

Database Interfaces

The following topics are covered:

- Natural for Adabas
 - Natural for DB2
 - Natural for DL/I
 - Natural for VSAM
-

Natural for Adabas

The following enhancements are provided with Natural for Adabas:

- Support of Adastar Discontinued
- Adabas-Related Natural Enhancements

Support of Adastar Discontinued

Natural Version 4.1 requires at least Adabas Version 7.1. Consequently, Adastar will no longer be supported.

Adabas-Related Natural Enhancements

The following Adabas-related enhancements are provided with Natural Version 4.1:

- Dynamic change of reading direction within an active READ or HISTOGRAM processing loop.
- Dynamic repositioning within a READ processing loop.
- New comparators LESS/GREATER THAN and LESS/GREATER EQUAL for READ and HISTOGRAM statements.
- Support of Multi-Fetch in FIND, HISTOGRAM and READ statements.
- New keyword TO that enables end of range condition (ENDING AT) to be controlled by the database itself.
- Support of the Adabas Transaction Manager.

Natural for DB2

The following enhancements are provided with Natural for DB2 Version 4.1:

- The SQL syntax enhancements provided by DB2 Versions 6 and 7 will be supported.
- With earlier versions of Natural for DB2, you have to use Natural Format A for SQL data types DATE and TIME. With Version 4.1, it is possible to use Natural variables of Formats D and T; these are automatically converted to SQL data types DATE and TIME.
- Large objects (alphanumeric and binary variables of up to 1 GB) are supported.
- In addition to the two existing DB2 parameter styles, the new parameter style "DB2SQL" for the passing of data to stored procedures are supported.
- It is possible to write "user-defined functions" in Natural.
- Support of insensitive and sensitive static scrollable cursors in the Natural SQL statement SELECT.
- New comparators LESS/GREATER THAN and LESS/GREATER EQUAL for READ and HISTOGRAM statements.
- New keyword TO that enables end of range condition (ENDING AT) to be controlled by the database itself.
- Dynamic change of reading direction within an active READ or HISTOGRAM processing loop.
- Allow usage of SQL reserved words as SQL identifiers by enabling delimited identifiers generation. (See NDBPRM parameters DELIMID and RWRDONL.)
- The SYSDDM utility supports the definition of DDMs to enable access to DB2 tables on UNIX platforms. For details, see SQL Services in DDM Generation in the Natural for DB2 documentation.

The Natural Tools for DB2 provide the following enhancements:

- SYSDDM SQL Services
 - Support of new DB2 data types by DDM fields with a length of up to 1 GB -1 byte or with dynamic fields.
- ISQL
 - Infrastructure for "SQL skeleton members" for SQL statements, which are not supported by the catalog maintenance.
 - Model 4 support.

- Environment Setting
 - Support of four additional special registers.
- Catalog Maintenance
 - Support of the new DB2 data types in the CREATE TABLE statement.

Natural for DL/I

- DL/I-Related Enhancements
- Note Concerning NDB / NSB Generation in LE370 Environment

DL/I-Related Enhancements

The following DL/I-related enhancements are provided with Natural for DL/I Version 4.1:

- Dynamic repositioning within a READ processing loop.
- New comparators LESS/GREATER THAN and LESS/GREATER EQUAL for READ and HISTOGRAM statements.
- New keyword TO that enables end of range condition (ENDING AT) to be controlled by the database itself.

Note Concerning NDB or NSB Generation in LE370 Environment

If you are not using SMA:

When executing modules NDPBNDB0 or NDPBNSB0 in an LE370 enabled batch Natural to store an NDB or NSB into the FDIC system file, the following Natural error message may be issued:

```
SYSDLI 3970 Error when loading NDB/NSB
```

The step ends with Condition Code 8 in this case.

To prevent this error, the NDB or NSB load module must be link-edited with AMODE(31).

The binder step will then end with Return Code 4 due to the following warning message:

```
IEW2651W 511C ESD AMODE 24 CONFLICTS WITH USER-SPECIFIED AMODE 31
```

This return code must be ignored in the following step by means of a COND=(8,LE) keyword.

Natural for VSAM

The following VSAM-related enhancements are provided with Natural for VSAM Version 4.1:

- Dynamic change of reading direction within an active READ or HISTOGRAM processing loop.
- Dynamic repositioning within a READ processing loop.
- New comparators LESS/GREATER THAN and LESS/GREATER EQUAL for READ and HISTOGRAM statements.
- New keyword TO that enables end of range condition (ENDING AT) to be controlled by the database itself.
- Support of native Smarts environment for Natural Development Server.

A new parameter SMARTS for the IO Interface NVSMISC is provided to support Complete and/or Smarts environments.

The function MIGRATE for the parameter SFILE in the NVSPARM module has been dropped.