

# Installing Natural for DL/I

This section describes step by step how to install Natural for DL/I, also referred to as NDL.

- Prerequisites
- Installation Tape - OS/390 Systems
- Installation Tape - VSE/ESA Systems
- Installation Procedure
- Installation Verification

## Prerequisites

Products and versions are specified under Natural and Other Software AG Products in and Operating/Teleprocessing Systems Required in the current Natural Release Notes for Mainframes.

## Installation Tape - OS/390 Systems

The installation tape contains the datasets listed in the table below. The sequence of the datasets is shown in the Report of Tape Creation which accompanies the installation tape.

Dataset Name	Contents
NDL $nnn$ .LOAD	Natural executable modules necessary for the linkage editor.
NDL $nnn$ .SRCE	Macros and sources for the parameter module NDLPARM and for the batch procedures NATDBD/NATPSB.
NDL $nnn$ .JOBS	Example installation jobs.

The notation  $nnn$  in dataset names represents the version number of the product.

## Copying the Tape Contents to Disk

If you are using System Maintenance Aid (SMA), refer to the SMA documentation (included on the current edition of the Natural documentation CD).

If you are **not** using SMA, follow the instructions below.

This section explains how to:

- Copy data set COPY.JOB from tape to disk.
- Modify this data set to conform with your local naming conventions.

The JCL in this data set is then used to copy all data sets from tape to disk.

If the datasets for more than one product are delivered on the tape, the dataset COPY.JOB contains the JCL to unload the datasets for all delivered products from the tape to your disk.

After that, you will have to perform the individual install procedure for each component.

## Step 1 - Copy data set COPY.JOB from tape to disk

The data set COPY.JOB (label 2) contains the JCL to unload all other existing data sets from tape to disk. To unload COPY.JOB, use the following sample JCL:

```
//SAGTAPE JOB SAG,CLASS=1,MSGCLASS=X
//* -----
//COPY EXEC PGM=IEBGENER
//SYSUT1 DD DSN=COPY.JOB,
// DISP=(OLD,PASS),
// UNIT=(CASS,,DEFER),
// VOL=(,RETAIN,SER=<Tnnnnn>),
// LABEL=(2,SL)
//SYSUT2 DD DSN=<hilev>.COPY.JOB,
// DISP=(NEW,CATLG,DELETE),
// UNIT=3390,VOL=SER=<vvvvvv>,
// SPACE=(TRK,(1,1),RLSE),
// DCB=*.SYSUT1
//SYSPRINT DD SYSOUT=*
//SYSIN DD DUMMY
//
```

Where:

<hilev> is a valid high level qualifier

<Tnnnnn> is the tape number

<vvvvvv> is the desired volser

## Step 2 - Modify COPYTAPE.JOB

Modify the COPYTAPE.JOB to conform with your local naming conventions and set the disk space parameters before submitting this job:

- Set HILEV to a valid high level qualifier.
- Set LOCATION to a storage location.
- Set EXPDT to a valid expiration date.

## Step 3 - Submit COPY.JOB

Submit COPY.JOB to unload all other data sets from the tape to your disk.

## Installation Tape - VSE/ESA Systems

The installation tape contains the datasets listed in the table below. The sequence of the datasets is shown in the Report of Tape Creation which accompanies the installation tape.

Dataset Name	Contents
NDL $nnn$ .LIBR	LIBR backup file

The notation  $nnn$  in dataset names represents the version number of the product.

### Copying the Tape Contents to Disk

If you are using System Maintenance Aid (SMA), refer to the SMA documentation (included on the current edition of the Natural documentation CD).

If you are **not** using SMA, follow the instructions below.

This section explains how to:

- Copy data set COPYTAPE.JOB from tape to library.
- Modify this member to conform with your local naming conventions.

The JCL in this member is then used to copy all data sets from tape to disk.

