

LE Subprograms

This section applies under OS/390 batch, VSE/ESA batch, IMS/TM and TSO. It provides information on how Natural supports IBM Language Environment (LE) subprograms.

The following topics are covered:

- Support of IBM LE Subprograms
- Enabling Natural Support of LE Subprograms
- Passing LE Runtime Options
- LE Abend Handling

Natural Execution - Miscellaneous - Other Topics:

Asynchronous Processing | Double-Byte Character Sets | Input/Output Devices | Back-End Program Calling Conventions | Natural 31-Bit Mode Support | External SORT

Support of IBM LE Subprograms

To support IBM Language Environment (LE) subprograms, Natural must be prepared for the CALL statement to be able to call LE subprograms. LE subprograms can be static (CSTATIC and RCA profile parameters) or dynamic subprograms of Natural.

Dynamic subprograms of Natural (LE and non-LE) are loaded via LE services (CEEFETCH or CEELOAD macro). All dynamic subprograms loaded during a Natural session are deleted upon LE environment termination, i.e. during termination of the Natural session. That is, the DELETE profile parameter does not have any effect.

Enabling Natural Support of LE Subprograms

The following is required to be able to call LE subprograms from Natural:

1. When installing Natural, the corresponding driver must be generated with option LE370=YES.
2. The IBM LE runtime modules must automatically be included from the IBM LE library during the linkage editor step. There must not be any unresolved externals starting with "CEE". Do not set the linkage editor option NCAL for OS/390 or NOAUTO for VSE/ESA.
3. Under OS/390 batch, IMS/TM and TSO, Natural can also call LE main programs, but only as dynamic subprograms. If an LE main program is to be called dynamically, this has to be indicated by specifying SET CONTROL 'P=L' before the CALL statement. Otherwise, the LE environment created by Natural will be terminated by the LE main program.

Passing LE Runtime Options

Under OS/390 Batch and TSO and VSE/ESA Batch

You can pass LE run-time options by using the PARM= parameter in your JCL. The following applies:

- The run-time options that are passed to the main routine must be followed by a slash (/) to separate them from the Natural parameters.
- If you want to use a slash within your Natural parameters, then your Natural parameters must begin with a slash.

Example:

```
PARM= ' / ID= / , . . . '
```

Under IMS/TM

You can pass LE run-time options by providing the region-specific run-time options load module CEEROPT in your STEPLIB concatenation. In addition, the LE library routine retention initialization routine CEELRRIN must be present on the PREINIT list of your region JCL.

The following is a sample definition of a CEEROPT load modul that allows the execution of AMODE(24) subprograms:

```
CEEROPT  CSECT
CEEROPT  AMODE  ANY
CEEROPT  RMODE  ANY
          CEEXOPT ALL31=( (OFF) ,OVR) ,                                X
          STACK=( ( 128K ,128K ,BELOW ,KEEP , 512K , 128K) ,OVR)
          END    CEEROPT
```

LE Abend Handling

Natural supports the LE-specific user error handling, that is, if an LE subprogram has defined a user error handler, this handler gets control when an abend, a program check or any other LE error condition occurs in the subprogram. If no LE user error handler has been defined, Natural reacts according to the setting of the DU profile parameter.

In this case, a special error message (NAT0950 if DU=OFF or NAT9967 if DU=ON) is issued which indicates the LE error number. In addition, the corresponding LE error message is issued on CEEMSG and an LE snap dump is written to CEEDUMP according to LE run-time option TERMTHDACT.