

# Entire Output Management

## Installation and Customization

Version 3.5.1

October 2020

This document applies to Entire Output Management Version 3.5.1 and all subsequent releases.

Specifications contained herein are subject to change and these changes will be reported in subsequent release notes or new editions.

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# Installation and Customization

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**Installation and Customization on Mainframes** How to install Entire Output Management on BS2000, z/OS and z/VSE.

**Installing the Open Print Option** How to install the Open Print Option (OPO).

## **Notations** *vrs* and *vr*

When used in this documentation, the notations *vrs* and *vr* represent the product version number.

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# 1 About this Documentation

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## Document Conventions

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Convention	Description
<b>Bold</b>	Identifies elements on a screen.
Monospace font	Identifies service names and locations in the format <i>folder.subfolder.service</i> , APIs, Java classes, methods, properties.
<i>Italic</i>	Identifies:  Variables for which you must supply values specific to your own situation or environment. New terms the first time they occur in the text. References to other documentation sources.
Monospace font	Identifies:  Text you must type in. Messages displayed by the system. Program code.
{ }	Indicates a set of choices from which you must choose one. Type only the information inside the curly braces. Do not type the { } symbols.
	Separates two mutually exclusive choices in a syntax line. Type one of these choices. Do not type the   symbol.
[ ]	Indicates one or more options. Type only the information inside the square brackets. Do not type the [ ] symbols.
...	Indicates that you can type multiple options of the same type. Type only the information. Do not type the ellipsis (...).

## Online Information and Support

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### Software AG Documentation Website

You can find documentation on the Software AG Documentation website at <http://documentation.softwareag.com>. The site requires credentials for Software AG's Product Support site Empower. If you do not have Empower credentials, you must use the TECHcommunity website.

### Software AG Empower Product Support Website

If you do not yet have an account for Empower, send an email to [empower@softwareag.com](mailto:empower@softwareag.com) with your name, company, and company email address and request an account.

Once you have an account, you can open Support Incidents online via the eService section of Empower at <https://empower.softwareag.com/>.

You can find product information on the Software AG Empower Product Support website at <https://empower.softwareag.com>.

To submit feature/enhancement requests, get information about product availability, and download products, go to [Products](#).

To get information about fixes and to read early warnings, technical papers, and knowledge base articles, go to the [Knowledge Center](#).

If you have any questions, you can find a local or toll-free number for your country in our Global Support Contact Directory at [https://empower.softwareag.com/public\\_directory.aspx](https://empower.softwareag.com/public_directory.aspx) and give us a call.

### **Software AG TECHcommunity**

You can find documentation and other technical information on the Software AG TECHcommunity website at <http://techcommunity.softwareag.com>. You can:

- Access product documentation, if you have TECHcommunity credentials. If you do not, you will need to register and specify "Documentation" as an area of interest.
- Access articles, code samples, demos, and tutorials.
- Use the online discussion forums, moderated by Software AG professionals, to ask questions, discuss best practices, and learn how other customers are using Software AG technology.
- Link to external websites that discuss open standards and web technology.

## **Data Protection**

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Software AG products provide functionality with respect to processing of personal data according to the EU General Data Protection Regulation (GDPR). Where applicable, appropriate steps are documented in the respective administration documentation.

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## 2 Installation and Customization on Mainframes

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This documentation describes how to install Entire Output Management on BS2000, z/OS and z/VSE.

This documentation is organized under the following headings:

<b>Before the Installation</b>	Information you need to know and steps to perform before you start the installation.
<b>Installing Entire Output Management</b>	How to install Entire Output Management on BS2000, z/OS and z/VSE.
<b>Completing the Installation</b>	How to proceed after the installation.
<b>Installing Optional Features</b>	How to install various optional features.

### **Notations *vrs* and *vr***

When used in this documentation, the notations *vrs* and *vr* represent the product version number.

---

# 3 Before the Installation

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- Installation Jobs ..... 8
- Using System Maintenance Aid ..... 8
- Prerequisites ..... 8
- Contents of Installation Medium ..... 8
- Copying the Data Sets to Disk ..... 10

This section covers the following topics:

## Installation Jobs

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The installation of Software AG products is performed by installation jobs. These jobs are either created manually or generated by System Maintenance Aid (SMA).

