

Assigning and Maintaining Object Versions

Each time a new or changed object is migrated or incorporated into the PAC controlled environment from a development, maintenance, or incorporation status, it is assigned a version number. The object name, object type, and version number assigned by PAC are used together to uniquely identify each instance of an object belonging to a specific application.

The PAC and PAA systems each assign an independent version number to an object:

- PAC assigns the control version when the object enters the PAC controlled environment; and
- PAA assigns the production version when the object enters the PAA-controlled production environment.

The two different versions are maintained for purposes of consistency and ease of understanding. The Natural List Directory function lists the PAC control version. The PAA system tracks the correlation between version numbers in different environments. Refer to the PAA documentation for information about identifying the object version that is executing in production.

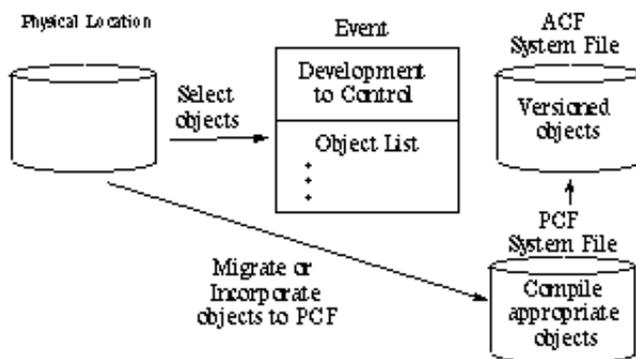
Objects that have been incorporated or migrated into the PAC controlled environment and have been assigned a version number are called versioned objects. A versioned object is not necessarily a compiled object. Each instance of a versioned object is called an object version. Migration events populate PAC with object versions.

For a specific version of an object in a specific status, you can view the date and time it was saved and cataloged, the event that migrated it to the status, other statuses in which the version exists, and related objects.

The object audit history shows every version of the object, the statuses to which each version has been migrated, and the dates and times of the migrations. You can view the source code for an object version.

You can use a PAC utility to compare the source code for two versions of an object or compare a PAC version with an object on a Natural system file outside the PAC-controlled environment. PAC indicates when objects are identical or displays the differences between them.

The following diagram shows how Natural objects being loaded into PAC are processed to create versioned objects:



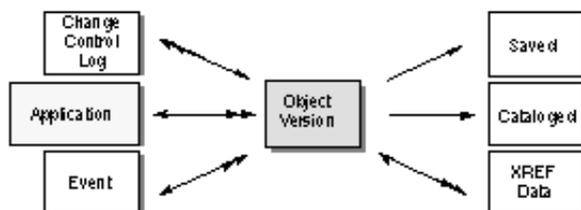
A migration event from a development or incorporate status to Control status is created and objects are selected for the object list from the physical location. The objects are migrated to the PCF system file where the appropriate objects are compiled. The object versions are stored in the ACF system file.

This chapter covers the following topics:

- Object Version

- Versioned Objects

Object Version



An object version is an application-specific instance of an object within PAC that can be uniquely identified by a version number.

A specific object version consists of a specific set of Natural (or foreign) statements. A compiled object optionally includes a specific set of subordinate objects.

An object version either performs the designated function or it does not. If it does not, it will probably be superseded by another version. Because of its interrelationships with other objects, the object itself must be a fixed definition; it may not change.

Removing Object Versions

Only the PAC administrator may remove objects from the PCF system file (PAC work area). Contact your administrator for more information.

The following examples illustrate situations where objects need to be removed from the PCF system file.

- If you rename a Natural subroutine and migrate it to PAC where the original version still exists, then try to compile the renamed subroutine, you will receive a NAT924 "Invalid subroutine name" message. The old subroutine name (that is, the one already existing in PAC) must be removed.
- When switching objects from one application to another application that is to be used as a steplib, the object must be removed from the original application or from the PCF system file so that PAC can use the object in the steplib application during compile.

Retrieving Information About Versioned Objects

You may check the integrity of application object versions with the Versioned Objects sub-function of PAC or by using the supplied PAC Application Program Interface (APIs).

Versioned Objects Sub-Function

The Versioned Objects sub-function of PAC allows you to retrieve information about all versions of an object in the PAC environment, including the current version. You may retrieve information about Natural, foreign, Predict, and Predict Case objects.

Along with the application name, object name, type, and version, you may display the following information about versioned objects:

- Development source directory information to identify the particulars about the person who changed the object before it was loaded into PAC:

- the save library name;
- the date it was saved in the development library;
- the user ID;
- the TP monitor and operating system;
- the Natural version and system maintenance level;
- the programming mode.
- The type of user error message (short or extended) and languages used; this information can be used for verification and also audit information.
- Subordinate objects that the versioned object uses; and the objects that use the versioned object; this information is useful for impact analysis and the expand facilities.
- Information about the statuses in which the object version exists for object list verification and possible problem resolution and state of the application.
- The "history" of an object version, for example the dates an object was migrated into a particular status; this information is used primarily for problem tracking; that is, to determine the state of an application at a specific previous date.
- Object versions that do not exist in any status; that is,
 - objects that have been superseded and no longer exist in any status other than Control;
 - objects that have been archived;
 - objects that have never been migrated to any status other than Control; that is, have never been used.

This information may be used to identify objects that should be purged from the PAC environment.

