line initiator will time-out the request and log an error indication.** This may be overridden by adding PARM='NOTIMER' to the USTBATCH EXEC statement.
- If the request is immediately accepted by the workstation, a “confirmed” response is returned to the requesting USTBATCH task, which in turn, logs the confirmation. If CONV=KEEP or WAIT was specified, the "confirmed" response is not returned until the workstation has validated and initiated the request.
- In the event the target workstation is busy or not available, the retry process is begun in the on-line initiator as indicated per your parameter specifications.
- Once the workstation initiation is completed (either successfully, or the retries have been exhausted), the on-line initiator logs the final results of the initiation attempt to the on-line UPSTREAM log.
- Assuming the initiation attempt was successful, the workstation then reconnects to the FDR/UPSTREAM-MVS on-line component and performs the requested function (backup or restore). If CONV=KEEP or WAIT was specified, the workstation will use the connection that was established to transmit the request to the workstation; otherwise it disconnects and establishes a new connection.
- If CONV=WAIT was not specified, USTBATCH terminates its connection as soon as the workstation has accepted the request. Then it continues to scan the input to see if another workstation operation has been requested; if so, that operation is initiated as described above. Otherwise, USTBATCH terminates.
- If CONV=WAIT was specified, USTBATCH scans all of the input during initiation and builds a queue of all of the workstation requests found. It goes through the process described above for each request in the queue. In addition, USTBATCH will remain connected to the FDR/UPSTREAM-MVS main task until the workstation has completed processing the request, and will log the final return code associated with the request in the USTBATCH log (and optionally to the system console if WTOCOMP is specified). Any FDR/UPSTREAM-MVS messages associated with the request will also be printed. It will attempt to initiate as many of the requests in its queue concurrently as possible.
- When USTBATCH is used to submit FDR/UPSTREAM-MVS console commands to the UPSTREAM main task, no workstation is involved. The command is executed by UPSTREAM as if it was entered on the console. If CONV=WAIT is specified, USTBATCH will wait for the end of execution for the command, will report on its success or failure and will display any messages associated with the command.

Along with the required input parameters to the USTBATCH batch job, you may include all the workstation parameters to remotely tailor the backup or restore request as shown in Sections 8.4 and 8.5. Workstation parameters are not used with COMMAND=.

8.3 THE USTBATCH UTILITY

USTBATCH JCL PARAMETERS

These are the JCL parameters required to execute USTBATCH. A sample jobstream is shown in Section 8.6.

EXEC STATEMENT

Must specify the Batch Utility program name, PGM=USTBATCH. You may optionally specify “PARM=NOTIMER” to override the 3-minute timer that the FDR/UPSTREAM-MVS on-line initiator uses to determine that a workstation is not responding; Innovation does not recommend using NOTIMER.

STEPLIB DD STATEMENT

If FDR/UPSTREAM has not been placed into the system linklist, this DD will be required to point to the FDR/UPSTREAM load library. This library must be APF-authorized.

USTLOG DD STATEMENT

This is the USTBATCH log file and contains informational and error messages. It is usually a SYSOUT dataset and has characteristics RECFM=V,LRECL=134,BLKSIZE=138.

SYSUDUMP DD STATEMENT

In the event of a catastrophic error, MVS will take a diagnostic dump to this dataset, which may be invaluable in resolving the problem. Usually a SYSOUT dataset.

USTPARM DD STATEMENT

This dataset contains the USTBATCH input parameters. It may be a SYSIN dataset or point to a parameter file. It must have characteristics RECFM=FB,LRECL=80.

8.3 CONTINUED

INPUT PARAMETERS

The input parameter records to USTBATCH are fixed-length 80-byte records. The rules for coding the USTBATCH input parameter records are:

- All parameters must start in the first position (column 1) of the record.
- All USTBATCH keyword parameters must be followed by at least one blank. All workstation override parameters,since they may contain imbedded blanks, must be followed by at least 2 blanks. Data beyond the terminating blank is considered comments. Blanks are not required if the parameters extend to the end of the record (column 71). Only one parameter is permitted per input record, except that the WSPARM= operand can also appear after a TARGLU=, TCPTARG= or TARGNAME= parameter. Parameters can be continued to another record, following these rules:
  - enter the parameter text in columns 1 to 71 of the current record. The text must continue through column 71. No comments are permitted
  - place any non-blank character in column 72
  - start the continuing text in column 1 of the next record. It will be concatenated with the text from the previous statement
  - a statement can be continued multiple times, for a maximum parameter length of 261 characters, including blanks.
- Comment records may be included anywhere in the input parameter file. They are indicated by the presence of an asterisk in the first position of the record.
- Certain parameters apply to the entire USTBATCH step. They can appear only once in the input and must be placed at the beginning of the input, unless they are omitted. They are: APPLPREF=, USAPPL=, MAXRETRY=, QUEUE, CONV=, WTOCOMP, APPLRETRY=, TMAXRETRY, RESTART=, VERIFY=, and WSPARM= (when it appears on a line by itself).
- TARGLU=, TCPTARG= and/or TARGNAME= may appear multiple times, indicating that operations are to be initiated with multiple workstations, or multiple operations on one workstation. TARGLU= and TARGNAME= may optionally be followed by TPNAME=.
- If the operation to be performed is completely described in a FDR/UPSTREAM parameter file at the workstation, you need only name that parameter file (or take the default). If not, you can specify workstation parameters which modify or completely override the workstation parameter file; these are described in Sections 8.4 and 8.5. The end of the workstation parameters is assumed when another TARGLU/TCPTARG/TARGNAME parameter is found (or the end of the USTBATCH input is encountered). Those workstation parameters apply only to the operation requested by the TARGLU/TCPTARG/TARGNAME that preceded them.

  Note: this is a change from previous releases of USTBATCH, where a set of workstation parameters might apply to several preceding operations. If you made use of this facility, you must now duplicate the workstation parameters and place them after each TARGLU/TCPTARG/TARGNAME to which they apply.
- If any of the optional parameters which have a default value are omitted, a warning message is logged and the USTBATCH step will end with return code 4 even if the request is successfully processed.

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8.3 CONTINUED

SINGLE-USE PARAMETERS

These USTBATCH input parameters may appear only once in the input and must be placed before any of the "multiple-use parameters" (except for LOGMODE=):

APPLPREF= specifies the five character prefix USTBATCH will use to build it's own VTAM APPLID value; it will append a character-numeric value beginning at “001” to the specified APPLPREF value and use the resulting name to attempt to open a VTAM ACB with this name as the APPLID, incrementing the number until it finds a free VTAM application ID (see Section 2.6). The default is UPSTR.

USAPPL= specifies the VTAM APPLID of the on-line FDR/UPSTREAM-MVS task. USTBATCH uses this value to allocate an LU 6.2 conversation to the running on-line UPSTREAM main task to request the remote initiation. It must match the value specified for APPLID= in the FDR/UPSTREAM configuration (see Section 3). The default is UPSTREAM.

LOGMODE= specifies the VTAM logon mode entry name which will be used by the FDR/UPSTREAM-MVS on-line task to establish a session to all VTAM APPC target workstations (TARGLU= or TARGNAME= when the connection is SNA) requested by this USTBATCH execution. It will also be used by the workstation when it establishes its session back to FDR/UPSTREAM-MVS to perform the requested function. It is not used for TCP/IP targets (TCPTARG= or TARGNAME= when the connection is TCP/IP). The default is#INTER. See Section 2.6 and 2.7 for a discussion of the mode tables used by FDR/UPSTREAM.

Unlike the other "single-use" parameters, LOGMODE= may actually appear more than once. If it is placed in the beginning of the USTBATCH input, with the other "single-use" parameters, it will be used for all sessions established by USTBATCH (unless overridden later in the input). LOGMODE= may also appear after a TARGLU= or TARGNAME= parameter; if so, it's value will be used for that session and all sessions that follow it unless overridden by another LOGMODE=. Luckily, the default of #INTER is usually correct for all sessions, so LOGMODE= will usually not have to be specified at all.

APPLRETRY= is used if USTBATCH cannot find a free VTAM application ID (see APPLPREF= above). It will wait 5 seconds and try again, repeating this until an application ID is found free or the APPLRETRY limit is reached. The default is 240 which will cause USTBATCH to retry every 5 seconds for about 20 minutes.

TMAXRETRY= is used if USTBATCH connects to FDR/UPSTREAM-MVS but is informed that FDR/UPSTREAM is already at its maximum permitted task limit. USTBATCH will retry the operation every 10 minutes until it is accepted or the TMAXRETRY limit is reached. The default is 0 (no retries).

MAXRETRY= specifies the maximum number of retry attempts the FDR/UPSTREAM-MVS on-line initiator will attempt prior to returning an “LU NOT AVAILABLE” indication to the USTBATCH utility. The value may range from zero to 255.
If the value is not zero and the initial attempt to initiate a conversation with the workstation is unsuccessful, USTBATCH will retry the conversation to the workstation <u>every ten (10) minutes</u> decrementing the retry count until it reaches zero. At that time, an “LU NOT AVAILABLE” indication will be sent to the USTBATCH utility task. The default is 0 (zero).

RESTART= controls automatic restart of restores and restartable backups if a communication failure occurs and CONV=WAIT was also specified. It has 2 parameters, e.g., RESTART=3,2 (without parenthesis). The first is the number of times to attempt restart of an interrupted operation and it defaults to 0 so automatic restart is disabled by default. The second parameter is the number of minutes to wait between restart attempts and defaults to 10. When a communication error occurs and a wait to restart is begun, a message is issued to the MVS operator in case manual intervention is required to restore communications.

QUEUE instructs the target workstation to queue the request if possible in the event it is unable to process it immediately. If not specified, requests will not be queued. QUEUE should be used with caution if CONV=KEEP or WAIT is also specified (see note under CONV=).

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8.3 CONTINUED

CONV=KEEP controls how USTBATCH manages its VTAM APPC conversation with the FDR/UPSTREAM-MVS main online task, and also that of the SNA or TCP/IP connection to the target workstations. USTBATCH always establishes a APPC connection to the main task for each requested operation in its input stream and transmits the request (target workstation and related parameters). The main task then initiates a APPC or TCP/IP conversation with the workstation and forwards the request. CONV= controls what happens next.

CONV=NONE (the default) causes the workstation to disconnect as soon as the request has been accepted. The main task informs USTBATCH that the request was accepted or not, and USTBATCH itself disconnects and goes on to process its next request or terminate. The workstation will reconnect to FDR/UPSTREAM-MVS to perform the requested function, but USTBATCH cannot tell if the request was successful, only that it was accepted by the workstation.

CONV=KEEP causes FDR/UPSTREAM-MVS to use the same conversation with the workstation for processing the request as was used to send the request to the workstation. In other words, FDR/UPSTREAM-MVS connects to the workstation, sends the request, and keeps that connection to process the request. USTBATCH will be notified as soon as the workstation begins processing the request at which point it will disconnect and process its next request. Certain parameter errors (such as invalid file specs) which prevent the request from ever being processed will be logged by the main task and by USTBATCH) with CONV=KEEP but will be recorded only at the workstation with CONV=NONE.

CONV=WAIT includes the effect of CONV=KEEP, but in addition USTBATCH will itself remain connected to the FDR/UPSTREAM-MVS main task until the workstation completes the requested operation. At the completion of the operation, USTBATCH will log the final return code and FDR/UPSTREAM-MVS messages associated with the workstation operation, so that the success or failure of the operation can be determined from the USTBATCH log. If WTOCOMP is also specified, the return code will be logged on the system console as well as in the USTBATCH log.

CONV=WAIT causes USTBATCH to maintain 2 internal queues of requests. All the requests in the USTBATCH input will be parsed and added to a "wait" queue, ready for initiation. USTBATCH will attempt to initiate concurrent requests to multiple workstations, keeping as many workstations busy as possible. Once a request has been successfully initiated, it is transferred to an "active" queue to await notification of its completion. CONV=WAIT also enables USTBATCH to accept console commands which can be used to display USTBATCH status and modify its operation; they are described later in Section 8.8.

If CONV=KEEP or WAIT is specified, you should be wary of also specifying QUEUE; if the workstation operation cannot be immediately started and must be queued, USTBATCH will wait until the request can finally be processed.

WTOCOMP if CONV=WAIT is also specified, WTOCOMP causes USTBATCH to issue a UST747 message on the system console indicating the success or failure of each workstation request. This may be used for visual confirmation by the operator or for use with automation products.

WSPARM= specifies the path name for the UPSTREAM parameter file on the target remote workstation(s). This value is passed to the target workstation in the remote initiation request; the FDR/UPSTREAM-PC parameters defined in that parameter file will be used to control this operation (unless overridden by workstation parameters in the USTBATCH input). This parameter is optional;
if omitted, no parameter is passed to the workstation. Note that WSPARM= can also be specified as a subparameter on the TARGLU= and TCPTARG= parameters. If specified there, it overrides this parameter; this parameter file name will be used only for TARGLU/TCPTARG statements that do not specify the WSPARM= subparameter.

VERIFY= **VERIFY=YES** (the default) specifies that the names of workstation parameters present in the USTBATCH input will be verified to detect incorrect spellings. The syntax or values of those parameters will **not** be verified. The valid workstation parameters are shown in Sections 8.4 and 8.5 (please consult the FDR/UPSTREAM workstation manual for a more up-to-date list of the parameters).

VERIFY=NO requests that workstation parameter names are not verified.

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8.3 CONTINUED

MULTIPLE-USE PARAMETERS

At least one occurrence of TARGLU=, TCPTARG= , TARGNAME= or COMMAND= is required. As noted earlier, the following parameters may be repeated to invoke multiple workstation operations or UPSTREAM console commands. Each repeated set must start with a TARGLU= (optionally followed by TPNAME=), TCPTARG=, TARGNAME= or COMMAND= parameter, and may be optionally followed by workstation override parameters which can be used to specify or modify the operation to be performed at the workstation (except for COMMAND= which stands alone).

COMMAND= specifies a FDR/UPSTREAM-MVS console command, as documented in section 5, to be executed. Do not include the "F UPSTREAM," preceding the command. For example,

COMMAND=STATUS
COMMAND=VAULT01 PROFILE=PAYROLL

TARGLU= specifies the network LU name of the target workstation, for those connected via VTAM/SNA.

TCPTARG= specifies the network address and port number of the target workstation, for those connected via TCP/IP. The network address (the IP address to which the workstation responds) is specified in “dotted decimal” form (4 decimal numbers separated by periods). The port number (the TCP/IP port on which the workstation is configured to listen for host requests, part of the FDR/UPSTREAM configuration on the workstation, usually 1972) is appended to the address as 2 more periods (or a comma) and the decimal port. For example, **TCPTARG=130.50.75.5..1972** or **TCPTARG=130.50.75.5,1972**

TARGNAME= specifies the FDR/UPSTREAM name of the target workstation (up to 16 characters including blanks and special characters). It allows you to identify the target workstation using a name which is independent of its current network address and connection type. TARGNAME= can be used only if the workstation is running a version of FDR/UPSTREAM which supports the FDR/UPSTREAM "Registered Name Service"; see Section 8.8 for details.

WSPARM= specifies the path name for the UPSTREAM parameter file on the target remote workstation. This value is passed to the target workstation in the remote initiation request; the FDR/UPSTREAM-PC parameters defined in that parameter file will be used to control this operation (unless overridden by workstation parameters in the USTBATCH input). This parameter is optional; if omitted, no parameter is passed to the workstation unless a global WSPARM= parameter was also specified. This WSPARM= parameter appears as a subparameter on TARGLU= and TCPTARG= parameters, e.g.,
TARGLU=LU34A5AB,WSPARM=C:\UPSTREAM\UPSTREAM.DAT

TPNAME= specifies the Transaction Program Name (TPName) used to communicate to OS/2 and DCA COMM SERVER workstations. It allows multiple simultaneous mainframe initiated conversations to such workstations. TPNAME= is used only following TARGLU= or TARGNAME= when the connection is SNA. It defaults to UPSTREAM.

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8.3 CONTINUED

WORK-STATION OVERRIDE PARAMETERS

The input parameter file read by USTBATCH may contain additional parameters specific to the workstation request, as shown in Sections 8.4 and 8.5. You might extract these parameters directly from the UPSTREAM parameter file on the workstation, or refer to the UPSTREAM Workstation/ Server manual for the format of these parameters. The sample member “BATPARM” shown in Section 8.6 contains a full sample parameter input specification.

The workstation parameters can optionally be followed by an "ENDPARM" statement to delineate the parameters. Workstation parameters apply **only** to the workstation session defined the TARGLU=, TCPTARG= or TARGNAME= parameter that immediately precedes it.

The workstation parameters are validated by USTBATCH unless VERIFY=NO is specified. Only the parameter names are validated; the syntax and values on those parameter statements are not. Any errors in the parameter values will be diagnosed by FDR/UPSTREAM at the workstation.

WARNING: there must be exactly one space between a workstation override parameter name and its value, multiple spaces will cause the value to be taken as a comment.

Note: the location and processing of these override parameters is described on the preceding pages.

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8.4 NON-REPEATED WORKSTATION PARAMETERS

This section contains non-repeated workstation parameters, i.e., those can be specified only once in each set of workstation parameters (once per target workstation). These optional parameters may be included in the USTBATCH input, as shown in Section 8.3, and will be sent to the target LU in the initiation request.

Refer to the FDR/UPSTREAM Workstation/Server manual for a complete and up-to-date list of the available parameters.

Name	Default	Required	Description
ACTION	1	Yes	The function to be performed: 0 = Restore (or workstation receive file transfer) 1 = Backup (or workstation send file transfer) 2 = As of...Restore 3 = Wait for remote initiate 4 = Restart backup only 5 = Run a workstation job 6 = Kill last restartable backup 7 = Run host report 8 = Restart restore only 9 = Kill last restartable restore 10 = submit a host job 11 = file migration 12 = Inquire versions 13 = Performance test 14 = Physical disk/FDRSOS restore 15 = Physical disk backup 16 = Delete backup 17 = Register target name 18 = Inquire file
USERID	NONE	No	Your security identifier, up to 32 characters. This may be required by some MVS systems (see your system administrator). There is a special format of this parameter: USERID &JOB which requests that the security userid under which the USTBATCH job is executing (usually specified on the JOB statement) is to be used. This format can be specified only in USTBATCH input.
PASSWORD	NONE	No	The password associated with the security userid. Usually required if USERID is required. However, it can be omitted if the security userid is the same as the userid under which the USTBATCH job is being run.
ASCTOEBC (File Transfer Only)	USATOE.TAB	No	The name of a workstation file containing a user-supplied ASCII to EBCDIC translation table. This table will be used for this and all subsequent operations on the workstation until FDR/UPSTREAM is terminated and restarted. If never specified on a workstation, a default US English translation table is used.
ATTENDED	Y	No	Y = It is assumed that there is a user present to make prompted decisions. N = Unattended mode. It is recommended that you also specify a MESSAGETIMELIMIT as well.
BACKUPPROFILE	NONE	Yes	The profile name used for backups, restores, as of...restores and file transfers. You can specify up to 8 characters.
BACKUPVERIFY	N	No	Only used for full-merge backups. If Y, UPSTREAM will read and compress the data, but not send it to the host. A checksum of the data will be compared against a checksum on the host. If a mismatch occurs, the file will be transmitted. As it degrades performance, it is only recommended with slow lines when you wish to verify non-file data.

8.4 CONTINUED

Name	Default	Required	Description
BLANKTRUNC (File Transfer Only)	Y	No	If LINEBLOCK is Y, controls truncation of trailing blanks: Y = trailing blanks will be removed from records being transmitted. N = trailing blanks are not removed.
CALCDASDSIZE	N	No	N = If you are performing a sequential disk backup the amount of space allocated on MVS for the backup depends on the amount of file data found. Y = If you are performing a sequential disk backup the amount of space allocated on MVS depends on the amount of file and non-file data found.
COMPRESSLEVEL (Backups only)	1	No	Specifies the compression level: 0 = No compression 1 = Fast compression 2 = High compression 1 3 = High compression 2 4 = High compression 3
DASDOVERRIDE **(Backups only)**	100%	No	Allows you to override the amount of space (bytes) requested on a sequential disk backup. 4 forms: +<number>: Add the given number of bytes to the total calculated. –<number>: Subtract the given number of bytes from the total calculated. <number>%: Use the given percentage to calculate the total. <number>: Use the given number to override any calculated value.
DISPLAY	Y	No	Y = Backup or restore status information continually updated. N = No status display during the backup or restore.
DUPDAYS (Backups only)	30	No	If duplicate checking is enabled, the number of days since the file was modified and the archive bit on before it can be considered eligible for duplicate handling.
DUPLICATE (Backups only)	N	No	Whether you wish to use duplicate file checking. N = No special duplicate file handling. Y = UPSTREAM on the workstation will send up placehold records for many files with the archive bit on for full fulls and incrementals (see DUPDAYS).
EBCTOASC (File Transfer Only)	USETO A.TAB	No	The name of a workstation file containing a user-supplied EBCDIC to ASCII translation table. This table will be used for this and all subsequent operations on the workstation until FDR/UPSTREAM is terminated and restarted. If never specified on a workstation, a default US English translation table is used.
EXCLUDELISTNAME	None	No	Specifies the workstation name of an exclude list file
FAILJOB	None	No	If specified, this job will be run if the current function fails and UPSTREAM is n unattended or host initiated mode.
FILETRANSFER	N	No	Y = this is a file transfer (the ACTION parameter controls whether it is a send or receive). N = this is a backup or restore.
HOLDTAPE	N	No	If 'Y', UPSTREAM will hold the tape for 2-3 minutes after a tape backup waiting for another one for he same problem to come it. Used primarily for DataTools.
HOSTFILENAME (File Transfer Only)	None	No	If specified, the name of the host file. If not specified, UPSTREAM will generate a name for workstation sends, or will use the latest recorded file transfer for workstation receives.
HOSTRECORD (File Transfer workstation sends only)	Y	No	Y = transferred files are recorded in the FDR/UPPSTREAM-MVS database for easy retrieval. N = transferred files are not recorded in the FDR/UPPSTREAM-MVS database.
HOSTSORT (Restores only)	N	No	Y=You wish the host sort utility used for restores. N=You do not wish the host sort utility used for restores.

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8.4 CONTINUED

Name	Default	Required	Description
INQOPTIONS (Merge Inquiries and Restores)	2	No	A bit map of options used during inquiry and restore 0 = Inquiries and restores only show normal files and the highlighted backup (VERSIONDATE) 1 = Inquiries show migrated files as well as normal files 2 = Inquiries and restores use "Highlighted back to full". This option must be on for "Highlighted back to FDRSOS" (32). 4 = Inquiries and restores operate from the currently highlighted backup to the first version ("Highlighted back to oldest"). 8 = (not used) 16 = Only display migrated files in an inquiry 32 = Restore "highlighted back to FDRSOS". You must also have value 2 ("Highlighted back to full") on as well 64=Expiration date is displayed for migrated files.
JOBOPTIONS (Request job only)	0	No	A bit map of options used when a job is requested and started 1 = Start job and do not terminate 2 = Wait for job to be terminated 8 = No job, terminate the current UPSTREAM or ULTra program.
JOBRETURNCODEMAP (Request job only)	0:0 ?:8	No	For CONV=WAIT jobs, a mapping between the workstation return code and the host job return code. You can specify multiple mappings (including workstation return code ranges), the '?' is used for all unassigned workstation return codes.
KEEPALIVE	2	No	For FDRSOS Local Backups, this parameter allows you to tune how often (in seconds) "Keep Alives" are transmitted to the host. Keep Alives are used to tell the host how much data the PC has written and allows the host to read the data from the disk as the PC is writing it.
LANINTERFACE (ULTra)	0	No	The communication protocol used to access the ULTra workstation: 0=IPX/SPX 1=NetBIOS 2=TCP/IP 3=Novell TLI (currently IPX/SPX)
LANWSNAME (ULTra)	NONE	No	(FDR/UPSTREAM ULTra) If you are using the LAN Workstation facility this is the name of the workstation that you are operating on behalf of, or if it is preceded with an "@" sign, it is the profile name which was set to a list of workstations to be used.
LANWSPASSWORD (ULTra)	NONE	No	(FDR/UPSTREAM ULTra) If you are specifying a LAN WSNAME and the workstation is password protected, then this is the password to enter. If parameter file stored, it is stored encrypted.
LATESTVERSION (Restores only)	Y	No	Y = You wish to restore the latest version available for the backup profile. N = You wish to use a specific version date.
LINEBLOCK (File transfer only)	Y	No	Y = records are separated by a CR/LF (LF only on Unix) for workstation sends; CR/LF (LF only on Unix) is added to the end of each record for workstation receives. N = all records are separated by the record size (workstation sends).
LINETRUNC (File transfer only)	Y	No	(Used only if LINEBLOCK=Y for workstation sends) Y = data exceeding the record size is truncated N = data exceeding the record size is sent as a separate record.
LOCALBACKUP	0	No	0 = host storage is used exclusively for backups and restores. 1 = during a backup files should be stored locally as well as the host; during a restore whether files should be taken from local storage whenever possible. 2 = local backups are stored on shared EMC FDRSOS Local Backup disks.

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8.4 CONTINUED

Name	Default	Required	Description
LOCALBACKUPDIR	None	YES (for FDRSOS backups)	If local backups are enabled to: – disk (LOCALBACKUP=1) the name of the directory where the local backup files are to be stored – FDRSOS (LOCALBACKUP=2) the internal UPSTREAM name of the disk where the data will be stored.
LOCALBACKUPMAX (Backups only)	3	No	The number of local backups to keep. When a new local backup is being created in the location specified by LOCALBACKUPDIR, and there are already "n" or more such backups in that location, the older ones are deleted.
LOCALBACKUPMAXFILESIZE (Backups only)	10MB	No	The maximum size of a file to be placed in local backup, in bytes. Files greater than this size will not be backed up locally.
LOCALBACKUPMAXSIZE (Backups only)	100MB	No	The maximum size of the local backup file, in bytes. Once this many bytes have been placed in the local backup file, no more files are backed up locally (but they are still sent to the FDR/UPSTREAM mainframe host).
LOGNONFATAL	N	No	Y = Non-fatal errors are logged to the screen, the log and (for backups) the host. N = Non-fatal errors are not logged but skipped files can optionally be written to the report.
MAXDUPS	10 (1 for DOS)	No	The maximum number of duplicate files that can be simultaneously written in a duplicate file restore. 0 or 1 disables duplicate file restores.
MAXKFILESIZE	0	No	Allows you to exclude files which are larger than the specified size (in 1024 byte increments). 0 indicates no file size exclusion.
MERGE	0	No	The backup type: 0 - No merge used 1 - Full merge 2 - Incremental merge 3 - First-time merge backup
MODIFYFILE	Y(UNIX) N(other)	No	Y = Incrementals are determined by the last date/time FDR/UPSTREAM was run (stored in the modification file). N = Incrementals are determined by the archive bit.
NOVELLPROFILE	NONE	No	The profile name, set in SETNOV.EXE, referencing the server, user name and drive mappings to be mapped to your NOVELL® file server.
NOVELLRECALL	Y	No	Y = this backup profile could be used to backup a Novell server which uses the FDR/UPSTREAM auto-recall facility. N = this backup profile will never be used to backup a Novell server which uses the FDR/UPSTREAM auto-recall facility.
NTREGRESTORE	0	No	Windows NT registry restore options: 0 = "legacy". Replace the registry with no additional prompting. 1 = "keep". Keep existing registry entries, but prompt allowing user interaction if attended. 2 = "replace". Replace registry entries, but prompt allowing user interaction if attended.
PACKFLUSHAFTERFILE	N	No	Y = Forces a packed record in a backup to be transmitted after each file. N = records are fully packed

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8.4 CONTINUED

Name	Default	Required	Description
PACKRECSIZE	32700 (0 for DOS)	No	The maximum number of bytes transmitted or received from the host. Specify 0 to disable record packing.
PERFORMBITMAP	96	No	If ACTION=13, specifies a bit map of the performance tests you want to run: 8 = backup, no I/O test 16 = VSAM performance test 32 = Raw communications test, PC send 64 = Raw communication test, MVS send
PERFORMNUMRECORDS	500	No	The size of records sent/received on raw communications performance tests.
PERFORMRECORDSIZE	8192	No	The record size to transmit in a PC or MVS send performance test.
POSTJOB	None	No	If defined, this is the name of a program, batch file or script file which will be run after the unattended UPSTREAM function.
PREJOB	None	No	If defined, this is the name of a program, batch file or script file which will be run before the unattended UPSTREAM function.
PRTYCLASS (OS/2, 32-bit Windows only)	4	No	The priority class for the requested action: 1 = Idle-time 2 = Regular 3 = Time-critical (VERY DANGEROUS) 4 = Fixed-high
PRTYLEVEL (OS/2, 32-bit Windows only)	1 (OS/2) 6 (32-bit Windows)	No	a number from 0 to 31 (OS/2) or 0 to 8 (32-bit Windows, where 0 and 1 are resolved as 8) modifying the priority class
RECALLCLEANUP	N	No	Y = FDR/UPSTREAM will examine Novell auto-recall stub files to determine if any have expired, and if any have, they will be deleted. N = Auto-recall stub files will not be deleted.
RECORDSIZE	8192	No	The data blocking size. This is a memory/performance tool. For file transfers to MVS, this is the largest record that can be transmitted and RECORDSIZE+4 is the LRECL of the output MVS data set.
REPORTNAME	US.RPT	Yes (if reporting)	The name of the file to write reporting information to.
REPORTOPTIONS	0	No	A bit map describing any of the report features you wish to enable, add the required options and enter the sum: 1 = files backed up/restored 2 = files skipped during the backup 4 = Files automatically deleted 8 = Inquire versions 16 = Inquire files 32 = specified parameters.
RESTARTTYPE (Backups only)	0	No	Specifies the action to be performed, at a restart point (usually the next time FDR/UPSTREAM is run), if there is a restartable error: 0 = Never restart. 1 = Restart failed files and incomplete backups. 2 = Restart only incomplete backups.
RESTOREARCHIVEBIT	N	No	If 'Y', archive bits are set for files that are restored.

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8.4 CONTINUED

Name	Default	Required	Description
RESTORECHECKPOINT	120	No	The number of seconds between automatic checkpoints when performing a restartable restore.
RESTOREFILEFAIL (Windows NT only)	0	No	Allows you to specify what to do if a file is locked when you attempt to restore it 0 = fail the file 1 = restore the file to a generated name 2 = restore the file to a generated name, and rename the file to its original name after a reboot.
SKIP (Restores only)	0	No	For restores using "List and Restore", a set of options of how to process existing files: 0 = Restore all files regardless of whether there are existing files 1 = Restore only files where there is no existing file of the same name 2 = Restore only files where the existing file's modification date/time and size are not the same.
STORAGETYPE (Backups only)	1	No	How the data is stored on the mainframe. 0 = Archive backup. Will be merged to tape when the next archive is performed on the mainframe. 1 = Keyed backup. Stored on mainframe disk until rolled off. 2 = Sequential disk. Stored on mainframe flat files. 3 = Sequential tape. Stored directly to mainframe tape.
TRANSLATE (File Transfer only)	Y	No	Y = ASCII/EBCDIC translation is performed on all data (assumes text). N = no translation of the data (assumes binary).
ULTRACOMP (ULTra)	4	No	The maximum level of compression supported by ULTra: 0 = No compression 1 = Fast compression 2 = High compression 1 3 = High compression 2 4 = High compression 3
ULTREG (ULTra backups only)	N	No	Whether the LAN Workstation name will be registered with the host
ULTUPD (ULTra backups only)	N	No	Whether the ULTra workstation can participate in automatic updates.
VERSIONDATE (Restores only)	NONE	No	For a restore, if you specified LATESTVERSION=N, then you are required to specify a complete version date. This is usually used with an inquire versions command. The version date is exactly 12 numeric characters.
XFERRECORDSIZE (File Transfer Only)	8192	No	The record blocking size for file transfers. Users will often use 80 for text files as well.

8.5 REPEATED WORKSTATION PARAMETERS

This section contains repeated workstation parameters, which may be specified in groups to define the workstation files to be processed. These optional parameters may be included in the USTBATCH input, as shown in Section 8.3, and will be sent to the target LU in the initiation request.

Refer to the appropriate FDR/UPSTREAM workstation manual for a complete and up-to-date list of the available parameters.

Name	Default	Required	Description
SPECNUMBER	None	Yes	The header to this file set. Each file set begins with a SPECNUMBER definition with an ascending number starting at 1.
ARCHIVEBIT (Backups only)	Y	No	Y = The archive bit is reset for all files successfully backed up. N = The archive bit is not reset.
BANYANDISK (Banyon restores only)	NONE	No	The disk name to be used when a file service is being created. If you specify nothing, then the service will be created on the disk which it originally came from. This field is case sensitive and should be the UNIX disk spec. For example "/disk1".
BANYANSERVER (Banyon restores only)	NONE	No	The server name to be used when a file service is being created. If you specify nothing, then the service will be created on the server which it originally came from.
DATELIMIT (Backups only)	N	No	Y = Only those files carrying a date the same or later than the specified LATESTDATE will be backed up. N = All files specified will be backed up.
DAYSOLD	180	No	The number of days that a file has not been accessed before inclusion in the backup.
DELETEPROMPTS (Backups only)	2	No	0 = No prompts; delete the files without waiting (unattended) 1 = Prompt for each file before deleting 2 = Prompt for the files in each directory before deleting.
DESTINATION (Restores only)	NONE	No	This parameter allows you to specify that files be restored to a different file or path name from which they were originally backed up. The wildcard specifications must match the wildcard specifications in the FILES parameter. You can specify up to 128 characters.
DIRDELETE (Backups Only)	Y	No	Y = If automatically deleting files, remove directories from which all files have been deleted. N = Leave the directories that were just emptied.
DIRSONLY (Restores only)	N	No	Whether ONLY directories and no files should be restored: Y = Restore only directories (no files) N = Restore files and directories.
DRIVEALIAS (Backups only)	None	No	If specified, the drive letter transmitted to the host in lieu of the specified one. Allows you to move drive mappings without affecting merge backups. Specify a single letter (no trailing colon).
FILEDELETE	N	No	Y = Delete the files which were successfully backed up. N = Do not delete the files which were successfully backed up.
FILES	NONE	Yes	The workstation file specification to be backed up or restored or the name of the job to run. This can include wildcards. For physical disk/backup restores, specify <\location*.* where location is the internal FDR/UPSTREAM physical disk form. For FDRSOS restores, specify />_FDRSOS_BACKUP if the source was a UNIX disk or >*.* if the source was a PC disk..
FILESOPENFORUPDAT	N	No	Y = Win32 and OS/2 backups will use the DENY_WRITE file open attribute. For AIX, files open for update will not be included at all.
HIDDENFILES (Backups only)	N	No	Whether hidden files should be backed up or restored as well as normal files.