If the datasets for more than one product are delivered on the tape, the member COPYTAPE.JOB contains the JCL to unload the datasets for all delivered products from the tape to your disk, except the datasets that you can directly install from tape, for example, Natural INPL objects.

After that, you will have to perform the individual install procedure for each component.

### Step 1 - Copy data set COPYTAPE.JOB from tape to disk

The data set COPYTAPE.JOB (file 5) contains the JCL to unload all other existing data sets from tape to disk. To unload COPYTAPE.JOB, use the following sample JCL:

```

* $$ JOB JNM=LIBRCAT,CLASS=0,                                     +
* $$ DISP=D,LDEST=(*,UID),SYSID=1
* $$ LST CLASS=A,DISP=D
// JOB LIBRCAT
* *****
*          CATALOG COPYTAPE.JOB TO LIBRARY
* *****
// ASSGN SYS004,NNN                                           <----- tape address
// MTC REW,SYS004
// MTC FSF,SYS004,4
ASSGN SYSIPT,SYS004
// TLBL IJSYSIN,'COPYTAPE.JOB'
// EXEC LIBR,PARM='MSHP; ACC S=lib.sublib'                   <----- for catalog
/*
// MTC REW,SYS004
ASSGN SYSIPT,FEC
/*
/&
* $$ EOJ

```

Where:

*NNN* is the tape address

*lib.sublib* is the library and sublibrary of the catalog

### **Step 2 - Modify COPYTAPE.JOB**

Modify COPYTAPE.JOB to conform with your local naming conventions and set the disk space parameters before submitting this job:

### **Step 3 - Submit COPYTAPE.JOB**

Submit COPYTAPE.JOB to unload all other data sets from the tape to your disk.

## Installation Procedure

The NDL installation procedure consists of the following steps:

### Step 1: Create the NDL Parameter Module - Job I055, Step 1500

Modify the NDL parameter module NDLPARM as described in the section Natural Parameter Modifications for DL/I.

Assemble and link/catalog NDLPARM.

### Step 2: Modify the Natural Parameter Modules - Jobs I060 and I080

Modify the appropriate I060 and I080 jobs according to the TP monitor or batch modules you are relinking; for example, NATI060 for batch and NCII080 for CICS. This applies also to Step 3 below.

Add the parameter DLISIZE and specify DLISIZE=27.

This value applies if the default values of the NDLPARM parameters are used.

Add an NTDB macro specifying the database identification list (DBID list) that relates to DL/I segment types. The numbers specified in this DBID list must be in the range from 1 to 254. They indicate which DBIDs are reserved for DL/I segment types. Up to 254 entries can be specified. All Natural DDMs that refer to a DL/I segment type are cataloged with a DBID from this list. The number with the lowest value in this list is the default DBID for DL/I segment types.

#### Examples:

```
NTDB DLI,(250,253,252)
NTDB DLI,250
```

#### Note:

Values for DL/I database IDs above 255 are not possible.

### Step 3: Link the Natural Nucleus - Job I060 and I080

#### Under OS/390:

Add the following INCLUDE instructions and the corresponding DD statements to the link step for Natural and link-edit the executable module:

CICS	IMS/TM	Batch Mode
INCLUDE NDLLIB(NDLNUC)	INCLUDE NDLLIB(NDLNUC)	INCLUDE NDLLIB(NDLNUC)
INCLUDE NDLLIB(NDLSIOCX)	INCLUDE NDLLIB(NDLSIOBA)	INCLUDE NDLLIB(NDLSIOBA)
INCLUDE SMALIB(NDLPARM)	INCLUDE SMALIB(NDLPARM)	INCLUDE SMALIB(NDLPARM)
INCLUDE TPSLIB(ASMTDLI)	INCLUDE DLILIB(ASMTDLI)	INCLUDE DLILIB(ASMTDLI)

**Under VSE/ESA:**

Add the following INCLUDE instructions and the corresponding sublibraries for ND L to the search chain for the linkage editor and link-edit the executable module:

CICS	Batch Mode
INCLUDE ND LNUC	INCLUDE ND LNUC
INCLUDE NDLSIOC X	INCLUDE NDLSIOBA
INCLUDE NDLPARM	INCLUDE NDLPARM
INCLUDE ASMTDLI	INCLUDE ASMTDLI

Under CICS, the link-edit of the load module that contains ND L can be done in any of the following ways:

- Include all ND L modules (that is, ND LNUC, NDLPARM and NDLSIOC X) and the DL/I module ASMTDLI in the link-edit of Natural.
- Include all ND L modules (that is, ND LNUC, NDLPARM and NDLSIOC X) and the DL/I module ASMTDLI in the link-edit of the Natural TP driver.  
This way of link-editing only applies if the Natural TP driver runs separately from the Natural nucleus.
- Link-edit all ND L modules (that is, ND LNUC, NDLPARM and NDLSIOC X), the DL/I module ASMTDLI and an alternate Natural parameter module as a separate module with the mandatory *entry* name CMPRMTB. The *name* of the resulting module is optional.  
This way of link-editing only applies if an alternate parameter module ("PARM=") is used. If so, under CICS, an additional CICS PPT entry with PROGRAM=name is required.
- Link-edit all ND L modules (that is, ND LNUC, NDLPARM and NDLSIOC X) and the DL/I module ASMTDLI as a separate module with the mandatory *entry* name NATGWDLI. The *name* of the resulting module is optional. If it is different from NATGWDLI, however, it must be specified as an alias name in an NTALIAS macro entry of the Natural parameter module.  
This way of link-editing only applies if the Natural Resolve CSTATIC Addresses feature (RCA) is used. If so, under CICS, an additional CICS PPT entry with PROGRAM=name is required.
- Include all environment-independent ND L Modules (i.e. ND LNUC and NDLPARM) in the link-edit of Natural. Include the environment-dependent ND L I/O module (NDLSIOC X) in the link-edit of the Natural TP driver.  
This way of link-editing only applies if a shared nucleus is created.

## Step 4: Establish a Natural Environment for DL/I

To verify the installation of NDL with a sample database rather than with existing databases, you perform the following steps:

1. Allocate VSAM spaces for the sample database  
(Job I008, Steps 1500 to 1502).
2. Create the DBDs, PSBs and ACB, and perform the initial load  
(Job I053, Steps 1500 to 1560).  
Creation of an ACB only applies to VSE/ESA.
3. Execute procedures NATPSB and NATDBD for the sample database  
(Job I075, Steps 1500 and 1510).  
To enable Natural to access DL/I databases, additional data must be added to the FDIC system file. To do so, the procedures NATPSB and NATDBD must be executed for each PSB/DBD to be used.

If you are not using System Maintenance Aid (SMA) the following applies:

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.

## Installation Verification

### To verify the installation of Natural for DL/I

1. Invoke online Natural.
2. Invoke the Natural utility SYSDDM by entering the following command:  
SYSDDM
3. On the SYSDDM menu, enter function code "D" to invoke the DL/I Services function.
4. On the resulting screen, enter function code "D" to invoke the NDB Maintenance function.
5. On the resulting screen, enter function code "S" to select the NDB which was created in substep 3 of Step 4.
6. On the resulting screen, enter function code "L" to list the NDB segments.
7. On the resulting screen, enter function code "A" to assign DBID and FNR to the segments.
8. On the same screen, enter function code "G" to generate a DDM from the segment description.
9. Catalog the generated DDM.
10. Only if running under CICS:  
Enter "NATPSB ON *psbname*" in the command line.
11. Edit and run the following program:

```
                DEFINE DATA LOCAL
01 COURSE VIEW OF DPQA03-COURSE
02 COURSEN
02 TITLE
02 DESCRIPN

                                                    /* End of DPQA03-COURSE View

END-DEFINE
READ (100) COURSE BY COURSEN
    DISPLAY COURSEN TITLE DESCRIPN
END
```