For each step of the installation procedure described below, the job number of a job performing the respective task is indicated. This job number refers to an installation job generated by SMA. If you are not using SMA, an example installation job of the same number is provided in the job library on the Entire Output Management installation medium; you have to adapt this example job to your requirements.



**Note:** The job numbers on the installation medium are preceded by the product code (for example, NOMI060).

## Using System Maintenance Aid

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For information on using Software AG's System Maintenance Aid (SMA) for the installation process, refer to the *System Maintenance Aid* documentation.

## Prerequisites

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Before you can install Entire Output Management, certain prerequisite products must be installed at your site. For detailed information on these products, see the *Prerequisites* sections in the *Release Notes*.

## Contents of Installation Medium

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The installation medium contains the files listed below.

The sequence of the files is shown in the *Software AG Product Delivery Report* which accompanies the installation medium.

**Notation vrs or vr:** If used in the following document, the notation *vrs* or *vr* stands for the relevant version. For further information on product versions, refer to the entry *Version* in the *Glossary* of the Natural documentation.

- z/VSE
- z/OS
- BS2000

## z/VSE

File Name	Contents
NOMvrs.LIBJ	Entire Output Management installation jobs.
NOMvrs.LIBR	Entire Output Management source and load library.
NOMvrs.INPL	Entire Output Management system libraries (Natural).
NOMvrs.SYSF	Entire Output Management definition-data/active-data file (Adabas).
NOMvrs.SYS2	Entire Output Management container file (Adabas).

## z/OS

File Name	Contents
NOMvrs.JOBS	Entire Output Management installation jobs.
NOMvrs.SRCE	Entire Output Management source library.
NOMvrs.LOAD	Entire Output Management load library.
NOMvrs.INPL	Entire Output Management system libraries (Natural).
NOMvrs.SYSF	Entire Output Management definition-data/active-data file (Adabas).
NOMvrs.SYS2	Entire Output Management container file (Adabas).

## BS2000

File Name	Contents
NOMvrs.JOBS	Entire Output Management installation jobs.
NOMvrs.SRC	Entire Output Management source library.
NOMvrs.MOD	Entire Output Management module library.
NOMvrs.INPL	Entire Output Management system libraries (Natural).
NOMvrs.SYSF	Entire Output Management definition-data/active-data file (Adabas).
NOMvrs.SYS2	Entire Output Management container file (Adabas).

## Copying the Data Sets to Disk

- [Copying the Data Sets to a z/VSE Disk](#)
- [Copying the Data Sets to a z/OS Disk](#)
- [Copying the Data Sets to a BS2000 Disk](#)

### Copying the Data Sets to a z/VSE Disk

Copy the data sets from the supplied installation medium to your disk before you perform the individual installation procedure for each component to be installed.

The way you copy the data sets depends on the installation method and the medium used:

- If you use System Maintenance Aid (SMA), refer to the copy job instructions provided in the *System Maintenance Aid* documentation.
- If you are not using SMA and want to copy the data sets from CD-ROM, refer to the README.TXT file on the CD-ROM.
- If you are not using SMA and want to copy the data sets from tape, follow the instructions in this section.

This section explains how to copy the data sets .LIBJ, .LIBR and .LICS (if supplied) from tape to disk. All other data sets can be installed directly from the tape.

- [Step 1: Copy Data Set COPYTAPE.JOB to Disk](#)
- [Step 2: Modify COPYTAPE.JOB on Your Disk](#)
- [Step 3: Submit COPYTAPE.JOB](#)

### Step 1: Copy Data Set COPYTAPE.JOB to Disk

- Modify the following sample job according to your requirements:

```
* $$ JOB JNM=LIBRCAT,CLASS=0,                                     +
* $$ DISP=D,LDEST=(*,UID),SYSID=1
* $$ LST CLASS=A,DISP=D
// JOB LIBRCAT
* *****
*      STORE COPYTAPE.JOB IN LIBRARY
* *****
// ASSGN SYS004,nnn
// MTC REW,SYS004
// MTC FSF,SYS004,4
ASSGN SYSIPT,SYS004
// TLBL IJSYSIN,'COPYTAPE.JOB'
// EXEC LIBR,PARM='MSHP; ACC S=lib.sublib'
/*
```

```
// MTC REW,SYS004
ASSGN SYSIPT,FEC
/*
/&
* $$ E0J
```

where:

*nnn* is the tape address, and

*lib.sublib* is the library and sublibrary in which the data set COPYTAPE.JOB is to be stored.