8.5 CONTINUED

Name	Default	Required	Description
INCREMENTAL (Backups only)	Y	No	Y = Only those files with the archive bit set (files which have changed) will be backed up. N = All files specified will be backed up.
LASTACCESS (Backups only)	N	No	Y = Only include files which have not been accessed for the number of days (or more) specified in the DAYSOLD parameter. N = Don't restrict by access date.
LATESTDATE (Backups only)	NONE	No	This parameter is only used if you specify DATELIMIT=Y. This field must be 8 characters and specify the date in the format MM/DD/YY.
LATESTTIME (UNIX backups only)	NONE	No	The time, within the LATESTDATE to backup the files. In HH:MM:SS form
MIGRBITS (Restores only)	0	No	How migrated files should be treated in a restore: 1 = Include migrated files in the restore 2 = Include only migrated files (no regular files)
NDS	N	No	Y = This is a NetWare Directory Services backup specification. N = This is a non-NDS spec.
NONFILEDATABITMAP	915	No	An integer which defines the types of non-file data UPSTREAM will attempt to backup or restore. The separate values are coded as powers of 2 and are then added to reach the total value: 1 = OS/2 or NT extended attributes (files) 2 = OS/2 or NT extended attributes (dirs) 4 = NOVELL directory info 8 = NOVELL directory restrictions 16 = NOVELL directory trustees 32 = NOVELL file info 64 = NOVELL file trustees 128 = BANYAN access rights lists or NT Registry and Event Logs 256 = NOVELL, HPFS or NTFS reset last access date 512 = NOVELL set archive date 1024 = The name specified in the FILES parameter is a StreetTalk name. 2048 = BANYAN StreetTalk included. 4096 = BANYAN file service files. 8192 = BANYAN file Access Rights List. 16384 = HPFS or NTFS ACLs 32768 = Windows NT registry files
NOVELLMIGRATE (Migration specs only)	N	No	Y = Leave a Novell migration sub instead of deleting the file after the file has been successfully backed up. N = Delete the file after it has been successfully backed up.
RETAIN (Migration specs only)	90	No	In a migration spec, the number of days that the file should be merged forward onto new full backups.
ROOTENTRY	Y	No	Y = a fake file: <Volume Information> will be created for Windows NT and NLM backups containing non-file data for the volume itself. N = this file is not created.
SKIPOLD (Restores only)	Y	No	Y = Only those files which are newer on the mainframe will be restored. N = All files will be restored.
SOSDISK	None	Yes	The source for backups and the destination for physical disk/FDRSOS restores, using the internal FDR/UPSTREAM physical disk format.
SOSTIMESTAMP	N	No	Y = Create an FDRSOS Timestamp file during the backup which is used at restore time to determine if an FDRSOS restore has been done if the "Highlighted back to FDRSOS" restore option is selected. N = Do not create an FDRSOS Timestamp file.

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8.5 CONTINUED

Name	Default	Required	Description
SOSTIMESTAMPPATH	None	No	If SOSTIMESTAMP=Y, this is the path where the FDRSOS timestamp file is written (for backups) or read from (for restores). If not specified the file is written/ read in the specified backup directory.
SPECTYPE	0	No	0 = File specification is files to be included in the backup or restore. 1 = File specification is files to be excluded from the backup or restore. 2 = File specification is files to be migrated during the backup.
SUBDIRECTORIES	Y	No	Y = All subdirectories under the current one will be checked for files which match the file specification. N = Only those files in the specified or default directory which match the file specification will be transferred.

CONTINUED . . .

8.6 SAMPLE JCL AND INPUT

Two sample members are supplied in the FDR/UPSTREAM-MVS ICL (Installation Control Library) loaded during the installation of UPSTREAM.

SAMPLE MEMBER "BATCHJCL"

This is sample member "BATCHJCL". It shows a jobstream for the execution of USTBATCH with no workstation override parameters.

```
//RUNBAT   EXEC PGM=USTBATCH
//STEPLIB  DD   DISP=SHR,DSN=your.upstream.loadlib
//SYSUDUMP DD   SYSOUT=*
//USTLOG   DD   SYSOUT=*
//USTPARM  DD   *
*  THIS IS AN EXAMPLE OF USING USTBATCH TO INITIATE OPERATIONS
*  ON 2 WORKSTATIONS, ONE VIA VTAM, ONE VIA TCP/IP, USING
*  PARAMETER FILES ON THE WORKSTATIONS TO DEFINE THE OPERATION
APPLPREF=UPSTR                      THIS APPL NAME PREFIX
USAPPL=UPSTREAM                     ONLINE UPSTREAM APPLID
LOGMODE=USTMODE                     MODE NAME FOR SESSION
MAXRETRY=1                          RETRY COUNT
QUEUE                               QUEUE REQUEST IF WS BUSY
*  INITIATE OPERATION ON VTAM WORKSTATION
TARGLU=LU3AS012,WSPARM=C:\UPSTREAM\UPSTREAM.DAT
TPNAME=UPSTREAM                     OPTIONAL TRANSACTION PGM NAME
*  INITIATE OPERATION ON TCP/IP WORKSTATION
TCPTARG=130.50.75.5..1972,WSPARM=C:\UPSTREAM\UPSBKUP.DAT
```

8.6 CONTINUED

SAMPLE MEMBER "BATPARM"

This is sample member "BATPARM" from the FDR/UPSTREAM-MVS ICL (Installation Control Library). It shows a set of USTBATCH parameters with various sample workstation override parameters.

```
*  THIS IS AN EXAMPLE OF USTBATCH INPUT TO INITIATE OPERATIONS
*  AT 3 SNA WORKSTATIONS, PARTIALLY OR TOTALLY SPECIFYING THE
*  OPERATION THROUGH WORKSTATION OVERRIDE PARAMETERS
APPLPREF=UPSTR          THIS APPL NAME PREFIX (DEFAULT)
USAPPL=UPSTREAM         ONLINE UPSTREAM APPLID (DEFAULT)
MAXRETRY=3              RETRY 3 TIMES (EVERY 10 MINUTES)
CONV=WAIT               WAIT FOR RESULTS FROM WORKSTATION
QUEUE                   QUEUE REQUEST IF WORKSTATION BUSY
*
* THIS INITIATES AN INCREMENTAL BACKUP, USING A PARAMETER FILE AT
* THE WORKSTATION, BUT OVERRIDING THE FILESPEC.
*
TARGLU=L010F601,WSPARM=C:\UPSTREAM\MERGBKUP.DAT
ACTION 1              BACKUP
STORAGETYPE 2         SEQUENTIAL DISK
MERGE 2               INCREMENTAL MERGE
SPECNUMBER 1          FILE SPEC
FILES D:\*.*          BACKUP D DISK
*
* THIS INITIATES AN OPERATION DEFINED BY THE PARAMETER FILE AT THE
* WORKSTATION
*
TARGNAME=MARKETING 1,WSPARM=C:\UPSTREAM\DAILY.DAT
ENDPARM               NO WORKSTATION OVERRIDES
*
* THIS INITIATES AN OPERATION TOTALLY DEFINED BY THE WORKSTATION
* PARAMETERS, NO WORKSTATION PARAMETER FILE IS USED
*
TARGLU=L027F004
ACTION 0                 RESTORE
USERID USER37            MAINFRAME USERID
PASSWORD MYPASS          MAINFRAME PASSWORD
BACKUPPROFILE SERVER2    UPSTREAM WORKSTATION PROFILE NAME
LATESTVERSION Y          RESTORE LATEST VERSION OF ALL FILES
SPECNUMBER 1             FIRST FILE SPEC
FILES C:\APPL1\*.*       ALL FILES FOR APPLICATION 1
SPECNUMBER 2             SECOND FILE SPEC
FILES C:\APPL2\*.*       ALL FILES FOR APPLICATION 2
SUBDIRECTORIES N         DO NOT RESTORE FILES IN SUBDIRECTORIES
SKIPOLD N                RESTORE EVEN IF RESTORED FILES ARE OLDER
```

CONTINUED . . .

8.6 CONTINUED

EXAMPLE USING JOB EXECUTION

This example uses the function of USTBATCH to "run a job" at the target workstation and check the return code from that job. The first step executes a script at the workstation to close databases, the second step backs up the databases, and the third reenables those databases. The backup step is skipped if the job to close the databases does not get a zero return code.

```
//RUNJOB1  EXEC PGM=USTBATCH
//STEPLIB  DD   DISP=SHR,DSN=your.upstream.loadlib
//SYSUDUMP DD   SYSOUT=*
//USTLOG   DD   SYSOUT=*
//USTPARM  DD   *
*  THIS USES USTBATCH TO EXECUTE A "JOB" TO CLOSE DATABASES
CONV=WAIT
TARGNAME=MARKETSERVER
ACTION 5                        RUN A JOB
SPECNUMBER 1                    FIRST FILE SPEC
FILES C:\DB\CLOSEALL.BAT        EXECUTE THIS SCRIPT
/*
//BACKUP   EXEC PGM=USTBATCH,COND=(0,NE,RUNJOB1)
//STEPLIB  DD   DISP=SHR,DSN=your.upstream.loadlib
//SYSUDUMP DD   SYSOUT=*
//USTLOG   DD   SYSOUT=*
//USTPARM  DD   *
*  THIS INITIATES A BACKUP OF THE DATABASES
CONV=WAIT
TARGNAME=MARKETSERVER
ACTION 1                        BACKUP
STORAGETYPE 2                   SEQUENTIAL DISK
MERGE 1                         MERGE BACKUP
SPECNUMBER 1                    FILE SPEC
FILES D:\DB*.*                  BACKUP D DISK DATABASES
/*
//RUNJOB2  EXEC PGM=USTBATCH
//STEPLIB  DD   DISP=SHR,DSN=your.upstream.loadlib
//SYSUDUMP DD   SYSOUT=*
//USTLOG   DD   SYSOUT=*
//USTPARM  DD   *
*  THIS USES USTBATCH TO EXECUTE A "JOB" TO REOPEN DATABASES
CONV=WAIT
TARGNAME=MARKETSERVER
ACTION 5                        RUN A JOB
SPECNUMBER 1                    FIRST FILE SPEC
FILES C:\DB\OPENALL.BAT         EXECUTE THIS SCRIPT
/*
```

8.7 USTBATCH CONSOLE COMMANDS

When CONV=WAIT is specified in the USTBATCH parameters, USTBATCH will accept MODIFY (F) and STOP (P) commands from the MVS console in order to monitor and modify its operation. In the syntax shown, "jobname" is the name of the USTBATCH job.

STATUS DISPLAY

F jobname,STA

will cause USTBATCH to display multiple UST749I messages, one for each workstation request in that USTBATCH job which is either pending or active. The messages contain an internal 4-digit task ID (see the TERM command below), the workstation target name or address, the status of the request, and the time that the request was confirmed by the workstation. The possible status values are:

- WAIT – the request is still in the wait queue and has not yet been initiated.
- CNFRM – the request has been sent to the FDR/UPSTREAM online task and USTBATCH is waiting for confirmation from the target workstation that it has been accepted.
- ACTIV – the request has been initiated and confirmed by the target workstation and has been moved to the "active" queue awaiting completion notification.
- FAILD – the request has failed for one of many possible reasons. UPSTREAM will shortly issue the failure notification and remove the request from the queue.

REQUEST TERMINATION

F jobname,TERM ID=nnnn

requests that USTBATCH terminate the request with ID number "nnnn" (obtained from the status display above). It has two possible effects depending on the current status of the request.
If the request is in WAIT status, it will be deleted from the queue and will not be initiated. If it is in ACTIV or CNFRM status, it will continue to be processed since it has already been sent to the FDR/UPSTREAM online task; however, USTBATCH will remove it from its queues and will no longer wait for completion of that request (essentially converting it to CONV=NONE processing). Depending on the status of other requests, this may allow USTBATCH to terminate while the requested operations are still running.

FLUSH LOG

F jobname,FL

will cause USTBATCH to close and reopen its log file (DD USTLOG). This will allow the most recent USTBATCH messages to be available for viewing so that you can check on the status or results of requests while some requests are still executing.

IMMEDIATE STOP

P jobname

will cause USTBATCH to clear all of its queues and terminate as soon as possible. Any requests which have not yet been initiated (WAIT status) will be discarded. All requests which have been initiated (ACTIV or CNFRM status) will continue to execute but USTBATCH will no longer wait for them.

8.8 REGISTERED NAME SERVICE

The FDR/UPSTREAM "Registered Name Service" provides 2 functions:

- it allows workstations to be assigned names which are independent of their network address
- it allows for the automatic upgrade of FDR/UPSTREAM software on workstations when new releases are available

REGISTERED NAMES

The Registered Name Service allows workstations to be assigned arbitrary names, up to 16 characters long, for use with USTBATCH. These names can contain any characters, including special characters and blanks. This allows you to setup USTBATCH jobs which are independent of your network configuration. Changes in the network address of a particular workstation will no longer require changes in the USTBATCH input. **This is especially useful in environments where network addresses are dynamically assigned and may change without warning.**

The names are optionally assigned during the configuration of FDR/UPSTREAM on the workstation if you are running a version of FDR/UPSTREAM-PC which supports this service (V2.4.5 or above). When UPSTREAM is started on the workstation it will contact FDR/UPSTREAM-MVS on the host and transmit its name and the network address under which it can be contacted (either VTAM LU name or TCP/IP IP address and port number); you can also specify that FDR/UPSTREAM-PC periodically retransmit its name and address. FDR/UPSTREAM-PC must also be enabled for remote functions for this automatic registration to occur.

FDR/UPSTREAM-MVS will maintain these names and addresses in a table in the UPSTREAM catalog file (as well as in memory for quick access). A timestamp is maintained showing the last time that each Registered Name was updated in the table or was used by USTBATCH. If a given name has not been refreshed or used by USTBATCH for a period of 90 days, it will be deleted from the table automatically.

When the TARGNAME= parameter is specified in USTBATCH input, the FDR/UPSTREAM online initiator will look up the name specified in that table. If it is found, the address in the table will be used to contact the workstation. If the name is not found, the initiation attempt will fail. When the workstation is contacted, FDR/UPSTREAM will verify the workstation name to be sure that the network address has not been reassigned; if so, the request will fail.

The Registered Name Service allows you to setup USTBATCH jobs which are independent of your network configuration. Changes in the network address of a particular workstation will no longer require changes in the USTBATCH input. **This is especially useful in environments where network addresses are dynamically assigned and may change without warning.**

Care must be taken that the names used by each workstation are unique, but beyond that any name may be used. You will probably want to make the names meaningful, e.g. "3RD FLOOR SERVER". If FDR/UPSTREAM is used on many workstations, you may need some central control for the assignment of the names.

The current contents of the name table can be displayed with USTRPORT (RPTYPE=REGISTRY). The table can also be displayed from the FDR/UPSTREAM ISPF dialog or by FDR/UPSTREAM on a workstation; entries can also be deleted or modified using these interfaces (a manually modified entry must match the name assigned to the workstation at the indicated address or any attempt to use it will fail). A message (UST285) will be written to the FDR/UPSTREAM-MVS log whenever a table entry is added or updated.

If the workstation is running a version of FDR/UPSTREAM which does not support the service, if a name has not been assigned to the workstation in the FDR/UPSTREAM configuration or if the name has not been registered with FDR/UPSTREAM-MVS, then the USTBATCH jobstream must specify the network address of the workstation (TARGLU= or TCPTARG= instead of TARGNAME=).

8.8 CONTINUED

AUTOMATIC SOFTWARE UPDATES

The Registered Name Service includes a feature that can automatically update the version of FDR/UPSTREAM used on workstations, including those accessed by ULTra. This removes the need to manually install new releases of FDR/UPSTREAM on many workstations. Once a new release is tested, it can be automatically propagated to all workstations using FDR/UPSTREAM.

When a workstation registers itself, it will record the type and version of FDR/UPSTREAM in use on that workstation (e.g., "Windows 95 V2.5.7"). The currently recorded type/version will be shown when the registry table is displayed by USTRPORT, ISPF, or FDR/UPSTREAM on a workstation. As part of the registration data, the workstation can indicate if it is to be eligible for automatic upgrading (or an administrator can update the registration record to indicate this). When a new version of FDR/UPSTREAM of that type has been installed and tested on some workstation, a special backup of the FDR/UPSTREAM files is done, and the registration record for that workstation is updated to indicate it is a "master" copy.

When other workstations using the same type of software register themselves, if they are using a different version of that type of software, a function is invoked to automatically restore the backup of the FDR/UPSTREAM files to the workstation and install the new version.

Complete details on the steps necessary to implement this automatic distribution of FDR/UPSTREAM software can be found in the FDR/UPSTREAM Workstation manual.

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9.1 PROFILE MANAGEMENT

OVERVIEW

Two facilities for management of profiles are available from a workstation:

- PROFILE MANAGEMENT allows users to view and delete the backups that exist under one or more workstation profile names.
- PROFILE CONFIGURATION allows administrators to create, modify, and view the attributes of workstation profiles interactively.

PROFILE MANAGEMENT

Through the FDR/UPSTREAM-MVS PROFILE MANAGEMENT facility, a workstation user may view all versions currently cataloged for one or more workstation backup profiles, and may delete specific versions or all versions for a backup profile name. The PROFILE MANAGEMENT facility can be run from any FDR/UPSTREAM workstation. If SECLVL=2 or 3 is in effect, the user will be able to delete versions only for those profiles under which he is authorized to perform restores (See Section 4 “Security”).

When a version is deleted through this facility, all the file data and control information is erased. If the backup version deleted was a *sequential disk* or *sequential tape* backup the associated sequential dataset is deleted and uncataloged from the system.

PROFILE CONFIGURATION

Administrators may create, modify, and view the definitions of FDR/UPSTREAM workstation profiles from any FDR/UPSTREAM workstation. When requested, FDR/UPSTREAM will download the attributes of requested profiles from the mainframe; they can be displayed and modified on a screen which includes all of the profile attributes described under the DEFINE statement of USTCONFG (See Section 3.5; these attributes are described in detail in that section, and on-line help is available for each attribute as well). The administrator may modify existing profiles, create new ones, or delete existing profiles.

When changes in the profiles are transmitted back to the host, the FDR/UPSTREAM on-line task will make the requested changes in the FDR/UPSTREAM Configuration dataset. If the configuration dataset is a PDS, just as with mainframe executions of USTCONFG, the changes may be made back into the original member or stored in a new member of that PDS, but the changes are not immediately effective until the new configuration is activated. The Profile Configuration dialog also allows the administrator to activate the updated configuration from the workstation (effectively executing the F UPSTREAM,REFRESH command as described in Section 5.8).

WARNING: if a new configuration member is activated, the JCL for the FDR/UPSTREAM-MVS on-line task must also be updated to reflect the new member name. Otherwise, the old configuration will be activated the next time UPSTREAM is started.

If SECLVL=2 or 3 is in effect, the workstation user can be limited to maintaining only certain workstation profile names. FDR/UPSTREAM will check that the userid entered by the user has ALTER authority to the profile names which he is trying to display/modify/create (See Section 4 “Security”).

These facilities are fully documented in the FDR/UPSTREAM Workstation/Server manual.

The configuration can also be displayed and updated by authorized TSO users using the FDR/UPSTREAM ISPF interface; see Section 6.

9.2 UPSTREAM DATABASE MANAGEMENT

OVERVIEW

This section describes the FDR/UPSTREAM-MVS database (the "repository files"), helps you plan for their usage, and describes the procedures necessary to maintain the database and the files that comprise it.

The FDR/UPSTREAM system uses its database to store the status of completed functions, record the location of every workstation file which was backed up, track secondary copies of backups, identify system users, and to track candidate duplicate workstation files.

The FDR/UPSTREAM-MVS Database consists of three files. These files contain the internal control records that support all FDR/UPSTREAM functions. These are the DDnames by which they are referenced in FDR/UPSTREAM JCL are:

- USTCATLG - catalog
- USTFILEI - fileinfo
- USTFILEC - filedata

Each file's contents, usage, and maintenance requirements, are outlined in this section. The files do contain interrelated entries and control information so it is critical that they be processed as a single entity. They should not be altered individually, in any manner, by external programs without prior consultation with Innovation Technical Support personnel.

FILE FORMAT

The FDR/UPSTREAM-MVS database files can be in either of two formats:

- They can be standard VSAM KSDS (keyed) clusters
- They can be in a special Innovation proprietary format.

The proprietary format provides VSAM-compatible keyed access, so that most FDR/UPSTREAM-MVS programs are not sensitive to the format of the files. However, that format is designed to avoid the overhead of VSAM, providing high-speed access to the data, using an advanced internal file structure which is far superior to regular VSAM files and requires 30 to 70 percent less DASD space than a similarly defined VSAM file. Proprietary format files can be allocated on any DASD device and appear to the MVS operating system as physical sequential files (DSORG=PS) even though the data is accessed by key. To the MVS catalog, these files appear as non-VSAM type entries.

The proprietary format achieves these economies through the following design features:

- it loads it's entire index structure into memory eliminating the need for imbedded indices.
- index compression techniques scan the entire key
- file internal index components require minimal information to be stored on DASD.
- FREESPACE allocation techniques make much more efficient use of disk space.

Files in either format can be defined with the USTCAMS utility (see Section 2.5). VSAM files can also be allocated with IDCAMS.

9.2

DATABASE MAINTENANCE

The UPSTREAM database files are generally accessed by a key in order to reduce file access times during record location and insertion operations. Under normal operating circumstances, the vast majority of activity against the database will be for the insertion of FDR/UPSTREAM control records due to backups. Due to the nature of the insertion process on any type of key sequenced file, non-optimal organization of the file is the result. This may affect the future ability to add records, and may impact the performance of the database.

Two utilities are provided to address this problem:

- USTMAINT - purges obsolete records from the database files. USTMAINT is usually run automatically every time you start the FDR/UPSTREAM-MVS started task, but it can be run at any time (see Section 5.7).
- USTREORG - reorganizes one or more of the database files, in order to reclaim space for deleted records and put all inserted records in their proper locations. A re-organization of the database files will be required at periodic intervals, based upon the level of insertion activity and the sizing of the database file in question. USTREORG is run while the FDR/UPSTREAM-MVS started task is still active; however, all other activity must be quiesced. It will create a backup file containing all of the data set records, from which it is reloaded. You can retain that backup (perhaps as a GDG) to guard against database corruption or other problems.

You can also reorganize database files with the USTCAMS utility (or IDCAMS for VSAM files) but this requires that the FDR/UPSTREAM-MVS started task be stopped. See Section 2.15 for an example.

If you save the backup files created by USTREORG or USTCAMS/IDCAMS, and you find that you must restore them, perhaps because of database damage, you must restore backups of all 3 database files from the same point-in-time. The database files have interrelations, data from one used to access another, so if they are restored from backups taken at different times those relationships may not be valid. Since these files are often reorganized on different schedules, you may want use other products (e.g., FDR) to take backups for recovery purposes.

REPORTING

Most of the records in the database files can be displayed by:

- USTRPORT (generalized reporting utility, see Section 7.1). USTRPORT offers a great deal of flexibility in selecting records for display and formatting the report.
- USTDUPRT (duplicate file audit utility, see Section 7.10).
- USTBKPRT (backup file report utility, see Section 7.11)
- The FDR/UPSTREAM-MVS ISPF interface (see Section 6) automates use of the above utilities
- FDR/UPSTREAM-Workstation allows most of these reports to be generated and displayed on a workstation.

THE USTCATLG FILE

The USTCATLG (catalog) file contains the primary control records for the functions of the FDR/UPSTREAM system. It contains these data records:

- For a Workstation Backup: history record, backup control record, file specification record
- For a Workstation Restore: history record: history record
- For a Vault Operation: history record, vault control record

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9.2

HISTORY RECORDS

A catalog history record is created for each FDR/UPSTREAM function when it completes. These records contain information such as function requested, elapsed time, execution time, number of workstation files processed, etc. They allow you to report on FDR/UPSTREAM overall activity, or report on specific workstations or activities.

The setting of the system-wide MAXHIST parameter (See Section 3.4) controls the retention of the History records; it specifies the number of days that the History records should be retained before being purged by USTMAINT. The default setting for the MAXHIST parameter is 30 days, but Innovation suggests that this be altered to be equal to the highest retention of your Full backups so that you have full history reporting for all backups which still exist.

BACKUP DATASET RECORDS

A catalog record of this type is created for each backup requested. This record contains information such as: name of the backup profile used, type of backup requested, time and date of the backup request, the MVS data set name created to hold the contents of the backup, number of files backed up, etc. The contents of this record are used to access the other record types in the other database files. For example, an inquiry request would get a list of these records to identify all the backups for a particular backup profile. Then a selection of one or more of these records would be made and the contents of some the fields would be used in order to construct a database key to obtain, for example, a list of files backed up for a particular file server.

The retention of these records is controlled by the MVS catalog. All FDR/UPSTREAM backup data sets are cataloged in the appropriate MVS catalog, so the Backup Data set record only contains the data set name. When the backup named in a Backup Data set record is no longer in the MVS catalog, the record and its associated File Specification records are eligible for purge by USTMAINT.

FDR/UPSTREAM MVS will never automatically uncatalog any backup data sets it creates. Instead it assumes that the customer's tape and/or DASD management systems (i.e. CA-1, TLMS, FDR/ABR, HSM, etc.) will uncatalog the data set when they have reached their expiration as specified by the RETPD or EXPDT attributes of the associated workstation profile. If you create the backup as a GDG (Generation Data Group), then the number of backups to be retained is specified when the GDG base is created, and older backups are automatically uncataloged as new backups are created. Whatever technique is used, the FDR/UPSTREAM administrator must insure that backups are retained for an adequate period.

The FDR/UPSTREAM-MVS administrator or (with proper authorization) a FDR/UPSTREAM user can delete specific backups with the FDR/UPSTREAM-MVS ISPF interface (see Section 6.10) or FDR/UPSTREAM-Workstation.

FILE SPECIFICATION RECORDS

A catalog record is created for each file specification specified in a backup request. This record contains the file specification requested in the original backup and some supporting data.

For example, if you specified that you wanted to back up the C:*.* and D:*.* drives for a particular file server, this would cause the creation of two File Specification Records within the USTCATLG file.

File Specification records are purged when their associated Backup Data set record is purged.

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9.2

VAULT COPY RECORDS

Two Vault Copy catalog records are created for each VAULT request performed. One record contains the information related to the Vault Retention Data set that is created as the first data set on the Vault tape set. This data set is used to control the retention of the tape set that contains the output of the Vault request. The second Vault Copy Record is for the Vault Control File that is placed as the last data set on the Vault tape set. This file contains all the extracted database control information related to the backups that have been placed on this Vault tape set.

These records are purged by rules similar to the rules for Backup Data set records, described above. When the first data set on the vault tape is no longer cataloged, it is eligible for purge by USTMAINT.

REGISTERED NAME RECORDS

A catalog record is created for each workstation that signs on with auto-registration enabled or is manually defined via the ISPF interface. A Registered Name record is utilized in order to establish an alias for a remote workstation and conceal its network address (SNA LUNAME, IP address, etc.) from the connection process. This allows the use of IP DHCP protocols or dynamic SNA LU naming when interfacing between the FDR/UPSTREAM workstation and the host software. This record also contains information regarding the installed version of the particular FDR/UPSTREAM workstation when it last connected. This information can be used by the automatic software distribution feature of FDR/UPSTREAM to update the version of the FDR/UPSTREAM software on the workstation.

If a Registered Name Record was not accessed within the last 90-days, it is eligible for deletion, The records can be optionally manually deleted via the FDR/UPSTREAM-MVS ISPF interface (See Section 6.7).

CATALOG FILE SIZING

The approximate sizing for the USTCATLG file is fairly straightforward and can be expressed as follows:

$$N * (H + B + F + 2V) + R = T$$

where:

H = # of history records / backup (always one)
B = # of backups records / backup (always one)
F = # of File Specification Records / Backup (variable)
V = # of Vault Requests (two records per vault request)
R = # of defined registered names
N = # of retained backups (Full, Incremental, and Non-Merge)
T = Total # of records to allocate (average record size 150 bytes)

The easiest method for performing this calculation is to use the FDR/UPSTREAM MVS ISPF "DEFINE" panel (Section 2.5) which will calculate the size of the file from input you provide and generate all the necessary MVS JCL to define the file.

The USTCATLG file will change on a regular basis as each request made to the FDR/UPSTREAM system is completed. The file should be adequately allocated to allow for uninterrupted service for at least one week's time. It should be regularly reorganized with USTREORG. The USTCATLG file is generally less than 5 cylinders in size, even in the largest shops, so weekly or even daily reorganization causes few complications.

9.2

THE USTFILEI FILE

The USTFILEI (FILEINFO) file contains the control records created by the backup and the automatic duplicate file processing functions of the FDR/UPSTREAM system. It contains two types of records:

- File Information Records
- Automatic Duplicate File Candidate Records

FILE INFORMATION RECORDS

A File Information Record is created for each workstation file backed up by the FDR/UPSTREAM system. These records contain information such as file name, byte count, backup date and time, location of the backup, etc. They are used when constructing a list of files to be restored. You can also report on the files which have been backed up.

Since most workstations or file servers contain a very large number of files that you will wish to backup and track, these records comprise the most important capacity planning issue when setting up and maintaining the FDR/UPSTREAM-MVS system.

File Information records will be purged by USTMAINT when their associated Backup Data set record is purge from the USTCATLG file, described earlier.

AUTOMATIC DUPLICATE FILE CANDIDATE RECORDS

A FDR/UPSTREAM Automatic Duplicate File Candidate Record is created for each file that meets the selection criteria as it is backed up when the DUPLICATE=AUTO option is enabled (see Sections 3.4 and 1.4). They are used to identify files which are identical on multiple workstations, so they need to be backed up only once. These records contain information such as file name, size, date and time last modified, etc.

The retention of the Duplicate File Candidate Records is controlled by the parameter MAXDUPL (see Section 3.4), which defaults to 30 days. Once a file has been identified as a candidate for duplicate file processing, it will remain a viable candidate for only the period specified in MAXDUPL, if it is never selected for duplicate processing. Then it will be eligible for purge.

If the file is processed a second time during this period, then it is considered a selected duplicate file and the record will remain until the file is purged via the UPSTREAM Workstation Duplicate File Management function.

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9.2

FILEINFO FILE SIZING

The approximate sizing for this file is fairly straightforward and can be expressed as follows:

N * (F + C) = T

where:

F = Average # of files backed up (very variable per server)
N = # of retained backups (Full, Incremental, and Non-Merge)
C = # of first observed candidate duplicate files (very variable per server)
T = Total # of records to allocate (average record size 150 bytes)

If the DUPLICATE=AUTO option is not enabled, then the "C" portion of the above calculation can be ignored. The enabling this function is not suggested unless you have reviewed the Duplicate File section of this manual and have determined that the significant resources required are worth the benefits that this option provides. DUPLICATE=AUTO is not the default setting.

The easiest method for performing this calculation is to use the FDR/UPSTREAM MVS ISPF "DEFINE" panel (Section 2.5) which will calculate the size of the file from input you provide and generate all the necessary MVS JCL to define the file.

The USTFILEI file will change as each backup is completed. The file should be adequately allocated to allow for uninterrupted service for at least one week's time.

The USTFILEI file is generally quite large in size, routinely exceeding 500 cylinders in size. Due to the size of this file, the large amount of activity the file receives, and the need to interrupt the FDR/UPSTREAM-MVS system processing during it's reorganization, a weekly schedule for reorganization is suggested.

DATABASE FILE INTERRELA-TIONSHIPS

The USTFILEI file contains indirect references to the USTFILEC database file and is also the target of keyed access requests based on data from the USTCATLG file. The version date, profile name, and several other fields contained in the USTCATLG file are used in the construction of the access keys used to access records in this and the USTFILEC database files. The USTFILEI file contains references to entries in the USTFILEC file pertaining to the occurrence and usage counts associated with the Duplicate File Management features of the product.

As previously stated, any alteration or restore of a single UPSTREAM database file without similar activities to the other files will result in a corrupted and possibly unusable database.

MAINTF PROCESSING

USTMAINT contains an additional function which can be used to delete orphan records from the USTFILEI file. When an FDR/UPSTREAM backup is in progress, its USTFILEI entries are added as each file is backed up. The actual USTCATLG entries are not added until the backup completes. If the FDR/UPSTREAM system ABENDs or the MVS system is re-IPL'ed while a backup is in progress, the USTCATLG entries for the in-progress backups will not be written. However the related USTFILEI entries will still be in the USTFILEI file and inaccessible. The MAINTF utility function was created to correct this situation. To execute it, enter on the MVS console:

F UPSTREAM,MAINTF

Weekly execution is generally recommended.

9.2

THE USTFILEC FILE

The USTFILEC (FILEDATA) file contains the data records created by the Duplicate File Processing functions of the FDR/UPSTREAM system. It is also the storage medium for the "ARCHIVE" and "KEYED" backup functions from previous releases of the UPSTREAM system. These two features are no longer suggested for use and will not be discussed here.

The USTFILEC database file contains only one type of control record, the Duplicate File Data Record. These records contain the actual backup data selected and transmitted by the UPSTREAM workstation component. They are initially placed within this database file, either through manual or automatic processing, to allow UPSTREAM to avoid their retransmission upon subsequent discovery during the backup of different systems. These records are, optionally, later copied from this database file to the backup tape in lieu of their transmission from the UPSTREAM workstation during backup processing.

The Duplicate File Data Records can only be removed manually, there is no method for automatic elimination of duplicate file data. The UPSTREAM Workstation Duplicate Management function menu is the only method supplied to perform this manual removal. This interface allows for inquiry about stored duplicate files and removal of unwanted duplicate files.

FILEDATA FILE SIZING

The sizing issues for the USTFILEC file can be straightforward or quite unpredictable depending on whether you chose the "manual" or "automatic" method, respectively, of propagating this database file.

When sizing for the "manual" method, you can use the size of the workstation files or directories that you will be placing into the USTFILEC file (plus approximately 5% for overhead functions) as a basis for the calculations.

When sizing for the "automatic" method however, the number and size of the duplicated files selected for processing on the systems being backed up can be quite unpredictable. The only predictive method available is the Duplicate File Audit Report (USTDUPRT). This report is capable of looking at previously performed backups and identifying files on those backups that are candidate duplicates. The output of this report will supply you with a starting point for estimating the allocation size for this file.

The USTFILEC file is generally quite large in size when duplicate file processing has been enabled, and will routinely exceed several hundred cylinders in size. Due to the access pattern for this file, a regular schedule for reorganization is not usually necessary. However, if a large number of deletions are performed, the file should be reorganized to recapture "dead space" within the file.

If duplicate file processing is not being performed at this site, this file does not need to be reorganized at all.

CONTINUED . . .

10.1 FDR/UPSTREAM-MVS LOG FILE

LOG FILE

On-line FDR/UPSTREAM-MVS maintains a log file (DD name “USTLOG”) to record pertinent information and errors. This log is usually directed to SYSOUT and will be printed or held when the UPSTREAM on-line task terminates (depending on the SYSOUT class chosen). This log is a primary source of information when problems occur, so it should be saved for a few days or as long as necessary to resolve the problems. A sample listing of the log file follows. Each record written to the log contains:

- The FDR/UPSTREAM-MVS message number.
- The time the message was logged.
- The *Workstation Profile Name.* (When appropriate, this field contains the network LU name instead.)
- The message text. Refer to following sections for more detailed explanations of the message texts.

As described in Section 5, several FDR/UPSTREAM console commands are available to manage the log. The FLUSHLOG command will close and reopen the log so that the most recent messages are visible. If the log files are on disk, the SWITCHLOG command will switch between the primary log (“USTLOG”) and an alternate log (“USTLOG2”) so that the inactive log file can be read or copied for reporting purposes without shutting down UPSTREAM.

