SYSEXT Utility - Natural Application Programming Interfaces

The utility SYSEXT is used to locate and test Natural Application Programming Interfaces (APIs) contained in the current system library SYSEXT.

A Natural API is a Natural subprogram (cataloged object) that is used for accessing and possibly modifying data or performing services that are specific to Natural, a subcomponent or a subproduct. The purpose of a Natural API is to retrieve or modify information or use services that are not accessible by Natural statements.

The *SYSEXT Utility - Natural Application Programming Interfaces* documentation covers the following topics:

- Basic Features of SYSEXT

- Invoking and Terminating SYSEXT

- SYSEXT Utility Screen

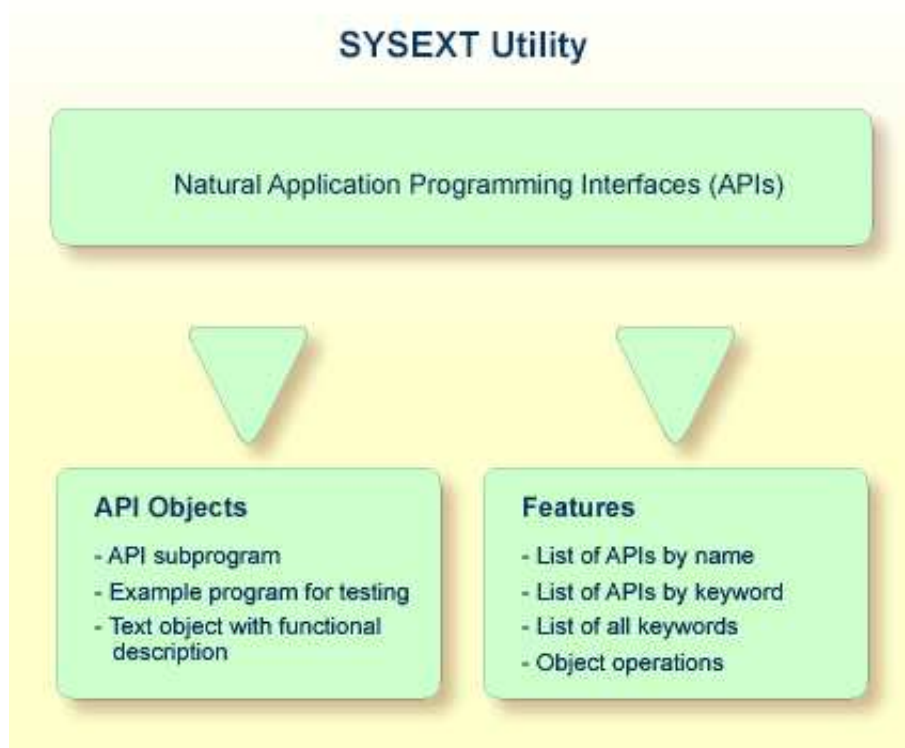- Performing SYSEXT Utility Functions

- Using a Natural API

Related Topics:

- *Application Programming Interfaces - Natural Security* documentation

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Basic Features of SYSEXT

For each Natural API, the utility SYSEXT provides a functional description, one example program and API-specific keywords.

The following diagram is an overview of the Natural objects and major features SYSEXT provides to test and implement an API:

Objects Provided for Natural APIs

The types of Natural object typically provided for each Natural API are listed in the following section. The section does not list additional objects that may be required for particular APIs.

All API-related objects are contained in the library SYSEXT on the system file FNAT.

In the following table, *nnnn* denotes the 4-digit number assigned to the API. All API objects that relate to one another have identical numbers.

Object Name	Explanation
USR*nnnn*N	The API subprogram (cataloged object) that performs the designated function.
USR*nnnn*P	An example program (source object) that can be used to test the effect of the API. The example program invokes the corresponding subprogram USR*nnnn*N.
USR*nnnn*T	A text object that contains a description of the corresponding API. The description comprises purpose, function and calling conventions of the API and relevant keywords. You can display a text object by using the line command D as described in *Line Commands* in *Performing SYSEXT Utility Functions*. You can search for a text object by specifying a keyword as described in *Keyword Search* in *Performing SYSEXT Utility Functions*.

Invoking and Terminating SYSEXT

This section provides instructions for invoking and terminating the SYSEXT utility.