- Execute the job to copy the data set COPYTAPE.JOB to disk.

COPYTAPE.JOB contains the JCL required to copy the data sets .LIBJ, .LIBR and .LICS from tape to disk.

### Step 2: Modify COPYTAPE.JOB on Your Disk

- Modify COPYTAPE.JOB according to your requirements and set the disk space parameters as appropriate.

### Step 3: Submit COPYTAPE.JOB

- Execute COPYTAPE.JOB to copy the data sets .LIBJ, .LIBR and .LICS to your disk.

### Copying the Data Sets to a z/OS Disk

Copy the data sets from the supplied installation medium to your disk before you perform the individual installation procedure for each component to be installed.

The way you copy the data sets depends on the installation method and the medium used:

- If you use System Maintenance Aid (SMA), refer to the copy job instructions provided in the *System Maintenance Aid* documentation.
- If you are not using SMA and want to copy the data sets from CD-ROM, refer to the README.TXT file on the CD-ROM.
- If you are not using SMA and want to copy the data sets from tape, follow the instructions in this section.

This section explains how to copy all data sets from tape to disk.

- [Step 1: Copy Data Set COPY.JOB from Tape to Disk](#)
- [Step 2: Modify hilev.COPY.JOB on Your Disk](#)

- [Step 3: Submit COPY.JOB](#)

### Step 1: Copy Data Set COPY.JOB from Tape to Disk

- Modify the following sample job according to your requirements:

```
//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=tape-volser),
// LABEL=(2,SL)
//SYSUT2 DD DSN=hilev.COPY.JOB,
// DISP=(NEW,CATLG,DELETE),
// UNIT=3390,VOL=SER=disk-volser,
// SPACE=(TRK,(1,1),RLSE),
// DCB=*.SYSUT1
//SYSPRINT DD SYSOUT=*
//SYSIN DD DUMMY
//
```

where:

*tape-volser* is the VOLSER of the tape, for example: T12345,  
*hilev* is a valid high-level qualifier, and  
*disk-volser* is the VOLSER of the disk.

- Execute the job to copy the data set COPY.JOB to your disk.

### Step 2: Modify hilev.COPY.JOB on Your Disk

- Modify *hilev*.COPY.JOB according to your requirements:

Set EXPDT to a valid expiration date, for example, 99365.

Set HILEV to a valid high-level qualifier, for example, USERLIB.

Set LOCATION to a storage location, for example, STORCLAS=ABC or UNIT=3390,VOL=SER=USR123.

### Step 3: Submit COPY.JOB

- Execute `hilev.COPY.JOB` to copy single, multiple, or all data sets to your disk.

### Copying the Data Sets to a BS2000 Disk

Copy the files (data sets) from the supplied installation medium to your disk before you perform the individual installation procedure for each component to be installed.

The way you copy the files depends on the installation method and the medium used:

- If you use System Maintenance Aid (SMA), refer to the copy job instructions provided in the *System Maintenance Aid* documentation.
- If you are not using SMA and want to copy the files from CD-ROM, refer to the README.TXT file on the CD-ROM.
- If you are not using SMA and want to copy the files from tape, follow the instructions in this section.

This section explains how to copy all files from tape to disk.

- [Step 1: Copy Library SRVvrs.LIB from Tape to Disk](#)
- [Step 2: Copy the Procedure COPY.PROC from Tape to Disk](#)
- [Step 3: Copy all Product Files from Tape to Disk](#)

#### Step 1: Copy Library SRVvrs.LIB from Tape to Disk

This step is not necessary if you have already copied the library `SRVvrs.LIB` from another Software AG installation tape. For further information, refer to the element `#READ-ME` in this library. The library `SRVvrs.LIB` is stored on the tape as a sequential file named `SRVvrs.LIBS` containing LMS commands. The current version `vrs` can be obtained from the *Software AG Product Delivery Report*.