The FDR/UPSTREAM-MVS utility programs, such as USTARCH and USTBATCH, also produce a log on DD name USTLOG with a similar format.

SUMMARY FILE

On-line FDR/UPSTREAM-MVS also optionally creates a summary file (DD name “USTSUMM”) which contains one line describing each operation performed by FDR/UPSTREAM. This summary is usually directed to SYSOUT and will be printed or held when the UPSTREAM on-line task terminates. This summary provides a quick reference to FDR/UPSTREAM activity. You request that the summary be produced simply by including a USTSUMM DD in the FDR/UPSTREAM start-up proc (see Section 2.9).

The FLUSHLOG command will also flush the summary file, if open. The SWITCHLOG command will switch between the primary summary (“USTSUMM”) and an alternate (“USTSUMM2”) if present.

CONSOLE MESSAGES

Some FDR/UPSTREAM-MVS messages, particularly those which indicate initialization errors or other conditions of interest to the system operator, will be written to the system console as well as USTLOG. These are identified in the message descriptions that follow by an asterisk (“*”) after the message ID. Also, if the WTOCOMP option is specified on the FDR/UPSTREAM-MVS Configurator MAIN statement (see Section 3.2), then all backup started and backup completed messages will be written to the system console as well as the UPSTREAM log.

MESSAGE FORMAT

All normal FDR/UPSTREAM-MVS messages are in the format:

USTnnns

where “nnn” is a 3-digit message number, and “s” is a severity code:

E	for error message
W	for warning messages
T	for internal trace messages (not documented in this manual)
blank	for informational messages (so the others stand out)

PROBLEM REPORTING

Should you have any questions regarding the installation, implementation, or use of the FDR/UPSTREAM product, please feel free to contact Innovation Technical Support. See the front pages of this manual for the Innovation address and phone numbers. In the event you are having difficulty with FDR/UPSTREAM, please retain all the error information you can gather (UPSTREAM logs, relevant JOBLOG or SYSLOG messages, and configuration information) and contact Innovation Technical Support as soon as possible. We will make every effort to resolve the difficulty in the shortest possible time.

10.1

SAMPLE LOG FILE

The following is a sample of a FDR/UPSTREAM-MVS Log File:

```
UST106..08:51:54          *** CUSTOMER NUMBER: 99999999 ***
UST241  08:51:55          USTMAINT NOW ACTIVE
UST500  08:51:55 USTMAINT UPSTREAM USTMAINT PROCESS STARTED ***
UST507  08:51:56 USTMAINT         50 OF    500 HISTORY RECORDS ERASED FOR DATES EARLIER THAN 96/01/12
UST510  08:51:56 USTMAINT UPSTREAM MAINT COMPLETED - 20 VERSION RECORDS ERASED 157 FILE RECORDS ERASED
UST224  08:51:56          USTMAINT        0.061 CPU SECOND(S) USED IN MAINT
UST241  08:51:56          USTMAINT COMPLETED RC=00
UST248  08:51:56          USTMAINT USTMAINT * PROCESS DETACHED *
UST280  08:51:58          TCP MAIN CONNECT TO SOCKET=00001,PORT=01972,IPA=130.50.75.1
UST035  08:51:58          FDR/UPSTREAM V3.0.0 INIT COMPLETE-CONFIG=CONFIG02,APPLID=UPSTREAM,SECLVL=2

UST280  09:18:06          TCP USER CONNECT TO SOCKET=00002,PORT=01032,IPA=130.50.75.11
UST233  09:18:07 MERGE1   STARTING BACKUP PROCESS, TYPE=DASD LU=82324B0B BACKUP=FULLM
UST234  09:18:07 MERGE1   BACKUP DATE: 01/25/99
UST001  09:18:08 MERGE1   TO DSN:PROD.UPSTREAM.GDGBKUP.G0077V00
UST158  09:20:33 MERGE1    2150 MERGE FILES: 1900 COPIED FROM BACKUP  0 ALREADY ON BACKUP  250 FROM PC
UST158  09:20:33 MERGE1           2 COPYINCR FILES:        2 BACKUPS COPIED TO FULL
UST078  09:20:36 MERGE1   BACKUP STATISTICS (TOTALS RECEIVED):
UST079  09:20:36 MERGE1   VERSIONDATE: 990125091807;       138 FILES RECEIVED   4 DIRECTORIES RECEIVED
UST080  09:20:36 MERGE1             1,194 DATA-BLOCKS;       6,730,078 DATA-BYTES RECEIVED
UST173  09:20:36 MERGE1   BACKUP FULLY COMPLETED SUCCESSFULLY (LU=82324B0B)
UST224  09:20:39          MERGE1          1.871 CPU SECOND(S) USED IN BACKUP
UST248  09:20:39          MERGE1   82324B0B * PROCESS DETACHED *

UST009  23:50:26          SESSION STARTED TO T550F6AA BIND=001307B0 B050B108 24898924 08060200 L
UST233  23:50:28 WS2145DL STARTING BACKUP PROCESS, TYPE=ARCH LU=T550F6AA
UST234  23:50:28 WS2145DL BACKUP DATE: 01/25/99
UST247  23:53:28 T550F6AA *** SNA SESSION DEACTIVATED ***
UST086E 23:53:28 WS2145DL APPC RECEIVE REQUEST TIMEOUT - BACKUP TERMINATED
UST078  23:53:28 WS2145DL BACKUP STATISTICS (TOTALS RECEIVED):
UST079  23:53:28 WS2145DL VERSIONDATE: 990125235028;       10 FILES RECEIVED   1 DIRECTORIES RECEIVED
UST080  23:53:28 WS2145DL           350 DATA-BLOCKS;          73,022 DATA-BYTES RECEIVED
UST175E 23:53:28 WS2145DL BACKUP FAILED COMMUNICATIONS(LU=T550F6AA)
UST224  23:53:30          WS2195DL        0.103 CPU SECONDs USED IN BACKUP
UST248  23:53:30          WS2195DL T550F6AA * PROCESS DETACHED *

UST197  01:03:42 T550F6AA REMOTE INITIATION TO T550F6AA FROM UPSTR001
UST009  01:03:42          SESSION STARTED TO T550F6AA
UST247  01:03:50 UPSTR001 *** SNA SESSION DEACTIVATED ***
UST233  01:04:02 WS0443DL STARTING BACKUP PROCESS, TYPE=DASD LU=T550F6AA
UST234  01:04:02 WS0443DL BACKUP DATE: 01/25/96
UST001  01:04:02 WS0443DL TO DSN:G1ITS2T.UST13.WS0443DL.Z990125.Z010402
UST050  01:04:10 WS0443DL (2004,2) a:\NULL.TXT
UST050  01:04:12 WS0443DL (2005,13) a:\USSTART.EXE
UST113  01:04:16 WS0443DL a:\USSTART.EXE
UST050  01:04:22 WS0443DL (2005,13) a:\US.RES
UST113  01:04:22 WS0443DL a:\US.RES
UST050  01:04:24 WS0443DL (2005,13) a:\DIR3\8022I.EXE
UST113  01:04:24 WS0443DL a:\DIR3\8022I.EXE
UST078  01:04:46 WS0443DL BACKUP STATISTICS (TOTALS RECEIVED):
UST079  01:04:46 WS0443DL VERSIONDATE: 990125010402;      13 FILES RECEIVED
UST080  01:04:46 WS0443DL     24 DATA-BLOCKS;   20,327 DATA-BYTES RECEIVED
UST174W 01:04:46 WS0443DL BACKUP COMPLETED WITH ERRORS (LU=T550F6AA)
UST224  01:04:48          WS0443DL        0.051 CPU SECONDs USED IN BACKUP
UST248  01:04:48          WS0443DL T550F6AA * PROCESS DETACHED *

UST197  03:39:28 T550F6ZZ REMOTE INITIATION TO T550F6ZZ FROM UPSTR001
UST247  03:39:28 T550F6ZZ *** SNA SESSION DEACTIVATED ***
UST190E 03:39:28 T550F6ZZ APPC ALLOCATE ERROR
UST038E 03:39:29 T550F6ZZ NAME=T550F6ZZ RCFB=000B RCPRI=0004 RCSEC=0000 - ALLOCATION ERROR
UST038E 03:39:29 T550F6ZZ R0=0000000B R15=00000000 SENSE=087D0001
UST193E 03:39:29 T550F6ZZ TARGET LU NOT AVAILABLE - REQUEST FAILED
UST247  03:39:29 UPSTR001 *** SNA SESSION DEACTIVATED ***

UST008  05:51:44          FDR/UPSTREAM STOP ACCEPTED - SHUTDOWN IN PROGRESS
UST999  05:52:19          FDR/UPSTREAM SHUTDOWN COMPLETED
```

CONTINUED . . .

10.1

In the preceding sample FDR/UPSTREAM-MVS log file:

- FDR/UPSTREAM-MVS was started at 08:51. The USTMAINT utility was automatically called to clean up the repository clusters. The TCP/IP and VTAM APPC interfaces were initialized.
- A full MERGE backup to *sequential tape* was initiated by the TCP/IP workstation at address 82324B0B (equivalent to 130.50.75.11) using the profile name MERGE1 at 09:18. It completed at 09:20 and FDR/UPSTREAM-MVS logs the backup completion statistics.
- At 23:50 the VTAM LU T550F6AA initiated an “archive” type backup. However, after initiating the backup, a network or workstation error caused the FDR/UPSTREAM-MVS ten-minute receive timer to expire. Consequently, the backup failed.
- A USTBATCH batch backup job was submitted and started at 01:03. Consequently, a “sequential DASD” backup was begun by the T550F6AA LU using the profile name WS0443DL. The sequential dataset name is logged by FDR/UPSTREAM-MVS. During the backup process, the workstation notified FDR/UPSTREAM-MVS of four skipped files. The backup completed (with the errors logged) at 01:04:46.
- A mainframe job to backup LU T550F6ZZ was submitted and began execution at 03:39:28. FDR/UPSTREAM-MVS received an error indication attempting to allocate the LU 6.2 session and conversation to the target LU. The error indicates that the LU was not available at the time the request was made. The submitted batch job was notified and the attempt terminated. In this case, had there been a “MAXRETRY” value specified in the USTBATCH job input stream, FDR/UPSTREAM-MVS would have delayed and then retried the conversation allocation again.

SAMPLE SUMMARY FILE

The following is a sample of a FDR/UPSTREAM-MVS summary file:

```
FAST DUMP RESTORE – FDR/UPSTREAM SUMMARY REPORT V3.0.0   – INNOVATION DATA PROCESSING                        DATE=98.019  PAGE   1
  START DATE/TIME END-TIME PROFILE  LUNAME   USERID  OPERATION TYPE COMPCODE TIME(M)   CPU(S) # FILES PC BLOCKS   BYTES(KB)  PHYBLKS
98/01/19 09:15:20 09:15:31 USTMAINT USTMAINT          MAINT                0     0.2    0.970   1,196         0           0         0
98/01/19 09:16:05 09:16:09 MERGE1   82324B0B          INQUIREV             0     0.1    0.066       4         0           0         0
98/01/19 09:16:22 09:16:27 M*       82324B0B          INQUIREV             0     0.1    0.100      15         0           0         0
98/01/19 09:16:33 09:16:37 MERGE1   82324B0B          REMOVE B             0     0.1    0.176       6         0           0         0
98/01/19 09:17:32 09:17:50 MERGE1   82324B0B          BACKUP         SUSPEND*    0.3    0.609      11        80         440        21
98/01/19 09:18:07 09:18:39 MERGE1   82324B0B          BACKUP   MERG        0     0.6    1.871     138     1,194       6,573       653
98/01/19 09:15:14 21:51:57 UPSTREAM                   SHUTDOWN            8*  756.3   55.063     133         0           0         0
```

The fields in the summary are:

Start date/time – the date and time that the indicated operation started. For backups, this will also be the version-date.

End-time – the time that the operation ended. The report will be in order of end-time.

Profile – the profile name associated with the operation. For inquiries and profile operations, this may be a mask, as in the sample (M*). For utility operations, such as USTMAINT, this will be the utility name.

Luname – the VTAM LUNAME or TCP/IP network address (in hex) of the workstation associated with the operation. For utility operations, such as USTMAINT, this will be the utility name.

Userid – the security userid entered at the workstation, if any (may be blank if SECLVL=0 is in effect).

Operation – indicates the operation requested, such as INQUIREV (inquire versions), REMOVE B (remove backups), BACKUP, RESTORE.

Type – for some operations, the type of operation, such as INCR for merge incremental backup, MERG for merge full backup, TAPE or DISK for restores.

Compcode – indicates the completion status (see below).

Time/CPU – the elapsed time in minutes and tenths, the CPU time used in seconds and thousandths (TCB time only).

 # Files – the number of files processed, for backups/restores. For other functions, indicates the relevant quantity (e.g., for INQUIREV, the number of versions).

PC Blocks – the number of transmission records actually sent to/from the workstation.

Bytes – total data kilobytes processed for this request

Phyblks – total blocks read from or written to backup for this request. For MERGE backups, total blocks read from all sources, including the workstation, incremental backups, and the previous full backup. This is physical blocks on the backup medium, which may differ from the records sent to/from the workstation.

The final entry, operation SHUTDOWN, shows the start/stop time, total elapsed time and CPU (TCB) time used by this execution of FDR/UPSTREAM. # FILES will be the total number of operations that FDR/UPSTREAM handled, and COMPCODE will be highest completion code of any operation (20 if any operation abended).

CONTINUED . . .

10.1

COMPLETION CODES

There is a completion (return) code associated with every subtask under the FDR/UPSTREAM main task. These are displayed in the summary file above, and also in many reports produced by USTRPORT. The possible values are:

SUSPEND	Backup was suspended	4	Completed with warnings
CANCEL	Cancelled by operator	8	Terminated with error
Ssss	System abend sss	12	Terminated with severe errors
Uuuuu	User abend uuuu	16	Terminated by operator
0	Normal completion	20	Terminated by abend

The completion code of the FDR/UPSTREAM main task, at shutdown, will be the highest numeric return code encountered for any subtask. FDR/UPSTREAM batch utility and reporting programs will also set one of the numeric completion codes.

CONTINUED . . .

10.2 ONLINE COMPONENT MESSAGES (UST000 – UST299)

These messages are generated by the on-line FDR/UPSTREAM-MVS task. In general they are written to the UPSTREAM log (USTLOG). Messages with an asterisk (*) following the message ID may also be written to the system console. For messages that indicate an error condition: if you are unable to resolve the problem, please save all documentation (usually the UPSTREAM log and the system SYSLOG for the time of the problem) and contact Innovation Technical Support for assistance.

UST001 **TO DSN: *backup file dataset name* APPENDING TO PREVIOUS BACKUP PC FILE=*pcfilename***

Reason: This informational message is issued by the sequential backup processes to log the name of the sequential dataset dynamically allocated to contain the backup data for this version. The optional text APPENDING TO PREVIOUS BACKUP indicates that the backup is being added to an existing backup data set. For file transfers only, the PC FILE= specifies the name of the workstation file that was transfered.

UST002E* **OPEN *clustername* CLUSTER FAILED COMP=*rrrr* CODE=*cccc* – TERMINATING**

Reason: The FDR/UPSTREAM-MVS Main task was unable to open the indicated “clustername”, either “CATALOG”, “FILE-INFO”, or “FILE-DATA”. FDR/UPSTREAM will terminate. “rrrr” is the return code in R15 after the open, and “cccc” is the ACBERFLG error code.

Action: Verify your JCL specification for the “USTCATLG”, “USTFILEI” or “USTFILEC” DD statement. Refer to the IBM “VSAM MACRO REFERENCE” or “MACRO INSTRUCTIONS FOR DATA SETS” manual (depending on the level of your operating system) to understand the OPEN error codes reported.

UST003E* **VTAM SETLOGON REQUEST FAILED – SNA DISABLED**

Reason: The FDR/UPSTREAM-MVS Main task received a non-zero return code from a VTAM “SETLOGON START” request to begin queuing sessions. This is most likely a temporary VTAM problem. FDR/UPSTREAM will terminate disable SNA (VTAM) operations; if TCP/IP operations are enabled, it will continue, otherwise it will terminate.

Action: Verify the VTAM “APPL” and “MODE TABLE” definitions were correctly installed. Stop and restart FDR/UPSTREAM to attempt the VTAM connection again.

UST004E **TCP/IP ERROR REQUEST=*xx* COMP=*ccccc reason***

Reason: A TCP/IP error when FDR/UPSTREAM was connecting to TCP/IP during initialization, or when a mainframe-initiated request (USTBATCH) attempted to connect to a TCP/IP-attached target workstation. "xx" is an internal FDR/UPSTREAM request code. "ccccc" is the TCP/IP completion code from register 15 in decimal, and reason is a brief explanation of the error. For IBM's TCP/IP, common error codes include:

42 PROTOCOL NOT AVAILABLE - port in use or improper PORT statement in the TCP/IP profile (see Section 2.8). Can also occur after FDR/UPSTREAM-MVS abend if UPSTREAM is restarted too quickly.
60 CONNECTION TIMED OUT - workstation not active or wrong IP address specified
61 CONNECTION REFUSED - wrong workstation port number specified or FDR/UPSTREAM-PC not active on workstation.

For Interlink SNS/TCPaccess, "reason" will be in one of two formats:
INTERLINK ERROR CODE=X'rrrrrrrr' or
CODE=nnnnn INTERLINK ERROR DIAG=X'ddddd'
Interlink error codes may be found in the SNS/TCPaccess Programmers Reference.

Action: Determine the cause, correct it, and repeat the operation (or restart FDR/UPSTREAM).

UST005 ***function* COMPLETED SUCCESSFULLY**

Reason: A management function requested from a workstation has completed successfully. “function” may be **UPDATE OF PROFILE**, **REFRESH REQUEST** or **LOGIN REQUEST.**

UST005E ***function* COMPLETED WITH ERRORS - REASON=*reason***

Reason: A management function from a workstation has completed abnormally. "reason", if present, explains the error.

Action: Determine the cause, correct it, and repeat the request. If necessary, contact Innovation for assistance.

UST006E* **OPEN CONFIGURATION-FILE FAILED – TERMINATING**

Reason: The FDR/UPSTREAM-MVS Main task, “USTMAIN”, was unable to open the Configuration File, “USTCONFG” DD statement. FDR/UPSTREAM will terminate.

Action: Verify your JCL specification for the “USTCONFG” DD statement. Review the most recent Configurator output for possible errors which may have made the file unusable.

10.2

UST007E* **OPEN FOR VTAM ACB FAILED – ACBERFLG=*nn - reason***

Reason: The FDR/UPSTREAM-MVS main task was unable to open the VTAM “ACB”. FDR/UPSTREAM will terminate. "reason" indicates the meaning of the ACBERFLG error code.

Action: For certain errors, FDR/UPSTREAM will retry the OPEN once a minute for up to 5 minutes, in case the error is due to VTAM not being fully initialized. In this case, the message will be printed every minute until the OPEN is successful or the 5th attempt fails (which will cause FDR/UPSTREAM to terminate). If FDR/UPSTREAM does fail, correct the error, if possible. Review the VTAM "APPL" definition for FDR/UPSTREAM-MVS to be sure the VTAM "APPLID" (or "ACBNAME" , if used) matches the "APPLID=" specification in your Configuration file "MAIN" record. Be sure the VTAM application IDs for UPSTREAM are active.

UST007W **OPEN FOR VTAM ACB BYPASSED**

Reason: The VTAM ACB was not opened because you specified APPLID=NONE in the FDR/UPSTREAM-MVS configuration. Only TCP/IP connections will be supported. Note that mainframe-initiated operations via USTBATCH will not be possible.

UST007W **OPEN FOR TCP/IP OR INTERLINK BYPASSED**

Reason: The TCP/IP connection was not established because you specified TCPIP=NONE in the FDR/UPSTREAM-MVS configuration, or because the required TCP/IP interface module was not found (probably because TCP/IP is not installed on your system). Only VTAM APPC connections will be supported.

UST008* **FDR/UPSTREAM STOP ACCEPTED – SHUTDOWN IN PROGRESS**

Reason: A P UPSTREAM console command has been entered, requesting an orderly shutdown of FDR/UPSTREAM.

UST009* **SESSION STARTED TO *luname* BIND=*bindimage x***

Reason: This is an information message only. It is logged only for VTAM LUs at the time the session is initiated to the workstation. “bindimage” is the first 16 bytes of the SNA bind, in hex, used for this session. "x" will be "L" for dependent LUs and "S" for independent LUs. If the “WTOCOMP” option was selected in the UPSTREAM configuration “MAIN” record, this message will also be written to the system log (SYSLOG).

UST010E* **UNABLE TO ENQUEUE CONTROL FILE**

Reason: The FDR/UPSTREAM online task detected that a FDR/UPSTREAM utility function which updates the FDR/UPSTREAM repository files is running. The two cannot execute together.

Action: Wait until the utility job terminates, then start the on-line task again.

UST011W **INQUIRE-FILES MAY NOT BE IN ORDER DUE TO INSUFFICIENT MEMORY**

Reason: An inquire-files request that required sorting of UPSTREAM records, such as request against a MERGE backup profile, failed due to insufficient above-the-line storage for the sort. This could be due to multiple such requests running concurrently. The displayed files may not be in the correct order.

Action: If you need the files properly sorted, try the request again. If these requests fail frequently, you may have to increase the REGION= value in the FDR/UPSTREAM-MVS start-up JCL (values over 32M will increase the above-the-line region size).

UST011E **RESTORE-FILES TERMINATED DUE TO INSUFFICIENT MEMORY**

Reason: A restore request that required sorting of UPSTREAM records, such as a “restore-to-full” or “restore-as-of” from a MERGE backup, failed due to insufficient above-the-line storage for the sort. This could be due to multiple such requests running concurrently.

Action: Try the request again later. If it still fails, you may have to increase the REGION= value in the FDR/UPSTREAM-MVS start-up JCL (values over 32M will increase the above-the-line region size).

UST012E* **UPSTREAM COMMAND NOT RECOGNIZED - *command***

Reason: A command issued from the System Console to FDR/UPSTREAM-MVS was not STOP(P) or MODIFY(F). The command received is shown.

Action: Refer to Section 5 “OPERATION” for the valid commands for FDR/UPSTREAM-MVS.

UST012E* **MODIFY REQUEST NOT RECOGNIZED REQ: *request***

Reason: An MVS MODIFY(F) command issued from the System Console was not recognized by FDR/UPSTREAM-MVS. The invalid request is shown.

Action: Recall the command and check the spelling and syntax. Refer to Section 5 “OPERATION” for the valid commands for FDR/UPSTREAM-MVS.

CONTINUED . . .

10.2

UST013* ***(PART OF STATUS DISPLAY GROUP)***

Reason: This message is issued as part of a message group when a “STATUS” inquiry request is issued from the System Console.

UST014* ***(PART OF STATUS DISPLAY GROUP)***

Reason: This message is issued as part of a message group when a “STATUS” inquiry request is issued from the System Console.

UST015* ***(PART OF STATUS DISPLAY GROUP)***

Reason: This message is issued as part of a message group when a “STATUS” inquiry request is issued from the System Console.

UST016* **NO TASKS CURRENTLY ACTIVE V *n.n.n.***

Reason: This message is issued as part of a message group when a “STATUS” inquiry request is issued from the System Console.

UST017E **APPCCMD RCVFMH5 REQUEST FAILED**

Reason: The FDR/UPSTREAM-MVS main task received an error indication during an “APPC” request to receive the SNA Function Management Header (FMH) type-5 for the conversation allocation.This message is accompanied by message UST038E containing the VTAM error indicators.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to understand the reported error.

UST018E **START CONVERSATION RECEIVE FAILED**

Reason: The FDR/UPSTREAM-MVS subtask received an error indication from a VTAM APPC RECEIVE DATA request.This message is accompanied by message UST038E containing the VTAM error indicators.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to understand the reported problem.

UST019E **INITIAL RECEIVE NOT START-CONVERSATION**

Reason: The FDR/UPSTREAM-MVS subtask received an unexpected data type during it's conversation initialization.

Action: This is an internal error. Retain the error log and contact Innovation Data Processing Technical Support for assistance.

UST020E **PROFILE NAME FAILED CONFIGURATION VERIFICATION**

Reason: The FDR/UPSTREAM-MVS subtask was unable to validate the Workstation Profile Name received for this conversation.

Action: Verify that the Profile Name sent by the Workstation is correct and was included in the Configuration file that last time the FDR/UPSTREAM-MVS Configurator was run.

UST021 **COMM. PERFORMANCE TEST (WORKSTATION SEND) REQUESTED**

Reason: An UPSTREAM workstation has requested the communication performance (WS send) test. This message is informational only.

UST022E **RECEIVED STRUCTURE NOT RECOGNIZED**

Reason: The FDR/UPSTREAM-MVS subtask received a data or control structure it did not recognize.

Action: This is an internal error. Retain the error log and contact Innovation Data Processing Technical Support for assistance.

UST023 **COMM. PERFORMANCE TEST (M/F SEND) COMPLETED *n* BYTES PER SECOND**

Reason: The communications performance test (M/F send) logic has completed the request and achieved a data rate of "n" bytes per second. This message is informational only.

UST024E **APPC SEND FOR BACKUP-STARTED FAILED**

Reason: The FDR/UPSTREAM-MVS Backup process received a VTAM error indication trying to send control information to the Workstation. This message is accompanied by message UST038E.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to understand the error indications.

UST025E **APPC RECEIVE ERROR**

Reason: FDR/UPSTREAM-MVS received a VTAM error indication while receiving data or control information from the Workstation.This message is accompanied by message UST038E containing the VTAM error codes.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to understand these error codes.

10.2

UST026E RECEIVED DATA *xxxxxxxx* UNRECOGNIZED – EXPECTED FILE-INFORMATION

Reason: The FDR/UPSTREAM-MVS Backup process received an unrecognized data or control structure.

Action: This is an internal error. Retain the error log and contact Innovation Data Processing Technical Support for assistance.

UST027E RECEIVED DATA *xxxxxxxx* UNRECOGNIZED – EXPECTED FILE-DATA

Reason: The FDR/UPSTREAM-MVS Backup process received an unexpected data or control structure.

Action: This is an internal error. Retain the error log and contact Innovation Data Processing Technical Support for assistance.

UST028E UNEXPECTED DEALLOCATE RECEIVED

Reason: The FDR/UPSTREAM-MVS Backup process received an unexpected APPC DEALLOCATE-CONVERSATION request. This is most likely the result of an error having occurred on the Workstation.

Action: Review the Workstation log file for the error.

UST029 COMM. PERFORMANCE TEST (M/F SEND) REQUESTED

Reason: The communications performance test (M/F send) requested by a workstation has begun. Message UST023 will be logged at its completion. This message is informational only.

UST030E REQUESTED DATA BLOCK-SIZE LESS THAN 10 BYTES

Reason: The communications performance test (M/F send) requested by a workstation has found that the requested block size for the test transmission was less than 10 bytes.

Action: Reissue the request from the workstation specifying a valid test block size.

UST031E REQUESTED DATA BLOCK SIZE EXCEEDS 32760 BYTES

Reason: The communications performance test (M/F send) requested by a workstation has found that the requested block size for the test transmission exceeded 32760 bytes.

Action: Reissue the request from the workstation specifying a valid test block size.

UST032E REQUESTED SEND-COUNT INVALID

Reason: The communications performance test (M/F send) requested by a workstation has found that the requested data block send count was invalid.

Action: Reissue the request from the workstation specifying a valid send count.

UST033E APPC ERROR ON SEND OF DATA BLOCK

Reason: The communications performance test (M/F send) requested by a workstation has received an error indication from VTAM after issuing a SEND-DATA request. This message is accompanied by message UST038E containing the VTAM error codes associated with the request.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to understand these error codes and correct the error. Retry the communications performance test.

UST034E APPC ERROR ON CONFIRM TO WORKSTATION

Reason: The communications performance test (M/F send) requested by a workstation has received an error indication from VTAM after issuing a CONFIRM request at the completion of the test. This message is accompanied by message UST038E containing the VTAM error codes associated with the request.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to understand these error codes and correct the error. Retry the communications performance test. Review the UPSTREAM log on the workstation to determine the cause of the error.

UST035 FDR/UPSTREAM V*n.n.n* INITIALIZATION COMPLETE – CONFIG=*member* APPLID=*applid* SECLVL=*n*

Reason: This is an informational message only. It is issued by the FDR/UPSTREAM-MVS main task when it's initialization process has completed. If shows the configuration membername used (if the configuration data set is a PDS), the VTAM application ID used, and the security level (0, 1, or 2) in effect.

CONTINUED . . .

10.2

UST036E* **CONFIGURATION FILE FORMAT ERROR – TERMINATING**

Reason: During loading the Configuration Table, the FDR/UPSTREAM-MVS Main task found the file contained an error. FDR/UPSTREAM terminates with a non-zero return code.

Action: Review the most recent output from the FDR/UPSTREAM-MVS Configurator for errors. Correct them, rerun the Configurator, and restart the task.

UST037E* **ATTACH FOR SUBTASK FAILED – SESSION DENIED LU=luname**

Reason: The FDR/UPSTREAM-MVS Main task was unable to attach a processing subtask for the indicated logical unit. This may be a result of a storage shortage.

Action: Try increasing the REGION size for the UPSTREAM task and retry the operation.

UST038E ***VTAM error return codes and sense information***

Reason: This message is written by an error processing routine used for VTAM APPC and control-type requests. It contains the VTAM error codes from the "RPL" control block. In most cases it will also contain a brief text description of the error, to save you the effort of trying to interpret the error codes manually from VTAM manuals. This message is usually written to the log along with other messages indicating the location of the error.

Action: See the "Action" for the accompanying message.

UST039E **PROFILE NAME IS INVALID**

Reason: The profile name received from a workstation had a length greater than 8.

Action: This is an internal error. Retain the error log and contact Innovation Data Processing Technical Support for assistance.

UST040E* **LU=*luname* USERID IS MISSING OR INVALID**

Reason: The userid received from a workstation had a length of 0 or greater than 8.

Action: This error message may be issued if you have specified a non-zero security level parameter (SECLVL=) in the FDR/UPSTREAM-MVS configuration and the request being processed specified no USERID value. Otherwise, this is internal error; Retain the error log and contact Innovation Data Processing Technical Support for assistance.

UST041E* **LU=*luname* PASSWORD IS MISSING OR INVALID**

Reason: The password received from a workstation had a length of 0 or greater than 8.

Action: This error message may be issued if you have specified a non-zero security level parameter (SECLVL=) in the FDR/UPSTREAM-MVS configuration and no password was specified. Otherwise, this is an internal error; Retain the error log and contact Innovation Data Processing Technical Support for assistance.

UST042E **VTAM APPC RECEIVE-DATA ERROR**

Reason: The FDR/UPSTREAM-MVS subtask received an error indication during an APPC RECEIVE-DATA request. This message is accompanied by message UST038E containing the VTAM error codes.

Action: Refer to the IBM "VTAM PROGRAMMING FOR LU 6.2" manual to resolve these error codes.

UST043E **UNEXPECTED DEALLOCATE RECEIVED**

Reason: The FDR/UPSTREAM-MVS subtask received an unexpected APPC DEALLOCATE-CONVERSATION indication. This is most likely the result of an error condition on the Workstation.

Action: Review the error log on the Workstation to resolve the problem.

UST044W **NON-KEYED BACKUP DISALLOWED BY CONFIGURATION**

Reason: This Profile Name was not permitted to perform any *non-keyed* Backups by the mainframe Configuration file. The "ARCHIVE=" parameter of this profile was specified as zero.

Action: If this Profile Name should be allowed to perform *non-keyed* Backups, execute USTCONFG to MODIFY the "ARCHIVE=" parameter for this profile to a non-zero value (see Section 3 "Configuration"), and refresh the configuration.

10.2

UST045W KEYED BACKUP DISALLOWED BY CONFIGURATION

Reason: This Profile Name was not permitted to perform any *keyed* Backups by the mainframe Configuration file. The “ONLINE=” parameter of this profile was specified as zero.

Action: If this Profile Name should be allowed to perform *keyed* Backups, execute USTCONFG to MODIFY the “ONLINE=” parameter for this profile to a non-zero value (see Section 3 “Configuration”), and refresh the configuration.

UST046E APPC RECEIVE BACKUP-DESC REPEATED STRUCTURE FAILED

Reason: The FDR/UPSTREAM-MVS Backup process received an error indication during an APPC RECEIVE-DATA request. This message is accompanied by message UST038E containing the VTAM error codes.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to resolve these error codes.

UST047E APPC RECEIVE FOR FILE-INFORMATION FAILED

Reason: The FDR/UPSTREAM-MVS Backup process received an error indication from VTAM during an APPC RECEIVE-DATA request. This message is accompanied by message UST038E containing the VTAM error codes.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to resolve these error codes.

UST048E MAIN SUBEND UNABLE TO LOCATE ATB FOR TCB=*tcbaddress*

Reason: This is an internal error.

Action: Retain all error information and contact Innovation Data Processing Technical Support for assistance.

UST049E APPC SEND CONFIRMED-RESPONSE FAILED

Reason: The FDR/UPSTREAM-MVS Backup process received a VTAM error indication attempting to send an APPC CONFIRMED response. This message is accompanied by message UST038E containing the VTAM error codes.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to resolve these error codes.

UST050 *event information reported from workstation LU*

Reason: This message contains text sent from the Workstation. It is usually used to report an error condition at the Workstation.

UST051E *general VSAM error diagnostic information*

Reason: This message is logged by the VSAM error diagnosis routine. It contains specific error codes from the VSAM “RPL” control block. If possible, the message also contains a brief text description of the error. This message is accompanied by others indicating the location of the error.

Action: If necessary, refer to the IBM "VSAM MACRO REFERENCE" or "MACRO INSTRUCTIONS FOR DATA SETS" manual (depending on the level of your operating system) to understand the error codes reported. Correct the error or contact Innovation for assistance.

UST052E VTAM APPC ERROR ON RECEIVE DATA REQUEST

Reason: The communications performance test (PC send) requested by a workstation has received an error indication from VTAM after issuing a RECEIVE request. This message is accompanied by message UST038E containing the VTAM error codes associated with the request.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to understand these codes and correct the error. Retry the communications performance test.

UST053E RECEIVE FOR RESTORE-DESC REPEATED STRUCTURE FAILED

Reason: The FDR/UPSTREAM-MVS Restore process received a VTAM error indication during a RECEIVE-DATA request. This message is accompanied by message UST038E containing the VTAM error codes.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to understand these error codes.

UST054E APPC SEND OF BACKUP-DESCRIPTION FAILED

Reason: The FDR/UPSTREAM-MVS Restore process received a VTAM error indication during an APPC SEND-DATA request. This message is accompanied by message UST038E containing the VTAM error codes.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to resolve these error codes.

CONTINUED . . .

10.2

UST054E **APPC SEND OF PROFILE-DESCRIPTION FAILED – *reason***

Reason: A workstation requested display or update of a profile definition, but the request failed for the reason given.

Action: If possible, correct the error and resubmit the request. If necessary, contact Innovation for assistance.