- Extended information from user-modifiable reporting front-ends supplied with PAC provide extended user facilities similar to user exit processing. These reporting front-ends are invoked by selecting the Extended User Info option from Additional Options.
- The date the object was saved and cataloged when it was brought into PAC.
- The maintenance version used: the version number of the object when it was checked out for maintenance; this information can be used for back-tracking the origin of the object that was changed; a compare of these two versions will identify the exact changes.
- The migration event that brought this object version into PAC and the date the event was created; to determine the actions associated with the loading of this object, for example, other objects also migrated.

Application Program Interface (APIs)

PAC object version reporting has fixed definitions for the actual reports. You can tailor the reports to your specific needs using the APIs or even the supplied PAC Express.

The following PAC APIs can be used to retrieve information about versioned objects. A list of current APIs is provided in the PAC Reference documentation.

- The Display Object Version Natural Source API (APINNSRC) allows you to display the Natural source code for a particular object version in the Natural source area.

- The Load Object Version Natural Source API (APINLSRC) allows you to load the Natural source code for a particular object version into the Natural source area and edit it. Any changes made to the object version will not be reflected in PAC.
- The Object Version API (APINOBJV) allows you to display information about a particular object version; this information is the basic information about the object.

Versioned Objects

When an object is moved into the PAC controlled environment, it is assigned a version number and is called a versioned object. You can use the Versioned Objects function to retrieve information about all versions of an object in the PAC environment and the Compare function to compare object versions.

You can display version information about Natural programming objects and user error messages; foreign, Predict, and Predict Case objects. Available information about versioned objects includes

- migration information;
- development source directory information (Natural objects);
- type of user error message (short or extended) and languages used;
- subordinate objects that the versioned object uses;
- objects that use the versioned object;
- statuses in which the object version exists;
- history information such as the dates an object was migrated into a particular status;
- object versions that do not exist in any status;

You may print information about versioned objects using the Hardcopy sub-function.

You may use direct commands to display

- a specific version of an object;
- an object in a specific status;
- the most current version of an object, or
- a specific version of an object previous to the most current version.

For detailed information about direct commands, refer to the PAC Reference documentation.

Accessing Versioned Objects Information

To access information about versioned objects, enter Code V on the PAC Main Menu.

The Versioned Objects Reporting Menu appears:

```

08:38:53          ***** PREDICT APPLICATION CONTROL *****          2000-04-19
User PACUSR      - Versioned Objects Reporting Menu -

                Code  Sub-Function
                ----  -
                D    Display Versioned Object
                H    Hardcopy Versioned Object
                S    Select Versioned Object
                U    List Objects with no Application Status
                V    Object history
                ?    Help
                .    Exit
                ----  -

Code ..... _
Application .... _____
Object Name .... _____
Version From ... _____ Version To ... _____
Object Type .... _____
Foreign .... _____

Command ==>
  Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
        Help  Menu  Exit                                     Canc
    
```

This menu provides the following fields for entering selection criteria:

Field	Description
Application	Name of the application to which the versioned objects belong. If you leave this field blank or enter range notation, a selection list of available applications is displayed.
Object Name	Name of the object to be processed. A range may be specified.
Version From	Version number of the object to be processed. If a range is specified, this field is used along with the Version To field. Version numbers are always equal to or less than the version number specified in the Version To field. Valid values are 1-9999. If a range is specified only for the Version From field, this value is used as the starting value of the versions selected.
Version To	Used along with the Version From field to specify a range. Version numbers are always greater than or equal to the version number specified in the Version From field. If specified, this value will be used for the ending value of the requested range. Valid values are 1-9999.
Object Type	Versioned object user error message Versioned object Natural Versioned object Predict Versioned object Predict Case The type of object to be processed (Natural, foreign, Predict, Predict Case, user error message). A question mark (?) in this field produces a list of Natural object types with the option to also list Predict object types.
Foreign	Foreign object to be processed, specified as 3nnn. A question mark (?) in this field produces a list of foreign datasets supported by the specified application.

You may also select the D, H, and S sub-functions directly from the Versioned Objects Selection List that is accessed using Code S (Select Versioned Object).

Selecting a Versioned Object from a List

- To display a list of versioned objects for a specified application, enter Code S (Select Versioned Object) and the application name on the Versioned Objects Reporting Menu.

If the application name is not specified, a selection window of available applications is displayed on which you may make your selection.

You may limit the list of object versions retrieved by specifying the version numbers in the Version From.../Version To... fields; and/or object types to be displayed in the Object Type field.

The Object Version Selection List appears displaying the selected list of object versions:

```

11:20:09          ***** PREDICT APPLICATION CONTROL *****          2000-06-07
User PACUSR          - Object Version Selection List -

C Nr Object Name          Object Type          Ver Migration Date
-----
_ 1 AAA-GDA              Global              0002 1997-04-28 11:25:09
_ 2 AAA-GDA              Global              0001 1997-04-24 16:45:32
_ 3 AAACOPY1            Copycode            0001 1997-04-24 16:45:32
_ 4 AAAPGM1             Program             0003 1997-04-28 11:25:09
_ 5 AAAPGM1             Program             0002 1997-04-24 17:01:39
_ 6 AAATEXT1            Text                0001 1997-04-24 16:45:33
_ 7 ADAMPM              Cobol Source        0002 1997-04-24 17:01:57
_ 8 AVB00001            Cobol Source        0002 1997-04-24 17:01:57
_ 9 AVB00002            Cobol Source        0002 1997-04-24 17:01:58
_ 10 A1                  Program             0003 1997-04-28 11:25:10
_ 11 A1                  Program             0002 1997-04-24 17:01:39
_ 12 A10                 Program             0003 1997-04-28 11:25:10
_ 13 A10                 Program             0002 1997-04-24 17:01:39

Mark Selection, Enter Number or 'T' (Top) __

Command ==>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help Menu Exit          --          +          Canc
    
```

This screen lists the objects of the application; the type and version of each object; and the date and time that each object version was migrated into PAC.