- Execute the following commands to convert `SRVvrs.LIBS` into an LMS library:

```
/IMPORT-FILE SUPPORT=*TAPE(FILE-NAME=SRVvrs.LIBS,-
/  VOLUME=volser, DEV-TYPE=tape-device)
/ADD-FILE-LINK LINK-NAME=EDTSAM, FILE-NAME=SRVvrs.LIBS,-
/  SUPPORT=*TAPE(FILE-SEQ=3), ACC-METH=*BY-CAT,-
/  BUF-LEN=*BY-CAT, REC-FORM=*BY-CAT, REC-SIZE=*BY-CAT
/START-EDT
@READ '/'
@SYSTEM 'REMOVE-FILE-LINK EDTSAM'
@SYSTEM 'EXPORT-FILE FILE-NAME=SRVvrs.LIBS'
@WRITE 'SRVvrs.LIBS'
@HALT
/ASS-SYSDTA SRVvrs.LIBS
/MOD-JOB-SW ON=1
/START-PROG $LMS
```

```
/MOD-JOB-SW OFF=1  
/ASS-SYSDTA *PRIMARY
```

where:

*tape-device* is the device type of the tape, for example, TAPE-C4, and  
*volser* is the VOLSER of the tape (see the *Software AG Product Delivery Report*).

### Step 2: Copy the Procedure COPY.PROC from Tape to Disk

- Call the procedure P.COPYTAPE in the library SRVvrs.LIB to copy the procedure COPY.PROC to disk:

```
/CALL-PROCEDURE (SRVvrs.LIB,P.COPYTAPE), -  
/ (VSNT=volser, DEVT=tape-device)
```

If you use a TAPE-C4 device, you can omit the parameter DEVT.

### Step 3: Copy all Product Files from Tape to Disk

- Enter the procedure COPY.PROC to copy all product files to disk:

```
/ENTER-PROCEDURE COPY.PROC, DEVT=tape-device
```

If you use a TAPE-C4 device, you can omit the parameter DEVT.

The result of this procedure is written to the file L.REPORT.SRV.

# 4 Installing Entire Output Management

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- Step 1: Load the Data File - for First-Time Installation Only ..... 16
- Step 2: Load the Container File ..... 16
- Step 3: Activate Index Compression (optional) ..... 16
- Step 4: Scratch NOM Libraries - for Update Installation Only ..... 17
- Step 5: Adapt Parameter Modules and Link Jobs for Batch and Online Natural ..... 17
- Step 6: Load the INPL File ..... 20

To install Entire Output Management on on BS2000, z/OS or z/VSE, perform the following steps:

## Step 1: Load the Data File - for First-Time Installation Only

---

(Job I050, Step 2800)

If you are installing Entire Output Management for the first time, use the Adabas load utility to load the `NOMvrs.SYSF` file. The data file contains some examples and initializations.

## Step 2: Load the Container File

---

(Job I050, Step 2801)

When working with container files, load one or more files using `NOMvrs.SYS2` with `NUMREC=0`. For more information on how to use container files, see *Defining Container Files* in the *System Administration* documentation.

## Step 3: Activate Index Compression (optional)

---

In large environments, it may be useful to activate Adabas index compression for the Entire Output Management system files. This will result in less space required in the Adabas ASSO container, as Entire Output Management uses several similar descriptors which can be compressed very efficiently.

If you decide to perform this step, it is recommended to do so now during the installation. However, it is also possible to perform it later if desired.

To activate Adabas index compression, invoke the Adabas reorder utility as follows:

```
ADAORD REORFASSO FILE=NOM-system-file-number INDEXCOMPRESSION=YES
```

## Step 4: Scratch NOM Libraries - for Update Installation Only

### (Job I051, Step 2800)

If Entire Output Management has been installed before, scratch all objects from the libraries `SYSNOM`, `SYSNOMS`, `SYSNOMH1` and `SYSNOMH2`.