UST055 **COMM. PERFORMANCE TEST (WORKSTATION SEND) COMPLETED *n* BYTES PER SECOND**

Reason: The communications performance test (PC send) requested by a workstation has completed and achieved a data rate of "n" bytes per second. This message is informational only.

UST056W **NO CATALOG RECORD FOUND FOR THIS PROFILE NAME**

Reason: This message is issued by the FDR/UPSTREAM-MVS Restore process. While searching for a Catalog Version record for the supplied Workstation Profile Name, no record was found. The specified Profile Name has no versions currently recorded. There may have been no prior

Backup done specifying this name.

UST057E **NO F-RECORDS FOUND FOR THIS FILENAME**

Reason: During the Restore process, FDR/UPSTREAM-MVS was unable to locate a record for the requested filename. The requested filename may not have been Backed up in a prior Backup request.

UST058E **APPC SEND OF F-RECORD FAILED**

Reason: The FDR/UPSTREAM-MVS Restore process received an error indication from VTAM after requesting an APPC SEND-DATA for control information to the Workstation. This message is accompanied by message UST038E containing the VTAM error codes.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to resolve these error codes.

UST0059 **APPC SEND OF FILE-DATA RECORD FAILED**

Reason: The FDR/UPSTREAM-MVS Restore logic received a VTAM error indication after an APPC SEND-DATA request to send File Data to the Workstation. This message is accompanied by message UST038E containing the VTAM error codes.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to resolve these error codes.

UST060E **UNEXPECTED DEALLOCATE RECEIVED FROM WORKSTATION**

Reason: The communications performance test (WS send) requested by a workstation has received an unexpected conversation deallocation indication from the workstation. This message is accompanied by message UST038E containing the VTAM error codes associated with the request.

Action: Use these error codes to determine the cause of the error and correct it. Retry the communications performance test. Review the workstation UPSTREAM log to determine the cause of the APPC DEALLOCATE request.

UST061E **APPC DEALLOCATE-CONFIRM REQUEST FAILED**

Reason: The FDR/UPSTREAM-MVS Restore logic attempted to normally terminate the conversation by issuing an APPC DEALLOCATE-CONFIRM request. VTAM returned an error indication to the request. This message is accompanied by message UST038E containing the VTAM error codes.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to resolve these error codes.

UST062E **UNEXPECTED DEALLOCATE RECEIVED FROM WORKSTATION**

Reason: The FDR/UPSTREAM-MVS Restore logic received an unexpected APPC DEALLOCATE-CONVERSATION request from the Workstation. This is most likely the result of an error condition having occurred on the Workstation.This message is accompanied by message UST038E containing the VTAM error codes.

Action: Review the Workstation error log to determine the reason the DEALLOCATE request was sent. Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to understand these error codes.

UST063E* **UNABLE TO LOAD CONFIG TABLE – ENQ FAILED**

Reason: The FDR/UPSTREAM-MVS Main task was unable to acquire an exclusive ENQ in order to load the Configuration Table.

Action: Ensure that you were not trying to start more than one copy of the FDR/UPSTREAM main task. If not, this may be an internal error. Retain all error information and contact Innovation Data Processing Technical Support for assistance.

10.2

UST064E* **CONFIGURATION TABLE LOAD FAILED – TERMINATING**

Reason: The FDR/UPSTREAM-MVS Main task was unable to load the Configuration Table, and is terminating as a result.

Action: This is an internal error. Retain all error information and contact Innovation Data Processing Technical Support for assistance.

UST065E **INQUIRE-VERSIONS INVALID FLAG BYTE FOUND**

Reason: The FDR/UPSTREAM-MVS Version Inquiry logic detected an invalid value in an internal structure.

Action: This is an internal error. Retain all error information and contact Innovation Data Processing Technical Support for assistance.

UST066E **INVALID *value* IN INQUIRE– FILES REQUEST**

Reason: The FDR/UPSTREAM-MVS Version Inquiry logic detected an invalid value in an internal structure. "value" will be either "LENGTH VALUE" or "DIRECTORY STRUCTURE".

Action: This is an internal error. Retain all error information and contact Innovation Data Processing Technical Support for assistance.

UST067E **SEND OF BACKUP-DESC FAILED – VERSIONDATE**

Reason: The FDR/UPSTREAM-MVS Version Inquiry logic received a VTAM error indication after issuing an APPC SEND-DATA request. This message is accompanied by message UST038E containing the VTAM error codes.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to understand these error codes.

UST068E **SEND OF BACKUP-DESC FAILED – ALL VERSIONS**

Reason: The FDR/UPSTREAM-MVS Version Inquiry logic received a VTAM error indication after issuing an APPC SEND-DATA request. This message is accompanied by message UST038E containing the VTAM error codes.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to understand these error codes.

UST069E **SEND OF BACKUP-DESC FAILED – LATESTVERSION**

Reason: The FDR/UPSTREAM-MVS Version Inquiry logic received a VTAM error indication after issuing an APPC SEND-DATA request. This message is accompanied by message UST038E containing the VTAM error codes.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to understand these error codes.

UST070W **NO RECORDS FOUND FOR INQUIRE-VERSIONS REQUEST**

Reason: The FDR/UPSTREAM-MVS Version Inquiry logic found no records for the inquiry request.

Action: Verify the Profile Name and the VERSIONDATE requested are valid. Verify that a successful Backup had been performed previously for this Profile.

UST071E **APPC SEND FOR FILE-INFORMATION RECORD FAILED**

Reason: The FDR/UPSTREAM-MVS File Inquiry logic received a VTAM error indication after issuing an APPC SEND-DATA for an internal control structure. This message is accompanied by message UST038E containing the VTAM error codes.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to understand these error codes.

UST072W **NO FILES FOUND FOR VERDATE=*versiondate* PATH=*fileid***

Reason: The FDR/UPSTREAM-MVS File Inquiry logic was unable to find a match for the request.

Action: Verify the requested Profile Name and VERSIONDATE are correct and retry the operation.

UST073E **ATTNEXIT FOUND *function* IN PROGRESS – REJECTED**

Reason: The requested conversation initiation was denied due to a FDR/UPSTREAM-MVS having a status which prevents new workstation functions from starting. If “function” is SHUTDOWN, then UPSTREAM received a System Console STOP request and is waiting for all currently active subtasks to terminate. If it is REORG, then one or more of the UPSTREAM files is being reorganized in response to a console REORG request.

Action: The workstation can retry the request after FDR/UPSTREAM-MVS is restarted or after the REORG completes.

CONTINUED . . .

10.2

UST074E ATTNEXIT FMH5 CONV TYPE NOT BASIC – REJECTED

Reason: The FDR/UPSTREAM-MVS Main task found an invalid value in the received Function Management Header (FMH) type-5 from the Workstation.

Action: This is an internal error. Retain all error information and contact Innovation Data Processing Technical Support for assistance.

UST075E ATTNEXIT FMH5 SYNC LEVEL NOT CONFIRM – REJECTED

Reason: The FDR/UPSTREAM-MVS Main task found an invalid value in the received Function Management Header (FMH) type-5 from the Workstation.

Action: This is an internal error. Retain all error information and contact Innovation Data Processing Technical Support for assistance.

UST076E ROLLOFF – NO C-RECORDS FOUND FOR ROLLOFF

Action: This is an internal error. Retain all error information and contact Innovation Data Processing Technical Support for assistance.

UST077E ROLLOFF – VSAM ERROR

Reason: The FDR/UPSTREAM-MVS Backup "Version Rolloff" logic encountered an error during a VSAM I/O request. This message is accompanied by message UST051E containing the VSAM error codes as reported.

Action: Retain all error information and contact Innovation Data Processing Technical Support.

UST078 BACKUP STATISTICS (TOTALS RECEIVED):

Reason: This is the first of a three message group. Statistics are logged to the UPSTREAM log file for each backup performed. This message is accompanied by messages UST079 and UST080 containing the statistics for the backup just ended.

UST079 VERSIONDATE: *vvvvvvvvvvvv; nnnnnnnnnnnnnn* FILES *function mmmmmmmmmm* DIRECTORIES *function*

Reason: If "function" is RECEIVED, this is the second message of a three message group (including UST078 and UST080); it shows the "versiondate" used to store the files being backed up as well as the number of files and the number of subdirectories backed up. If "function" is RESTORED, the message is issued with UST080 to show the number of files and subdirectories sent to the workstation from the indicated "versiondate" (the workstation may not restore all of them).

UST080 *nnnnnnnnnnnn* DATA-BLOCKS; *mmmmmmmmmmmm* DATA-BYTES RECEIVED

Reason: This is the last of a multi-message group. This message is preceded by messages UST078 and UST079 containing the statistics for the backup just ended. This message contains the total count of transmission data blocks and bytes send to or from the workstation.

UST081W RESTORE: C-RECORD NOT FOUND FOR SPECIFIC VERSIONDATE= *versiondate*

Reason: During FDR/UPSTREAM-MVS Restore processing, the logic was unable to locate a Repository Catalog record for the specific version requested by the End User.

Action: Use the "INQUIRE VERSIONS" function of the Restore panel to locate the version you are attempting to Restore. If the version is shown, this is an internal error. Otherwise, select a version listed, and retry the Restore request.

UST082E RESTART: MODCB FOR RPL-C FAILED

Reason: During a Restarted Backup, the FDR/UPSTREAM-MVS logic received an error indication from a VSAM "MODCB" request. This message is accompanied by message UST051E containing the VSAM error codes as reported.

Action: Refer to the IBM "VSAM MACRO REFERENCE" or "MACRO INSTRUCTIONS FOR DATA SETS" manual (depending on the level of your operating system) to understand the error codes reported.

UST083E UNABLE TO RESTART BACKUP – WAS NOT COMMITTED

Reason: During a Restarted Backup, FDR/UPSTREAM-MVS was unable to locate the specific Catalog record referenced in the Restart request from the workstation. This generally occurs when a Backup is interrupted for any reason prior to FDR/UPSTREAM-MVS having received sufficient data to consider the Backup committed, i.e. the interrupt occurred too early in the Backup process to retain the Backup information.

Action: You will have to rerun the Backup – it is not restartable.

10.2

UST084E **RESTART: APPC SEND OF BACKUP-DESC FAILED**

Reason: During a Restarted Backup, FDR/UPSTREAM-MVS received an error indication from VTAM, having issued an APPC SEND-DATA request. This message is accompanied by message UST038E containing the VTAM error codes from the RPL control block.

Action: Refer to the IBM "VTAM PROGRAMMING FOR LU 6.2" manual to understand the error codes.

UST085W **WARNING – FILES BACK TO FULL IGNORED FOR NON-MERGE**

Reason: A workstation user requested a "back-to-full" restore, but the backups to be restored were not MERGE backups, so the option was ignored. The restore will proceed.

UST086E **APPC RECEIVE REQUEST TIMEOUT – *function* TERMINATED**

Reason: A function in progress will be terminated after a period of ten minutes if no data is received from the workstation.

Action: Review the UPSTREAM log on the workstation to determine the cause of the time-out.

UST087E* **LU=*luname* USERID/PASSWORD OR PROFILE VALIDATION UNSUCCESSFUL**

Reason: The SAF (security) call to verify the userid and password or profile name provided by the workstation user (as requested by SECLVL=1 or 2 in the UPSTREAM Configuration) has failed. The user may have specified the wrong userid, password or profile name.

Action: Verify the specified userid, password and profile name are correct and are defined correctly to your security system.

UST088E **ROLLOFF – VSAM POINT REQUEST FOR "R" RECORD FAILED**

Reason: During "Version Rolloff" processing, a VSAM error indication was return to a POINT request. This message is accompanied by message UST051E containing the VSAM error codes as reported.

Action: Refer to the IBM "VSAM MACRO REFERENCE" or "MACRO INSTRUCTIONS FOR DATA SETS" manual (depending on the level of your operating system) to understand the error codes reported.

UST089E **ROLLOFF – NO "R" RECORD FOUND FOR ROLLOFF**

Reason: The FDR/UPSTREAM-MVS "Version Rolloff" routine was called in error.

Action: This is an internal error. Please retain all error information and contract Innovation Data Processing Technical Support for assistance.

UST090E **ROLLOFF – VSAM ERASE FOR "R" RECORD FAILED**

Reason: The FDR/UPSTREAM-MVS "Version Rolloff" routine received a VSAM error indication from an ERASE request. This message is accompanied by message UST051E containing the VSAM error codes as reported.

Action: Refer to the IBM "VSAM MACRO REFERENCE" or "MACRO INSTRUCTIONS FOR DATA SETS" manual (depending on the level of your operating system) to understand the error codes reported.

UST091E **ROLLOFF – VSAM PUT FOR "R" RECORD FAILED**

Reason: The FDR/UPSTREAM-MVS "Version Rolloff" routines received a VSAM error indication from a PUT request. This message is accompanied by message UST051E containing the VSAM error codes as reported.

Action: Refer to the IBM "VSAM MACRO REFERENCE" or "MACRO INSTRUCTIONS FOR DATA SETS" manual (depending on the level of your operating system) to understand the error codes reported.

UST092E **ROLLOFF – VSAM GET FOR "R" RECORD FAILED**

Reason: The FDR/UPSTREAM-MVS "Version Rolloff routines received a VSAM error indication from a GET request. This message is accompanied by message UST051E containing the VSAM error codes as reported.

Action: Refer to the IBM "VSAM MACRO REFERENCE" or "MACRO INSTRUCTIONS FOR DATA SETS" manual (depending on the level of your operating system) to understand the error codes reported.

UST093W **RESTORE: CATALOG ARCHIVE-RECORD NOT FOUND**

Reason: During FDR/UPSTREAM-MVS Restore processing for a specified "versiondate", no records were found.

Action: Use the "Inquire Versions" request on the Restore menu to list all available versions, to verify your request was correct. If your request was correct, this is an internal error; retain all error information and contact Innovation Data Processing Technical Support for assistance.

CONTINUED . . .

10.2

UST094E **OPEN FOR ARCHOLD DATASET FAILED**

Reason: During FDR/UPSTREAM-MVS Restore processing, an error indication was received trying to open the Archive dataset.

Action: Refer to your System log for any additional messages to resolve the problem.

UST095E **DYNALLOC ERROR:** ***reason***
R15=*rrrr* CODE=*cccc* INFO=*iiii* DSN=*dsname*
DYNALLOC MSGS: ***messages***

Reason: This message is issued when the dynamic allocation (SVC 99) request for a tape or disk sequential dataset fails with a non-zero return code. If the error code is a common one, a brief explanation of the cause is shown as "reason". In any case, the return code (rrrr), return code (cccc) and information code (iiii) returned by SVC 99 are shown, as well as the name of the data set whose allocation failed. If SVC 99 also returned any messages (such as SMS errors) they are also displayed.

Action: If you cannot determine the cause of the error from the messages printed, dynamic allocation error codes are listed in various IBM manuals, depending on your MVS level:
XA -- "SPL: SYSTEM MACROS AND FACILITIES"
ESA3 -- "SPL: APPLICATION DEVELOPMENT GUIDE
ESA4/ESA5 -- "AUTHORIZED ASSEMBLER PROGRAMMING GUIDE"
and are also listed in Appendix A of the IBM ISPF online HELP.

If you are unable to resolve the problem, please retain all error information, including your System log, and contact Innovation Technical Support for assistance.

UST096E **RESTORE: ARCHIVE VOLUME NOT IN CURRENT SET – FILE NOT ACCESSIBLE**

Reason: During a Restore from the Archive dataset, FDR/UPSTREAM-MVS was unable to mount the correct volume.

Action: This indicates an internal error in the Repository Catalog records. Please retain all error information, including your System log, and contact Innovation Data Processing Technical Support for assistance.

UST097W **IMMEDIATE SHUTDOWN REQUESTED – *function* TERMINATED**

Reason: The indicated function was in progress when FDR/UPSTREAM-MVS received an immediate shutdown request from the System Operator. The function is terminated.

UST098E **LOGON EXIT – NOT APPC INIT REQUEST**

Reason: During session initiation processing, the main task “logon exit” has determined that the requested session is not LU type-6.2.

Action: Be sure the LU attempting the session initiation is using the correct VTAM MODE table and MODE entry.

UST099E **APPC ACTSESS REQUEST FAILED**

Reason: This message indicates VTAM returned an error indication to an APPC “ACTSESS” request to activate the session to the Workstation. This message is accompanied by message UST038E containing the VTAM error codes from the RPL control block.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to understand the error codes.

UST100W **'QUIT' REQUESTED – INITIATION ABORTED**

Reason: A **F UPSTREAM,TERM** or **F UPSTREAM,QUIT** console command was entered to request immediate termination of UPSTREAM. This workstation was in the process of initiating a conversion; it is terminated.

UST101E ***type* EXIT – CHECK FOR ACTSESS ERROR**

Reason: This message indicates VTAM returned an error indication to an APPC “CHECK” request to activate the pending active session to the workstation. This message is accompanied by message UST038E containing the VTAM error codes from the RPL control block.

Action: Refer to the IBM “VTAM PROGRAMMING FOR LU 6.2” manual to understand the error codes.

UST102W **PROFILE NAME ALREADY IN USE – DISALLOWED**

Reason: A workstation attempted to use a Profile Name which was already in use by another workstation currently in conversation with UPSTREAM.

Action: Verify that the same Profile Name has not been accidentally assigned to two workstations, and that the two workstations involved are using the correct Profile Names.

10.2

UST102W PROFILE NAME *profilename* NOT AUTHORIZED – DISALLOWED

Reason: A workstation user requested display or update of a profile in the FDR/UPSTREAM configuration, and SECLVL=2 or 3 was in effect, but the userid entered by the user was not authorized for ALTER access to the profile name requested.

Action: Repeat the request using a userid that is authorized to ALTER the profile name, or update your security system to authorize the userid.

UST103E LOGON EXIT – INQUIRE SESSPARM ERROR

Reason: The Main Task VTAM LOGON EXIT was unable to issue an INQUIRE request to verify the suggested BIND image. The session request is denied. This message is accompanied by message UST038E containing the VTAM error indicators. Please refer to the IBM VTAM PROGRAMMING

Action: Refer to the IBM "PROGRAMMING FOR LU 6.2" manual to understand the error codes.

UST104W LU=*luname* – USING DEFAULT BIND

Reason: This message is issued from within the Main Task VTAM LOGON exit. The supplied BIND image failed LU 6.2 standard verification. FDR/UPSTREAM-MVS will attempt to use the internal default Bind image to establish the session.

Action: If you are using the IBM-supplied #INTER log mode table entry for FDR/UPSTREAM sessions (See Section 2.6), this is normal and can be ignored. Otherwise, verify that the specified parameters in the mode table entry you are using are correct for an LU 6.2 session.

UST105E RESTORE: APPC RECEIVE FOR EVENT RECORD FAILED

Reason: The RESTORE logic detected an error report forthcoming from the indicated workstation. However, VTAM reported an error during the Receive request for the error event record. This message is accompanied by message UST038E containing the VTAM error codes from the RPL control block.

Action: Refer to the IBM "PROGRAMMING FOR LU 6.2" manual to understand the error codes.

UST106 FDR/UPSTREAM CUSTOMER NUMBER *nnnnnnnn*

Reason: This message is informational only. It is issued by the FDR/UPSTREAM-MVS main task during its initialization. If this is a FDR/UPSTREAM trial, the text "TRIAL VERSION" will appear instead of a customer number.

UST107W* *nnnn* DAYS TO UPSTREAM EXPIRATION

Reason: This message is issued during main task initialization to indicate the FDR/UPSTREAM-MVS product authorization time period is about to expire.

Action: Contact Innovation Data Processing technical support if you have any questions.

UST108 MAXIMUM WORKSTATIONS PERMITTED = *nnnn*

Reason: This message is informational only. It is issued during main task initialization to indicate the number of workstations licensed for use.

UST109E AUTHORIZATION FAILED, CODE = *nn*

Reason: During initialization, the FDR/UPSTREAM-MVS main task found an authorization violation. The "CODE=nn" value indicates the type of authorization failure.

Action: Retain the error log and contact Innovation Data Processing Technical Support for assistance.

UST110E* MAXIMUM WORKSTATIONS EXCEEDED CODE = *nn* LU = *luname*

Reason: This message is issued by the UPSTREAM main task to indicate you have exceeded the maximum number of workstations licensed. The value of "nn" is the number of licensed workstations, and the "luname" value is the LUname of the workstation UPSTREAM is attempting to add.

Action: Contact Innovation Data Processing technical support for assistance.

UST111E* UPSTREAM USE HAS EXPIRED, CONTACT INNOVATION DATA FOR ASSISTANCE

Reason: This message is issued by the UPSTREAM main task to indicate that the timed use of the product has expired. FDR/UPSTREAM-MVS will not start.

Action: Contact Innovation Data Processing Technical Support for assistance.

CONTINUED . . .

10.2

UST112 **WS FILE SKIPPED:** ***wsfilename***

Reason: This message is informational, it is issued during a Backup process to indicate that the workstation notified the mainframe it is skipping a file. This is a normal condition and is encountered if the workstation finds a file inaccessible during the Backup process.

UST113 **CHECKSUM ERROR:*checksm1-checksm2 wsfilename***

Reason: During a full MERGE backup, the checksum validation option was requested. For files which are already on the backup and do not need to be translated, FDR/UPSTREAM will calculate a checksum of each workstation file on the workstation and also on MVS (from the backup). This message is issued if the checksums do not match; "checksm1" is the checksum from MVS, "checksm2" is the checksum from the workstation. This detects files which have changed on the workstation since the last backup but were not flagged as requiring backup.

Action: The workstation file whose checksum did not match will be retransmitted from the workstation.

UST114E **MAINFRAME VSAM ERROR**

Reason: This message is issued during a Backup process along with a group of other messages indicating an error was encountered during a VSAM request. This message is also sent to the workstation.

Action: Review the other messages associated with the VSAM error.

UST115E **REQUESTED RECORDSIZE EXCEEDS ALLOWED BLKSIZE – TERMINATING**

Reason: The “RECORDSIZE” value specified in the workstation backup parameters exceeded the allowable blocksize for the target device.

Action: Verify that a valid “RECORDSIZE” value was specified for the backup request. If the request is for a “sequential DASD” backup, you may increase the “DASDBLK” value in the FDR/UPSTREAM-MVS mainframe configuration to accommodate the request.

UST116E **ATTNEXIT: APPC ERROR RCVFMH5 REJECT FAILED**

Reason: A FMH5 was received in error; a request to REJECT it did not complete successfully. This message is accompanied by message UST038E containing the VTAM additional information.

Action: Review that additional information to resolve the problem. Review the UPSTREAM log on the workstation for information as to the cause of the failure.

UST117 **INQUIRE-VERSIONS PROCESS STARTED**

Reason: An inquire-versions request was received from a workstation.

UST118E **PRIMARY RECEIVE PACING=ZERO – SESSION DISALLOWED *****

Reason: The UPSTREAM main task VTAM logon exit found, during session initiation, that the bind contained a zero value for the primary receive pacing count. Using this value could result in serious mainframe problems. The logon exit instead disallowed the requested session.

Action: Verify that the VTAM APPL definition for FDR/UPSTREAM-MVS contains a valid “VPACING” value. Contact Innovation Data Processing Technical Support for assistance.

UST119E* **APF AUTHORIZATION CHECK FAILED – CANNOT CONTINUE**

Reason: During initialization, an FDR/UPSTREAM-MVS component has determined that it is not running as an APF authorized task. FDR/UPSTREAM terminates.

Action: Verify that the load library from which FDR/UPSTREAM-MVS is being run is APF authorized in the MVS system.

UST120E **RECEIVE FOR RESTORE-DESC REPEATED STRUCTURE FAILED**

Reason: The Sequential Restore process received an error indication from VTAM after issuing an APPC receive request. This message is accompanied by others with specific VTAM error information.

Action: Refer to the additional error information to resolve the problem. Contact Innovation Technical Support for assistance.

UST121E **UNEXPECTED DEALLOCATE RECEIVED FROM WORKSTATION**

Reason: The Sequential Restore process received an unexpected LU 6.2 Deallocate indication, terminating the active conversation.

Action: Review the UPSTREAM log file on the workstation for an indication as to the error cause. Contact Innovation Technical Support for assistance.

10.2

UST122W RESTORE: C-RECORD NOT FOUND FOR SPECIFIC VERSIONDATE

Reason: The sequential restore processor was unable to locate a catalog record for the requested versiondate. It is possible that the original backup was not committed prior to it's termination.

Action: Perform an “inquire versions” function to verify that you are requesting a valid versiondate as recorded in the VSAM repository.

UST123E ARCHIVE RESTORE DISALLOWED – SECURITY CHECK FAILED

Reason: SECLVL=2 or 3 was specified in the configuration, and the security check for tape restores failed.

Action: See Section 4 “Security” for details on authorizing restores from tape.

UST124E APPC SEND OF BACKUP-DESCRIPTION FAILED

Reason: FDR/UPSTREAM-MVS received an error indication after issuing an APPC Send request. This message is accompanied by other messages indicating the VTAM return information.

Action: Refer to those additional messages to resolve the problem.

UST125E RESTORE: CATALOG S-RECORD NOT FOUND

Reason: The sequential restore process was unable to locate the catalog record requested. It is possible that the backup was terminated before it was committed.

Action: Perform an “inquire versions” request to determine whether the backup information does exist. Verify that you are using the correct version information in the request. Verify that the sequential backup dataset exists and is cataloged in the system.

UST126E DYNALLOC ERROR: R15=*rrrrrr* CODE=*cccc* INFO=*iiii*

Reason: The sequential restore process was unable to dynamically allocate the requested sequential backup dataset. The additional information fields contain the return codes and information reason codes associated with the failed dynamic allocation request.

Action: Verify that the requested sequential backup dataset exists and is cataloged in the system. See message UST095E for information on interpreting the error codes.

UST127E OPEN FOR RESTORE DATASET FAILED

Reason: The sequential restore process was unable to open the sequential dataset to perform the restore.

Action: Verify that the requested sequential backup dataset exists and is cataloged in the system. Use another system utility to verify that the backup sequential dataset is the correct format and has not been altered, copied to a different format, or corrupted in any way.

UST128W NO CATALOG RECORD FOUND FOR THIS PROFILE NAME

Reason: The sequential restore process was unable to locate the FDR/UPSTREAM-MVS catalog record for the requested sequential backup.

Action: Perform an “inquire versions” request to verify that you are requesting the correct Profile Name and versiondate.

UST129E APPC SEND FOR F-RECORD FAILED

Reason: The sequential restore process received an error indication from VTAM after issuing an APPC Send-Data request for a File-Information Record. This message is accompanied by message UST038E containing the VTAM additional information.

Action: Review that additional information to resolve the problem. Review the UPSTREAM log on the workstation for information as to the cause of the failure.

UST130E INSUFFICIENT STORAGE FOR MERGE BACKUP

Reason: The MERGE BACKUP function requires storage above the 16MB line; the amount varies by the number of files involved and the number of concurrent backups in progress. Insufficient storage was available for the MERGE BACKUP requested by this workstation and the backup is terminated.

Action: Increase the above the line storage available to FDR/UPSTREAM-MVS by coding a REGION= value on the EXEC statement in the UPSTREAM start-up proc, with a value greater than 32M (32MB is the default above the line storage size), or schedule the MERGE BACKUPs so that fewer are running concurrently.

UST131W IMMEDIATE SHUTDOWN REQUESTED – RESTORE TERMINATED

Reason: The sequential restore process was notified that the system operator requested an immediate UPSTREAM shutdown.

CONTINUED . . .

10.2

UST132E RESTART: BACKUP ALREADY ARCHIVED – CANCELLED

Reason: Restart of an interrupted backup was attempted, but UPSTREAM records indicate that the backup was successfully completed.

Action: No restart is required.

UST133E APPC DEALLOCATE-CONFIRM REQUEST FAILED

Reason: The sequential restore process received an error indication from VTAM at the end of the restore process after issuing an APPC Confirm request. This message is accompanied by message UST038E containing the VTAM additional information.

Action: Review that additional information to resolve the problem. Review the UPSTREAM log on the workstation for information as to the cause of the failure.

UST134E APPC SEND FILE-DATA RECORD FAILED

Reason: The sequential restore process received an error indication from VTAM after issuing an APPC Send-Data request for a File-Data Record. This message is accompanied by message UST038E containing the VTAM additional information.

Action: Review that additional information to resolve the problem. Review the UPSTREAM log on the workstation for information as to the cause of the failure.

UST135E APPC RECEIVE FOR EVENT RECORD FAILED

Reason: The sequential restore process received an error indication from VTAM after issuing an APPC Receive request for a workstation event record. This message is accompanied by message UST038E containing the VTAM additional information.

Action: Review that additional information to resolve the problem. Review the UPSTREAM log on the workstation for information as to the cause of the failure.

UST136E RESTORE: DATA RECORD NOT FOUND IN BLOCK EXPECTED

Reason: The sequential restore process was unable to locate a data record during the restore in the block in which it was expected.

Action: Verify that you are restoring from the correct dataset, that it is not a copy of the current backup dataset. You may have to run the USTREGEN utility to make the copied dataset current in the VSAM control clusters.

UST137E RESTORE: UNABLE TO LOCATE BACKUP FILE FOR RESTORE

Reason: The sequential restore process was unable to dynamically allocate a *sequential disk* backup file to perform the restore. It received an indication that the file does not exist or is not cataloged. You may be attempting to restore from a sequential backup file that has been deleted or uncataloged in the system. This message is accompanied by message UST138E containing the dataset name FDR/UPSTREAM-MVS was attempting to dynamically allocate.

Action: Verify that the dataset exists and is cataloged.

UST138E DSN=*dsname*

Reason: This message accompanies message UST137E above. It contains the dataset name FDR/UPSTREAM-MVS was attempting to dynamically allocate.

UST139E UNABLE TO LOCATE BACKUP DATASET FOR RESTORE

Reason: The sequential restore process was unable to dynamically allocate a *sequential tape* backup file to perform the restore. It received an indication that the file does not exist or is not cataloged. You may be attempting to restore from a sequential backup file that has been deleted or uncataloged in the system. This message is accompanied by message UST159E containing the dataset name FDR/UPSTREAM-MVS was attempting to dynamically allocate.

Action: Verify that the dataset exists and is cataloged.

10.2

UST140E VTAM APPC ERROR

Reason: The sequential backup process received a non-zero return code from VTAM after issuing an APPC request. This message is accompanied by message UST038E containing the VTAM additional information.

Action: Review that additional information to resolve the problem. Review the UPSTREAM log on the workstation for information as to the cause of the failure.

UST141 ***text of a message from the workstation***

Reason: This message is issued when a workstation in session with FDR/UPSTREAM-MVS sends an error or informational message. This message is a workstation message.

UST142W ***function*** **DISALLOWED BY CONFIGURATION**

Reason: The profile in use is not enabled for the function indicated.

Action: Review the FDR/UPSTREAM-MVS configuration file to determine whether this profile should be permitted to perform the requested function.

UST143E APPC RECEIVE FOR BACKUP-DESC-REP FAILED

Reason: The sequential backup process received a non-zero return code from VTAM after issuing an APPC Receive-Data request. This message is accompanied by message UST038E containing the VTAM additional information.

Action: Review that additional information to resolve the problem. Review the UPSTREAM log on the workstation for information as to the cause of the failure.

UST144E RECEIVED UNRECOGNIZED STRUCTURE

Reason: The sequential backup process received an unrecognized structure from the workstation.This is most likely an internal UPSTREAM error.

Action: Review the UPSTREAM log on the workstation for information as to the cause of the failure.

UST145E DYNALLOC ERROR: R15=*rrrrrrr* CODE=*cccc* INFO=*iiii*

Reason: The sequential backup process was unable to dynamically allocate the backup sequential backup dataset.

Action: Verify that the requested sequential backup dataset exists and is cataloged in the system. See message UST095E for information on interpreting the error codes.

UST146E * OPEN FOR BACKUP DATASET FAILED *****

Reason: The sequential backup process was unable to open the sequential backup output dataset.

Action: If you are unable to resolve the problem, contact Innovation Data Processing technical support for assistance.

UST147E SEND BACKUP-STARTED STRUCTURE FAILED

Reason: The sequential backup process received a non-zero return code from VTAM after issuing an APPC Send-Data request. This message is accompanied by message UST038E containing the VTAM additional information.

Action: Review that additional information to resolve the problem. Review the UPSTREAM log on the workstation for information as to the cause of the failure.

UST148E * MAINFRAME VSAM ERROR *****

Reason: The sequential backup process sends this message to the workstation to indicate an error occurred during a mainframe VSAM request.

UST149E DEALLOCATE-CONFIRM ERROR

Reason: The sequential backup process received a non-zero return code from VTAM after issuing an APPC Deallocate request. This message is accompanied by message UST038E containing the VTAM additional information.

Action: Review that additional information to resolve the problem. Review the UPSTREAM log on the workstation for information as to the cause of the failure.

CONTINUED . . .

10.2

UST150E BACKUP-DESC FLAG LENGTH ERROR

Reason: The sequential backup process received an invalid internal structure from the workstation. The most probable cause for this problem is that the workstation is using an old, unsupported version of UPSTREAM.

Action: If you are unable to resolve the problem, contact Innovation Data Processing technical support for assistance.

UST151W DASD BACKUP DISALLOWED BY CONFIGURATION

Reason: The sequential backup process has determined that this workstation profile name was not configured to allow sequential backups to mainframe DASD.

Action: Review your mainframe configuration file. Verify that this Profile Name is permitted to perform *sequential disk* backups.

UST152W TAPE BACKUP DISALLOWED BY CONFIGURATION

Reason: The sequential backup process has determined that this workstation profile name was not configured to allow sequential backups to mainframe tape.

Action: Review your mainframe configuration file. Verify that this Profile Name is permitted to perform *sequential tape* backups.

UST153E REMOVE-FILE NAME MISMATCH – IGNORED

Reason: The sequential backup process received a REMOVE-FILE request from the workstation for a file other than the current file being processed.

Action: This is an internal error. Notify Innovation Technical Support as soon as possible.

UST154W CATALOG RECORD NOT FOUND FOR BACKUP RESTART

Reason: The sequential backup process was unable to locate the control record to restart the backup. The prior backup may not have progressed far enough to be committed.

Action: Perform an “inquire versions” process to determine whether you are attempting to restart an interrupted backup, whether this backup actually exists.

UST155E ERROR READING CATALOG RECORD – UNABLE TO RESTART BACKUP ***

Reason: The sequential backup process was unable to read the required control record to restart the backup. The prior backup may not have progressed far enough to be committed.

Action: Perform an “inquire versions” process to determine whether you are attempting to restart an interrupted backup, whether this backup

UST156E TAPE BACKUP DISALLOWED – NO UNIT VALUE SPECIFIED IN CONFIGURATION

Reason: The *sequential tape* backup process is unable to build the dynamic allocation request because the “TUNIT” value was not specified in the FDR/UPSTREAM-MVS configurator input “DEFINE” record for this Profile Name.

Action: This may be perfectly valid if you intended to disallow this workstation Profile Name from performing *sequential tape* backups. Otherwise, verify that the configuration “DEFINE” record for this Profile Name contains the “TUNIT” parameter to specify the MVS “unitname” to be used for the dynamic allocation request.