Note:

Where no cataloged version exists, the object name is highlighted.

- To display information about individual objects, mark the desired object with the cursor, enter the D, H, or S sub-function ins the "C" column, or enter the number of the object (from the "Nr" column) in the Mark Selection... field. A Display Object Version screen appears.

Selecting an Object Type from a List

You can select a Natural or Predict object type to limit your list of object versions by entering a question mark (?) in the Object Type field on the Versioned Objects Reporting Menu.

The List of Natural Object Types window appears:

```

08:38:53          ***** PREDICT APPLICATION CONTROL *****          2000-04-19
User PACUSR      - Versioned Objects Reporting Menu -
+-----+
| -- List of NATURAL Object Types --
|
| P Program          A Parameter Data
| N Subprogram      G Global Data
| S Subroutine      L Local Data
| M Map             C Copycode
| H Helproutine     T Text
| Y ExpertModel    Z Recording
|
| V View            R Rule
| 3 Dialog          4 Class
| 5 Processor       E Error Message
| * All Objects
|
| Object Type ... _____
| Predict Types ... N
|
+-----+

Command ==>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help Menu Exit                               Canc
    
```

To select one or more Natural object types, enter the corresponding one-character code(s) in the Object Type field in this window; for example, "PMC" to select programs, maps, and copycode. To request all objects of the application, enter an asterisk (*). Press ENTER.

To select one or more Predict object types, change the default N in the Predict Types field to Y(es) to display a List of Predict Object Types:

```

08:38:53          ***** PREDICT APPLICATION CONTROL *****          2000-04-19
User PACUSR      - Versioned Objects Reporting Menu -
+-----+
| -- List of PREDICT Object Types --
|
| D Database        N DataSpace
| F Adabas File     C File Type
| K Keyword         M Module
| W Network         G PackageList
| P Program         L Relationship
| T Report         O StorageSpace
| S System         U User
| R Verification   Q Virtual Mach
| V View           * All Objects
|
| Object Type ... _____
| Natural Types ... N
|
+-----+
| Non-Natural .... _____
|
+-----+

Command ==>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help Menu Exit                               Canc
    
```

Enter the corresponding one-character code(s) in the Object Type field in this window; for example, "DFV" to select programs, modules, and file types. To request all objects of the Predict application, enter an asterisk (*). Press ENTER.

In either case, an Object Version Selection List screen appears.

Selecting Foreign Datasets from a List

When you enter a question mark (?) in the Non-Natural field on the Versioned Objects Reporting Menu, the Foreign Support Maintenance screen appears:

07:05:00		* PREDICT APPLICATION CONTROL *				2000-06-08
User PACUSR		- Foreign Support Maintenance -				
C	Nr	Description	Code	Type	Date Added	Added By
-	--	-----	----	-----	-----	-----
_	1	Cobol Source	3COB	Source	1997-04-20	SAGJV
_	2	Job Cntl Lan	3JCL	Source	1997-04-20	SAGJV
_	3	NATURAL Mod	3NAT	Load	1997-04-20	SAGJV
_	4	QA Nat Nuke	3QA	Load	1997-05-04	SAGJV
Command ==>						
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---						
Help		Menu	Exit	--	-	+ Canc

This screen lists the foreign datasets supported for the specified application, the identifying code, the type of dataset (source, load/compiled, or both), the date the dataset entered the PAC controlled environment, and the user who added it.

To list the object versions in a particular foreign dataset, mark the dataset with any non-blank character the "C" column. An Object Version Selection List screen appears.

Displaying a Natural Object

1. To display version information for a Natural object, enter Code D (Display Versioned Object), the application, and optionally the Natural object name, version, and type (or ranges of these) on the Versioned Objects Reporting Menu.

If the application name is not specified, a selection window of available applications is displayed on which you may make your selection.

Unless you have uniquely specified the object version to be displayed, an Object Version Selection List screen appears.

2. On the Object Version Selection List, select the object version to display.

The Display Object Version screen appears:

```

15:43:57          ***** PREDICT APPLICATION CONTROL *****          2000-01-01
User PACUSR              - Display Object Version -

Application ... ORDERS
Object ..... ORD-COPY.0004 (Copycode)
Saved ..... 1993-06-21 18:14:07
Cataloged ..... 0000-01-02 00:00:00
                Maintenance version used ..... 0003

Migration Event ... ORD_DC_01
Created ..... 1990-06-21 17:53:13

                --- Development Source Directory Information ---
Library .... ORD-EXAM   User-ID ..... SADXX
Saved .. 1993-06-07 15:42:26
Tp-System .. COMPLETE   Terminal-ID .. 7      11
Op-System .. MVS/XA     Transaction .. NAT22
NAT-Ver .... 2.2.3      Mode ..... Report
Size in ESIZE ..... 88      Bytes

Additional Options ... N

Command ==>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help  Menu  Exit  Opts                                     Canc
    
```

This screen identifies the name, version, and type of the object along with the application to which it belongs.