## Step 5: Adapt Parameter Modules and Link Jobs for Batch and Online Natural

Monitors of the System Automation Tools product family run as a Natural subtask. For further information, see the section *Monitor Defaults* in the *System Administration* documentation, and the sections *Installing System Automation Tools* and *Starting a Server* in the *System Automation Tools* documentation.

In the online and batch modules, `EOMVOLID`, `EOMSPL` (for z/VSE), `EOMTFT` (for BS2000) must be linked with the Natural shared nucleus. In this case, the Natural parameter module with `CSTATIC=(ESF. .)` must be linked to the shared and dependent parts. For 3GL programs, `NOMPUT`, `NOMADA` and `NOMCOMPR` must be linked to the 3GL program itself.

In addition to the specifications described in the *System Automation Tools Installation* documentation, you have to adapt and link the following:

### 1. Adapt the Batch Natural Parameter Module (Job I060)

Add or change the following parameters in your Natural parameter module:

<code>CSTATIC=(ESFCLOS,ESFOPEN,ESFPURG, ↔ ESFREAD,ESFROUT,ESFSTAT,ESFWRITE)</code>	Optional; required only if CA Spool is installed.  <b>Note:</b> If you wish to access TCP/IP printers directly, you also have to specify the module <code>ESMLPR</code> in the <code>CSTATIC</code> list. See the section <i>TCP/IP Direct Printing</i> in the <i>Concepts and Facilities</i> documentation.
<code>NTLFILE 91,dbid,fnr</code>	The database ID and file number of the Entire Output Management active data file.  If you wish to keep all data in a single Entire Output Management data file, specify the same database ID and file number as for <code>NTLFILE 206</code> (see below).
<code>NTLFILE 206,dbid,fnr</code>	The database ID and file number of the Entire Output Management data file.
<code>NTLFILE 131,dbid,fnr</code>	The database ID and file number of the System Automation Tools system file (mandatory).

NTSORT WRKSIZE=30,STORAGE=MAIN,EXT=OFF	Sort program specifications.  <b>Note:</b> The Natural SORT statement may optionally invoke an external sort program. In this case, EXT=ON must be specified. For further information, see the section <i>External Sort Programs</i> in the <i>Natural Operations</i> documentation.
RUNSIZE=64	Required for the correct execution of the Entire Output Management monitor.

## 2. Link the Natural Batch Module (Job I060)

### z/VSE:

Take the link job as described in the *System Automation Tools Installation* documentation and adapt the following. Include the library definitions for NOMLIB in your LNKEDT procedure (LIBDEF chain).

INCLUDE NOMCOMPR
INCLUDE EOMVOLID
INCLUDE EOMSPL
INCLUDE NOMPUT
INCLUDE NOMADA
INCLUDE NATAM12

### z/OS:

Take the link job as described in the *System Automation Tools Installation* documentation and adapt the following libraries for the linkage:

//NOMLIB DD DISP=SHR,DSN=SAGLIB.NOMvrs.LOAD	Supplied Entire Output Management load library.
//CMALIB DD DISP=SHR,DSN=CMASPOOL.LOAD	Supplied CA Spool load library (optional).
INCLUDE NOMLIB(NOMCOMPR)	Compression.
INCLUDE NOMLIB(NOMPUT)	Install Natural Advanced Facilities printer type "NOM".
INCLUDE NOMLIB(NOMADA)	
INCLUDE NOMLIB(NATAM12)	Install Natural printer type "NOM".
INCLUDE CMALIB(AESFPRIV)	Optional. Only if CA Spool is installed.

### BS2000:

Take the link job as described in the *System Automation Tools Installation* documentation and adapt the following libraries for the linkage. Use the library NOMvrs.MOD for the linkage.

INCLUDE NOMCOMPR	Compression
INCLUDE EOMTFT	Get volume information from BS2000.
INCLUDE NOMPUR	Only if printing from Natural Advanced Facilities to a printer of type "NOM" is desired. See the section <a href="#">Using NOMPUR</a> .
INCLUDE NOMADA	
INCLUDE NATAM12	If you want Natural to print directly to an Entire Output Management container file (AM=NOM in printer definitions), you have to make the module NATAM12 available. See the section <a href="#">Printing from Natural to Entire Output Management Directly</a> .