10.2

UST157E MERGE BACKUP ERROR – REASON=reason text

Reason: A MERGE BACKUP was requested by the workstation, but it failed for the reason indicated. Possible reason codes and the actions to be taken are:

1 – PREVIOUS FULL BACKUP NOT FOUND
FDR/UPSTREAM-MVS cannot find a record of a previous full backup taken under this profile. Either it has expired or one was never taken. Take a “first time full” backup.

2 – ERROR READING CATALOG FOR PREVIOUS BACKUP
FDR/UPSTREAM-MVS could not successfully read its catalog records to locate the previous backup under this profile. Contact Innovation for assistance. If necessary, take a “first time full” backup.

3 – PROFILE DOES NOT ALLOW MERGE BACKUP
The profile does not have the MERGE attribute, so MERGE BACKUPs cannot be done. Use a different profile with MERGE, or update the configuration to add MERGE to this profile, or do a “non-MERGE backup”.

4 – OPERATOR CANCELLED MOUNT OF PREVIOUS TAPE – CALLING FOR SCRATCH
The console operator replied NO to the console messages requesting that a previous backup tape be mounted so that UPSTREAM can append data to it. UPSTREAM will call for the mount of a SCRATCH tape instead.

5 – OPERATOR CANCELLED MOUNT OF MERGE BACKUP
The console operator replied NO to the console messages requesting that a previous backup tape be mounted. If message UST157 REASON=Z is issued, UPSTREAM will recover by requesting the missing files from the workstation. Otherwise, a “first-time full” backup will have to be done.

6 – PREVIOUS FULL BACKUP FAILED TO OPEN
An OPEN error occurred when trying to open a previous backup. See the MVS SYSLOG or the UPSTREAM JOBLOG for IBM messages indicating the error. Contact Innovation for assistance. UPSTREAM will recover by requesting the missing files from the workstation.

7 – DYNAMIC ALLOCATE FAILED FOR PREVIOUS FULL BACKUP COMP=*cccc* DSN=*dsn*
FDR/UPSTREAM-MVS had an error (completion code “cccc”) trying to dynamically allocate the previous full backup file named “dsn”. See message UST095E for codes. UPSTREAM will recover by requesting the missing files from the workstation.

8 – DEBLOCKING ERROR
FDR/UPSTREAM-MVS found an invalidly formatted block when reading a previous backup tape. That backup is probably not usable. UPSTREAM will recover by requesting the missing files from the workstation.

9 – NO PREVIOUS BACKUPS WILL REQUEST FILES FROM PC
FDR/UPSTREAM-MVS could not find a catalog record for a previous backup for this profile. Either it has expired or one was never taken. All required files will be requested from the workstation.

A – FILEDATA WITHOUT FILEINFO
FDR/UPSTREAM-MVS did not find expected file-info records on a previous backup tape. This is probably due to a backup taken with a version of UPSTREAM prior to V2.3.2 after MERGE BACKUPs were taken under this profile. A “first-time full” backup will have to be done. If necessary, contact Innovation for assistance.

Y – DUE TO PRIOR ERROR MERGE TERMINATED
A preceding message indicates that an error occured during a Full Merge Migration. No recovery is possible so the Merge was terminated. See Section 1.6 for the necessary actions you must take before rerunning the Migration.

Z – DUE TO PRIOR ERROR WILL REQUEST MISSED FILES FROM PC
This is an information message which follows another message and indicates that the previous error is one that UPSTREAM can recover from by requesting files from the workstation to replace those that it was unable to copy from a previous backup.

CONTINUED . . .

10.2

UST158 *aaaaaaaa* **MERGE FILES:** *bbbbbbbb* **COPIED FROM BACKUP**
cccccccc **ALREADY ON BACKUP** *ddddddd* **FROM PC IN PHASE3**
eeeeeeee **DEFERRED MERGE FILES**
ffffffff **FILES MIGRATED:** *gggggggg* **MIGRATED FILES COPIED**
hhhhhhhh **MIGRATED FILES DELETED**
IIIIIIII **COPYINCR FILES:** *mmmmmmmm* **COPYINCR DIRECTORIES**
nnnnnnnn **BACKUPS COPIED TO FULL**
oooooooo **FILES COPIED FROM DUPLICATE DATABASE**
pppppppp **FILES SAVED IN DUPLICATE DATABASE**

Reason: At the end of a successful MERGE BACKUP, this message indicates what work the MERGE had to do. Not all parts of the message shown will appear, depending on what parts of the MERGE BACKUP process were required for this backup.

UST159E **DSN=***dsname*

Reason: This message accompanies message UST139E. It contains the dataset name FDR/UPSTREAM-MVS was attempting to dynamically allocate.

UST160W **NO RECORDS MATCH RESTORE SPECIFICATION**

Reason: The *sequential tape* restore process was unable to locate any backup records which match the requested restore specification.

Action: Verify that you are using a correct Profile Name and VersionDate value. You should perform an Inquire-Versions to verify that the backup version exists. Also, verify that the workstation path name you are requesting was contained in the backup you are attempting to restore. You should perform an Inquire-Files process to verify this.

UST161E **APPC SEND OF FILE-INFO RECORD FAILED**

Reason: The *sequential tape* restore process received an error indication from VTAM after issuing a SEND-DATA request to send a File-Information record to the workstation. This message is accompanied by message UST038E containing the VTAM error codes associated with this failed request.

Action: Refer to the IBM “VTAM Programming for LU 6.2” manual to resolve the error.

UST162E **OPEN FOR SEQUENTIAL BACKUP FILE FAILED**

Reason: The *sequential tape* restore process received an error indication trying to OPEN the *sequential tape* backup dataset.

Action: If you are unable to resolve the problem, retain all error information and contact Innovation Data Processing Technical Support for assistance as soon as possible.

UST163E **APPC SEND OF FILE-DATA RECORD FAILED**

Reason: The *sequential tape* restore process received an error indication from VTAM after issuing a SEND-DATA request to send a File-Data record to the workstation. This message is accompanied by message UST038E containing the VTAM error codes associated with this failed request.

Action: Refer to the IBM “VTAM Programming for LU 6.2” manual to understand the error codes.

UST164E **DYNALLOC ERROR: R15=***rrrrrrr* **CODE=***cccc* **INFO=***iiii*

Reason: The *sequential tape* restore process received an error indication trying to dynamically allocate the tape backup dataset to perform the restore process.

Action: Verify that the requested sequential backup dataset exists and is cataloged in the system. See message UST095E for information on interpreting the error codes.

UST165E **GOTEVENT APPC RECEIVE ERROR**

Reason: The *sequential tape* restore process received an error indication from VTAM while attempting to receive an “event” information record from the workstation. This message is accompanied by message UST038E containing the VTAM error codes associated with this failed request.

Action: Refer to the IBM “VTAM Programming for LU 6.2” manual to understand the error codes.

10.2

UST166W NO FILES MEET RESTORE SPECIFICATION *versiondate filespec*

Reason: The *sequential tape* restore process was unable to locate any files which match the requested restore specification.

Action: Verify that the workstation has specified the correct Profile Name and Versiondate for the restore request; perform an Inquire-Versions request to verify this. Verify that the workstation has specified a valid restore file specification path name that is contained in the backup version being requested; run a Inquire-Files request on this version to verify this.

UST167E OPEN FOR SEQUENTIAL BACKUP FILE FAILED

Reason: The *sequential tape* restore process was unable to OPEN the sequential backup file to perform the restore.

Action: If you are unable to resolve the problem, retain all error information and contact Innovation Data Processing Technical Support for assistance as soon as possible.

UST168E APPC SEND OF FILE-INFO RECORD FAILED

Reason: The *sequential tape* restore process received an error indication from VTAM while attempting to send a File-Information record to the workstation. This message is accompanied by message UST038E containing the VTAM error codes and information.

Action: Refer to the IBM “VTAM Programming For LU 6.2” manual to understand the error codes.

UST169E APPC SEND OF FILE-DATA RECORD FAILED

Reason: The *sequential tape* restore process received an error indication from VTAM while attempting to send a File-Data record to the workstation. This message is accompanied by message UST038E containing the VTAM error codes and information.

Action: Refer to the IBM “VTAM Programming For LU 6.2” manual to understand the error codes.

UST170E EVENT HANDLER APPC RECEIVE ERROR

Reason: The *sequential tape* restore process received an error indication from VTAM while attempting to receive an event record from the workstation. This message is accompanied by message UST038E containing the VTAM error codes and information.

Action: Refer to the IBM “VTAM Programming For LU 6.2” manual to understand the error codes.

UST171E DATA RECORD NOT FOUND FOR RESTORE

Reason: The *sequential tape* restore process found that the data requested by the workstation for restore was not where FDR/UPSTREAM records indicate it should be located.

Action: Verify that the correct tape dataset is being used for the restore and that it is not a copy of the tape backup. If so, you will need to run the USTREGEN utility to make that tape dataset usable for restore processing.

UST172E *error type* FOR RESTORE OF FILE=*file description*

Reason: The *sequential tape* restore process found that the data requested by the workstation for restore was not where FDR/UPSTREAM records indicate it should be located. “error type” will be
NO DATA RECORD FOUND – if no records were found at all
DATA RECORDS MISSING – if some records were found
VSAM RECORD ERROR – if an error occurred reading the FDR/UPSTREAM repository, or PREMATURE END-OF-FILE – if the end of the backup was encountered when not expected.
"file description” will include the data set name, volume serial, and location information describing the backup file where the error occurred.

Action: Verify that the correct tape data set is being used for the restore and that it is not a copy of the tape backup. If so, you will need to run the USTREGEN utility to make that tape data set usable for restore processing.

UST173 *function* COMPLETED SUCCESSFULLY (LU=luname)

Reason: This message is issued by all processes to show that the indicated function has completed successfully. This message may optionally be written to the system log (SYSLOG) if the “WTOCOMP” option was specified in the FDR/UPSTREAM-MVS configurator “MAIN” record.

UST174W *function* COMPLETED WITH ERRORS (LU=luname)

Reason: This message is issued by all processes to show that the indicated function has completed with some potential errors. This may simply indicate that one or more of the files requested for backup were not available for one reason or another at the time the backup was performed (“skipped files”). This message may optionally be written to the system log (SYSLOG) if the “WTOCOMP” option was specified in the FDR/UPSTREAM-MVS configurator “MAIN” record.

CONTINUED . . .

10.2

UST175E ***function* FAILED *reason* (LU=*luname*)**

Reason: This message is issued by all processes to indicate the indicated function has failed. This message may optionally be written to the system log (SYSLOG) if the "WTOCOMP" option was specified in the FDR/UPSTREAM-MVS configurator "MAIN" record. "reason" may be "WAS SUSPENDED" if the workstation requested suspension or "COMMUNICATIONS" if the failure was due to a communications error; otherwise it will be blank.

Action: Review any preceding messages in the FDR/UPSTREAM-MVS log file, the MVS system log (SYSLOG), and the workstation UPSTREAM log file for the causes of the process failure.

UST176 **RESTORE COMPLETED SUCCESSFULLY (LU=*luname*)**

Reason: This message is issued by all restore processes to indicate a restore has completed successfully. This message may optionally be written to the system log (SYSLOG) if the “WTOCOMP” option was specified in the FDR/UPSTREAM-MVS configurator “MAIN” record.

UST177W **RESTORE COMPLETED WITH ERRORS (LU=*luname*)**

Reason: This message is issued by all restore processes to indicate a restore process has encountered errors. This message may optionally be written to the system log (SYSLOG) if the “WTOCOMP” option was specified in the FDR/UPSTREAM-MVS configurator “MAIN” record.

Action: Review any preceding messages in the FDR/UPSTREAM-MVS log file, the MVS system log (SYSLOG), and the workstation UPSTREAM log file for the causes of the process errors.

UST178E **RESTORE FAILED *reason* (LU=*luname*)**

Reason: This message is issued by all restore processes to indicate a restore process has failed. This message may optionally be written to the system log (SYSLOG) if the "WTOCOMP" option was specified in the FDR/UPSTREAM-MVS configurator "MAIN" record. "reason" may be "WAS CANCELLED" if the workstation requested termination or "COMMUNICATIONS" if the failure was due to a communications error; otherwise it will be blank.

Action: Review any preceding messages in the FDR/UPSTREAM-MVS log file, the MVS system log (SYSLOG), and the workstation UPSTREAM log file for the causes of the process errors.

UST179E **FILE-INFO VOL=*vvvvvv* AND BACKUP CATALOG DO NOT MATCH ON DSN=*dsname***

Reason: The volume information in the FDR/UPSTREAM File-Info dataset and that in the system catalog entry for the backup dataset do not match.

Action: Attempt to determine the reason for the mismatch. If you can determine which volume list is correct, either recatalog the backup dataset (e.g., IDCAMS DEFINE NONVSAM) or run USTREGEN against the backup tapes to update the UPSTREAM information (see Section 8).

UST180E **SUBTASK PROCESS FAILED *profilename luname* COMP=‘*nnnnnn*’**

Reason: This message is issued by the FDR/UPSTREAM-MVS main task to indicate that a subtask process has abnormally terminated; “nnnnnn” is the subtask completion or abend code. This message may optionally be written to the system log (SYSLOG) if the “WTOCOMP” option was specified in the FDR/UPSTREAM-MVS configurator “MAIN” record.

Action: Review the FDR/UPSTREAM-MVS JES “joblog” to determine the cause of the subtask failure.

UST181W **NO FILES FOUND FOR VERDATE=*versiondate* PATH=*fileid***

Reason: This message is issued by the FDR/UPSTREAM-MVS sequential restore processes to indicate they were unable to locate any File-Information records which matched the requested restore specification.

Action: Verify that the workstation is using the correct Profile Name and VersionDate to perform the restore; perform an Inquire-Versions request to verify this. Verify that the workstation is using a valid file path name for the restore that was included in this backup version; perform an Inquire-Files request to verify this.

UST182E **APPC CNOS REQUEST FAILED**

Reason: During an initiation request an APPC “CNOS” request to VTAM returned an error indication. This message is accompanied by message group UST038E containing the VTAM error indicators.

Action: Refer to the IBM “VTAM Programming For LU 6.2” manual to resolve the error codes.

10.2

UST183E APPC SEND-DATA RUN-FUNCTION STRUCTURE FAILED

Reason: During an initiation request an APPC “send data” request to VTAM returned an error indication. This message is accompanied by message group UST038E containing the VTAM error indicators.

Action: Refer to the IBM “VTAM Programming For LU 6.2” manual to resolve the error codes provided by VTAM.

UST184E APPC ERROR ON RECEIVE FROM REQUESTOR

Reason: During an initiation request an APPC “receive data” request to VTAM returned an error indication. This message is accompanied by message group UST038E containing the VTAM error indicators.

Action: Refer to the IBM “VTAM Programming For LU 6.2” manual to resolve the error codes provided by VTAM.

UST185E APPC ERROR ON SEND-DATA TO WORKSTATION

Reason: During an initiation request an APPC “send-data” request to VTAM returned an error indication. This message is accompanied by message group UST038E containing the VTAM error indicators.

Action: Refer to the IBM “VTAM Programming For LU 6.2” manual to resolve the error codes provided by VTAM.

UST186E APPC ERROR ON DEALLOC-CONFIRM TO WORKSTATION

Reason: During an initiation request an APPC “deallocate-confirm” request to VTAM returned an error indication. This message is accompanied by message group UST038E containing the VTAM error indicators.

Action: Refer to the IBM “VTAM Programming For LU 6.2” manual to resolve the error codes provided by VTAM.

UST187E ERROR RECEIVING TYPE-90 EVENT RECORD FROM WORKSTATION

Reason: During an initiation request an APPC “receive data” request for an error notification message from the workstation returned an error indication. This message is accompanied by message group UST038E containing the VTAM error indicators.

Action: Refer to the IBM “VTAM Programming For LU 6.2” manual to resolve the error codes provided by VTAM.

UST188E INVALID STRUCTURE RECEIVED FROM WORKSTATION – EXPECTED TYPE-*xx* EVENT

Reason: During an initiation request an invalid structure was received from the workstation LU. This is most likely an internal UPSTREAM error.

Action: Please retain all the error information and contact Innovation Data Processing Technical Support for assistance.

UST189E APPC SEND-CONFIRMED TO REQUESTOR FAILED

Reason: During an initiation request an APPC “send-confirmed” request to the USTBATCH requestor returned an error indication. This message is accompanied by message group UST038E containing the VTAM error indicators.

Action: Refer to the IBM “VTAM Programming For LU 6.2” manual to resolve the error codes provided by VTAM.

UST190E APPC/TCP ALLOCATE ERROR

Reason: VTAM returned an error indication as the result of the FDR/UPSTREAM-MVS mainframe-initiator module having issued an APPC “ALLOCATE” request to initialize a conversation to the indicated workstation. This message is accompanied by message group UST038E containing the VTAM error indicators from the RPL control block. It can also be caused by the equivalent function in TCP/IP.

Action: Refer to the IBM “VTAM Programming For LU 6.2” manual to resolve the error codes provided by VTAM.

UST191E UNEXPECTED DEALLOCATE RECEIVED FROM WORKSTATION

Reason: An APPC “deallocate” indication was detected prematurely. This message is accompanied by message UST038E containing the VTAM error indicators.

Action: Refer to the IBM “VTAM Programming For LU 6.2” manual to resolve the error codes provided by VTAM.

UST192E DEALLOCATE RECEIVED FROM REQUESTOR – REQUEST TERMINATED

Reason: During an initiation request an APPC “deallocate” indication was received from the requestor prematurely. The initiation request is being discarded. This message is accompanied by message UST038E containing the VTAM error indicators.

Action: Refer to the IBM “VTAM Programming For LU 6.2” manual to resolve the error codes provided by VTAM.

CONTINUED . . .

10.2

UST193E ***reason*** **– REQUEST FAILED**

Reason: During an remote initiation attempt (USTBATCH), the request could not be initiated due to the reason indicated. This message may be accompanied by message UST038E containing the VTAM error indicators.

Action: Validate that the target workstation name is valid and that the workstation is active and eligible for a session and conversation request (for TCP/IP-connected workstations, FDR/UPSTREAM may need to started on the workstation before the remote initiation is attempted).

UST194E **TARGET LU IS INVALID – REQUEST FAILED**

Reason: The USTBATCH utility found the specified "TARGLU" value to be invalid. This can also occur if TARGNAME= was specified but the indicated name was not registered.

Action: Verify that the "TARGLU" value specified to USTBATCH is correct. If the target name was not registered, ensure that the name is registered and resubmit the request.

UST195E **LOGMODE NAME IS INVALID – REQUEST FAILED**

Reason: The USTBATCH utility found the value specified for the “LOGMODE” parameter was invalid.

Action: Verify that the “LOGMODE” parameter value specified to the USTBATCH utility is valid.

UST196E **REQUEST PARAMETER ERROR RC='*xxxxxxxx*'**

Reason: The USTBATCH utility found an invalid parameter in the input stream.

Action: Correct the indicated parameter statement.

UST197 **REMOTE INITIATION TO *lu1* FROM *lu2* - USTBATCH JOBNAME=jobname USERID=userid**

Reason: This is an informational message indicating a remote initiation is in progress from an LU named "lu2" to an LU named "lu1'. If the request is from USTBATCH, the batch jobname or TSO userid running USTBATCH is shown. If the security userid was successfully extracted from that job or TSO session, it is also shown.

UST198E **APPC ERROR RECEIVING RUN-FUNCTION FROM REQUESTOR**

Reason: During an initiation request an APPC “receive data” request to VTAM returned an error indication. This message is accompanied by message UST038E containing the VTAM error indicators.

Action: Refer to the IBM “VTAM Programming For LU 6.2” manual to resolve the error codes provided by VTAM.

UST199E **INITIATOR UNABLE TO GENERATE A VTAM RPL – POSSIBLE STORAGE SHORTAGE**

Reason: During an initiation request the on-line initiator was unable to generate a VTAM RPL control block. This may indicate a storage shortage. This message is accompanied by message UST038E containing the VTAM error indicators.

Action: Refer to the IBM “VTAM Programming” manual to resolve the error codes provided by VTAM.

UST200E **RESTORE BACKUP DENIED DUE TO DUMMY (SIMULATE) PROFILE**

Reason: A request was received from a workstation to restore from a backup taken under a special DUMMYxxx profile used for backup testing and simulation. Such backups do not contain file data and cannot be restored.

UST200E **REMOVE BACKUP DENIED DUE TO DUPLICATE=NOCOPY OPTION**

Reason: A request was received from a workstation to remove from a *keyed* backup under the special USTDUPFL profile used for duplicate file support. The USTDUPFL profile has the DUPLICATE=NOCOPY option which inhibits this function. The backup was not removed.

UST201E **VSAM MODCB/POINT REQUEST FAILED**

Reason: The “remove-backup” processor encountered a VSAM error. This message is accompanied by message UST051E containing the VSAM error indicators.

Action: Refer to message UST051E for details on interpreting the error.

UST202E **REMOVE BACKUP ERROR REASON=*reason***

Reason: The “remove-backup” processor encountered an error for the reason shown.

Action: Based on the reason code, correct the error and resubmit the request.

UST203E **VSAM ERASE REQUEST FAILED**

Reason: The “remove-backup” processor encountered a VSAM error. This message is accompanied by message UST051E containing the VSAM error indicators.

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Action: Refer to message UST051E for details on interpreting the error.

UST204E *reqtype* **REQUEST FAILED – R15=***nnnnnnnn DSN=dsname*

Reason: The “remove-backup” processor encountered an error attempting to delete a sequential dataset. “reqtype” is LOCATE, SCRATCH, or UNCATALOG. “nnnnnnnn” is the return code in hex.

Action: If you are unable to resolve the problem, please retain all the error information and contact Innovation Data Processing Technical Support for assistance.

UST205E **DSN=***dsname*

Reason: The “remove-backup” processor encountered an error attempting to delete a sequential dataset. This message is accompanies message UST204E and identifies the dataset in error.

UST206E ***** APPC SEND CONFIRMED RESPONSE ERROR *****

Reason: The “remove-backup” processor encountered a VTAM error attempting to return an APPC “confirmed” response to the requestor. This message is accompanied by message group UST038E containing the VTAM error indicators.

Action: Refer to the IBM “VTAM Programming For LU 6.2” manual to resolve the error codes provided by VTAM.

UST207 **REMOVE-BACKUP ENTERED BY USER** *username*

Reason: The “remove-backup” processor has been entered on request by the user indicated. This message is informational only.

UST208 **REMOVING:** *profile versiondate backup-type – nnnnnnnn* **FILE RECORDS ERASED**

Reason: The "remove-backup" function (REMOVEDSN) has been entered and is deleting the specified backup version. This may also occur during Full Merge Migration as Simple Migration files are copied to the full backup and deleted. "nnnnnnnn" includes both file records and directory records. If backups under the special USTDUPFL profile for duplicate files are being deleted, the text will say "DUPLICATE FILES ERASED". This message is informational only.

UST209E **PREMATURE END-OF-FILE ON DSN=***dsname*

Reason: The restore processor encountered the end of the tape backup file before finding all expected data. Possibly the catalog entry was corrupted so that not all volumes are recorded.

Action: Verify that the tape dataset requested during the restore is the correct one, and that this is not a copy of the original backup file data dataset.

UST210E **TARGET LU NOT AVAILABLE –** *function* **TIMEOUT**

Reason: The FDR/UPSTREAM-MVS mainframe initiator has determined that the target LU is not available to respond to a conversation initiation request.

Action: Verify that the target LU is specified correctly in the batch requestor job. Verify that the target LU is available and configured for session and conversation requests. Review the UPSTREAM log on the target LU for error messages. assistance.

UST211 **ENTERING WAIT FOR RETRY**

Reason: The FDR/UPSTREAM-MVS mainframe initiator was unable to allocate the requested conversation with the target UPSTREAM LU. It is entering a 10-minute wait period prior to attempting a retry operation. This message is informational only.

UST212 **ATTEMPTING CONVERSATION RETRY**

Reason: The FDR/UPSTREAM-MVS mainframe initiator task has completed it's wait period and is attempting to retry the conversation initiation to the specified target UPSTREAM LU. This message is informational only.

UST213E **TARGET LU NOT AVAILABLE – CONFIRM TIMEOUT**

Reason: The FDR/UPSTREAM-MVS mainframe initiator has sent the specified request to the target LU; but, has not received a confirmation response within the 5 minute time-out window.

Action: Verify that the target UPSTREAM LU is still functional. Review the UPSTREAM log on the target LU for errors.

UST214E **INVALID STRUCTURE RECEIVED – REQUEST ABORTED**

Reason: The FDR/UPSTREAM-MVS mainframe initiator received an invalid response from the target LU. This is most likely an internal UPSTREAM error.

Action: Please retain all the error information and contact Innovation Technical Support for assistance.

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10.2

UST215E **IMMEDIATE SHUTDOWN REQUESTED – REQUEST ABORTED**

Reason: The FDR/UPSTREAM-MVS mainframe initiator was notified that the system operator requested an immediate FDR/UPSTREAM-MVS shutdown. The indicated process was aborted.

UST216W **IMMEDIATE SHUTDOWN REQUESTED – *function* TERMINATED**

Reason: The indicated function was in progress when FDR/UPSTREAM-MVS received an immediate shutdown request from the System Operator. The function is terminated.

UST217 **INTERLNK TCP CONNECTED TO SSN=ssss,PORT=ppppp**

Reason: A connection has been made between FDR/UPSTREAM and a workstation via Interlink's SNS/ TCPaccess. The subsystem id (ssss) and port number used (ppppp) are displayed.

UST218E **TAPE RESTORE DISALLOWED – TAPEMOUNT SECURITY CHECK FAILED**

Reason: SECLVL=2 or 3 was specified in the configuration, and the security check for tape restores failed.

See Section 4 “Security” for details on authorizing restores from tape.

UST219E **CATALOG RECORD NOT FOUND FOR RESTORE OF *versiondate***

Reason: During FDR/UPSTREAM-MVS Restore processing for a specified “versiondate”, no records were found.

Action: Use the “Inquire Versions” request on the Restore menu to list all available versions, to verify that your request was correct. If it was correct, this is an internal error.

UST220E **SECURITY: INVALID USERID FORMAT**

Reason: During security authorization checking, FDR/UPSTREAM-MVS determined there was an invalid format in a control structure containing the specified UserID.

Action: This is an internal error. Retain all error information and contact Innovation Data Processing Technical Support for assistance.

UST221E **SECURITY: INVALID PASSWORD FORMAT**

Reason: During security authorization checking, FDR/282UPSTREAM-MVS detected an invalid format item in a received control structure.

Action: This is an internal error. Please retain all error information and contact Innovation Data Processing Technical Support for assistance.

UST222E **SECURITY CHECK FAILED SAF COMP=X’*ssss*’,RACF COMP=X’*rrrr*’ CODE=X’cccc’ reason**

Reason: During security authorization checking, FDR/UPSTREAM-MVS received a non-zero return code from the MVS SAF Router (ssss) or from your security system (rrrr and cccc). "reason" will have a brief description of the error for common error codes. However, if a check for authority to a given resource failed, "reason" will display the class and entity names, e.g.,

CLASS=$UPSTRM ENTITY=profile

Action: Verify the specified Userid and Password are correct and defined to your security system. A SAF error may mean that your security system is not functioning.

UST223E **SECURITY: LEVEL-2 VERIFICATION FAILED**

Reason: The SAF (security) call to verify the user's authority to the UPSTREAM Profile Name (as requested by SECLVL=2 or 3 in the UPSTREAM Configuration) has failed. The user is not authorized.

Action: If appropriate, authorize the user to use the Profile Name.

UST224 ***profilename ssssss.sss* CPU SECONDs USED IN *process***

Reason: The indicated number of CPU seconds were used in processing the just-completed request for the indicated Profile name

UST226 **VERSION ROLLOFF STARTED**

Reason: This informational message is issued by the *keyed* and *non-keyed* (archive) backup processes to indicate a “version rolloff” is occurring for the specified Profile Name.

UST227 **ROLLOFF – ERASE C-RECORD *aaaaaaaa nnnnnnnnnnnn***

Reason: This informational message is issued by the *keyed* and *non-keyed* backup “rolloff” processes to indicate a “version rolloff” is occurring for the specified Profile Name “aaaaaaaa” with the VersionDate or workstation path name of “nnnnnnnnnnnn”.

UST228 **CONFIGURATION TABLE [RE]LOADED**

Reason: This informational message confirms that the FDR/UPSTREAM configuration table has been successfully LOADED during on-line initialization or successfully RELOADED in response to a F UPSTREAM,REFRESH console command.

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UST229 REQUEST USING *"profname"* CONFIGURATION ENTRY
Reason: The profile name entered at the workstation has no entry in the FDR/UPSTREAM-MVS configuration, but there was either a profile defined with WSPREF=prefix which matched the beginning of the entered profile name, or a profile defined with the special name "GLOBAL". The characteristics of this profile were used for this request.

UST230 INQUIRE-FILES PROCESS STARTED
Reason: An inquire-files request was received from a workstation.

UST231 RESTARTED-BACKUP PROCESS ENTERED
Reason: This informational message is issued by the backup "restart" process to indicate it has accepted the workstation request and has begun the restart process.

UST232 RESTARTED-BACKUP PROCESS ENDING
Reason: This informational message is issued by the backup "restart" process to indicate it has completed the "backup restart" process. Any errors that may have occurred will be indicated by other messages in the log file.

UST233* STARTING BACKUP PROCESS, TYPE=*tttt* LU=*nnnnnnnn*[BACKUP=*bbbbb*]
Reason: This informational message is issued by all backup processes at the time the backup begins. The "type" value (tttt) may be any of the four backup types supported by FDR/UPSTREAM-MVS: "KEYED", "ARCH", "DASD", or "TAPE". The LU value contains the network LU name of the workstation. If this is a sequential backup, the "backup" value (bbbbb) indicates the type of sequential backup: "FULL" (first-time full), "FULLM" (full merge), "INCR" (incremental merge), "USER" (non-merge under a profile enabled for MERGE) or "NON-M" (non-merge under a non-merge profile). If the "WTOCOMP" option was specified on the FDR/UPSTREAM-MVS configurator "MAIN" record, this message is also written to the system console and the system log (SYSLOG) via a "WTO". If this is a simulated backup (using a DUMMYxxx profile name), "STARTING" is changed to "SIMULATE". For a file transfer, "STARTING" is changed to "TRANSFER".

UST234 BACKUP DATE: *mm/dd/yyyy*- ESTIMATED SIZE: *kkkkkkkkkkk* KB
Reason: This informational message is issued by all backup processes at the time the backup begins. It indicates the date the backup began on the mainframe and the estimated size in kilobytes.

UST235 STARTING BACKUP NON-I/O TEST
Reason: This informational message indicates that the non-I/O backup test routine has started.

UST236 INQUIRE-VERSIONS PROCESS ENDING
Reason: An inquire-versions request from a workstation was completed.

UST237 INQUIRE-FILES PROCESS ENDING *nnnnnnnn* FILES SENT FROM *mmmmmmm* VERSIONS
Reason: An inquire-files request from a workstation was completed.

UST238 SEQUENTIAL RESTORE PROCESS STARTED
Reason: This informational message indicates that a sequential restore has begun.

UST239* RESTORE PROCESS STARTED, TYPE=*tttt* LU=*nnnnnnnn*
Reason: This informational message is issued for all restore processes at the time the restore begins. The "type" value (tttt) may be any of the four backup types supported by FDR/UPSTREAM-MVS: "KEYED", "ARCH", "DASD" or "TAPE". The LU value contains the network LU name of the workstation. If the "WTOCOMP" option was specified on the FDR/UPSTREAM-MVS configurator "MAIN" record, this message is also written in the system console and the system log (SYSLOG)via a "WTO".

UST240W* ACTIVE TASK FOUND – REPLY W(AIT)–FOR TASK TERM,TERM ID=NNNN, C(ANCEL),S(TATUS) OR I(GNORE)
Reason: The operator issued a console CANCEL command for the FDR/UPSTREAM on-line task, but FDR/UPSTREAM CANCEL protection (See Section 5.3) detected that there were active backup, restore or utility subtasks. This message is preceded by the UST013/014/015 messages showing the active subtasks.
Action: The operator may reply:
WAIT – to wait for all tasks to end naturally before terminating FDR/UPSTREAM
TERM ID=nnnn – to terminate the specified task (nnnn is the task ID from the status display)
CANCEL – to process the CANCEL command after closing all open data sets.
STATUS – to redisplay the subtask status
IGNORE – to ignore the CANCEL and return to normal operation
All of the replies (except TERM) can be abbreviated by the first character.

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10.2

UST240W* **ACTIVE TASK FOUND – function AWAITING TASK TERMINATION**

Reason: The operator requested termination of FDR/UPSTREAM via a STOP (P) console command (*function*=SHUTDOWN) or via a CANCEL (C) console command (*function*=CANCEL) but there were active backup/restore/utility tasks in progress. For CANCEL, this message is issued if the operator replies WAIT to the preceding UST240W message.

Action: FDR/UPSTREAM will terminate when all subtasks have completed.

UST241* ***function* NOW ACTIVE**

Reason: A trace or utility function has been started. See Section 5 for details on starting traces and utility functions.

UST241* ***function* COMPLETED RC=*nn***

Reason: A trace or utility function has completed with completion code “nn”.

UST242* **QUIT ACCEPTED – SHUTDOWN IN PROGRESS**

Reason: A console command has been entered requesting immediate shutdown of FDR/UPSTREAM. See Section 5 “Operating” for details on shutting down UPSTREAM.

Action: If there were active backup/restore tasks, they will be signaled to interrupt their processing. FDR/UPSTREAM will terminate when all subtasks have terminated.

UST243* **QUIT ACCEPTED – LU=*luname* TERMINATED**

Reason: A console command has been entered requesting immediate termination of the UPSTREAM session with the specified logical unit. The termination was successful.

UST244E* **QUIT REJECTED – LU=*luname* INVALID OR NOT ACTIVE**

Reason: A console command has been entered requesting immediate termination of the UPSTREAM session with the specified logical unit. The luname is either not a valid name or is not currently in session with UPSTREAM.

UST245 **STARTING VSAM WRITE TEST PROCESS**

Reason: This informational message indicates that the VSAM write test has begun.

UST246 ***xxxx* FILE-DATA, *xxxx* FILE-INFO**

Reason: This informational message indicates the number of records written per second to the File-Data and File-Info files during the VSAM write test.

UST247 ***luname* * SNA SESSION DEACTIVATED ***

Reason: The SNA session with the indicated logical unit has been terminated.

UST248 ***profilename luname* * PROCESS DETACHED ***

Reason: The backup or restore subtask for the indicated profile name and logical unit has been terminated.

UST249* **MODIFY COMMAND COMPLETED – REQUEST: *parms***

Reason: An F UPSTREAM command entered on the system console has been completely processed by UPSTREAM.

UST250E **DATA RECORD(S) NOT FOUND ON REPOSITORY**

Reason: Data records were not found where they were expected.

Action: The FDR/UPSTREAM repository may be corrupted. Contact Innovation for assistance.

UST253E* **MAXTASKS EXCEEDED – LU=*luname* REJECTED**

Reason: The FDR/UPSTREAM-MVS received a request to initiate a new conversation, but the maximum number of active UPSTREAM tasks specified in the UPSTREAM configuration (See Section 3) has been reached. This conversion request is rejected.