It displays the date and time the object was saved and cataloged when it was brought into PAC (note the default values for Cataloged date and time in the example because the object type copycode is not cataloged in PAC).

If the object has been maintained, it displays the maintenance version used; that is, the version number of the object when it was checked out for maintenance.

It identifies the migration event that brought this object version into PAC and the date the event was created. If the object version was incorporated, the Incorporated field appears displaying the date and time of incorporation.

Development Source Directory Information

Development source directory information reproduces the Natural directory of the object as it was when the object was migrated into PAC. It includes

- the name of the development library;
- the date and time the object was saved in the development library and the user who saved it;
- the TP monitor and operating system under which Natural was running in the development environment, along with the version of Natural used;
- the terminal ID and the name of the transaction under which the object was saved.
- the programming mode of Natural used: Report or Structure; and
- the size of the object in bytes.

Additional Options

Type over the default N in the Additional Options field with Y or press PF4 to access the following additional information about the versioned object:

Option	Action
Date	Date and time and by whom the object version was migrated.
Source	Screens Object Version Source Object source code The Object Version Source screen appears displaying the Natural editor with a source listing for the object version. The source is not modifiable. However, certain editor commands are available for viewing the object.
Status Values	Screens Object Version Status Values Screens Display Object Status Versioned object status The Object Version Status Values window displays the statuses in which the object version exists. You can access information about the object version in the status by entering D in the "C" column. The Display Object Status screen appears displaying the date and time the object version was migrated into the status and the migration event that was used. The additional option on the Display Object Status screen displays the user who created/modified the event that migrated the object version to the status and the date and time of the creation/modification.
Used by Objects	Screens Used By Objects Subordinate object used by versioned object The Used by Objects window appears displaying the Natural program editor with information about objects that use (that is, invoke using the Natural statements FETCH, CALLNAT, or PERFORM) the specified object version during execution.
Objects Used	Screens Objects Used Subordinate object object used The Objects Used window appears displaying the Natural program editor with information about the subordinate objects (and their versions) that the specified object version uses. Subordinate objects are objects needed to compile another object, or invoked during the execution of that object.
PCA Objects Used	Predict Case objects used (If applicable) Lists Predict Case objects that the specified object version uses.
Extended User Information	HISTORY command Invokes a user-modifiable routine to display user-defined information.
List Directory	Screens Directory Display The Directory Display screen appears displaying saved or catalog directory information for the object version in PAC. See Development Source Directory Information for a listing of the types of system information displayed.

Displaying Database Calls for a Natural Object

You may review the use of database calls for Natural programs, subprograms, subroutines, and help routines.

To display database calls, enter the SHOW CALL direct command on the Display Object Version screen command line as shown below:

```

10:26:21          ***** PREDICT APPLICATION CONTROL *****          2001-04-10
User UKMJ                - Display Object Version -

Application ... HAIFI
Object ..... APA.0001 (Program)
Saved ..... 2001-03-28 11:04:08
Cataloged ..... 2001-03-28 11:04:08

Migration Event .. HINCCON
Incorporated ..... 2001-03-28 15:02:58

          --- Development Source Directory Information ---
Library .... FIS          User-ID ..... XSETGP          Saved .. 2001-03-28 11:04:08
Tp-System .. COMPLETE   Terminal-ID .. DAEFTCJ8
Op-System .. MVS/ESA     Transaction .. NAT31
NAT-Ver .... 3.1.4      Mode ..... Structured
Size in ESIZE ..... 291          Bytes

Additional Options ... N

Command ==> SHOW CALL
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help  Menu  Exit  Opts                                Canc

```

For the particular object, its field information shows:

- object and application name
- Natural version of that object
- database calls (commands: L6, L1, E1, S4)
- database and file numbers to which each call is issued
- line numbers within the Natural object that issued each call
- length and content of the search buffer
- length and content of the format buffer.

The following screen displays an example of the database call information:

```

10:27:05                                     2001-04-10
User UKMJ           - Display ADABAS Calls -

Object ..... APA.1           NATURAL Version ..... 3.1
Application ..... HAIFI

CMD of ADA call ..... L6
Dbnr of ADA call ..... 164
Fnr of ADA call ..... 200
Linenummer ..... 0080

Length of FB ..... 18
Format buffer ..... LJ,018,A,LL,018,A.

Length of SB ..... 8
Search buffer ..... LJ,18,A.
    
```

By pressing ENTER the individual commands will be displayed on a seperate screen. When the last screen is reached then a message: "Last SBT-entry accessed" will be displayed at the bottom of the screen.

On pressing ENTER again the user will be returned to the display object screen. The following screen shows an example of the database call information for the last displayed call:

```

10:27:29                                     2001-04-10
User UKMJ           - Display ADABAS Calls -

Object ..... APA.1           NATURAL Version ..... 3.1
Application ..... HAIFI

CMD of ADA call ..... A1
Dbnr of ADA call ..... 164
Fnr of ADA call ..... 200
Linenummer ..... 0150

Length of FB ..... 18
Format buffer ..... LJ,018,A,LL,018,A.

Length of SB ..... 0
Search buffer .....

Last SBT-entry accessed
    
```

The Show Call function uses two messages:

- 'No Adabas calls have been found'

This will be displayed when the object in question is suitable for the function but physically has no Adabas Calls to be displayed.