### 3. Adapt the Online Natural Parameter Module (Job I080)

Add or change the following parameters in your Natural parameter module:

NTLFILE 91,dbid,fnr	The database ID and file number of the Entire Output Management active data file.  If you wish to keep all data in a single Entire Output Management data file, specify the same database ID and file number as for NTLFILE 206 (see below).
NTLFILE 206,dbid,fnr	The database ID and file number of the Entire Output Management data file.
NTLFILE 131,dbid,fnr	The database ID and file number of the System Automation Tools system file (mandatory).
NTSORT WRKSIZE=30,STORAGE=MAIN,EXT=OFF	Sort program specifications.  <b>Note:</b> The Natural SORT statement may optionally invoke an external sort program. In this case, EXT=ON must be specified. For further information, see the section <i>External Sort Programs</i> in the <i>Natural Operations</i> documentation.

### 4. Link the Online Natural Parameter Module (Job I080)

Take the link job as described in the *System Automation Tools Installation* documentation and adapt the following:

**z/VSE:**

Include the library definitions for NOMLIB in your LNKEDT procedure (LIBDEF chain):

INCLUDE NOMCOMPR
INCLUDE NOMPUR
INCLUDE NOMADA
INCLUDE NATAM12

**z/OS:**

Take the link job as described in the *System Automation Tools Installation* documentation and adapt the following libraries for the linkage:

//NOMLIB DD DISP=SHR,DSN=SAGLIB.NOMvrs.LOAD	Supplied Entire Output Management load library.
INCLUDE NOMLIB(NOMCOMPR)	Compression.
INCLUDE NOMLIB(NOMPUT)	Install Natural Advanced Facilities printer type "NOM".
INCLUDE NOMLIB(NOMADA)	
INCLUDE NOMLIB(NATAM12)	Access method AM=NOM.

**BS2000:**

Take the link job as described in the *System Automation Tools Installation* documentation, and adapt the following libraries for the linkage. Use the library `NOMvrs.MOD` for the linkage (reentrant part of Natural).

INCLUDE NOMLIB(NOMPUT)	Install NAF printer type "NOM".
INCLUDE NOMLIB(NOMADA)	
INCLUDE NOMLIB(NATAM12)	Install Natural access method "NOM".
INCLUDE NOMCOMPR	Install compression.

**Additional Steps**

If you want to print from Natural to Entire Output Management directly (without a spooling system), additional steps are required; see the section [Printing from Natural to Entire Output Management Directly](#).

If you want to print from Natural Advanced Facilities to Entire Output Management directly, additional steps are required; see the section [Using NOMPUT](#).

**Step 6: Load the INPL File**

---

(Job I061, Step 2800)

Load the INPL file. The following libraries are loaded:

---

Library	File	Contents
SYSNOM	FNAT	Entire Output Management application.
SYSNOMH1	FNAT	Entire Output Management help system (English).
SYSNOMH2	FNAT	Entire Output Management help system (German).
SYSNOMS	FNAT	JCL skeletons and separator examples.



# 5

## Completing the Installation

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This section covers the following topics:

## Adapting to an Existing Environment

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- [Step 1: Create a User Library](#)
- [Step 2: Modify the Job Skeletons](#)
- [Step 3: VTAM Definitions](#)
- [Step 4: Entire System Server Parameters](#)

### Step 1: Create a User Library

The library `SYSNOMS` contains standard separator pages for reports and bundles, as well as job skeletons which have to be modified to suit your requirements. As the contents of `SYSNOMS` are overwritten by every new product release, copy the job skeletons you wish to modify from `SYSNOMS` to the library `SYSNOMU`, and modify them there.

If you want to use the Entire Output Management standard separation exits for reports and bundles, copy the current versions of the members `RS*` and `BS*` (with `REPLACE` option) to the library `SYSNOMU`.

Always copy the current versions of the following data areas (with the `REPLACE` option) to the library `SYSNOMU`:

- `P-UEXIT` and `P-UEXITE` (for separation exits),
- `P-PEXIT` (for printing exits),
- `NOMEXP*` and `NOMEX08E` (for user exits).

Then recatalog your user exits which use these parameter data areas.