Action: Retry the request at a later time, after some other UPSTREAM tasks have terminated.

UST254W **FDRSOS/RAW BACKUP FROM *versiondate* BYPASSED.**
USE FDRSOS/PHYSICAL BACKUP PANEL.

Reason: One or more of the backups selected for restore are either "raw" backups or FDRSOS backups. These cannot be restored from the normal restore panels; select the raw backup panel to restore them.

Action: The FDRSOS/RAW backup is bypassed. If no other backups were selected, the restore is terminated.

UST263* **UPSTREAM LOG SWITCH WAS SUCCESSFUL**

Reason: A F UPSTREAM,SWITCHLOG console command was successfully executed, to switch the UPSTREAM log to the alternate log file.

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UST263E* **UPSTREAM LOG SWITCH FAILED**

Reason: A F UPSTREAM,SWITCHLOG console command was entered, but the switch to the alternate log file failed, probably due to errors opening the alternate log. Logging to the current log file continues.

Action: Check the FDR/UPSTREAM job log for IBM error messages relating to this error. Correct the problem if possible.

UST265E* **REORG COMMAND BYPASSED REASON=*reason text***

Reason: A F UPSTREAM,REORG console command was entered, but the reorganization request was rejected for the reason indicated, which may be:

TASK ACTIVE – a REORG cannot be initiated when another task other than a REORG of another file is already active

DD NOT FOUND – the DDNAME specified was not one of the 3 permitted.

FILE IS NOT BELOW %FREE – %F=nn was specified and the file has more that nn% free space.

%F KEYWORD INVALID – an invalid value was specified for the %F= operand.

UST266E **OPERATOR CANCELLED MOUNT OF BACKUP VOLUME**

Reason: The console operator replied NO to the console messages requesting that a previous backup tape be mounted.

Action: The requested restore is terminated. If the tape can be mounted at a later time, resubmit the request at that time.

UST267E **C-STRUCTURE NOT FOUND**

Reason: A catalog record was not found where expected.

Action: The FDR/UPSTREAM repository may be corrupted. Contact Innovation for assistance.

UST268E **INVALID TCP ADDRESS RECEIVED – REQUEST ABORTED**

Reason: For a mainframe-initiated request (via USTBATCH) an invalid TCP/IP target address was specified.

Action: Verify and correct the TCPTARG= value and resubmit the USTBATCH job.

UST269E **REQUEST CONTROL REJECT FAILED**

Reason: For a mainframe-initiated request (via USTBATCH) a VTAM APPC REQUEST-CONTROL request to the workstation failed.

Action: Check the workstation. Make sure that its APPC software is operating correctly.

UST270E **NOTIFY SEND TO USTBATCH FAILED**

Reason: The FDR/UPSTREAM on-line initiator attempted to communicate with the USTBATCH job that initiated the request, but the APPC SEND request failed. A UST038E message will follow with details.

UST280 **TCP *type* CONNECT TO SOCKET=*sssss*,PORT=*pppp*,IPA=*aaa.bbb.ccc.ddd***

Reason: A connection has been made between FDR/UPSTREAM and IBM's TCP/IP. The socket number and port number used, and the network address (in dotted decimal format) are displayed. If "type" is MAIN, this is the UPSTREAM connecting to TCP/IP during initialization and the IPA is UPSTREAM's primary address (there may be others if your host has multiple TCP/IP connections to the network). If "type" is USER, this is a workstation connecting to UPSTREAM and the address is that of the workstation.

UST281E **INTERLINK MSG: *text***

Reason: Interlink's SNS/TCPaccess reported an error. "text" is the descriptive error text returned by Interlink.

Action: This is usually accompanied by other messages. See the Action for those messages.

UST283 **BYTES PER SECOND**

Reason: A FDR/UPSTREAM performance test was requested from a workstation. This message is the header on a histrogram which shows the range of instantaneous data rates that were measured during that test.

UST284 **BACKUP EXCEEDS MAXIMUM VOLUMES - BACKUP TERMINATED**

Reason: A single tape backup file has required more than 100 tape volumes

Action: The backup is terminated. To rerun the backup, you must reduce the number of tapes required. If the hardware supports it, you might use larger capacity tapes, or you might enable IDRC compaction by adding the TAPECOMP operand to the workstation profile in the FDR/UPSTREAM configuration (see Section 3). If necessary, change the backup file specifications to reduce the amount of data to be backed up (you may need to break the backup into 2 pieces, under different profile names).

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10.2

UST285 **TARGET *pcversion* NAME=*targname* IS REGISTERED TO *netname***

Reason: A workstation has used the FDR/UPSTREAM-MVS "Registered Name Service" to report that it has been configured with FDR/UPSTREAM workstation name "targname" (up to 16 characters). "netname" will be "LU=luname" for VTAM/SNA workstations and will be "IP=nnn.nnn.nnn.nnn..port" for TCP/IP-connected workstations. "pcversion" will display the version of FDR/UPSTREAM in use on the workstation, if available. The target name name can now be used with the TARGNAME= parameter of USTBATCH (see Section 8.8 for details).

If the target name is being deleted from the table due to a request from the workstation or from the FDR/UPSTREAM-MVS ISPF dialog, the additional text " WAS DELETED" appears at the end of the message. The target name is no longer usable unless it is registered again. If the target name is marked for automatic FDR/UPSTREAM software updates, the additional text "AUTO-UPDATE" appears.

UST286W **DUPLICATE INDEX BYPASSED - *reason***

Reason: A backup was being done under the special profile USTDUPFL for duplicate files (see Section 1.4). The workstation file identified by the UST113 message which follows was not included in the index of duplicate files for the reason given:

FILE EXCEEDS 30 CHARACTERS – for workstations that support long file names, a filename over 30 characters cannot be included in the duplicate file list.

FILE ALREADY EXISTS – a workstation file with the same file name, update timestamp and size has already been backed up under USTDUPFL.

FILENAME IS INVALID – the file name is invalid or is missing

Action: No action is normally required, but in some circumstances you may want to rename the failing file and delete and redo the USTDUPFL backup.

UST287* **UPSTREAM TAPE UNIT NOT AVAILABLE, VARY ONE ONLINE OR REPLY 'RETRY', 'WAIT', CANCEL' OR 'DISPLAY'**

Reason: To avoid allocation interlocks, FDR/UPSTREAM does dynamic allocation of tape drives with a flag indicating it is not to wait if no drives are available. An allocation received an error indicating that all eligible tape drives are offline or in use. This message is displayed on the system console as a WTOR.

Action: If the operator does not reply to the message, FDR/UPSTREAM will retry the allocation at 5 second intervals; if the operator varies a drive online or a drive is deallocated by another task, the allocation will succeed and the message will be deleted. The operator may also reply:

RETRY - retry the allocation. The message will be reissued if there are still no available drives.

WAIT - same as not replying except that the message is deleted.

CANCEL - fail the allocation, which will fail the backup.

DISPLAY - retry the allocation, allowing MVS allocation recovery to take place. MVS messages on the console will indicate which offline tape drives are eligible.

WARNING: if you reply DISPLAY you must reply to the MVS allocation messages promptly to avoid potential allocation interlocks.

UST288E **I/O ERROR *type* BACKUP FILE CHECK MVS LOG**

Reason: A sequential backup or restore has encountered an I/O error on the backup file. “type” is either “WRITING TO” or “READING THE”. The backup or restore is interrupted.

Action: Check the MVS job log of the FDR/UPSTREAM-MVS tasks for MVS messages which may indicate the type of I/O error which occured. It will probably not be possible to restart the backup, but you should be able to restore any files which were successfully written and recorded. If necessary, contact Innovation Technical Support for assistance.

UST289E **ERROR DURING POINT TO A BACKUP FILE**

Reason: A sequential restore has encountered an error issuing a POINT to position to a record in the backup file. The restore is interrupted. This may be due to an invalid pointer in the FDR/UPSTREAM repository.

Action: Execute the USTREGEN utility against this backup to refresh the pointers in the repository. If necessary, contact Innovation Technical Support for assistance.

UST290W **HISTORY RECORD BYPASSED reason**

Reason: A FDR/UPSTREAM history record was not recorded in the FDR/UPSTREAM catalog file for the reason indicated, which may be:

CATALOG NOT OPEN – probably because it is being reorganized

DUE TO CATALOG ERROR COMP=xxxxxxxx – the "comp" is the VSAM RPL feedback word.

Action: The operation completed, only the history record was lost. If multiple catalog errors occur, you may need to reorganize the catalog file. If necessary, contact Innovation Technical Support for assistance.

CONTINUED . . .

10.2

UST291W ACQUIRING THE USERID OF USTBATCH BYPASSED REASON=reason

Reason: FDR/UPSTREAM attempted to extract the security userid from the address space of a USTBATCH job which has requested a UPSTREAM function, but the attempt was unsuccessful. Reason codes are:

1 - CROSS-MEMORY ALREADY SETUP indicates an internal error.
2 - AXSET MACRO ERROR indicates an internal error.
3 - ERROR FINDING USTBATCH TCB indicates that could not locate a TCB (Task Control Block) in the other address space. May indicate that the indicated address space was not really a batch job or TSO user.
4 - JOB PACK QUEUE ERROR indicates that the list of programs loaded in the address space could not be located. May indicate that the indicated address space was not really executing a batch job.
5 - PROGRAM NAME NOT USTBATCH indicates that UPSTREAM could not find a program called USTBATCH in the address space. May indicate that the address space was not really executing USTBATCH.
6 - USTBATCH IS NOT AUTHORIZED indicates that the USTBATCH program in the address space is not an authorized program. When USTBATCH is executed directly under TSO, this will occur unless USTBATCH is added to the list of authorized TSO programs (See Section 2.12).
7 - MISMATCH ON INTERNAL FIELD indicates a validation check failed.
8 - NO ACEE (SECURITY) POINTER indicates there was no ACEE (security control block) associated with the address space, so no userid could be extracted.
9 - NO USERID ON USTBATCH JOB indicates that there was no security userid stored in the ACEE.
A - USTBATCH NOT ON SAME CPU indicates that the USTBATCH job was not executing on the same MVS image as the FDR/UPSTREAM online task, so the userid could not be extracted.

Action: Since a validated userid could not be extracted from the USTBATCH job, FDR/UPSTREAM will require that a security password be provided (as well as a userid) for validation. This security infomation could be specified at the workstation or could be in the USTBATCH parameters. If a validated userid was extracted and it matched the userid associated with the USTBATCH request, no password would be necessary.

If necessary, contract Innovation for assistance. Existing USTBATCH users might get this message and the resulting return code 4 in jobstreams which used to get RC=0.

UST292 BACKUP SIZE EXCEEDS DASD MAX SIZE - SWITCHING TO TAPE

Reason: An incremental MERGE backup was directed to sequential DASD, but the estimated size of the backup exceeded the DASDMAXSIZE= value in the profile, so the backup was directed to tape instead.

10.2

UST295E FDRSOS LOCAL BACKUP ERROR VOL=vvvvvv reason

Reason: FDR/UPSTREAM/SOS attempted to use the volume with serial "vvvvvv" as an FDRSOS Local Backup volume (see section 1.7) but an error occurred. Reason codes are:

MVS VOLSER NOT PSEUDO ONLINE - the volume has not been made available by a FDRSOS VARYON command since the last IPL.

VOLSER LENGTH IS INVALID - the pseudo volume serial passed by FDR/UPSTREAM on the workstation was too long. Internal error.

DUE TO DYNAMIC ALLOCATE ERROR - dynamic allocation of the local backup volume failed. A UST095 message will be printed to document the dynamic allocation error.

UNABLE TO ACQUIRE STORAGE - a GETMAIN for required local backup working storage failed. You may need to increase the region for the FDR/UPSTREAM task or reduce the number of concurrent UPSTREAM operations.

I/O ERROR READING/WRITING DISK - an I/O error occurred on the local backup disk.

PROFILE CONTROL RECORD ERROR - the profile records written to the local backup by the LOCALBACKUP statement of FDRSOS are not valid. You may need to run the FDRSOS LOCALBACKUP again.

CANNOT ACQUIRE SPACE ON VOLUME - FDR/UPSTREAM has deleted all of the eligible backups from the local backup volume (if any) but is still unable to allocate sufficient space on that volume for the current backup. You may need to use a different local backup volume, or reconfigure/reformat this volume to be larger.

DUE TO TIOT/DEBCHK ERROR - internal error.

PROFILE NAME NOT FOUND - the profile name was not found in the records of the local backup disk. Internal error.

MAXIMUM # OF BACKUPS EXCEEDED - more than 255 backups have been retained on the local disk for the current profile.

MAXIMUM # OF PROFILES EXCEEDED, but the number of profiles currently recorded exceeds MAX#PROF=nnn. You must either update MAX#PROF or use a different local backup disk for this profile.

BACKUP VERSIONDATE NOT FOUND - FDR/UPSTREAM was attempting to delete a backup from the local backup disk, but it was not found in the records of the disk. This is probably an internal error.

RELEASE UNUSED SPACE ERROR - internal error.

MISSING INTERNAL STRUCTURE - internal error

NOT ALLOWED TO ADD NEW PROFILE - when the volume was initialized (the LOCALBACKUP statement of FDRSOS), DYNADDPROF=NO was specified, to prevent new profile names from being dynamically added, and the current profile name is not among those already recorded on the disk.

UNKNOWN RECORD TYPE - xxxxxxxx - invalid local backup record. Internal error

RECORDSIZE EXCEEDS BUFFER SIZE - internal error

SEGMENT NUMBER NOT IN EXTENTS - internal error

VERSION NUMBER IS STILL IN USE - internal error

UNABLE TO ACQUIRE PERMA-CACHE - internal error

Action: If possible, correct the error and reexecute. If necessary, contract Innovation for assistance.

UST296 FDRSOS LOCAL BACKUP #nnn-versiondate status VOL=vvvvvv

Reason: FDR/UPSTREAM/SOS successfully used a FDRSOS Local Backup volume (vvvvvv) for the backup indicated by "versiondate". "nnn" is an internal backup number on the local disk. "status" may be:

WAS ALLOCATED TO

WAS DELETED FROM

WAS ROLLED OFF

CONTINUED . . .

10.3 CONFIGURATOR MESSAGES (UST301 – UST399)

These messages are generated by the FDR/UPSTREAM-MVS configurator program, USTCONFG. They are written to the UPSTREAM log (DD "USTLOG") which is usually a SYSOUT dataset. Please refer to Section 3 for the correct syntax of all USTCONFG input statements and parameters.For messages that indicate an error condition: if you are unable to resolve the problem, please save all output from USTCONFG and contact Innovation Technical Support for assistance.

UST301E NO APPLID FOUND IN "MAIN" RECORD – TERMINATING

Reason: While parsing the configuration input file "MAIN" record, the FDR/UPSTREAM-MVS Configurator, USTCONFG, was unable to locate the "APPLID=" parameter. The "APPLID" parameter is required in the configuration input file "MAIN" record.

Action: Add the "APPLID" parameter and rerun the Configurator.

UST305W WSNAME/WSPREF MISSING IN COMMAND – RECORD BYPASSED:

Reason: While parsing a DEFINE/MODIFY/COPY statement, the FDR/UPSTREAM-MVS Configurator, USTCONFG, found no WSNAME= or WSPREF= parameter in the listed record.

Action: Correct the input configuration source file and rerun the Configurator.

UST306W NEWNAME/NEWPREF MISSING IN COMMAND – RECORD BYPASSED:

Reason: While parsing a COPY statement, the FDR/UPSTREAM-MVS Configurator, USTCONFG, found no NEWNAME= or NEWPREF= parameter in the listed record.

Action: Correct the input configuration source file and rerun the Configurator.

UST307W DEFAULTS TAKEN – ONE ONLINE BACKUP PERMITTED FOR FOLLOWING RECORD:

Reason: This message is a warning message. It indicates that the Configurator was unable to find the "ONLINE" and "ARCHIVE" parameters and their associated values in the record listed. The Configurator, USTCONFG, has taken the default values for these parameters.

Action: If necessary, correct the input configuration source file and rerun the Configurator.

UST313E CONTINUATION STATEMENT EXPECTED – NOT FOUND

Reason: The previous statement indicated that it should continue on the next statement (trailing comma) but a valid continuation statement was not found.

Action: Correct the continuation syntax and rerun the configurator.

UST319W SUBSYS PARAMETER NOT FOUND – DEFAULTED TO UPSTREAM

Reason: This is a warning message. The FDR/UPSTREAM-MVS Configurator, USTCONFG, did not find a "SUBSYS=" parameter in the input configuration "MAIN" record. The "SUBSYS" parameter value has been defaulted to "UPSTREAM".

UST322E NO CONFIGURATION RECORD GENERATED – FILE IS NOT USABLE

Reason: Due to catastrophic errors, the FDR/UPSTREAM-MVS Configurator, USTCONFG, was unable to generate the configuration table.

Action: Review the Configurator output log for errors, correct them, and rerun the Configurator.

UST323E VAULT CANNOT BE SPECIFIED ON RESERVED PROFILES

Reason: A DEFINE/MODIFY/COPY for one of the reserved profile names (see Section 3.8) contained the VAULT parameter. This is not valid.

Action: Remove VAULT, and rerun the Configurator.

UST324E DASDPREF/TAPEPREF MUST CONTAIN "?" MASK WITH VAULT OPTION

Reason: For profiles with the VAULT parameter specified, the DASDPREF= and TAPEPREF= parameters must contain a question mark (?) somewhere within the name, anywhere except as the first character of an index level. This will be replaced with the copy number (1 or 9).

Action: Correct the prefix, or specify NOVAULT, and rerun the Configurator.

UST325 *nnnnnnnn* PROFILE ENTRIES IN CONFIG ON *mm/dd/yy* AT hh:mm:ss

Reason: This in a informational message issued at the conclusion of a Configurator run. This message contains the count of profile entries in the configuration table after applying all updates from your current Configurator input.

10.3

UST326E OPEN FOR CONFIGURATION FILE FAILED – ABEND IN PROGRESS

Reason: The FDR/UPSTREAM-MVS Configurator, USTCONFG, was unable to open the output configuration file.

Action: Review your JCL specifications and DCB attributes for the output configuration file, correct any errors, and rerun the Configurator.

UST327E OPEN FOR INPUT SOURCE FILE FAILED – ABEND IN PROGRESS

Reason: The FDR/UPSTREAM-MVS Configurator, USTCONFG, was unable to open the input source configuration file.

Action: Review your JCL specifications and DCB attributes for the input source configuration file, correct any errors, and rerun the Configurator.

UST328E UNABLE TO FIND "MAIN" RECORD – CONFIGURATOR TERMINATING

Reason: The FDR/UPSTREAM-MVS Configurator, USTCONFG, found the first input record was not a configuration "MAIN" record. It cannot continue.

Action: Correct the error and rerun the configurator.

UST329E CONFIGURATION FILE DEFINITION ERROR – LRECL MUST BE 120

Reason: The configuration data set does not have proper DCB characteristics. It must be RECFM=FB and LRECL=120 (any blocksize a multiple of 120 is acceptable).

Action: Define a new configuration data set with proper characteristics. Innovation recommends using the FDR/UPSTREAM ISPF dialog (see Section 2.4).

UST330W/E UNABLE TO OPEN DDNAME=*ddname* – MISSING OR MISSPECIFIED

Reason: USTCONFG was unable to open the indicated DDNAME. It may have been omitted or misspelled. If the file was required, this will be an Error message, otherwise it is a Warning.

Action: If necessary, correct the USTCONFG JCL and resubmit.

UST331 ddname=dsname,VOL=volser

Reason: This informational message documents that the indicated DDNAME points to the indicated data set name, on the indicated volume.

UST342W DSNAME TOO LONG WITHOUT "GDG" SPECIFIED – RECORD BYPASSED:

Reason: The FDR/UPSTREAM-MVS configurator, USTCONFG, found an invalid value specified for the "DASDPREF=" or "TAPEPREF=" parameter in the listed DEFINE/MODIFY/COPY record. The value specified exceeded the 19 allowable characters without the "DASDGDG" or "TAPEGDG" parameter also being specified.

Action: Correct the value or specify the appropriate GDG parameter, and rerun the configurator.

UST343W WARNING: "DASDBLK" NOT FOUND IN "MAIN" RECORD – DEFAULTING TO 10752

Reason: The FDR/UPSTREAM-MVS configurator, USTCONFG, was unable to locate the "DASDBLK" keyword parameter in the configuration "MAIN" record. This message warns that when appropriate, the "DASDBLK" value will default to 10752.

Action: If this is not appropriate for your installation, add the DASDBLK parameter with the correct value and rerun the configurator.

UST344W DSNAME TOO LONG FOR RESERVED PROFILE – RECORD BYPASSED

Reason: On a DEFINE/MODIFY/COPY statement specifying a WSNAME= of one of the reserved profiles (see Section 3.8), the DASDGDG or TAPEGDG option was not specified, and the data set name prefix (DASDPREF= or TAPEPREF=) specified exceeds 26 characters.

Action: Correct the data set name and rerun the configurator.

UST345E "DASDPREF" REQUIRES "DASD" – RECORD BYPASSED

Reason: On a DEFINE/MODIFY/COPY statement, DASDPREF= was specified without DASD.

Action: Correct the parameters and rerun the configurator.

10.3

UST346E **"DASDGDG" REQUIRES "DASDPREF" AND "DASD" – RECORD BYPASSED**

Reason: On a DEFINE/MODIFY/COPY statement, DASDGDG was specified without DASD and DASDPREF=.

Action: Correct the parameters and rerun the configurator.

UST347E **INVALID VALUE SPECIFIED FOR *xxxxxxxx* – RECORD BYPASSED**

Reason: An invalid value was specified for the parameter "xxxxxxxx".

Action: Check Section 3 for valid values. Correct the parameters and rerun the configurator.

UST348E **"WSNAME/WSPREF" SPECIFIED IS A RESERVED NAME – ENTRY NOT ADDED**

Reason: A DEFINE/MODIFY was entered which specified a profile name which may not be used.

Action: Check Section 3 for valid values. Correct the parameters and rerun the configurator.

UST349E **"DASDBLK" REQUIRES "DASD" AND "DSNPREF" – RECORD BYPASSED:**

Reason: The FDR/UPSTREAM-MVS configurator, USTCONFG, found the "DASDBLK" parameter in the listed record, but was unable to find the "DASD" and/or "DASDPREF" additional required parameters.

Action: Correct the parameters and rerun the configurator.

UST350E **"GROUPID" MUST BE EXACTLY 2 ALPHA-NUMERIC CHARACTERS - RECORD BYPASSED:**

Reason: The FDR/UPSTREAM-MVS configurator, USTCONFG, found that the "GROUPID" parameter in the listed record did not have the correct syntax.

Action: Correct the parameters and rerun the configurator.

UST351E **"DUNIT" REQUIRES "DASD" AND "DSNPREF" – RECORD BYPASSED:**

Reason: The FDR/UPSTREAM-MVS configurator, USTCONFG, found the "DUNIT" parameter in the listed DEFINE/MODIFY/COPY record, but was unable to find additional required parameters.

Action: Correct the "DEFINE" record definition and rerun the configurator.

UST352E **"TUNIT" REQUIRES "TAPE" AND "DSNPREF" – RECORD BYPASSED:**

Reason: The FDR/UPSTREAM-MVS configurator, USTCONFG, found the "TUNIT" parameter in the listed DEFINE/MODIFY/COPY record, but was unable to find additional required parameters.

Action: Correct the parameters and rerun the configurator.

UST353E **"TAPE" REQUIRES "TUNIT" AND "DSNPREF" – RECORD BYPASSED:**

Reason: The FDR/UPSTREAM-MVS configurator, USTCONFG, found the "TAPE" parameter in the listed record, but was unable to find additional required parameters.

Action: Correct the parameters and rerun the configurator.

UST354E **"DASD" REQUIRES "DSNPREF/DASDPREF" – RECORD BYPASSED:**

Reason: The FDR/UPSTREAM-MVS configurator, USTCONFG, found the "DASD" parameter in the listed record, but was unable to find the "DSNPREF" or "DASDPREF" required parameter.

Action: Correct the parameters and rerun the configurator.

UST355E **"DSNPREF" REQUIRES "TAPE" OR "DASD" – RECORD BYPASSED:**

Reason: The FDR/UPSTREAM-MVS configurator, USTCONFG, found the "DSNPREF" parameter in the listed DEFINE/MODIFY/COPY record, but was unable to find additional required parameters.

Action: Correct the parameters and rerun the configurator.

UST356E **"GDG" REQUIRES "DSNPREF" AND "TAPE" OR "DASD" – RECORD BYPASSED:**

Reason: The FDR/UPSTREAM-MVS configurator, USTCONFG, found the "GDG" parameter in the listed DEFINE/MODIFY/COPY record, but was unable to find additional required parameters.

Action: Correct the parameters and rerun the configurator.

CONTINUED . . .

10.3

UST357E "STORCLAS" REQUIRES "DASD" – RECORD BYPASSED:

Reason: The FDR/UPSTREAM-MVS configurator, USTCONFG, found the "STORCLAS" parameter in the listed record, but was unable to find additional required parameters.

Action: Correct the parameters and rerun the configurator.

UST358E "MGMTCLAS" REQUIRES "DASD" – RECORD BYPASSED:

Reason: The FDR/UPSTREAM-MVS configurator, USTCONFG, found the "MGMTCLAS" parameter in the listed DEFINE/MODIFY/COPY record, but was unable to find additional required parameters.

Action: Correct the parameters and rerun the configurator.

UST359W "SORTUNIT" NOT FOUND IN MAIN RECORD – DEFAULTING TO "SYSDA"

Reason: The FDR/UPSTREAM-MVS Configurator was unable to find the "SORTUNIT" keyword parameter in the listed configuration "MAIN" record. The sort unitname will be defaulted to "SYSDA" for any *sequential tape* restores performed.

Action: This message is mostly informational. If you do not intend doing any *sequential tape* backups and restores, or if the unitname of "SYSDA" is acceptable for temporary sort work datasets, you can safely ignore this message.

UST360E PROFILE NOT IN CONFIGURATION – CAN NOT UPDATE

Reason: A MODIFY/COPY statement was entered, but the WSNAME= or WSPREF= parameter specified a profile name that does not exist in the input configuration, so it cannot be processed.

Action: Change the MODIFY/COPY to a DEFINE or remove it and rerun the configurator.

UST361E ENQ CONTENTION FOR THE CONFIGURATION FILE. TRY AGAIN LATER.

Reason: The FDR/UPSTREAM-MVS configurator, USTCONFG, found on-line UPSTREAM held the ENQ on the UPSTREAM configuration file and did not release it within a reasonable period of time. UPSTREAM only holds the ENQ while it is actually reading the configuration file, so this indicates that something is wrong.

Action: Rerun the configurator at a later time. If it still fails, you may have to terminate the UPSTREAM on-line task before running the configurator.

UST362E EXPDT= MUST BE 5 DIGIT NUMERIC – RECORD BYPASSED

Reason: EXPDT= did not have a 5-digit value in the format "yyddd".

Action: Correct the parameter and rerun the configurator.

UST363E MEMBER DOES NOT EXIST IN CONFIGURATION DATASET

Reason: The member name specified on the USTCFGIN DD statement does not exist in the configuration PDS.

Action: Correct the USTCFGIN member name and rerun the configurator.

UST364W ONLY ONE "GLOBAL" DEFINE PERMITTED IN CONFIGURATION FILE

Reason: The FDR/UPSTREAM-MVS Configurator found multiple configuration entries with the reserved profile name "WSNAME=GLOBAL".

Action: Correct your configuration input to contain only one "GLOBAL" definition record and rerun the configurator.

UST365E "GLOBAL" RECORD MUST BE FIRST IN CONFIGURATION

Reason: The FDR/UPSTREAM-MVS Configurator found the "WSNAME=GLOBAL" definition record was not the first record in the configuration file.

Action: Correct your configuration input file placing the "GLOBAL" definition record as the first "DEFINE" record of the file and rerun the configurator.

UST366 "GLOBAL" RECORD INCLUDED IN CONFIGURATION

Reason: This informational message documents that a DEFINE record with "WSNAME=GLOBAL" was found in the configuration file.

UST367W WARNING: NO "GLOBAL" RECORD FOUND IN CONFIGURATION

Reason: The FDR/UPSTREAM-MVS Configurator found no "GLOBAL" definition record in your input configuration file. This message is a warning only.

10.3

UST368 NO CHANGES MADE TO CONFIGURATION. FILE NOT REWRITTEN

Reason: The input configuration was not altered (perhaps because of syntax errors in configuration statements) so the output configuration was not written to DD name USTCONFG.

UST369E PROFILE ALREADY EXISTS CANNOT ADD TO CONFIGURATION

Reason: A DEFINE statement specified a WSNAME= or WSPREF= name that already exists in the input configuration

UST370 MAIN STATEMENT ACCEPTED. MAIN WILL BE ADDED TO CONFIGURATION

Reason: The MAIN statement passed syntax checking. The options will be added to the output configuration.

UST371W DELETE "ALL" REQUEST INVALID. STATEMENT IGNORED

Reason: The DELETE statement specified "ALL" instead of a specific WSNAME= workstation profile name. This is not allowed.

Action: Remove or correct the DELETE statement. If your intention was to delete the entire configuration file, delete the configuration dataset or (if it is a PDS) delete the desired member.

UST372 DELETE REQUEST ACCEPTED. PROFILE WILL BE DROPPED FROM CONFIGURATION

Reason: This informational message indicates that the requested workstation profile will be deleted from the configuration.

UST373W DELETE FUNCTION FAILED. WORKSTATION NOT FOUND IN CONFIGURATION

Reason: The workstation profile specified by WSNAME= was not found in the existing configuration and could not be deleted.

Action: Correct the workstation profile name and resubmit. If necessary, use the PRINT function to display existing profile names.

UST374 REQUEST ACCEPTED. PROFILE WILL BE ADDED TO THE CONFIGURATION

Reason: This informational message indicates that the specified workstation profile name will be added to the configuration.

UST375W WARNING: WORKSTATION ALREADY DEFINED. PROFILE WILL BE REPLACED

Reason: The workstation profile name specified on a DEFINE statement by WSNAME= already exists. The existing profile will be deleted and redefined as specified by the DEFINE statement.

Action: If your intention was to replace the profile, no action is required. If you intended to modify an existing profile, but neglected to use the MODIFY statement instead of DEFINE, review the profile to be sure that all required options have been specified.

UST376W PRINT FUNCTION FAILED. WORKSTATION NOT FOUND IN CONFIGURATION

Reason: A PRINT statement specified a workstation profile name which does not exist in the configuration.

Action: Correct the WSNAME= and resubmit.

UST377 PRINT FUNCTION COMPLETED

Reason: This informational message indicates that a PRINT function has completed successfully.

UST378W WARNING: "MAIN" RECORD ALREADY IN FILE. ABOVE STATEMENT IGNORED.

Reason: A MAIN statement was encountered in the USTCONFG input, and the configuration file is not NEW, i.e., an existing configuration is being modified. The MAIN statement is ignored.

Action: If your intention was to modify an existing configuration, you can ignore the message or remove the MAIN statement and resubmit. If you intended to create a new configuration, change your JCL to specify a new configuration dataset or member and resubmit.

UST379W WARNING: MAIN STATEMENT ALREADY IN CONFIG – REPLACING MAIN STATEMENT

Reason: A MAIN statement was entered for an update to an existing configuration. All the original MAIN options will be replaced by options (and defaults) on the new MAIN statement.

CONTINUED . . .

10.3

UST380W **WARNING: NOTHING TO MODIFY – RECORD BYPASSED:**

Reason: A MODIFY statement did not contain any operands indicating which attributes of the workstation profile to modify. The MODIFY is ignored.

Action: If necessary, correct the MODIFY statement and resubmit.

UST381W **WARNING: RECORD NOT FOUND IN CONFIG FILE CHANGING TO DEFINE**

Reason: The workstation profile name specified by WSNAME= on a MODIFY statement was not found in the configuration. The MODIFY is treated as a DEFINE and the profile is added to the configuration.

Action: Verify that the profile name is correct and that all required attributes have been specified. If necessary, DELETE the incorrect profile name and MODIFY the correct one.

UST382W **DELETE 'GLOBAL' INVALID. STATEMENT IGNORED**

Reason: A DELETE WSNAME=GLOBAL statement was encountered. You cannot delete the GLOBAL profile. The statement is ignored.

Action: If necessary, correct the input and resubmit.

UST383W **WARNING: "GLOBAL" RECORD ALREADY IN FILE – ABOVE STATEMENT IGNORED**

Reason: A DEFINE WSNAME=GLOBAL statement was encountered, and the GLOBAL profile already exists in the configuration. This DEFINE was ignored.

Action: Remove the DEFINE, or change the DEFINE to a MODIFY if you intend to change the attributes of the GLOBAL profile, and resubmit.

UST384W **MODIFY REQUEST ACCEPTED. PROFILE WILL BE CHANGED IN CONFIGURATION**

Reason: This informational message indicates that a MODIFY statement was successfully processed.

UST385W **REQUEST FAILED. PROFILE NOT UPDATED IN THE OUTPUT CONFIGURATION**

Reason: A MODIFY statement was rejected for some reason. The workstation profile will not be updated.

Action: Correct the MODIFY and resubmit.

UST386W **PRINT REQUEST FAILED. CONFIGURATION FILE IS EMPTY.**

Reason: A PRINT statement could not be executed because the configuration file does not contain a configuration definition.

UST387E **INVALID MEMBER NAME, CONFIG FILE IS NOT A PDS**

Reason: A member name was specified for the output configuration, but the configuration file is not a PDS.

Action: Specify a PDS for the output configuration or omit the member name.

UST388E **PC DRIVEN CONFIGURATION UPDATE ERROR**

Reason: The configuration was being updated from FDR/UPSTREAM at a workstation, but an error occurred. The configuration was not updated.

Action: Correct the error, if possible, and update the configuration again.

UST389E **CONFIGURATION ERROR – *reason***

Reason: An invalid parameter or another error was encountered. "reason" is a short description of the error.

Action: Correct the error and rerun the configurator.

UST390 **ACCEPTED CHANGES NOW APPLIED. CONFIGURATION FILE UPDATED SUCCESSFULLY**

Reason: One or more changes have been successfully applied to the configuration and the configuration file has been rewritten with the new configuration.

UST391E **SERIOUS CONFIGURATION PROCESSOR CHAIN ERROR. ABEND IN PROGRESS**

Reason: A serious error in the configuration file format has been detected.

Action: Save the abend dump and contact Innovation for assistance.

10.3

UST392E **SERIOUS ERROR DURING PRINT PROCESSING. ABEND IN PROGRESS**

Reason: A serious error in the configuration file format has been detected.

Action: Save the abend dump and contact Innovation for assistance.

UST399E ***error text from control statement processor***

Reason: The FDR/UPSTREAM-MVS control statement processor detected a syntax or usage error in a USTCONFG or USTRPORT control statement. The text indicates the error and where on the control statement it occurred. The job is terminated.

Action: Correct the control statement and resubmit. See Section 3 for details on syntax and usage of USTCONFG control statements or Section 7 for details on syntax and usage of USTRPORT control statements.

