

Special Considerations for Administrators

This section covers the following topics:

- SYSMAIN Security
- User Exit Routines

SYSMAIN Security

The security aspects of the SYSMAIN utility can be divided into two categories:

- File Security
- Natural Security

File Security

The file security relates to the security which users can define for their Natural system files, FUSER, FNAT, FDIC and FSEC. This type of security can be used in both Adabas and VSAM environments.

To define file security to the SYSMAIN utility (that is, passwords and cipher codes), invoke the SYSMAIN utility security screens and enter the appropriate security profiles. The security screens are invoked as shown in the following section:

File	Special Command	Key	Objects Affected
FUSER, FNAT	SET FNAT	PF12	programming objects debug environments error messages profiles
FDIC	SET FDIC	PF11	rules DDMs XREF information DL/I subfiles
FSEC	SET FSEC	PF10	Natural Security profile

The security screens are windows similar to the one shown below:

```
--- Security for the NATURAL System Files ---

Specify the password(s), cipher(s) and VSAM FCT
name(s) for the source/target file(s) below:

    - Source -                - Target -
Library .... OLDLIB          Library .... NEWLIB
Database ... 10              Database ... 10
File ..... 32                File ..... 51

Password ...                 Password ...
Cipher .....                 Cipher .....
VSAM Name .. _____     VSAM Name .. _____
```

The FUSER and FNAT files relate to the source and target environments since these environments must relate to the appropriate Natural system file.

Note:

No validation is performed for any of the information. The field or entry Library is applicable only when processing programming objects.

If the security information is not provided and the Natural system file requires security, the Adabas security for the appropriate Natural system file is taken as the default.

You can override this feature by invoking the appropriate security screen as mentioned above. Once file security is defined, the SYSMAIN utility uses this security information for all subsequent processing. If a user then requires that the default security information (obtained at initialization of the session) be used, the corresponding security screen must be re-invoked and the password and cipher code fields set to blank. (The password and cipher codes are non-display, so even though they appear to be blank, they should be set to blank again.)

Natural Security

Two aspects must be considered when using the SYSMAIN utility within a Natural Security environment:

- Defining the Natural Security Environment
- Restricting Use of SYSMAIN under Natural Security

Defining the Natural Security Environment

The source and target libraries can be within one Natural Security environment or within two different Natural Security environments. These environments must be defined to the SYSMAIN utility.

The definition of the Natural Security environment(s) to be used is specified with the command SET FSEC.

By default the current FSEC setting assigned at the start of the Natural session is used. If you change these settings (on the screen Security for Natural Security), they remain in effect until they are changed by the next SET FSEC process. In batch mode, the SEC parameter should be used to specify the file security and assignments of the request.

Once the source and target environments have been determined, SYSMAIN verifies both the source and target libraries with Natural Security. (The source and/or target database and file must correspond with the DBID and FNR specified in the library security profile; if these values are not specified, default values are taken from the security profile.)

Restricting Use of SYSMAIN under Natural Security

The use of the SYSMAIN utility itself can be restricted, or the use of the SOURCE and TARGET libraries to be handled with the SYSMAIN utility can be restricted. See Protecting Utilities in the Natural Security documentation for details.

User Exit Routines

The user exit routines of the SYSMAIN utility provide information about each object being processed.

The user exit routines are Natural subprograms invoked with CALLNAT statements. All subprograms (as well as the data areas they use) are provided in source form in library SYSMAIN.

The source codes of the subprograms are stored under the names SM-UX-*nn* (*nn* = 01 to 11) in library SYSMAIN. To make a user exit routine available, you have to store the corresponding source under the name MAINEX*nn*, either in the library SYSMAIN or in one of its steplibs.

Note:

The names of the user exit routines' sources and objects are different to ensure that the overwriting of the sources by an update installation does not affect the objects.

You can change or expand any of the user exit routines as necessary.

Use of these exits results in additional overhead to the SYSMAIN utility, depending on the code logic. It is necessary, however, always to return control to SYSMAIN when exit processing is completed.