▶ To invoke SYSEXT

- Enter the following system command:

```
SYSEXT
```

A SYSEXT utility screen similar to the example below appears with a list of all available Natural APIs:

```
15:07:28              ***** NATURAL SYSEXT UTILITY *****           2006-01-26
User SAG                          - Menu -                    Library SYSEXT

Cmd   Source    Interface  Comment                                       Prod
 _    USR0010P  USR0010N   Get 'SYSPROF' Information                       NAT
 _    USR0011P  USR0011N   Information about logical file                  NAT
 _    USR0020P  USR0020N   Read any error text from FNAT / FUSER           NAT
 _    USR0040P  USR0040N   Get type of last error                         NAT
 _    USR0050P  USR0050N   Get 'SYSPROD' Information                       NAT
 _    USR0060P  USR0060N   Copy LFILE definition from 'FNAT' to 'FUSER'    NAT
 _    USR0080P  USR0080N   Handle Type/Name of Editor Contents            NAT
 _    USR0120P  USR0120N   Read NATURAL Short Error Message                NAT
 _    USR0210P  USR0210N   Save, cat or stow NATURAL object                NAT
 _    USR0220P  USR0220N   Read NATURAL Long Error Message                 NAT
 _    USR0221P  USR0221N   Read NATURAL Long Error Message                 NAT
 _    USR0320P  USR0320N   Read User Short Error Message from FNAT or FUSER NAT
 _    USR0330P  USR0330N   Read NATURAL Object Directory                   NAT
 _    USR0360P  USR0360N   Modify User Short Error Message                 NAT

  Keyword .. _____


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

The list is sorted by the names of the example programs (USR*nnnn*P). If required, press PF8 to scroll down one page in the list or PF7 to go to the beginning of the list.

▶ To terminate SYSEXT

- On the SYSEXT utility screen, press PF3 or PF12.

  Or:
  In the **Command** line, enter a period (.) or enter EXIT.

SYSEXT Utility Screen

The field and columns contained on the SYSEXT utility screen are explained in the following table:

Column	Explanation
Cmd	The input field for a line command to be executed on a text object or an example program: see Line Commands in *Performing SYSEXT Utility Functions*.
Source	The name of the example program (source object USR*nnnn*P) that can be used to invoke the API.
Interface	The name of the API subprogram USR*nnnn*N.
Comment	A brief description of the purpose of the API.
Prod	The product code of Natural (NAT) or a Natural add-on product affected by the API. For example: NAT = Natural, NDB = Natural for DB2, NVS = Natural for VSAM, PRD = Predict, RPC = Natural Remote Procedure Call.
Keyword	The input field for a keyword relevant to an API: see Keyword Search in *Performing SYSEXT Utility Functions*.

Performing SYSEXT Utility Functions

The SYSEXT utility functions can be used to perform operations on the text objects and example programs referenced in the API list on the SYSEXT utility screen. In addition, you can use the keyword search function to shorten the list of APIs or list all keywords available for the APIs.

The section below covers the following topics:

- Line Commands

- Keyword Search

Line Commands

Line commands are used to perform object operations. You enter a line command in the **Cmd** column next to the API required. For a list of valid line commands, enter a question mark (?) in this column.

The following line commands are available on the SYSEXT utility screen:

Line Command	Function
E	Edit example program USR*nnnn*P.
L	List example program USR*nnnn*P.
R	Run example program USR*nnnn*P.
X	Execute example program USR*nnnn*P.
D	List text object USR*nnnn*T for a description of the corresponding API. The description comprises purpose, function and calling conventions of the API and keywords that are relevant to the API.
K	List keywords relevant to the specified API.
.	Terminate the SYSEXT utility.

Keyword Search

Keywords help you find the Natural APIs relevant to your current task. You can use the keyword search function to list APIs by keyword or list the keywords relevant to a specific API.

▶ To list APIs by keyword

- Choose any of the following methods:

    - Enter a single keyword:

      On the SYSEXT utility screen, in the **Keyword** field, type in a keyword and press ENTER.

      A list of all APIs to which the specified keyword applies appears.

    - Select a single keyword from a list of valid keywords:

      1. On the SYSEXT utility screen, in the **Keyword** field, enter an asterisk (*) and press ENTER.

         The **List Keywords** window with a list of all keywords available for all APIs appears as shown in the example below.

         If required, press PF8 to scroll down the list of keywords or press PF7 to go to the beginning of the list.

      2. In the **M** column, next to the desired keyword, type in any character and press ENTER.

         Or: In the **Direct** field, enter the desired keyword and press ENTER.

         A list of all APIs to which the specified keyword applies appears.

    - Select multiple keywords from a list of valid keywords:

      1. On the SYSEXT utility screen, in the **Keyword** field, enter an asterisk (*) and press ENTER.

The **List Keywords** window with a list of all keywords available for all APIs appears as shown in the example below.

If required, press PF8 to scroll down the list of keywords or press PF7 to go to the beginning of the list.

2. In the **M** column, next to the desired keywords, type in an asterisk (`*`) and press ENTER.

The **Keyword** window appears with a list of all APIs to which the first keyword selected applies (here: `*LANGUAGE`) as shown in the example below:

```
 11:08:58                 ***** NATURAL SYSEXT UTILITY *****          2005-11-10
 User SAG                        - Menu -                     Library SYSEXT

 Cm +--------List Keywords---------+  +--------Keyword *LANGUAGE--------+   Prod
  _ !                              !  !                                !   NAT
  _ ! M Keyword                    !  ! Object                         !   NAT
  _ ! _ *DATX                      !  ! USR0020P                       !   NAT
  _ ! _ *ERROR-NR                  !  ! USR0120P                       !   NAT
  _ ! _ *ERROR-TA                  !  ! USR0320P                       !   NAT
  _ ! * *LANGUAGE                  !  ! USR1027P                       !   NAT
  _ ! _ *LEVEL                     !  ! USR1030P                       !   NAT
  _ ! _ *STEPLIB                   !  ! USR2034P                       !   NAT
  _ ! * *TIMESTMP                  !  ! USR3320P                       !   NVS
  _ ! _ *TIMX                      !  !                                !   NAT
  _ ! _ ABEND                      !  !                                !   NAT
  _ !                              !  !                                !   NAT
  _ ! Direct ... _____   !  !                                ! R NAT
  _ !                              !  !                                !   NAT
    +-----------------------------+  +--------------------------------+
   Keyword .. *_____


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

3. Press ENTER to open the **Keyword** window for the next keyword selected (here: `*TIMESTMP`).

4. Press ENTER or PF3 to return to the **List Keywords** window.

5. Press PF3 to leave all windows and return to the SYSEXT utility screen.

▶ **To list keywords relevant to a specific API**

● Next to the API required, enter the line command `K`. The **Keywords** window appears for the specified API with a list of all keywords that are relevant to this API as shown in the example below:

```
11:24:27                 ***** NATURAL SYSEXT UTILITY *****                2005-11-10
User SAG                             - Menu -                    Library SYSEXT

Cmd   Source     Interface  Comment                                           Prod
 K    USR0010P   USR0010 +--Keywords for USR0010P--+                          NAT
 _    USR0011P   USR0011 !                             !  file                NAT
 _    USR0020P   USR0020 !  DBID                       ! FNAT / FUSER         NAT
 _    USR0040P   USR0040 !  ENVIRONMENT                !                      NAT
 _    USR0050P   USR0050 !  FILE                       !                      NAT
 _    USR0060P   USR0060 !  FNAT                       ! m 'FNAT' to 'FUSER'  NAT
 _    USR0070P   USR0070 !  FNR                        ! YSTEM'               NAT
 _    USR0080P   USR0080 !  FUSER                      ! r Contents           NAT
 _    USR0100P   USR0100 !  SYSPROF                    !                      NVS
 _    USR0120P   USR0120 !                             ! Message              NAT
 _    USR0210P   USR0210 !                             !  object              NAT
 _    USR0220P   USR0220 !                             ! essage               NAT
 _    USR0320P   USR0320 +-------------------------+ sage from FNAT or FUSER  NAT
 _    USR0330P   USR0330N   Read Natural Object Directory                     NAT


  Keyword .. _____


Command ===>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---;
```

If required, press PF8 to scroll down one page in the list. Press PF7 to go to the beginning of the list.

Using a Natural API

If you want to use a Natural API contained in the SYSEXT system library, perform one of the following steps:

- Define the SYSEXT system library in the FNAT system file as a steplib library for the user library which contains the Natural objects that use this API. Thus, no API-specific actions are required when upgrading your Natural version.

- Copy the required API to the SYSTEM system library in the FNAT system file. Thus, you only need to check a single library for APIs when upgrading your Natural version.

- Copy the required API to the SYSTEM library in the FUSER system file (not recommended).

- Copy the required API to the user library (or one of its steplibs) in the FUSER system file which contains the Natural objects that use this API (not recommended).

An API can only be used in the Natural version with which it is delivered. It cannot be executed in any other Natural version. Therefore, it is strongly recommended that APIs are stored only in the FNAT system file.