10.4 USTREGEN AND USTRPORT UTILITY MESSAGES (UST400 – UST499)

These messages are generated by the FDR/UPSTREAM-MVS "regen" utility, USTREGEN, or the generalized report writer, USTRPORT. They are written to the UPSTREAM log (DD "USTLOG") which is usually a SYSOUT dataset. For messages that indicate an error condition: if you are unable to resolve the problem, please save all output from USTREGEN and contact Innovation Technical Support for assistance.

UST400E* ***** ONLINE UPSTREAM IS ACTIVE – CANNOT CONTINUE *****

Reason: The USTREGEN utility found the on-line FDR/UPSTREAM component active upon starting.

Action: Stop On-line FDR/UPSTREAM while the Regen utility is run or run REGEN under the on-line task (see Section 5).

UST401E* **USTREGEN UNABLE TO OPEN LOG FILE – TERMINATING**

Reason: The USTREGEN utility was unable to open the Log File (DD name "USTLOG"). For obvious reasons, this is written as a WTO to the system console only.

Action: Verify that the USTLOG DD statement is correctly specified.

UST402E* **USTREGEN APF AUTHORIZATION CHECK FAILED – CANNOT CONTINUE**

Reason: The USTREGEN utility detected it was not being run as an MVS APF authorized program.

Action: Verify that the load library containing the USTREGEN utility is currently APF authorized.

UST403E* **OPEN FOR CATALOG CLUSTER FAILED – TERMINATING**

Reason: USTREGEN was unable to open the VSAM UPSTREAM Catalog cluster.

Action: Review your JCL to be sure it is correct. Review the USTREGEN job log for error messages which may indicate the cause of the problem.

UST404E* **OPEN FOR FILE-INFO CLUSTER FAILED – TERMINATING**

Reason: USTREGEN was unable to open the VSAM UPSTREAM File-Information cluster.

Action: Review your JCL to be sure it is correct. Review the USTREGEN job log for error messages which may indicate the cause of the problem.

UST405E **DYNAMIC ALLOCATION ERROR R15=*rr* CODE=*cccc* INFO=*iiii***

Reason: USTREGEN encountered an error trying to dynamically allocate the backup file to be read.

Action: See message UST095E for details on the error codes and possible actions.

UST406E* **OPEN FOR ARCHOLD DD FAILED – TERMINATING**

Reason: USTREGEN was unable to open the ARCHOLD file.

Action: Review your JCL to be sure it is correct. Review the USTREGEN job log for error messages which may indicate the cause of the problem.

UST407E **BACKUP DATASET NOT FOUND DSN=*dsname***

Reason: USTREGEN was executing as a subtask of the FDR/UPSTREAM on-line task, as the result of a console command (See Section 5, "Operation"). The backup dataset specified in that command was not cataloged.

Action: Verify that the backup dataset name was properly specified, and that the name is currently cataloged in the MVS catalogs.

UST408E* **VSAM ERROR – SNAP-002 TAKEN**

Reason: USTREGEN encountered an error on one of the VSAM clusters. A diagnostic SNAP dump with ID 002 was taken to the USTSNAP DD, if present. It is accompanied by message UST409E with VSAM diagnostic codes.

Action: See message UST409E.

UST409E **VSAM error indicators**

Reason: This message is logged by the VSAM error diagnosis routine. It contains specific error codes from the VSAM "RPL" control block and also indicates the location in USTREGEN of the error.

Action: Refer to the IBM "VSAM MACRO REFERENCE" or "MACRO INSTRUCTIONS FOR DATA SETS" manual (depending on the level of your operating system) to understand the error codes reported. The job log or SYSLOG may contain additional diagnostic messages. If you are unable to resolve the problem, contact Innovation Technical Support.

UST410 **UPSTREAM REGEN PROCESS STARTED**

Reason: This informational message indicates that the USTREGEN process has begun.

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UST411 **ARCHOLD DSN:** ***dsname***
Reason: This informational message indicates the dsname of the ARCHOLD dataset.

UST412 **ARCHOLD VOL:** ***volser***
Reason: This informational message indicates the volume serial of the ARCHOLD dataset.

UST413 **FILE INFORMATION RECORDS UPDATED:** ***nnnnnnn*** **ADDED:** ***mmmmmmmm***
Reason: This informational message indicates the number of records in the FILE-INFO dataset that were updated and added during this execution of USTREGEN.

UST414 **FILE DATA RECORDS READ:** ***nnnnnnnn***
Reason: This informational message indicates the number of data records read from the ARCHOLD dataset.

UST415 **UPDATE FILE-INFO:** ***profilename versiondate filename***
Reason: The FILE-INFO record for the indicated profile name, versiondate, and filename has been updated with data from the ARCHOLD dataset.

UST416E **MISSING FILE-INFO RECORD FOR PROFILE=*profilename locator***
Reason: File descriptors were not found on the backup tape for the indicated profilename.
Action: Contact Innovation for assistance.

UST417E **C-RECORD MISSING ON BACKUP**
Reason: A catalog record was not found on the backup tape.
Action: Contact Innovation for assistance.

UST418E **C-RECORD ERROR IN CONTROL FILE**
Reason: USTREGEN had an error reading a control record from the on-line repository.
Action: Contact Innovation for assistance.

UST419E **F-RECORD IN CONTROL FILE MISSED UPDATE FILE=*filename***
Reason: A file record was not updated properly.
Action: Contact Innovation for assistance.

UST420E **F-RECORD GET PREVIOUS VERSION NOT FOUND FILE=*filename***
Reason: An expected file record was not found.
Action: Contact Innovation for assistance.

UST421 **USTREGEN COMPLETED SUCCESSFULLY**
Reason: USTREGEN completed with no errors

UST422W **USTREGEN COMPLETED WITH ERRORS**
Reason: USTREGEN completed with warnings or errors.
Action: Review the USTREGEN messages for the specific error.

UST423E **F-RECORD TIMESTAMP NOT FOUND ON BACKUP FILE=*filename***
Reason: An expected file record was not found.
Action: Contact Innovation for assistance.

UST424 **VAULT REGEN STARTED FOR DSN=*dsname***
Reason: USTREGEN determined that the backup data set being read was the control file for a vault tape created by USTVAULT. The FDR/UPSTREAM control records will be updated to point to the secondary (vault) copy of the backups, as recorded in that control file.

UST425 **UPSTREAM REGENED** ***nnnnnn*** **BACKUP VERSIONS**
Reason: USTREGEN updated the control records for the indicated number of versiondates.

UST426E **UNKNOWN RECORD TYPE** ***data***
Reason: USTREGEN found a record which it could not identify in the backup data set being read. Part of the record is displayed.
Action: Contact Innovation for assistance.

CONTINUED . . .

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UST427E **VAULT BACKUP DATA SET NOT CATALOGED VOL=*vvvvvv* DSN=*dsname***

Reason: USTREGEN was reading a vault control file created by USTVAULT (See Section 7.8) but a backup dataset pointed to by the control records was no longer cataloged in the system catalog. The backup would not be usable.

Action: USTREGEN does not add the records for that backup to the online repository. If the backup file still exists, you may be able to manually recatalog it and run USTREGEN again.

UST428E **BACKUP CATALOGED TO ANOTHER VOLUME - REGEN FROM LASTEST COPY ONLY CATALOGED TO *cccccc* VAULT COPY IS *vvvvvv* DSN=*dsname***

Reason: USTREGEN was reading a vault control file created by USTVAULT (See Section 7.8) but a backup dataset pointed to by the control records is currently cataloged in the system catalog to a different tape volume. "cccccc" is the volser in the catalog, while "vvvvvv" is the volser in the vault records. This probably occured because you vaulted a copy of the same backup file multiple times. For example, an incremental MERGE BACKUP will normally append data to the previous incremental. If you vault that backup every day, you will have multiple vaulted copies with each copy containing an additional day's data. You only need to regen the most recent vault copy of that backup.

Action: USTREGEN does not add the records for that backup to the online repository. The message can be ignored, as long as you do eventually regen from the proper vault copy.

UST429 **VAULT BACKUP REGENED PROF=*profile* DATE=*versiondate* DSN=*dsname***

Reason: USTREGEN was reading a vault control file created by USTVAULT (See Section 7.8). The records for the indicated backup (profile, versiondate, and backup dsn) have been successfully updated in the FDR/UPSTREAM repository.

UST480E **FILEINFO POINT FAILED KEY=*kkkkkkkkkkkkkkkk***

Reason: A VSAM POINT in the FILE-INFO data set for the specified key failed.

Action: Contact Innovation for assistance.

UST481E **FILEINFO GET FAILED KEY=*kkkkkkkkkkkkkkkk***

Reason: A VSAM GET in the FILE-INFO data set for the specified key failed.

Action: Contact Innovation for assistance.

UST482E **CATALOG CLUSTER POINT FAILED KEY=*kkkkkkkkkkkkkkkk***

Reason: A VSAM POINT in the catalog data set for the specified key failed.

Action: Contact Innovation for assistance.

UST483E **CATALOG CLUSTER GET FAILED KEY=*kkkkkkkkkkkkkkkk***

Reason: A VSAM GET in the catalog data set for the specified key failed.

Action: Contact Innovation for assistance.

UST488E* **error text**

Reason: USTRPORT encountered an error opening or processing some data set that made it impossible to continue. This may be due to missing DD statements. The text indicates the error.

Action: Correct the error and resubmit the USTRPORT job.

UST494 **USTRPTPC - REPORT STARTED**

Reason: A USTRPORT request was received from a workstation.

UST495 **USTRPTPC - REPORT ENDED**

Reason: A USTRPORT request from a workstation was completed.

UST496 **USTRPTPC - REPORT CANCELED BY USER OR SEND ERROR**

Reason: A USTRPORT request from a workstation was terminated because of user request at the workstation or because of a transmission error.

UST498E **NO ENTRIES FOUND MATCHING SELECTION CRITERIA**

Reason: USTRPORT did not find any records which met the criteria specified on SELECT statements.

Action: Correct the SELECT statements (See Section 7.3) and reexecute USTRPORT.

UST499 **TOTAL HISTORY RECORDS READ: *nnnnnnnn* TOTAL RECORDS SELECTED: *mmmmmmm***

Reason: For RPTYPE=HISTORY or BACKUP, shows the total records read, and the total records selected for reporting.

10.5 USTMAINT/USTREORG UTILITY MESSAGES (UST500-UST599)

These messages are generated by the FDR/UPSTREAM-MVS utility programs, USTMAINT and USTREORG. They are written to the UPSTREAM log (DD "USTLOG"). USTMAINT is automatically executed during initialization of the FDR/UPSTREAM-MVS on-line task unless PARM=NOMAINT is specified. USTREORG is executed as a subtask of the FDR/UPSTREAM on-line task when a F UPSTREAM,REORG console command is entered.

For messages that indicate an error condition: if you are unable to resolve the problem, please save all output from USTMAINT and contact Innovation Technical Support for assistance.

UST500 ***** UPSTREAM USTMAINT PROCESS STARTED *****
Reason: This informational message indicates that USTMAINT has begun execution.

UST501E* **USTMAINT UNABLE TO OPEN LOG FILE – TERMINATING**
Reason: The USTMAINT utility was unable to open the USTLOG dataset. It will not continue processing. For obvious reasons, this message is issued as a WTO to the system console only.
Action: Verify that you have correctly specified the USTLOG dataset in your UPSTREAM JCL.

UST503E* **OPEN FOR CATALOG CLUSTER FAILED – TERMINATING**
Reason: USTMAINT was unable to open the VSAM UPSTREAM Catalog cluster.
Action: Review your UPSTREAM JCL to be sure it is correct. Review the UPSTREAM job log for error messages which may indicate the cause of the problem.

UST504E* **OPEN FOR FILE-INFO CLUSTER FAILED – TERMINATING**
Reason: USTMAINT was unable to open the VSAM UPSTREAM File-Information cluster.
Action: Review your UPSTREAM JCL to be sure it is correct. Review the UPSTREAM job log for error messages which may indicate the cause of the problem.

UST505 **PURGING: PROFILE=*profilename* DATE/TIME=*versiondate***
Reason: USTMAINT is purging a backup version with the indicated profile name and versiondate. This message is informational only.

UST506 **DSN: *dataset name* WAS DELETED – *nnnnnnnn* FILE RECORDS ERASED**
Reason: USTMAINT is purging a backup version having found the above named dataset is no longer cataloged on the MVS system. This message is issued along with message UST505 and is informational only.

UST507 ***nnnnnnnn* OF *nnnnnnnn* HISTORY RECORDS ERASED FOR DATES EARLIER THAN *mm/dd/yy***
Reason: History records are being kept in the FDR/UPSTREAM catalog data set (MAXHIST= was specified or default other than 0 in the configuration). USTMAINT has deleted obsolete history records older than MAXHIST days, calculated as "mm/dd/yy".

UST508E* **VSAM ERROR – SNAP 002 TAKEN**
Reason: USTMAINT encountered an error on one of the VSAM clusters. A diagnostic SNAP dump with ID 002 was taken to the USTSNAP DD, if present. It is accompanied by message UST509E with VSAM diagnostic codes.
Action: See message UST509E.

UST509E ***VSAM error indicators***
Reason: This message is logged by the VSAM error diagnosis routine. It contains specific error codes from the VSAM "RPL" control block and also indicates the location in USTREGEN of the error.
Action: Refer to the IBM "VSAM MACRO REFERENCE" or "MACRO INSTRUCTIONS FOR DATA SETS" manual (depending on the level of your operating system) to understand the error codes reported. The job log or SYSLOG may contain additional diagnostic messages. If you are unable to resolve the problem, contact Innovation Technical Support.

UST510 **UPSTREAM MAINT COMPLETED – *nnnnnnnn* VERSION RECORDS ERASED *mmmmmmmm* FILE RECORDS ERASED**
Reason: This informational message indicates the number of records erased from the FDR/UPSTREAM catalog due to USTMAINT processing.

UST511E **UPSTREAM LOCATE ERROR COMP=*cccc* DSN=*dsname***
Reason: UPSTREAM issued a catalog LOCATE for a backup dataset, and the return code was other than 0 (successful) and 8 (not found).
Action: Investigate the catalog entry for the indicated dataset; correct or delete it as appropriate.

UST512 ***n* OF *m* REGISTERED NAME RECORDS ERASED FOR DATES EARLIER THAN *mm/dd/yy***
Reason: This informational message indicates that of the "m" records in the Registered Name table (See Section 8.7), "n" of them have not been referenced or updated in the last 90 days and have been deleted.

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UST513 ***n* OF *m* DUPLICATE PLH RECORDS ERASED FOR DATES EARLIER THAN *mm/dd/yy***

Reason: This informational message indicates that of the "m" records of potential duplicate files (See Section 1.4), "n" of them have not been backed up from a second workstation in the number of days specified by the MAXDUPL= parameter in the configuration. Their records have been deleted.

UST514 ***n* OF *m* DUPLICATE UNREFERENCED FILES ERASED *p* DATA-RECS ERASED**

Reason: This informational message indicates that of the "m" backups of duplicate files (See Section 1.4), "n" of them have not been backed up from a third workstation in the number of days specified by the MAXDUPL= parameter in the configuration and have been deleted. "p" data records have been removed from the on-line repository.

UST550 **REORG BEGUN FOR DDNAME *ddname***

Reason: A F UPSTREAM,REORG DD=ddname console command was entered to request dynamic reorganization of the FDR/UPSTREAM data set referenced by the indicated DDNAME. No other tasks were active (except possibly other reorganizations), so the requested reorganization was initiated.

UST551W **REORG BYPASSED – DDNAME *ddname* NOT FOUND**

Reason: The ddname indicated on a F UPSTREAM,REORG DD=ddname console command is not one of the ddnames that can be reorganized.

Action: Reenter the command, specifying DD=USTCATLG, USTFILEI or USTFILEC.

UST524W **REORG BYPASSED – PROFILE *ddname* NOT IN CONFIGURATION**

Reason: A profile whose name matches the ddname to be reorganized was not found in the FDR/UPSTREAM configuration currently active. The reorganization is not done.

Action: Update the configuration to specify a profile with a name matching the ddname to be reorganized. It must specify DASD or TAPE/TAPECOMP and will be used to dynamically allocate a backup file for the reorganization.

UST553W **REORG BYPASSED – PROFILE *ddname* DOES NOT ALLOW SEQUENTIAL BACKUP**

Reason: The profile named "ddname" in the currently active FDR/UPSTREAM configuration is not enabled for either DASD or TAPE/TAPECOMP, so the backup file for the reorganization could not be allocated. The reorganization is not done.

Action: Update the named profile in the configuration to specify either DASD or TAPE or TAPECOMP, along with an appropriate DSNPREF.

UST554E **DYNALLOC ERROR: R15=*rrrrrrr* CODE=*cccc* INFO=*iiii***

Reason: USTREORG received an error indication trying to dynamically allocate the backup file for a data set reorganization.

Action: Verify that the specifications for DASDPREF/TAPEPREF and DUNIT/TUNIT in the profile used for the reorganization are correct. If DASD, verify that the unit or volser specified by DUNIT have enough space for the data set. See messages UST095E for information on interpreting these error codes.

UST555 **BACKUP DATA SET ALLOCATED, DSN=*dsname***

Reason: USTREORG has successfully dynamically allocated the named backup file, which will be used to backup the data from the UPSTREAM data set being reorganized. It may be on tape or disk.

Action: If the reload of the FDR/UPSTREAM data set fails, you will probably have to delete and redefine the data set (possibly with more space) and manually REPRO this backup file back into the data set using the USTCAMS utility. This file will be retained until deleted by your DASD or tape management software, or until manually deleted.

UST556E **OUTPUT OPEN FOR BACKUP DATA SET FAILED**

Reason: The OPEN for OUTPUT on the backup file by USTREORG has failed. The FDR/UPSTREAM data set being reorganized has not been modified.

Action: Check the joblog of the FDR/UPSTREAM on-line task for IBM error messages. Correct the cause if possible.

UST557E **INPUT OPEN FOR BACKUP DATA SET FAILED**

Reason: USTREORG has completed the backup of the FDR/UPSTREAM data set being reorganized, and has closed the backup file, but the reOPEN of the backup file for input has failed. The data set being reorganized has not been modified.

Action: Check the joblog of the FDR/UPSTREAM on-line task for IBM error messages. Correct the cause if possible.

CONTINUED . . .

10.5

UST558E ***general VSAM error diagnostic information***

Reason: USTREORG has received an error reading or writing the FDR/UPSTREAM data set being reorganized. The message contains specific error indicators from the VSAM RPL. If REQ=00 is displayed, this was a read error; the backup was not completed and the data set has not been modified; however, there is probably an error in that data set which should be corrected. If REQ=01, this was a write error and the data set is probably unusable.

Action: You will probably need to shutdown FDR/UPSTREAM and correct the error. If this was a write error, the backup file contains a backup of the data set. See IBM manual *"VSAM MACRO REFERENCE"* or *"MACRO INSTRUCTIONS FOR DATA SETS"* (depending on the level of your operating system) to understand the error codes.

UST559E **OPEN OR CLOSE OF CLUSTER FAILED**

Reason: An OPEN or CLOSE of the FDR/UPSTREAM data set being reorganized by USTREORG has failed. The dataset is probably unusable.

Action: You will probably need to shutdown FDR/UPSTREAM and correct the error. Check the joblog of the FDR/UPSTREAM on-line task for IBM error. Check the joblog of the FDR/UPSTREAM on-line task for IBM error messages.

UST560E **I/O ERROR ON BACKUP DATA SET**

Reason: An I/O error (input or output) has occurred on the backup file being used by USTREORG during the reorganization of a FDR/UPSTREAM data set. If this is followed by message UST565, then this was a READ error during the RELOAD and the data set being reorganized is probably unusable.

Action: You will probably need to shutdown FDR/UPSTREAM and correct the error. Check the joblog of the FDR/UPSTREAM on-line task for IBM error messages.

UST562* **REORG SUCCESSFUL FOR DDNAME *ddname* – RELOADED WITH:**

Reason: The reorganization of the FDR/UPSTREAM data set pointed to by the named ddname has been successfully reorganized by USTREORG. It will now be reOPENed by the main task, and FDR/UPSTREAM will again accept requests for backups and restores (unless another reorganization is still running).

UST563 **nnnnnnnnnnnnnn DATA-BLOCKS; nnnnnnnnnnnnnn DATA-BYTES**

Reason: This message follows message UST562 on the FDR/UPSTREAM log and indicates the number of blocks and bytes rewritten to the data set that was reorganized.

UST564W* **REORG UNSUCCESSFUL FOR DDNAME *ddname* – FDR/UPSTREAM FILE STILL USABLE**

Reason: An error occurred during the reorganization of the FDR/UPSTREAM data set indicated, but it was before USTREORG began reloading the data set, so it is still usable, and FDR/UPSTREAM will continue.

Action: Reexecute the reorganization after correcting the error, if possible.

UST565E* **REORG UNSUCCESSFUL FOR DDNAME ddname – FDR/UPSTREAM FILE NOT USABLE – MUST BE RELOADED**

Reason: An error occurred during the reorganization of the FDR/UPSTREAM data set indicated, while USTREORG was reloading the data set. The data set is probably not usable. This is displayed on the console as a non-scrollable message to ensure that the operator does not overlook it.

Action: You will probably need to shutdown FDR/UPSTREAM and correct the error. You may be able to correct it by manually reloading the file from the backup just created by USTREORG. You may also need to redefine the failing dataset with more space.

UST566W **IMMEDIATE SHUTDOWN REQUESTED - REORG TERMINATED**

Reason: The operator has requested an immediate shutdown of FDR/UPSTREAM. The USTREORG operation in progress was terminated. The file being reorganized may or may not be usable.

UST567 **BACKUP DATASET SUCCESSFULLY CREATED**

Reason: USTREORG has successfully created its backup dataset. The reload of the file being reorganized will now begin.

UST568E* **REORG FAILED WITH SYSTEM ABEND S*sss***

Reason: The USTREORG task has failed with the indicated system abend.

Action: USTREORG will terminate. If the abend code is other than a Sx37, an abend dump will be taken before termination. If the failure occurred during the reload phase, message UST565E will be issued (indicating that the file has become unusable); otherwise message UST564W is issued.

CONTINUED . . .

10.5

UST570E* **USTBKPRT UNABLE TO OPEN REPORT FILE - TERMINATING**

Reason: USTBKPRT had a failure opening its report file (USTRPRT). Probably the DD statement was missing or incorrectly specified.

Action: Correct the JCL and resubmit.

UST571E **BSAM ERROR: USTBKUP DATASET – *synod info***

Reason: An I/O error occurred reading the USTBKUP dataset in the USTBKPRT backup report utility. The "synod info" is the description of the error generated by the IBM SYNADEF macro. This may be accompanied by an IBM message in the joblog of the USTBKPRT job. The sequential backup data set may be damaged or unusable.

Action: If this is a *sequential tape* backup, try a different tape drive. It the error cannot be corrected, the backup is not usable.

UST572E ***** ERROR READING USTBKUP DATASET – MAY BE EMPTY**

Reason: An I/O error or end of file occurred reading the first block of the USTBKUP dataset in the USTBKPRT backup report utility. This may mean that the data set was created but was never written into due to some error during the backup.

Action: If this is a *sequential tape* backup, try a different tape drive. It the error cannot be corrected, the backup is not usable.

UST573E ***** ERROR OPENING USTBKUP DATASET – TERMINATING *****

Reason: An error occurred opening the USTBKUP dataset in the USTBKPRT backup report utility. This will probably be accompanied by an IBM message in the joblog of the USTBKPRT job. This may mean that the USTBKUP DD statement was omitted or the DD name misspelled, or that the dsname of the backup data set was misspelled.

Action: Determine the error from the IBM message, and correct the error is possible.

10.6 ARCHIVE, MIGRATE, VAULT, MERGE UTILITY MESSAGES (UST600 – UST699)

These messages are generated by the FDR/UPSTREAM-MVS archive program USTARCH, the migration program USTMIGRT, the vaulting utility USTVAULT, and the deferred merge utility USTMERGE. They are written to the UPSTREAM log (DD "USTLOG") which is usually a SYSOUT dataset. For messages that indicate an error condition: if you are unable to resolve the problem, please save all output from USTARCH and contact Innovation Technical Support for assistance.

UST601E* USTARCH UNABLE TO OPEN LOG FILE – TERMINATING

Reason: The USTARCH utility was unable to open the Log File (DD name "USTLOG"). For obvious reasons, this is written as a WTO to the system console only.

Action: Verify that the USTLOG DD statement is correctly specified.

UST602E* USTARCH FOUND ONLINE UPSTREAM ACTIVE – REPLY "GO" TO CONTINUE, "CAN" TO CANCEL

Reason: The FDR/UPSTREAM-MVS Archive Utility, USTARCH, executing as a batch job, has detected an on-line FDR/UPSTREAM-MVS region is active within the System, and issues this message to the system console.

Action: The operator can reply "CAN" to terminate USTARCH, or "GO" to continue with the archive operation. **Do not reply "GO" unless the USTARCH JCL is pointing to a different, inactive, set of FDR/UPSTREAM repository data sets, otherwise damage to the repository will result.**

UST602E ONLINE UPSTREAM IS ACTIVE – OPERATOR REPLIED xxxxxx

Reason: This message is printed after the operator replies to the UST602E message on the console. xxxxxx is either "GO" or "CANCEL". If CANCEL, USTARCH terminates.

UST603E* OPEN FOR CATALOG CLUSTER FAILED – TERMINATING

Reason: The FDR/UPSTREAM-MVS Archive Utility, USTARCH, was unable to open the Repository Catalog Cluster.

Action: Review your JCL to be sure it is correct. Review the USTARCH job log for error messages which may indicate the cause of the problem.

UST604E* OPEN FOR FILE-INFO CLUSTER FAILED – TERMINATING

Reason: The FDR/UPSTREAM-MVS Archive Utility, USTARCH, was unable to open the Repository File-Information Cluster.

Action: Review your JCL to be sure it is correct. Review the USTARCH job log for error messages which may indicate the cause of the problem.

UST605E* OPEN FOR FILE-DATA CLUSTER FAILED – TERMINATING

Reason: The FDR/UPSTREAM-MVS Archive Utility, USTARCH, was unable to open the Repository File-Data Cluster.

Action: Review your JCL to be sure it is correct. Review the USTARCH job log for error messages which may indicate the cause of the problem.

UST606E* OPEN FOR ARCHOLD DD FAILED – TERMINATING

Reason: The FDR/UPSTREAM-MVS Archive Utility, USTARCH, was unable to open the prior Archive dataset, "ARCHOLD" DD statement. This message can be issued only if USTARCH is operating in MERGE mode.

Action: Review your JCL to be sure it is correct. Review the USTARCH job log for error messages which may indicate the cause of the problem.

UST607E* OPEN FOR OUTPUT ARCHNEW DD FAILED – TERMINATING

Reason: The FDR/UPSTREAM-MVS Archive Utility, USTARCH, was unable to open the new Archive dataset, "ARCHNEW" DD statement.

Action: Review your JCL to be sure it is correct. Review the USTARCH job log for error messages which may indicate the cause of the problem.

UST608E* VSAM ERROR

Reason: The utility received a VSAM error indication. This message is accompanied by message UST609E containing the VSAM error codes.

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UST609E *VSAM error indicators*

Reason: This message is logged by the VSAM error diagnosis routine. It contains specific error codes from the VSAM "RPL" control block and also indicates the location in the utility of the error.

Action: Refer to the IBM "VSAM MACRO REFERENCE" or "MACRO INSTRUCTIONS FOR DATA SETS" MANUAL (depending on the level of your operating system) to understand the error codes reported. The job log or SYSLOG may contain additional diagnostic messages. If you are unable to resolve the problem, contact Innovation Technical Support.

UST610E* DEVTYPE CHECK FOR *ddname* DD FAILED – TERMINATING

Reason: The DEVTYPE macro for ARCHNEW or ARCHOLD, to determine the device type, has failed.

Action: Be sure that the DD statements for ARCHNEW and ARCHOLD are correct.

UST611E* ARCHNEW DEVICE IS NOT TAPE – TERMINATING

Reason: The FDR/UPSTREAM-MVS Archive utility, USTARCH, has determined the device for the "ARCHNEW" DD statement is not a TAPE device.

Action: Change your JCL to specify a valid TAPE device to contain the new Archive dataset and rerun the USTARCH job.

UST612E* APF AUTHORIZATION CHECK FAILED – TERMINATING

Reason: The FDR/UPSTREAM-MVS Archive utility, USTARCH, has determined it is not running as an MVS APF authorized program.

Action: Verify that the load library containing the USTARCH utility is currently MVS APF authorized.

UST613E* UNABLE TO MOUNT CORRECT ARCHOLD TAPE – ARCHIVE ABORTED

Reason: The FDR/UPSTREAM-MVS Archive utility, USTARCH, had an error reading the ARCHOLD tape volume. It is not possible for it to continue. This message can occur only if USTARCH is operating in MERGE mode.

Action: Be sure that the ARCHOLD DD points to the correct old archive tape. Contact Innovation Technical Support if required.

UST614E FEOV VOLUME SWITCH – ARCHOLD DATASET

Reason: The FDR/UPSTREAM-MVS Archive utility, USTARCH, is issuing the FEOV request to switch to the next volume in the ARCHOLD DD tape set. This message is informational only.

UST615W* WARNING: ARCHOLD DEVICE IS NOT TAPE

Reason: The FDR/UPSTREAM-MVS Archive utility, USTARCH, has determined that the ARCHOLD DD statement in it's execution JCL does not indicate a tape device. ARCHOLD must be either a tape or DUMMY. If it is not DUMMY, message UST616E will also be issued. This message can occur only if USTARCH is operating in MERGE mode.

Action: If ARCHOLD was specified as DUMMY, USTARCH will run without reading ARCHOLD. This is correct if this is the first time you have run USTARCH. Otherwise, correct the ARCHOLD DD and rerun USTARCH.

UST616E* ARCHOLD DEVICE IS NOT DUMMY – TERMINATING

Reason: The FDR/UPSTREAM-MVS Archive utility, USTARCH, has determined that the device specified in the ARCHOLD DD statement is not a tape device and is not specified as "DUMMY". USTARCH will not continue with the archival process. This message can occur only if USTARCH is operating in MERGE mode.

Action: Correct your JCL and rerun USTARCH.

UST618E* LOCATE FAILED FOR ARCHOLD DD – TERMINATING

Reason: The FDR/UPSTREAM-MVS Archive utility, USTARCH, was unable to issue an MVS catalog "LOCATE" request for the specified dataset name in the ARCHOLD DD statement. This message can occur only if USTARCH is operating in MERGE mode.

Action: Review your execution JCL to be sure you have specified the correct dataset name in the ARCHOLD DD statement. Correct your JCL and rerun USTARCH.

10.6

UST619E UNABLE TO LOCATE FILE DATA RECORDS:

Reason: This is the first in a series of error messages from the archive utility, USTARCH. It indicates that the archive utility was unable to find the file data records in the ARCHOLD file. This may be the result of a prior BSAM I/O error encountered reading or writing this ARCHOLD tape volume. The archive process continues, but the file data for this file is no longer accessible.

UST620E *profilename versiondate filename*

Reason: This message contains additional information for message UST619E.

UST621E ARCHNEW BSAM WRITE ERROR – ABEND U0609

Reason: The FDR/UPSTREAM-MVS Archive utility, USTARCH, detected an unrecoverable BSAM write error while attempting to write a block to the ARCHNEW DD. It is not possible for it to continue. USTARCH abends with a U0609 abend. There will be additional MVS BSAM error messages in the FDR/UPSTREAM-MVS job log.

Action: Contact Innovation Technical Support.

UST622E ARCHNEW BSAM WRITE ERROR – ABEND U0610

Reason: The FDR/UPSTREAM-MVS Archive utility, USTARCH, detected an unrecoverable BSAM write error while attempting to write a block to the ARCHNEW DD. It is not possible for it to continue. USTARCH abends with a U0610 abend. There will be additional MVS BSAM error messages in the FDR/UPSTREAM-MVS job log.

Action: Contact Innovation Technical Support

UST623E BSAM ERROR: *ddname* DATASET *dsname*

Reason: The utility detected a fatal BSAM error accessing the dataset in the DD statement named. It is not possible for it to continue. There will be additional MVS BSAM error messages in the FDR/UPSTREAM-MVS job log.

Action: Contact Innovation Technical Support.

UST624E REPOSITION ARCHOLD TAPE VOL

Reason: An error occurring positioning the “old” Archive Dataset. The Archived file being processed is skipped, and the ARCHOLD dataset is repositioned to the beginning.

Action: This is an internal error; contact Innovation Technical Support.

UST625E UNABLE TO FIND THE *cccccccc* CONFIGURATION ENTRY

Reason: The utility was being run as a subtask of the FDR/UPSTREAM-MVS on-line task, and the current configuration did not contain a profile with the appropriate name (USTARCH, USTMIGxx, USTMERxx, or USTVLTxx).

Action: Update the configuration with an appropriate reserved profile (see Section 3.8) and reexecute the request.

UST626E UNIT NAME INVALID IN *cccccccc* CONFIGURATION ENTRY

Reason: No value was specified for TUNIT= in the reserved profile used for this utility operation.

Action: Update the reserved profile in the configuration (see Section 3.8) and reexecute the request.

UST627E DYNALLOC ERROR: R15=*rrrrrrr* CODE=*cccc* INFO=*iiii*

Reason: The utility received an error indication trying to dynamically allocate the output tape when executing as a subtask of the FDR/UPSTREAM-MVS on-line task.

Action: Verify that the specifications for TAPEPREF and TUNIT in the associated reserved profile are correct (see Section 3.8). See message UST095E for information on interpreting these error codes.

UST628W INTERRUPTED BACKUP BYPASSED: *profile versiondate*

Reason: The indicated backup was interrupted, and will not be archived until it is restarted and successfully completed.

UST630 *program process* STARTED

Reason: This informational message indicates that the indicated program has started the indicated process, for example, "USTARCH ARCHIVE" or "USTMIGRT MIGRATE".

CONTINUED . . .

10.6

UST631 ARCHIVE PHASE-1 COMPLETE – STARTING CLEANUP PHASE

Reason: Phase 1 (Pass 1) of USTARCH processing is complete, Phase 2 (Pass 2) is beginning. See Section 7.5 for details on the 2 passes of USTARCH.

UST632 ARCHIVE PHASE-2 COMPLETE

Reason: Phase 2 (Pass 2) of USTARCH processing is complete. USTARCH will terminate.

UST633 BYPASSED: *nnnnnnnnnnn* VERSION(S)

Reason: Indicates the number of version records that were bypassed because they were flagged as "DELETE VERSION".

UST634 ARCHIVED: *nnnnnnnnnnn type*

Reason: Indicates the number of versions, files, and data records moved to the ARCHNEW dataset during USTARCH processing.

UST635 ERASED: *nnnnnnnn* DATA RECORDS

Reason: Indicates the number of data records erased from the UPSTREAM on-line repository during USTARCH processing.

UST636 ARCHNEW DSN: *dsname*

Reason: Indicates the dataset name of the ARCHNEW dataset.

UST637 ARCHNEW VOL: *volser*

Reason: indicates the volume serial of the ARCHNEW dataset.

UST638 ARCHOLD DSN: *dsname*

Reason: Indicates the dataset name of the ARCHOLD dataset.