- 'Command SHOW CALL is not applicable to this object'

This will be displayed when the object is not suitable for the function, for one of the following reasons.

- The object has no compiled code.
- The object has been Archived.
- The object type is not suitable.
- The object is not a Natural one.

Displaying a Foreign Object

To display a foreign object version, enter Code D (Display Versioned Object), the application name, and optionally the foreign object name in the format 3nnn and version (or name/version ranges) on the Versioned Objects Reporting Menu.

If the application name is not specified, a selection window of available applications is displayed on which you may make your selection.

If you enter a question mark (?) in the foreign field, the Foreign Support Maintenance screen appears. If you otherwise do not uniquely specify the object version, an Object Version Selection List screen appears. From this list you can select a specific object version.

Once a foreign object version is uniquely specified, the Display Foreign Object Version screen appears:

```

08:54:06          ***** PREDICT APPLICATION CONTROL *****          2000-01-01
User PACUSR      - Display Foreign Object Version -

Application ... ORDERS
Object ..... ASPGM.0001 (AS Src & Ld)

Migration Event .. OS-NONNAT-MIGRATE
Created ..... 1993:04:01 14:31:59

      --- External Object Information - Node 206 (MVS/ESA) ---
Source Dataset . AB.SAGXX.SOURCE
SMS004
Date Created .. 1994/06/15          Lines .. 576
Date Modified . 1994/12/15  07:54  Lines .. 88          Version.Mod .... 01.05
User-ID ..... SAGXX

Additional Options ... N

Command ==>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help  Menu  Exit  Opts                                Canc
    
```

The Display Foreign Object Version screen identifies the name, version, and type (in parentheses) of the object along with the application to which it belongs. No directory information exists for foreign object versions.

It identifies the migration event that brought this object version into PAC and the date the event was created. If the object version was incorporated, the Incorporated field appears displaying the date and time of incorporation.

External Object Information

External object information for a foreign object version includes the

- node ID and operating system type where the object version is located;
- name of the source dataset to which the object belongs and the volume on which it resides;
- date the object was created and its initial size (number of lines of code);
- date and time the object was last modified, the number of lines modified, the modification level, and the user who modified it.
- name of the object (load) dataset to which the object belongs and the volume on which it resides;
- the date the object (load) module was linked to the application and the module's size.

Additional Options

The Additional Options available for Natural objects are the same ones available for foreign objects.

Displaying a Predict Object

On the Versioned Objects Reporting Menu, enter function code D (Display Versioned Object); the application name PREDICT, and optionally, the Predict object name, version, type (or ranges of these).

Press ENTER to display the Display Object Version screen.

Alternatively, select the object type from a list as follows

1. On the Versioned Objects Reporting Menu, enter function code D (Display Versioned Object) in the Code field; the application name (or leave blank to display a selection list) in the Application field; and optionally, the Predict object name, and object versions. Enter a ? in the Object Type field and press ENTER.

The Object Version Selection List screen appears.

2. On the Object Version Selection List, enter D in the "C" column and press ENTER.

In both cases, the Display Object Version screen appears:

```

16:55:16          ***** PREDICT APPLICATION CONTROL *****          2000-01-01
User PACUSR              - Display Object Version -

Application ... ORDERS
Object ..... ARTICLE.0001 (View)
Cataloged ..... 1993:06:21 17:46:55

Migration Event .. ORD_DC_01
Created ..... 1990:07:21 17:46:55

          --- Predict Migrate Information ---
Initial Date ..... 1993:06:21 17:46:29  Initial User ..... SAGBAT
OP System ..... OS                      Predict DBnr/Fnr ..... 235
TP System ..... BATCH                    View DBnr/Fnr ..... 10
PREDICT Version ... 4.1.1

Additional Options ... N

Command ===>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help  Menu  Exit  Opts                                     Canc

```

The Display Object Version screen displays the following Predict information for the selected object version:

- The application name; the object name, version, and type; and the date the object was saved and cataloged when it was brought into PAC.
- The migration event that brought this object version into PAC and the date the event was created.
- The Predict event that brought the Predict objects into PAC.
- If the object version is a Predict object (for example, a view) the Predict Event field is displayed along with the name of the Predict event that brought the object version into PAC. This field does not apply if the application is Predict.
- Predict migration information, including initial user, TP and operating system, the Predict version with which the object was generated, the database/file number from which the object was migrated.
- For DB2 tables/views, the Truncate Creator field is displayed indicating whether or not (Y or N) the object was generated with the truncate creator option specified .

Additional Options

Refer to the Predict documentation for detailed information about Predict objects.

1. On the Display Object Version screen, press PF4 (Opts), or type Y (Yes) over the default and press ENTER to access the Additional Options.

The Additional Options window appears listing options which provide additional information about the versioned object; the following are discussed:

- Source
- Status Values

- Used by Objects
- Objects Used
- Extended User Information

2. Press ENTER to move from one screen to the next.

The following screens are examples of the information typically displayed for a Predict object for these additional options.