The sample exits `UEX*` in the library `SYSNOMS` also use these parameter data areas. For further information on user exits, see the source of subprogram `UEXFRAME` in the library `SYSNOMS`.

### Step 2: Modify the Job Skeletons

The following tasks require job skeletons which have to be adapted to your requirements. Adapt the sources in the library `SYSNOMU` which are specified in the Source column and make them available under the Target name as shown below:

Task	Environment	Source	Target
ARCHIVE	z/VSE Tape	JARCVTAP	JARCSKEL
	z/VSE with DYNAM-T	JARCVCAT	
	z/OS Tape	JARCMTAP	
	z/OS GDG or predefined Disk VOLSERs	JARCMSDK	
	z/OS, SMS	JARCMSMS	
	BS2000 Tape	JARCBTAP	
	BS2000 with job variables	JARCBTJV	
REVIVE	z/VSE Tape	JREVV TAP	JREVS KEL
	z/VSE with DYNAM-T	JREVVCAT	
	z/OS Tape	JREVM TAP	
	z/OS GDG or predefined Disk VOLSERs or SMS	JREVM DSK	
	BS2000 Tape	JREVB TAP	
	BS2000 with job variables	JREVB TJV	
CONDENSE	z/VSE Tape	JCDNV TAP	JCDNS KEL
	z/VSE with DYNAM-T	JCDNV CAT	
	z/OS Tape	JCDNM TAP	
	z/OS GDG or predefined Disk VOLSERs	JCDNM DSK	
	z/OS, SMS	JCDNM SMS	
	BS2000 Tape	JCDNB TAP	
	BS2000 with job variables	JCDNB TJV	
PRINT	POWER	SYSRPWR	SYSRPWR or user-defined
	z/VSE Tape	TAPEVSE	TAPEVSE or user-defined
	JES	SYSRJES	SYSRJES or user-defined
	z/OS Disk	DISKMVS	DISKMVS or user-defined
	z/OS Tape	TAPEMVS	TAPEMVS or user-defined
	BS2000	SYSRBS2	SYSRBS2 or user-defined
	BS2000 with job variables	SYSRBJV	SYSRBJV or user-defined
	BS2000 for binary printing	SYSBBS2	SYSBBS2 or user-defined

### Step 3: VTAM Definitions

To enable Entire Output Management to print to VTAM printers, add the definition from the member `NOMVTAM` in the Entire Output Management source library to your `SYS1.VTAMLST` library and activate it. If your `SYS1.VTAMLST` already contains a definition for Entire System Server, include only the definition for Entire Output Management in it.

In the Entire System Server parameters, assign the value for `SPOOLACB` as defined in your `SYS1.VTAMLST`.

### Step 4: Entire System Server Parameters

To activate the common data pool, assign a value of at least "1" to the `CDATALEN` parameter.

To run Natural subtasks, assign a value of at least "80" to the `NABS` parameter.

## Natural Profile Parameters

---

For all online and batch tasks which execute Entire Output Management, the following Natural profile parameters have to be set:

Parameter	Description
<code>CVMIN=ON</code>	Control variable modified at input.
<code>ID=' '</code>	Set input delimiter to blank.
<code>WH=ON</code>	Wait for locked Adabas records.

If UNIX or Windows platforms are to be used as external spooling system source, the following Natural profile parameters have to be set:

Parameter	Description
<code>CFICU=ON</code>	Unicode and code page support.
<code>CP=ON</code>	Default code page.
<code>XML=(ON, RDOC=ON, PARSE=ON)</code>	XML support.

## Natural Security Definitions

If Natural Security is installed at your site, you have to create security profiles for the following libraries and users.

### Libraries

Library	Description	with Steplibs
SYSNOM	Entire Output Management online application.	<ul style="list-style-type: none"> <li>■ SYSSAT</li> <li>■ SYSNOMU</li> <li>■ SYSSEC (optional)</li> <li>■ any other library containing user routines (optional)</li> </ul>
SYSNOMH1	Entire Output Management help system (English).	-
SYSNOMH2	Entire Output Management help system (German).	-
SYSNOMU	User copy of SYSNOMS library.	-

### Users

Create a Natural Security user profile of user type "Person" for the user representing the Entire Output Management server, with the user ID and password identical to the NSCUSER and NSCPSWD parameters taken from the main member *SATPnnn* or *SPnnnnn*.