UST639 ARCHOLD VOL: *volser*

Reason: indicates the volume serial of the ARCHOLD dataset.

UST649E function REQUEST INVALID REASON=*reason* REQ.: *request*

Reason: The request to start USTMIGRT, USTMERGE, USTVAULT or USTSCHED could not be processed for the reason indicated by "reason" which will consist of brief explanatory text, including:
GROUP ID NOT SPECIFIED indicates that the MODIFY command parameter did not contain a valid 2-character group ID, such as VAULTxx
BYTE AFTER COMMAND NOT BLANK that the MODIFY command parameter (MIGRTxx, MERGExx or VAULTxx) was not followed by a blank.
KEYWORD IS INVALID indicates the MODIFY command parameter (MIGRTxx, MERGExx or VAULTxx) was followed by an unrecognized keyword (see Section 5.7).
KEYWORD EXCEEDS MAXIMUM LENGTH indicates the MODIFY command parameter (MIGRTxx, MERGExx or VAULTxx) was followed by a keyword longer than the maximum permitted (see Section 5.7).
KEYWORD VALUE IS BLANK indicates the MODIFY command parameter (MIGRTxx, MERGExx or VAULTxx) was followed by a keyword with no value after it (see Section 5.7).
KEYWORD AREA EXCEEDS MAX indicates the MODIFY command parameter (MIGRTxx, MERGExx or VAULTxx) was followed by a keyword with value longer than the maximum permitted (see Section 5.7).
COPY= VALUE CANNOT BE 1 indicates that COPY=1 was specified on a VAULTxx command. The copy 1 backup is the original backup, COPY= must have some other value (usually 2 through 9).

Action: Correct the syntax of the command and reissue it.

10.6

UST650E **function BYPASSED REASON=*reason* DSN=*backupdsn***

Reason: USTMIGRT, USTMERGE or USTVAULT bypassed processing of the backup data set indicated by "backupdsn" for the reason indicated by "reason" which will consist of a reason number and brief explanatory text. Many of these reasons indicate an I/O error or inconsistency in the FDR/UPSTREAM repository data sets and are usually accompanied by additional messages detailing the error.
Reason codes are:
1 – C-RECORD DOES NOT EXIST indicates an internal error.
2 – C-RECORD NOT TYPE 81 indicates an internal error.
3 – BACKUP CATALOGED TO TAPE indicates that UPSTREAM's records indicated the backup was on disk but the MVS catalog shows it on tape. The backup may have been copied to tape with IEBGENER or some other copy utility outside of FDR/UPSTREAM.
4 – C-RECORD PUT VSAM ERROR see VSAM error message.
5 – BACKUP WAS INTERRUPTED indicates that USTMIGRT bypassed a restartable-interrupted backup.
6 – BACKUP IS NOT CATALOGED indicates a backup recorded by FDR/UPSTREAM is not in the MVS catalog. This might occur if the backup was expired and uncataloged recently but USTMAINT has not yet been run to delete it from UPSTREAM.
7 – LOCATE ERROR COMP=X'cccc' indicates that a catalog locate has failed.
8 – FILE CATALOGED TO MIGRAT indicates that the disk backup has been archived by FDR/ABR or HSM; USTMIGRT will not be recalled to disk.
9 – C-RECORD GET VSAM ERROR see VSAM error message.
A – C-REC GET-UPDATE VSAM ERR see VSAM error message.
B – S-REC GET-UPDATE VSAM ERR see VSAM error message.
C – S-RECORD PUT VSAM ERROR see VSAM error message.
D – F-REC GET-UPDATE VSAM ERR see VSAM error message.
E – F-RECORD PUT VSAM ERROR see VSAM error message.
F – I/O ERROR ON BACKUP FILE indicates an I/O error on the output. See the UST623E message.
G – MORE THAN 254 BACKUP VOLUMES indicates that a single tape file created required more than 254 tape volumes, which cannot be handled.
H – DEBLOCKING ERROR ON BACKUP indicates a corrupted backup data set.
I – INSUFFICIENT STORAGE indicates there is not sufficient free memory in the FDR/UPSTREAM online region to complete this operation. Increase the region if possible, restart UPSTREAM, and try again, or run the request at a time when fewer UPSTREAM operations are active.
J – MULTIPLE VERSION BACKUP indicates that the utility encountered a disk backup data set that contained backups from multiple versiondates; this should occur only if a full MERGE BACKUP was done to disk with COPYINCR. Change the profile to remove COPYINCR, since USTMIGRT will combine the backups into one file.
K – NAME MISSING COPY MASK (?) indicates that although the associated profile is enabled for vaulting, the backup data set name in the profile does not contain a question mark (?) for the copy number.
L – COPY VALUE NOT 1 AT OFFSET indicates that the copy number in the data set name of the input backup (at the position reserved by a ? in the profile) is not "1". Contact Innovation for assistance.
M – BACKUP IS A DEFERRED MERGE indicates that the backup will not be processed by USTMIGRT or USTVAULT because it is a full MERGE BACKUP taken with DEFER=MERGE and USTMERGE has not yet been run against it.
N – INSUFFICIENT STORAGE see reason I.
O – DEFER BACKUP OVER 20 VOLUMES indicates that when USTMERGE was trying to add deferred files to the end of a deferred MERGE BACKUP already on tape, that backup was cataloged to over 20 tape volumes.
P – DEFER BACKUP NOT 1ST FILE indicates that when USTMERGE was trying to add deferred files to the end of a deferred MERGE BACKUP already on tape, that backup was not cataloged as file 1 on the tape.
Q – OVER nn VERSIONS IN BACKUP indicates that the input backup file contains backups for more than nn unique versiondates. The utility cannot handle this backup.
R – INVALID RECORD LENGTH indicates that an invalid record was encountered.
T – FILE TRANSFER BACKUP indicates that a backup selected was actually a file transfer, not a backup.
U – ONLY VAULTED COPY EXISTS indicates that only a vault copy of the backup was found.

Action: If necessary, contact Innovation Technical Support for assistance.

UST651 **BACKUP SELECTED FOR operation PROFILE=*profilename* DSN=*backupdsn***

Reason: The indicated disk backup under the indicated profile was selected for "migration", "merging" or "vaulting" to tape.

UST652E **ALLOCATE/OPEN FOR BACKUP FAILED DSN=*backupdsn***

Reason: An error occured dynamically allocating or opening the indicated disk backup data set. There may be additional UPSTREAM or IBM messages indicating the specific cause.

Action: If the problem can be corrected, rerun the utility. If necessary, contact Innovation Technical Support for assistance.

UST653E ***action* FOR *file* FAILED DSN=*backupdsn***

Reason: An error occured on the indicated tape backup data set. "action" may be ALLOCATE/OPEN, CLOSE, or ADD S-RECORD. "file" may be OUTPUT TAPE or CONTROL FILE (the latter for USTVAULT only). There may be additional UPSTREAM or IBM messages indicating the specific cause.

Action: If the problem can be corrected, rerun the utility. If necessary, contact Innovation Technical Support for assistance.

CONTINUED . . .

10.6

UST654 **BACKUP WAS SCRATCHED FROM *source* PROFILE=*profile* DSN=*backupdsn***

Reason: If "source" is DASD, a disk backup was successfully copied to tape and the disk backup data set named was scratched from disk. If "source" is TAPE, a tape backup was copied onto a new tape by USTMIGRT and the input tape backup data set named was uncataloged.

UST655 **BACKUP PROF=*profile* D=*versiondate operation* TO DSN=*tapebackupdsn***

Reason: The utility has successfully completed the indicated opertion on the backup described by "profile" and "versiondate". The input backup data set is indentified in the UST651 message. It was copied to the tape backup data set indicated. FDR/UPSTREAM records have been updated to point to the new backup data set.

UST656E ***type* REQUEST FAILED COMP=X'*ffff00001111*' PROF=*profile* DSN=*backupdsn***

Reason: An operation against the indicated backup data set, under the indicated profile, failed. “type” may be SCRATCH (delete disk backup data set), CATALOG (catalog tape data set), or RECATLG (update tape data set catalog). COMP contains the contents of R15 (ffff), R0 (0000) and R1 (1111). There may also be an IBM message in the UPSTREAM job log with more information on the error. If you get this message for SCRATCH on a given data set, but not for CATALOG/RECATLG, the migration was successful but the backup is left on disk. If a CATALOG/RECATLG error occurs, the MVS catalog was not updated to point to the tape, and a USTMAINT execution might delete the records of this backup. These errors are NOT likely to occur.

Action: For a SCRATCH error, try to manually delete the data set from disk (IEHPROGM SCRATCH). For a CATALOG/RECATLG error, try to manually catalog the tape data set (IDCAMS DEFINE NONVSAM) using the information from the UST660 message (check the FDR/UPSTREAM joblog to see if the tape backup data set extended to additional tape volumes). If you need assistance, contact Innovation Technical Support.

UST657E ***operation* TERMINATED DUE TO VSAM ERROR**

Reason: An error has occurred reading or updating the FDR/UPSTREAM on-line repository data sets. Message UST609 is also printed detailing the error. The repository may be damaged.

Action: Contact Innovation Technical Support.

UST658E ***utility* CANNOT BE EXECUTED AS A BATCH PROGRAM – USE *command* UNDER USTMAIN**

Reason: You attempted to execute PGM=USTMIGRT, USTMERGE or USTVAULT in a batch job or under TSO.

Action: Use the F UPSTREAM command to initiate the utility. See Section 5.7.

UST659E ***type* NOT ENABLED IN *profile* CONFIGURATION ENTRY**

Reason: The reserved configuration profile, USTMIGxx, USTMERxx or USTVLTxx, was not properly enabled for tape backups. The tape parameters in that profile will be used to allocate the tape drive and create a dummy (empty) file at the beginning of that tape, followed by the migrated or vaulted backups. For USTVAULT, "type" may also be DASD, since vaulting requires that the profile be enabled for both tape and disk backups.

Action: Update the profile entry in the configuration. See Section 3.8.

UST660 ***operation* TO *type* BACKUP VOL=*volser* FILESEQ=*filsq* DSN=*tapebackupdsn***

Reason: The utility has successfully opened the tape backup data set named. "volser" is the first (or only) tape volume serial, and "filsq" is the file sequence number. If "type" is TAPE, then it has created a new tape data set; if it is PREV, it added data to the previously created tape data set.

UST661 **NEW *type* TAPE MOUNTED VOL=*volser* FILESEQ=*filsq* DSN=*tapebackupdsn***

Reason: The utility filled the previous output tape. The indicated tape volume was mounted to continue the output of the indicated tape backup data set.

UST662E ***operation* MISSED UPDATE FILE=*filespec***

Reason: The utility has copied a disk backup to tape, but while updating FDR/UPSTREAM's records for the backup, it discovered that the named file is recorded as being in that backup, yet the file was not encountered while copying the backup. In other words, UPSTREAM has a record of a file that is not in the backup. The utility continues updating the rest of the records.

Action: This error should not occur, but if it does, contact Innovation Technical Support for assistance.

10.6

UST663 *operation*: *vvvvvvv* VERSION(S) *ffffffff* FILES *ddddddd* DIRS *rrrrrrrr* DATA RECORDS *kkkkkkkkkk* KBYTES *wwwwwww* FORWARD

Reason: The utility copied this total number of versiondates, files, directories, blocks and kilobytes. FORWARD is the number of backups merged forward and appears only for USTMERGE.

UST664 *type* BACKUP TAPE NAME IS *backupdsn*

Reason: USTMIGRT, USTVAULT or USTMERGE has successfully written the dummy (empty) data set as file 1 on the output tape, using the tape name specification in the USTMIGRT special profile entry in the FDR/UPSTREAM configuration. The actual name is “backupdsn”. You may need to use this name in your tape management system for vaulting or retention purposes.

UST665 CONTROL FILE DATA SET NAME IS *dsn*

Reason: USTVAULT created the vaulting control file on disk with the indicated data set name. At the end of the vaulting operation, this control file is copied to the vault tape.

UST666E CONTROL FILE FAILED TO GET PUT ON TAPE REASON=*reason*

Reason: USTVAULT had an error copying the vault control file to the vault tape, for the reason indicated.

Action: Contact Innovation for assistance.

UST667 CONTROL FILE COPIED TO TAPE FILE=*ffff* VOL=*vvvvvv*

Reason: USTVAULT has successfully copied the vault control file to the vault tape, as file “ffff” on tape volser “vvvvvv”.

UST668 CONTROL FILE LEFT ON DASD BY REQUEST

Reason: USTVAULT has left a copy of its control file on DASD, as requested by an option.

UST669 OPERATOR CANCELLED MOUNT FOR VAULT

Reason: The operator replied CANCEL to a request to mount a tape for USTVAULT. A UST652E message is also issued, and the vaulting operation is terminated.

UST670E I/O OR LOGICAL ERROR FOR BACKUP FILE - CHECK MVS LOG DSN=*backupdsn*

Reason: An error occured opening or reading the indicated backup data set. There may be additional UPSTREAM or IBM messages indicating the specific cause.

Action: If the problem can be corrected, rerun the utility. If necessary, contact Innovation Technical Support for assistance.

UST671 MERGED: *bbb* BACKUPS *fff* FILES *ddd* DIRS *bbb* DATA BLOCKS *eee* DEFER FILES

Reason: USTMERGE has completed processing. These are statistics about the total data processed.

UST672E MERGE PREVIOUS BACKUPS MISSING FOR DEFERRED PROFILE=*profile*

Reason: USTMERGE found records for the named profile, indicating that deferred files should be found in previous backups for that profile, but the indicated previous backups cannot be found in the FDR/UPSTREAM repository. They have expired or been deleted.

UST673 MIGRATE FORWARD ENDED FOR PROFILE DUE TO FULL BACKUP

Reason: USTMIGRT was copying incremental backups from a backup file but encountered a full backup at the end of that file. Since this is the end of the data required, processing for that profile was completed.

CONTINUED . . .

10.7 USTBATCH UTILITY MESSAGES (UST700 – UST799)

These messages are generated by the FDR/UPSTREAM-MVS batch program, USTBATCH. They are written to the UPSTREAM log (DD "USTLOG") which is usually a SYSOUT dataset.For messages that indicate an error condition: if you are unable to resolve the problem, please save all output from USTBATCH and contact Innovation Technical Support for assistance.

UST700E OPEN FOR INPUT SOURCE FILE (USTPARM) FAILED

Reason: USTBATCH was unable to open the USTPARM dataset. The job terminates with a non-zero return code.

Action: Verify that your batch JCL is correct and that the USTPARM dataset is of the correct type and execute USTBATCH again.

UST701E VALUE FOR "APPLPREF" MUST BE 5 CHARACTERS

Reason: USTBATCH found an invalid value for the "APPLPREF" parameter in the input stream. The job terminates with a non-zero return code.

Action: Verify that the APPLPREF parameter value is 5 characters long and execute USTBATCH again.

UST702E VALUE FOR "USAPPL" EXCEEDS 8 CHARACTERS

Reason: USTBATCH found an invalid value specified for the USAPPL parameter in the input stream. The job terminates with a non-zero return code.

Action: Verify that the USAPPL parameter value is 8 characters long or less, and execute USTBATCH again.

UST703E VALUE FOR "USAPPL" INVALID

Reason: USTBATCH found an invalid value specified for the USAPPL parameter in the input stream. The job terminates with a non-zero return code.

Action: Correct the USAPPL parameter and execute USTBATCH again.

UST704E VALUE FOR "TARGLU" EXCEEDS 8 CHARACTERS

Reason: USTBATCH found an invalid value specified for the TARGLU parameter in the input stream. The parameter is ignored and USTBATCH continues looking for valid parameters.

Action: Correct the TARGLU parameter and execute USTBATCH again.

UST705E VALUE FOR "TARGLU" INVALID

Reason: USTBATCH found an invalid value specified for the TARGLU parameter in the input stream. The parameter is ignored and USTBATCH continues looking for valid parameters.

Action: Correct the TARGLU parameter and execute USTBATCH again.

UST706E PREVIOUS RETRY VALUE TOO LONG

Reason: USTBATCH found an invalid value specified for the MAXRETRY, APPLRETRY or TMAXRETRY parameter in the input stream. The parameter is ignored and USTBATCH continues looking for valid parameters.

Action: Correct the MAXRETRY parameter and execute USTBATCH again.

UST707E PREVIOUS RETRY VALUE INVALID

Reason: USTBATCH found an invalid value specified for the MAXRETRY, APPLRETRY or TMAXRETRY parameter in the input stream. The parameter is ignored and USTBATCH continues looking for valid parameters.

Action: Correct the retry parameter and execute USTBATCH again.

UST708W WARNING: "APPLPREF" DEFAULTED TO "UPSTR"

Reason: USTBATCH was unable to locate a value for the "APPLPREF" parameter in the input stream. The parameter will take its default value of "UPSTR".

Action: If this is incorrect, specify the APPLPREF parameter and execute USTBATCH again.

UST709W WARNING: "USAPPL" DEFAULTED TO "UPSTREAM"

Reason: USTBATCH was unable to locate a value for the "USAPPL" parameter in the input stream. The parameter will take its default value of "UPSTREAM".

Action: If this is incorrect, specify the USAPPL parameter and execute USTBATCH again.

10.7

UST710E **"TARGLU","TARGNAME OR "TCPTARG" PARAMETER NOT FOUND**

Reason: USTBATCH was unable to locate any "TARGLU", "TCPTARG" or "TARGNAME" required parameter in the input stream and is terminating.

Action: Add the TARGLU, TCPTARG or TARGNAME parameter and execute USTBATCH again.

UST711W **WARNING: "TPNAME" NOT VALID FOLLOWING A TCPIP TARGET – IGNORED**

Reason: The TPNAME= parameter is only valid following a TARGLU= parameter for a VTAM APPC target workstation. It is ignored if it follows a TCPTARG= for a TCP/IP workstation.

UST712E **"WSPARM" VALUE TOO LONG**

Reason: USTBATCH has detected an invalid value specified for the "WSPARM" parameter in the input stream. The parameter is ignored and USTBATCH continues looking for valid parameters.

Action: Correct the WSPARM parameter and execute USTBATCH again.

UST713E **"WSPARM" VALUE INVALID**

Reason: USTBATCH has detected an invalid value specified for the "WSPARM" parameter in the input stream. The parameter is ignored and USTBATCH continues looking for valid parameters.

Action: Correct the WSPARM parameter and execute USTBATCH again.

UST714E **UNABLE TO LOCATE AN AVAILABLE VTAM ACB NAME**

Reason: The application name built by USTBATCH from APPLPREF plus "nnn" (e.g., UPSTR001) was either not defined to VTAM or already in use by another application.

Action: Verify that your "APPLPREF" parameter specifies a valid prefix in agreement with your definitions in the VTAM APPL definition member for FDR/UPSTREAM-MVS. If not, correct the value and resubmit the USTBATCH job. You may need to increase the number of VTAM application definitions available for use with USTBATCH (see Section 2.6).

UST715E **VTAM SETLOGON REQUEST FAILED**

Reason: USTBATCH has received an error indication after issuing the VTAM "SETLOGON" request to enable session setup. This message is followed by message UST719E containing the applicable VTAM error codes.

Action: Use these error codes to resolve the problem.

UST716W* **USTBATCH COMPLETED WITH WARNINGS**

Reason: The USTBATCH job has completed with warning-level errors.

Action: Review the USTBATCH log file to determine the warnings issued, and whether they were acceptable.

UST717E* **USTBATCH COMPLETED WITH ERRORS**

Reason: The USTBATCH job has completed with errors.

Action: Review with USTBATCH log file to determine the errors that have occurred.

UST718* **USTBATCH COMPLETED SUCCESSFULLY**

Reason: The USTBATCH job has complete successfully.

UST719E ***VTAM error codes and indicators***

Reason: This message follows a descriptive error message and contains the applicable VTAM error codes relating the error described.

Action: Use the IBM "VTAM PROGRAMMING" or "VTAM PROGRAMMING FOR LU 6.2" manuals to understand the error codes.

UST720E **ALLOCATION FAILURE - BE SURE UPSTREAM TASK IS ACTIVE**

Reason: USTBATCH has received a VTAM allocation failure while attempting to connect to the FDR/UPSTREAM online task. For errors other than an allocation failure, the text of the message is "APPC CNOS ERROR". It is followed by a UST719E message giving details of the VTAM error.

Action: Be sure that the FDR/UPSTREAM online task is active.

CONTINUED . . .

10.7

UST721E APPC ALLOCATE TO APPL *aaaaaaaa* REQUEST FAILED

Reason: USTBATCH has received a VTAM error indication after issuing the APPC ALLOCATE request to the on-line UPSTREAM started task. This message is followed by message UST719E containing the returned VTAM error codes.

Action: Review the error codes to determine the cause of the error.

UST722E APPC SEND-DATA RUN-FUNCTION REQUEST FAILED

Reason: USTBATCH has received a VTAM error indication after issuing the APPC SEND-DATA request to the on-line UPSTREAM started task. This message is followed by message UST719E containing the returned VTAM error codes.

Action: Review the error codes to determine the cause of the error.

UST723E APPC SEND-DATA RUN-FUNCTION-PARAM REQUEST FAILED

Reason: USTBATCH has received a VTAM error indication after issuing the APPC ALLOCATE request to the on-line UPSTREAM started task. This message is followed by message UST719E containing the returned VTAM error codes.

Action: Review the error codes to determine the cause of the error.

UST724E APPC CONFIRM REQUEST FAILED

Reason: USTBATCH has received a VTAM error indication after issuing the APPC CONFIRM request to the on-line UPSTREAM started task. This message is followed by message UST719E containing the returned VTAM error codes.

Action: Review the error codes to determine the cause of the error.

UST725E RECEIVE FOR EVENT TYPE-90 FAILED

Reason: USTBATCH has received a VTAM error indication after issuing the APPC RECEIVE-DATA request to the on-line UPSTREAM started task. This message is followed by message UST719E containing the returned VTAM error codes.

Action: Review the error codes to determine the cause of the error.

UST726E RECEIVE FOR EVENT TYPE-91 FAILED

Reason: USTBATCH has received a VTAM error indication after issuing the APPC RECEIVE-DATA request to the on-line UPSTREAM started task. This message is followed by message UST719E containing the returned VTAM error codes.

Action: Review the error codes to determine the cause of the error.

UST727 *message text from the target workstation*

Reason: This message contains message text sent by the target workstation LU. This message is actually issued by the workstation LU.

Action: If it indicates an error, review the UPSTREAM log on the workstation for additional information as to the cause of the error.

UST728 ACB *aaaaaaaa* OPENED TO VTAM

Reason: USTBATCH has successfully located and opened an ACB to VTAM, using application name “aaaaaaaa”. This message is informational only.

UST729 APPC ALLOCATE TO *aaaaaaaa* SUCCESSFUL

Reason: USTBATCH has successfully allocated its LU 6.2 conversation to the on-line FDR/UPSTREAM-MVS started task using application name “aaaaaaaa”. This message is informational only.

UST730E PREVIOUS RETRY VALUE INVALID

Reason: USTBATCH found the MAXRETRY, APPLRETRY or TMAXRETRY value specified in the input stream was not numeric. The parameter is ignored and USTBATCH continues looking for valid parameters.

Action: Correct the MAXRETRY parameter and execute USTBATCH again.

UST731E LOGMODE VALUE TOO LONG

Reason: USTBATCH found an invalid value specified for the LOGMODE parameter in the input stream. The parameter is ignored and USTBATCH continues looking for valid parameters.

Action: Correct the LOGMODE parameter and execute USTBATCH again.

10.7

UST732E LOGMODE VALUE INVALID

Reason: USTBATCH found an invalid value specified for the LOGMODE parameter in the input stream. The job terminates with a non-zero return code.

Action: Correct the LOGMODE parameter and execute USTBATCH again.

UST733W WARNING: USING DEFAULT LOGMODE NAME "#INTER"

Reason: USTBATCH was unable to locate the LOGMODE parameter in the input stream, and is defaulting the value to "#INTER". This message is informational.

Action: If this is not correct, specify the LOGMODE= parameter and execute USTBATCH again.

UST734 REQUEST SENT TO ONLINE INITIATOR FOR *targetname*

Reason: The USTBATCH job has completed sending one request for workstation address or name indicated to the FDR/UPSTREAM-MVS on-line initiator. It has requested confirmation. This message is informational only.

UST735 REQUEST CONFIRMED BY ONLINE INITIATOR

Reason: USTBATCH has received positive confirmation to the request last sent to the FDR/UPSTREAM-MVS on-line initiator. This message is informational only.

UST736E REQUEST NOT CONFIRMED (MESSAGE FOLLOWS):

Reason: USTBATCH has received a negative indication to its confirmation request. This message is followed by an indicative message from the FDR/UPSTREAM-MVS on-line initiator or from the workstation itself.

UST737E TPNAME FOUND, BUT NO TARGET LU SPECIFIED

Reason: USTBATCH found a value specified for the TPNAME parameter in the input stream; but no TARGLU parameter preceding it.The parameter is ignored and USTBATCH continues looking for valid parameters.

Action: Correct the values and resubmit the USTBATCH job.

UST738E TPNAME VALUE TOO LONG

Reason: USTBATCH found an invalid value specified for the TPNAME parameter in the input stream. The associated TARGLU= parameter is ignored and USTBATCH continues looking for valid parameters.

Action: Correct the TPNAME parameter and execute USTBATCH again.

UST739E INVALID TPNAME VALUE FOUND

Reason: USTBATCH found an invalid value specified for the TPNAME parameter in the input stream. The associated TARGLU= parameter is ignored and USTBATCH continues looking for valid parameters.

Action: Correct the TPNAME parameter and execute USTBATCH again.

UST740E INVALID TCP ADDRESS AND/OR PORT SPECIFIED

Reason: USTBATCH found an invalid value specified for the TCPTARG parameter in the input stream. The parameter is ignored and USTBATCH continues looking for valid parameters.

Action: Correct the TCPTARG parameter and execute USTBATCH again.

UST741E INVALID VALUE FOUND FOR "CONV=", NOWAIT,NOKEEP USED

Reason: USTBATCH found an invalid value specified for the CONV= parameter in the input stream. The parameter is ignored and USTBATCH continues looking for valid parameters.

Action: Correct the CONV parameter and execute USTBATCH again.

UST743E INVALID "TARGNAME" PARAMETER FOUND

Reason: USTBATCH found an invalid value specified for the TARGNAME parameter in the input stream. The parameter is ignored and USTBATCH continues looking for valid parameters.

Action: Correct the TARGNAME parameter and execute USTBATCH again.

UST744W NO AVAILABLE VTAM ACBNAMES - ENTERING RETRIES

Reason: USTBATCH attempted to find a free VTAM application name starting with the prefix specified by APPLPREF (or the default of UPSTR), but all such application names defined to VTAM are in use and APPLRETRY=0 was not specified.

Action: USTBATCH will attempt to find an available VTAM application every 5 seconds until the retry limit specified by APPLRETRY is reached (default is 240).

UST745E UPSTREAM TASK AT "MAXTASKS" - INITIATING RETRIES

Reason: USTBATCH connected to the FDR/UPSTREAM online tasks but UPSTREAM reported that it is already at its maximum task limit and TMAXRETRY= was specified.

Action: USTBATCH will try to initiated its request every 5 minutes until it is accepted or until the retry limit specified by TMAXRETRY is reached.

CONTINUED . . .

10.7

UST746E **RETRY COUNT EXHAUSTED**
Reason: One of the USTBATCH retry parameters (indicated by a preceding message) was exceeded. The requested operation was not initiated.

UST746E **NO RETRIES SPECIFIED**
Reason: One of the USTBATCH retry parameters (indicated by a preceding message) was specified as or defaulted to zero (0). The requested operation was not initiated.

UST747/E* **PROCESS COMPLETED - RETURN CODE=*nnn*,TARGET=*target***
Reason: The requested operation at the target workstation "target" completed with the indicated return code. If the return code is non-zero, the message number is UST747E, otherwise it is UST747. This message is issued only if CONV=WAIT is specified in the USTBATCH parameters. If WTOCOMP is also in the USTBATCH parameters, will also be printed on the system console by a WTO.

UST748E **INVALID RECORD BYPASSED:**
Reason: A control statement was input to USTBATCH which was not recognized. The invalid record, printed after the message, is ignored.

UST749 ***status display***
Reason: A "F jobname,STA" console command was issued to a USTBATCH job. This message indicates the requests currently queued or active in that job.

UST750E* **USTBATCH COMMAND INVALID OR CANNOT BE ACCEPTED AT THIS TIME**
Reason: A STOP(P) or MODIFY(F) console command was issued to a USTBATCH job, but either the parameter was invalid or USTBATCH is not accepting console commands. Commands can only be accepted if CONV=WAIT was specified in the USTBATCH parameters.

UST751* **TERMINATING REQUEST ID = *nnnn***
Reason: A "F jobname,TERM ID=nnnn" console command was issued to a USTBATCH job. The request with ID number "nnnn" is being terminated.

UST752* **STOP SCHEDULED - CONFIRM IN PROGRESS**
Reason: A "P jobname" console command was issued to a USTBATCH job, but USTBATCH is currently waiting for FDR/UPSTREAM to confirm a request. USTBATCH will terminate as soon as the request is confirmed.

UST753* **STOP REQUEST RECEIVED**
Reason: A "P jobname" console command was issued to a USTBATCH job. USTBATCH will terminate.

UST754E* **ID VALUE FOR TERM REQUEST INVALID OR NOT FOUND**
Reason: A "F jobname,TERM ID=nnnn" console command was issued to a USTBATCH job, but either the parameter "nnnn" was not a valid 4-digit number, or no USTBATCH request was found with that ID number.

UST755 **USTBATCH V n.n.n STARTED**
Reason: The USTBATCH job has started.

UST756 **REQUEST COMPLETED, REQ=*request***
Reason: An "F jobname,request" console commmand was issued to a USTBATCH job. The request has been processed.

UST757W **WARNING: NO KEYWORD VERIFICATION WILL BE PERFORMED**
Reason: VERIFY=NO was specified; invalid workstation parameter names will not be detected.

UST758E **PREVIOUS RECORD KEYWORD INVALID - REQUEST BYPASSED**
Reason: An invalid workstation parameter name was encountered. The current workstation request will be bypassed. Other requests in the same jobstream will still be processed.

UST759E **USERID NOT SPECIFIED ON JOB - REQUEST BYPASSED**
Reason: A "USERID &JOB" statement was present in the USTBATCH input, but no security userid was associated with this job. The statement is bypassed. If a userid is required for FDR/UPSTREAM operation (a SECLVL= value greater than 0 in the UPSTREAM configuration), the requested function may fail when it is initiated by the workstation.

UST760 **RESTART IS/NOT ENABLED - COUNT=cccc DELAY=dddd**
Reason: This message documents that automatic restart of USTBATCH operations is or is not enabled. "cccc" is the retry limit, and "dddd" is the minutes between restart attempts. This is controlled by the RESTART operand of USTBATCH.

CONTINUED . . .

10.7

UST761* **ATTEMPTING type RESTART FOR target, REMAINING RETRIES=nnnn**

Reason: This message documents that an automatic restart of a USTBATCH operation is being attempted. "type" is BACKUP or RESTORE, "target" is the target workstation, and "nnnn" is the number of retries remaining.

UST762* **type INTERRUPTED - WAITING nnn MINUTES FOR RESTART TO target**

Reason: This message documents that a USTBATCH operation was interrupted, and will be restarted in "nnn" minutes. "type" is BACKUP or RESTORE, and "target" is the target workstation.

UST763E **RESTART REQUIRES CONV=WAIT**

Reason: The USTBATCH parameter RESTART= was specified without also specifying CONV=WAIT.

UST764E **RECEIVE OF STARTED TASK MESSAGES FAILED**

Reason: A VTAM error occurred while USTBATCH was reading messages from the MVS/UPSTREAM main task. Message UST719I will be printed with details of the error.

UST765E **ALLOCATE FOR STARTED TASK MESSAGES FAILED**

Reason: A VTAM allocation error occurred while USTBATCH was reading messages from the MVS/UPSTREAM main task.

UST766E **SEND OF "xx" STRUCTURE FOR LOG MESSAGES FAILED**

Reason: A VTAM error occurred while USTBATCH was requesting messages from the MVS/UPSTREAM main task. "xx" is the ID of the structure being transmitted.

UST767E **RECORD INVALID AFTER "ENDPARM" STATEMENT**

Reason: An ENDPARM statement must be followed by a TARGLU=, TARGNAME=, or TCPTARG= statement, or another ENDPARM. The invalid statement is ignored.

CONTINUED . . .

10.8 USTSCHED UTILITY MESSAGES (UST800 - UST810)

UST800E* **OPEN FOR USTSCHED DDNAME FAILED**

Reason: Either the DD statement for USTSCHED was omitted from the startup proc for the FDR/UPSTREAM-MVS started task, or another error occurred trying to open it. Check the joblog of the UPSTREAM task for IBM messages.

UST801E* **SCHEDULE RECORD DESCRIPTOR IS INVALID**

Reason: Schedule data in the USTSCHED data set is not in the format expected by the USTSCHED utility. Either the data set was never properly initialized with a schedule by the FDR/UPSTREAM ISPF dialogs, or the data has been corrupted.

Action: Rebuild the schedule data set or correct the FDR/UPSTREAM-MVS started task JCL to point to the correct data set.

UST802E* **SCHEDULE DATA SET IS EMPTY**

Reason: The USTSCHED data set is empty. Either the data set was never properly initialized with a schedule by the FDR/UPSTREAM ISPF dialogs, or the data has been corrupted.

Action: Build the schedule data set or correct the FDR/UPSTREAM-MVS started task JCL to point to the correct data set.

UST803* **SCHEDULE type DATE=mm/dd/yyyy DSN=datasetname(membername)**

Reason: The schedule in the schedule data set name has either been STARTED or REFRESHED.

UST805 **SCHEDULE TIME=hh:ss SELECTION ID: selection event ID**

Reason: A scheduled event has been executed. One of the two additional form of the UST805 shown below is also issued.

UST805 **SCHEDULE SENT TO THE INTERNAL READER: SUBMIT datasetname(membername)**

Reason: A scheduled SUBMIT event has been executed. The jobstream in the data set named has been submitted for batch execution through the internal reader (INTRDR).

UST805 **SCHEDULE ISSUED THE MVS COMMAND: console command**

Reason: A scheduled event has been executed. The indicated MVS console command was issued.

UST806* **NO ACTIVITY SCHEDULED FOR TODAY**

Reason: There are no scheduled events which will execute today. Check the schedule if you think this is incorrect.

UST807E* **SCHEDULE SUBMIT ERROR: error description**

Reason: A SUB event was scheduled, but USTSCHED had an error either reading from the input data set named in the SUB event or writing to the INTRDR DD used to submit jobs. The error description will identify the error.

Action: Make sure that the data set named in the SUB event contains LRECL=80 jobstreams. If a member name was given on the SUB event, the data set must be a PDS or PDSE. If the member name is omitted, it must be sequential (DSORG=PS).

UST808W* **IMMEDIATE SHUTDOWN REQUESTED - SCHEDULING TERMINATED**

Reason: The operator has requested shutdown of FDR/UPSTREAM or has done a TERM of USTSCHED. USTSCHED will terminate immediately.

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