Source

Source information about the specified Predict object is displayed on the Display File screen:

```

15:22:23          ***** PREDICT APPLICATION CONTROL *****          2000-07-01
User PACUSR              - Display File -
                        Page 1
File ID ..... EMPLOYEES.0003
Type ..... Adabas userview          Added: 2000-01-13 at 11:26 by SAGXX
File number ..... 1                  Modified
                                      Fields modified

File attributes
Sequence field .....
ADASTAR access number ...           L-DBNR ..           L-FNR ..
Adabas SQL usage .....
Literal name .....

Additional Options .. N
    
```

This screen includes the file name (specified object), object type, version number, and Natural attributes such as the primary sequence field and view type.

The following additional options are available from the Display File screen:

- Comments
- Long description
- Keywords
- Owners
- File attributes
- Elements
- Element attributes

The following screens are examples of these additional options:

Comments

```

14:36:50          ***** PREDICT APPLICATION CONTROL *****          2000-07-01
User: PACUSR          - Display File -          Page: 2
File ..... EMPLOYEES
----- Comments -----
CONTAINS UNIQUE DESCRIPTIONS
OF EMPLOYEES OF AN INTERN.
ENTERPRISE (COMPAR. TO SAG)
***** End of Report *****
    
```

The Comments screen displays comments about the file (in this example, EMPLOYEES).

Long Description

```

14:38:26          ***** PREDICT APPLICATION CONTROL *****          2000-07-01
User: PACUSR          - Display File -          Page: 2
File ..... EMPLOYEES

=====
FILE ADDITIONAL DESCRIPTION
=====

*
*****
DESCRIPTION OF OBJECTS (NOT FIELDS) CONTAINED IN THE FILE
*****
*
UNIQUE DESCRIPTION OF EMPLOYEES OF AN INTERN. ENTERPRISE
*
*****
FOR EACH OBJECT THE FOLLOWING INFORMATION IS STORED:
  1. PURPOSE DATA IS STORED FOR
  2. WHAT INFORMATION IS STORED (IN GENERAL)
  3. WHERE DO DATA COME FROM (IN GENERAL)
    
```

The Long Description screen displays an additional description of objects contained in the file.

Keywords

If keywords exist for the specified object, this information will be displayed.

Owners

If owners exist for the specified object, this information will be displayed.

File Attributes

File attributes are displayed only for an Adabas file. Several screens in sequence display the complete set of attributes.

```

15:25:50          ***** PREDICT APPLICATION CONTROL *****          2000-07-27
User PACUSR              - Display File -                               Page  2

File ID ..... EMPLOYEES-FILE
Type ..... Adabas, Simple file
In database .....

ADABAS attributes
  Required attributes
    Phys. file number ..... 80
    Min ISN ..... 1
    Max ISN .....

  Loading attributes
    Max recl .....
    ISN reusage ..... Y
    User ISN ..... N
    CIPHERED ..... N
    LOWNERID .....
    Refresh from program .. N
    Automatic allocation .. Y
    PLOG ..... N
    ISN size ..... 0 Adabas decides

  Loading attributes
    One AC extent ....
    DS reusage ..... Y
    Mixed DS device .. N
    Mirror ..... N

MORE
    
```

Elements

```

15:29:59          ***** PREDICT APPLICATION CONTROL *****          2000-07-27
User PACUSR              - Display File -                               Page  2

File ID ..... EMPLOYEES
Cnt Ty L Field name          F   Length  Occ  D U DB S
  1  1 PERSONNEL-ID          A     8.0   8    D U AA
  2 GR 1 FULL-NAME          AB
  3  2 FIRST-NAME          A    20.0   AC N
  4  2 MIDDLE-I            A     1.0   AD N
  5  2 NAME                A    20.0   D  AE
  6  1 MIDDLE-NAME         A    20.0   AD N
  7  1 MAR-STAT            A     1.0   AF F
  8  1 SEX                  A     1.0   AG F
  9  1 BIRTH                U     6.0   D  AH
 10 GR 1 FULL-ADDRESS      A1
 11 MU 2 ADDRESS-LINE      A    20.0   8    AI N
 12  2 CITY                A    20.0   D  AJ N
 13  2 ZIP                  A    10.0   AK N
 14  2 POST-CODE           A    10.0   AK N
 15  2 COUNTRY             A     3.0   AL N
 16 GR 1 TELEPHONE        A2
    
```

The Elements screen displays a description format of the file (in this example, EMPLOYEES).

Element Attributes

The Elements Attributes screen displays information about the file ID. (in this example, EMPLOYEES).

Displaying a Predict Case Object

On the Versioned Objects Reporting Menu, enter Code D (Display Versioned Object); PREDICT CASE in the Application field; and C in the Object Type field.

The Display Object Version screen for Predict Case objects appears:

```

15:00:31          ***** PREDICT APPLICATION CONTROL *****          2000-07-01
User PACUSR              - Display Object Version -

Application ... Predict_case
Object ..... IR-A-INCODE-FOR-SF-PROG-1.0001 (Integrity Rule)
Saved ..... 2000-04-15 07:46:57`

Migration Event .. BENS-PCA-D-C-01
Created ..... 2000-04-15 07:46:57

                --- Predict Case Information ---
Create Date ..... 1998-07-13 15:13:38  Create User ..... KRW
Maintenance Date .. 1998-07-16 09:17:07  Maintenance User ..... KRW
Status ..... in process

Additional Options ... N

Command ==>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help  Menu  Exit  Opts                                Canc
    
```

The Display Object Version screen displays the application name (Predict_Case), the object name and type, the associated migration event, the object status, the users associated with the creation and maintenance of the object, and relevant dates.