As the SYSMAIN utility uses ET logic with Adabas files, the use of user exit routines can lengthen the transaction time limit (Adabas parameter TT). Furthermore, the definition of the Adabas transaction should not be altered, which means that you should not issue any ET/BT commands or END/BACKOUT TRANSACTION statements. SYSMAIN is responsible for the issuing of all END TRANSACTION statements. The exception to this rule is in a situation where a user terminates the normal completion of any SYSMAIN function with the user exit routines. If this is the case you **must** issue a BACKOUT TRANSACTION before terminating.

If the return code is set to a non-zero value, this overrides any error given by SYSMAIN. (See the sections relating to specific object types for a discussion of message field settings.) When an error is received from an exit, it is placed in the message field and displayed or printed as appropriate. The exception is automated processing, because processing is completed with minimum terminal I/O.

The individual user exit routines are described below:

- MAINEX01 - First User Exit Routine for Object Interrogation
- MAINEX02 - Second User Exit Routine for Object Interrogation
- MAINEX03 - User Exit Routine for Request Interrogation
- MAINEX04 - User Exit Routine for Modification of File Assignments
- MAINEX05 - User Exit Routine for Verification of Direct Commands
- MAINEX06 - User Exit Routine for SYSMAIN Initialization
- MAINEX07 - User Exit Routine for SYSMAIN Termination
- MAINEX08 - User Exit Routine for Nothing Found in Batch Mode
- MAINEX09 - User Exit Routine for Abnormal Termination in Batch Mode
- MAINEX10 - User Exit Routine for Command Errors in Batch Mode
- MAINEX11 - User Exit Routine for Setting Special Flags to SYSMAIN

MAINEX01 - First User Exit Routine for Object Interrogation

Function	Interrogate the current value settings of the data elements associated with an object before the object is processed by SYSMAIN.
Remarks	Any object passed to MAINEX01 can be rejected by setting the RESP-CODE parameter to a non-zero value. If any additional logic is to be performed, the transaction may not be at end-of-transaction status and so no END TRANSACTION or BACKOUT TRANSACTION statement should be issued. Control must be returned to SYSMAIN.
Parameters	PARM-AREA1 (A250) /* SYSMAIN parameter area (fixed values) PARM-AREA2 (A250) /* SYSMAIN parameter area (variable values) RESP-CODE (B1) /* Response code to be returned to SYSMAIN Note: Only the RESP-CODE parameter can be modified.
Local Data Area	SM-UX-L

MAINEX02 - Second User Exit Routine for Object Interrogation

Function	Interrogate the current value settings of the data elements associated with an object after the object has been processed by SYSMAIN.
Remarks	Any object passed to MAINEX02 can be rejected by setting the RESP-CODE parameter to a non-zero value. If any additional logic is to be done, the transaction may not be at end-of-transaction status and so no END TRANSACTION or BACKOUT TRANSACTION statement should be issued. Control must be returned to SYSMAIN.
Parameters	PARM-AREA1 (A250) /* SYSMAIN parameter area (fixed values) PARM-AREA2 (A250) /* SYSMAIN parameter area (variable values) RESP-CODE (B1) /* Response code to be returned to SYSMAIN Note: Only the RESP-CODE parameter can be modified.
Local Data Area	SM-UX-L

MAINEX03 - User Exit Routine for Request Interrogation

Function	Interrogate any request made to SYSMAIN in terms of a direct command or information entered via the online menu system. MAINEX03 obtains control before SYSMAIN processes the command.
Remarks	Any command passed to MAINEX03 can be rejected by setting the RESP-CODE parameter to a non-zero value. Additional logic can be added, but it is your responsibility to issue any necessary END TRANSACTION requests to the database. Control must be returned to SYSMAIN.
Parameters	PARM-AREA (A250) /* Command string passed in three parts RESP-CODE (B1) /* Response code to be returned to SYSMAIN Note: Only the RESP-CODE parameter can be modified.