Additional Options

On the Display Object Version screen, press PF4 (Opts), or type Y (Yes) over the default and press ENTER to access the Additional Options.

The Additional Options window appears listing options which provide additional information about the versioned object:

- Source
- Abstract
- Used by Objects
- Extended User Information

The following screens are examples of the information typically displayed for a Predict Case object for these additional options.

Abstract

The Natural editor screen displays the abstract of the Predict Case object.

```

15:16:23          ***** PREDICT APPLICATION CONTROL *****                2000-04-27
Entity Component Type                               Obj: CT-1-INCODE-FOR-FR-PROG-5.0001
>
> + TX: Abstract
  ....+....1....+....2....+....3....+....4....+....5....+....6....+....7..All
Used by Frame ((Ext Sub)

.....+....1....+.... Size: 13      Chars free: 18144  ..+....6. S 1      L 1
    
```

To exit this screen and return to the previous screen, type a period (.) and press ENTER.

Used by Objects/Objects Used

The Natural program editor displays information about objects that use the specified object as shown in the following Used by Objects window:

```

15:16:44          ***** PREDICT APPLICATION CONTROL *****                2000-04-27
User PACUSR
Application ... PREDICT_C | +-----+-----+
Object ..... CT-1-INCO | > + TX: Used by Objects
Saved ..... 1993-04-15 | All....+....1.. Appl BENS-PCA-APPL ..+....4...
                          | *
                          | SFPROG15,P,1
                          |
Migration Event .. BENS-P |
Created ..... 2000-04 |
                          |
                          | ---
Create Date ..... 1992-0 |
Maintenance Date .. 1992-0 |
Status ..... in pr |
Additional Options ... y |
Command ==>
Enter-PF1---PF2---PF3---PF |
Help Menu Exit Op +-----+-----+
    
```

The Objects Used window is similar to this window and lists the objects that the specified objects uses.

To exit the Used by Objects window and return to the previous screen, type a period (.) and press ENTER.

Extended User Information

This additional option invokes a user-modifiable routine to display user-defined information.

Displaying a User Error Message

You may view information about individual user error messages. Error message text can be viewed the same way a Natural saved object is viewed.

Since no directory information is associated with user error messages, PAC tracks information obtained from the migration event used to incorporate the particular error message into the PAC system.

On the Versioned Objects Reporting Menu, enter Code D (Display Versioned Object), the application name, the user error message number or a range (for example, E1-E300) in the Object Name field, E in the Object Type field, and press ENTER.

The Display Object Version screen for error messages appears:

```

13:59:56          ***** PREDICT APPLICATION CONTROL *****          2000-01-01
User PACUSR          - Display Object Version -

Application ... ORDERS
Object ..... E7009.0001 (Error Message)
Loaded ..... 2000:01:05 17:42:31

Migration Event ... INC_ERR_01
Created ..... 2000:01:05 17:42:31

          --- Error Message Information ---
Error message contains 2 short error texts and 2 extended texts
Languages (first 9)..... English
                          German

Additional Options ... N

Command ==>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help  Menu  Exit  Opts                               Canc

```

In addition to the application name and the user error message number and version, the information displayed on this screen includes the following:

- The date and time the error message was loaded into PAC;
- The name of the migration event used to incorporate the error message;
- Information for the specified error message as follows:
 - Number of short messages;
 - Number of extended messages;

- Languages in which the message has been defined (up to nine in this screen example).

Displaying Additional Options for a User Error Message

On the Display Object Version screen, press PF4 (Opts), or type Y (Yes) over the default and press ENTER to access the Additional Options.

The Additional Options window appears listing options which provide additional information about the error message.

- Source
- Status Values
- Objects Used
- Used by Objects
- Extended User Information
- List Directory
(If applicable) Displays the saved/cataloged directory information for the object. (Not available for user error message objects.)

Source

The Display Error Version screen shown in the following example displays source information about the specified user error message, including the name of the application, the name (number) of the error message object, and the languages in which the error message exists:

```

14:04:42          ***** PREDICT APPLICATION CONTROL *****          2000-01-01
User PACUSR              - Display Error Version -

Application ... ORDERS
Object ..... E7009.0001 (ErrMsg)

C  Language      LC Short Error Text
-----
_ English        1 PAC7009: (I) Authorization has been removed.
_ German         2 PAC7009: (I) Authorisieren ist Geloescht.

.....1.....2.....3.....4.....5.....6.

Command ==>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help  Menu  Exit                                  Canc
    
```

To display more detailed information about a user error message language, mark the language with an X in the "C" column.

The screen accessed from the Display Error Version screen is similar to the Display Extended Error screen displayed when the Extended Information additional option is selected:

```

14:06:00          ***** PREDICT APPLICATION CONTROL *****          2000-07-01
User PACUSR      - Display Extended Error Nr. E7009                    English

Short Text

      PAC7009: (I) Authorization has been removed.

Explanation

      The Authorization for the specified Event has been removed, the
      Event may be modified.

Recommended Action

      Re-authorize the event before submitting.

Command ==>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help  Menu  Exit                                          Canc
    
```

The Display Extended Error screen displays the short text, explanation of the message, and recommended action, of the specified user error message.

Status Values

The Object Version Status Values window is accessed from the Display Object Version screen when the Status Values additional option is selected:

```

14:05:37          ***** PREDICT APPLICATION CONTROL *****          2000-01-01
Use  PACUSR
Application ... ORDERS
Object ..... ErrMsg 070
Cd  Language  LC  Short
--  -
___ English   1  PAC700
___ German    2  PAC700

- Object Version Status Values -
Object .. APMCL.0001
C      Status
--  -----
-      USER_TEST
-      PRODUCTION

Command ==>
Enter-PF1---PF2---PF3---P
      Help  Menu  Exit  O+
    
```

The Object Version Status Values window displays a list of the statuses in which the specified user error message version currently exists.

From the Object Version Status Values window, enter D in the "C" column to display additional information about a status.

The Display Object Status screen appears.

The information displayed on the Display Object Status screen includes the name of the application, object name, type, version number; the date the object was migrated, and the migration event that was used for the migration.

To exit the Object Version Status Values window and return to the previous screen, type a period (.) and press ENTER, or press PF3 (Exit).

Used By Objects/Objects Used

The Natural program editor displays information about objects that use the specified object as shown in the following Used by Objects window:

```

14:06:23          ***** PREDICT APPLICATION CONTROL *****          2000-01-01
User PACUSR      - +-----+-----+-----+-----+-----+-----+
Application ..... ORDERS      | >                               > + TX: Used by Objects
Status ..... USER_TE        | All...+....1...+ Appl ORDERS  3...+....4...
Object ..... E0029.0         | *
Object Type ..... ErrMsg _   | APGMP2,P,4
Version ..... 0001           | APGMP6,P,3
                               | APGMS1,S,1
                               | APGMS2,S,8
Migration Date ... 2000-07   |
Migration Event .. TE_0000   |
                               |
Additional Options ... N     |
                               |
Command ==>
Enter-PF1---PF2---PF3---PF |
Help Menu Exit Op +-----+-----+-----+-----+-----+-----+
    
```

This window lists the objects which use the specified error message (in this example, E0029).

To exit the Used by Objects window and return to the previous screen, type a period (.) and press ENTER.

Extended User Information

This additional option invokes a user-modifiable routine to display user-defined information.

Listing Objects with No Application Status

You may list the object versions of an application that have never been migrated to any status.

This information is useful when, for example, you are creating a list of objects to be archived or retired.

On the Versioned Objects Reporting Menu, enter function code U (List Objects with No Application Status), leave the object field blank, and press ENTER.

The Object Versions with No Status screen appears displaying the following information:

- The object name and version;
- The date and time the object version was created;
- The object type (for example, program, subroutine).

Object History

You may display information about an object's history in PAC.

On the Versioned Objects Reporting Menu, enter function code V (Object History) in the Code field; the desired application name; optionally, the object name, type, and version, or range notation; then press ENTER.

The Object Version Selection List screen appears as shown in the following example:

```

08:36:16          ***** PREDICT APPLICATION CONTROL *****          2000-07-01
User PACUSR          - Object Version Selection List -

C Nr Object Name          Object Type          Ver Migration Date-Time
-----
_  1 ORD-MAIN          Program          0004 1997-06-15  07:58:05
   USER_TEST          1997-06-15  07:58:43
_  2 ORD-MAIN          Program          0003 1997-06-14  20:00:07
   PRODUCTION          1997-06-15  07:56:13
_  3 ORD-MAIN          Program          0002 1997-06-13  14:24:08
   SYSTEMS_TEST          1997-06-13  16:05:01
   HISTORY-PRODUCTION  1997-06-13  16:07:26
_  4 ORD-MAIN          Program          0001 1990-06-21  17:53:14
_  5 ORD-MAIL          Program          0004 1997-06-15  07:58:06
   USER_TEST          1997-06-15  07:58:43
_  6 ORD-MAIL          Program          0003 1997-06-14  20:00:07
   PRODUCTION          1997-06-15  07:56:13
_  7 ORD-MAIL          Program          0002 1997-06-13  14:24:08
   SYSTEMS_TEST          1997-06-13  16:05:01

          Mark Selection, Enter Number or 'T' (Top) __
PAC2041: Mark one or more lines for display.
Command ==>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
          Help  Menu  Exit          --          +          Canc
    
```

The Object Version Selection List screen displays the following information:

- List of objects in the Object Name column.
- The statuses in which each object version exists (listed below each object name).
- The type of each object in the Object Type column.
- The object version in the "Ver" column.
- The date and time that each object version was created and moved to a specific status in the Migration Date-Time column.
- An object is highlighted to indicate that it did not compile; that is, it exists in saved form only.

For example, this screen shows that Version 0002 of the program ORD-MAIN was moved into Control status on 1997/06/13 at 14:24:08, into Systems Test status on 1997/06/13 at 16:05:01; and into History and Production status on 1997/06/13 at 16:07:26.

To access the following sub-functions directly from the Object Version Selection List, enter the code for the desired sub-function in the "C" column:

Code Function

-
- D Display a versioned object.
 - H Hard copy a versioned object.
 - S Select a versioned object and return to the Versioned Objects Reporting Menu.

If you enter S in the "C" column or you enter the object number (from the "Nr" column) in the Mark Selection... field, the Versioned Objects Reporting Menu is displayed on which you may select a sub-function.