MAINEX04 - User Exit Routine for Modification of File Assignments

Function	Override the database, file, password and cipher codes for the Natural system file(s).
Remarks	MAINEX04 is invoked before any request is processed or validated by SYSMAIN. When control is passed to MAINEX04, you are at end-of-transaction status; therefore you have to set the RESP-CODE parameter to a non-zero value if you wish to reject the request. Control must be returned to SYSMAIN.
Parameters	PARM-AREA (A250) /* SYSMAIN parameter area RESP-CODE (B1) /* Response code to be returned to SYSMAIN
Local Data Area	SM-UX-L4

MAINEX05 - User Exit Routine for Verification of Direct Commands

Function	Verify any direct command entered during online processing of SYSMAIN. In addition, the special characters used to indicate a system command can be overwritten.
Remarks	MAINEX05 is invoked before any direct command issued within SYSMAIN is processed. For example, MAINEX05 enables you to interrogate any of the special SET commands and also prevent them from being issued. You can verify these commands and reject them by returning a non-zero value in the RESP-CODE parameter. You are at end-of-transaction status when control is passed to MAINEX05. A Natural system command entered within SYSMAIN has to be preceded by two slashes (//); see Command Line. With MAINEX05, you can define two other special characters for this purpose; to do so, you assign the desired characters to the parameter CMD-DEL. If CMD-DEL is set to blanks, SYSMAIN uses the default value of two slashes (//). Control must be returned to SYSMAIN.
Parameters	COMMAND (A68) /* Actual command issued in SYSMAIN CMD-DEL (A3) /* Special character for system commands RESP-CODE (B1) /* Response code to be returned to SYSMAIN

MAINEX06 - User Exit Routine for SYSMAIN Initialization

Function	Obtain control at initialization of a SYSMAIN session.
Remarks	MAINEX06 is invoked at the start of the SYSMAIN session, where you can override some of the SYSMAIN default settings, as for example, prompts for confirmation of a request like deleting, moving or replacing an object. All parameters are verified. If they are invalid, the default settings are used. Control must be returned to SYSMAIN.
Parameters	MAINEX06 uses the parameter data area SM-UX-L6.

MAINEX07 - User Exit Routine for SYSMAIN Termination

Function	Obtain control at termination of a SYSMAIN session.
Remarks	MAINEX07 is invoked at termination of a SYSMAIN session to decide whether control is to be kept by SYSMAIN or not.
Parameters	USER-AREA (A50) /* Area for free usage

MAINEX08 - User Exit Routine for Nothing Found in Batch Mode

Function	Determine further processing if no objects are found for a command in batch mode.
Remarks	MAINEX08 is invoked if no objects are found that meet the specified criteria for a specific command executed in batch mode. If this is the case, control may, but need not, be returned to SYSMAIN. If control is returned to SYSMAIN, SYSMAIN will continue processing with the next command.
Parameters	CMD (A250) /* Command string passed in three parts

MAINEX09 - User Exit Routine for Abnormal Termination in Batch Mode

Function	Determine action to be taken in case of error in batch mode.
Remarks	MAINEX09 is invoked if SYSMAIN processing in batch mode leads to an error. If this is the case, control may, but need not, be returned to SYSMAIN. If control is returned to SYSMAIN, SYSMAIN will be terminated with condition code 45. Note: Errors NAT4810, NAT4818, NAT4867, NAT4868 and NAT4893 cannot be handled by this user exit routine.
Parameters	CMD (A250) /* Command string passed in three parts ERROR-CODE (N4) /* Number of error which caused termination

MAINEX10 - User Exit Routine for Command Errors in Batch Mode

Function	Determine action to be taken in case of command error in batch mode.
Remarks	MAINEX10 is invoked if an error is detected in a SYSMAIN command in batch mode. If this is the case, control may, but need not, be returned to SYSMAIN. If control is returned to SYSMAIN, SYSMAIN will continue processing with the next command.
Parameters	CMD (A250) /* Command string passed in three parts ERROR-CODE (N4) /* Number of error which caused termination

MAINEX11 - User Exit Routine for Setting Special Flags to SYSMAIN

Function	Special settings user exit routine.
Remarks	MAINEX11 is invoked at the start of the SYSMAIN session, where you can set some special SYSMAIN flags, as for example, display of MAINUSER messages in batch. See the source of the user exit routine (SM-UX-11) for the available flags. Control must be returned to SYSMAIN.
Parameters	FLAGS (A250) /*Flag string (redefined)