You can use one user ID for all or different user IDs for each server type. See also the [example](#) under *Define Environment for Entire Output Management Server* below.

## Entire Output Management in a Non-Security Environment

Entire Output Management's start program MENU is executed from SYSSAT. In a non-security environment, this means that MENU will not be found as start program. Therefore you have to rename the program MENUNOM in the library SYSNOM to MENU. As an alternative, you can copy the program MENU of the library SYSSAT into the library SYSTEM. This, however, may have the disadvantage of causing other applications to erroneously find the program MENU in the library SYSTEM, thus producing undesired results.

If Natural Security is not installed at your site, the following steplibs are automatically assigned to the library SYSNOM:

- SYSSAT

■ SYSNOMU

## Define Environment for Entire Output Management Server

- [General Layout of a Parameter Block](#)
- [Parameter Blocks and Parameters for Entire Output Management](#)

See also the section *Defining SAT, Natural and Product Parameters* in the *System Automation Tools Installation* documentation.

For each Entire Output Management Server you must define the run-time environment in one or more Natural members in the System Automation Tools user library SYSSATU.

If you want to run various Entire Output Management Servers under different Entire System Server nodes *nnn*, you must provide startup parameters at least in the related "main" members. These must conform to the following naming convention: *SATPnnn* or *SPnnnnn*. In addition, you can provide further Entire Output Management-specific parameters in a second member, whose name must not match the naming convention for the main members.

### General Layout of a Parameter Block

```
<Prefix> <block-identifier>[<keyword>=<value>, ...]
```

where:

Parameter	Description
<Prefix>	SAT or compressed product code + prefix as specified in the SATSTART instruction.
<block-identifier>	SATENV/NATENV/SATSTART or product block identifier.
[<keyword>=<value>, ...]	Block-specific parameter.

### Parameter Blocks and Parameters for Entire Output Management

#### Mandatory Parameters

Parameter Block	Parameter	Description
SATENV	NSC=YES/NO	Indicates whether Natural Security is installed or not.
	NSCUSER=	If Natural Security is installed, this is the user ID for logging on to it.

Parameter Block	Parameter	Description
	NSCPSWD=	Password for logging on to Natural Security.
	ESYUSER=	User ID for logging on to Entire System Server, if it is installed and an interface to an external security system is activated.
	NATTASK=	Name of the Natural subtask module for starting a server as a subtask.
SATSTART	PRODUCT=NOM	3-byte product code.
	PREFIX=	PRODUCT and PREFIX are compressed into a prefix which identifies the Server-specific parameters.
	TYPE=SUBTASK/BATCH	Entire Output Management Servers are always started as subtasks.
	APPLIB=SYSNOM	Name of the Natural library where Entire Output Management Server is installed.
	SERVSYSF=	Pointer to the Entire Output Management data file (must be unique within all SATSTART instructions of this node).
NOMENV	BS2USER=	BS2000 user ID under which the Monitor, Archive, Revive and Condense jobs are submitted. Default: ESYUSER.
	ETID=*	Generate unique ETIDs for tasks.
	ETIDPREF=	6-byte prefix for ETIDs.
NATENV	LFILE=(206, <i>NOMSYSF-DBID</i> , <i>NOMSYSF-FNR</i> ) or LFILE=(131, <i>SATSYSF-DBID</i> , <i>SATSYSF-FNR</i> ) or LFILE=(91, <i>NOMACTDATA-DBID</i> , <i>NOMACTDATA-FNR</i> )	These pointers can be set either in the common Natural parameter module created for the System Automation Tools products or in a Natural parameter profile indicated by the Natural parameter PROFILE. Make sure that the system-file pointer coincides with the pointer to the Entire Output Management system file 1 provided with the SERVSYSF parameter in the SATSTART block.
	WH=ON	The user is placed in "wait" status until either the requested record becomes available, or an error message is issued due to Adabas exceeding a time limit or other limit while attempting to place the record in "hold" status.

### Optional Parameters

You can overwrite the SATENV and NATENV parameters with Entire Output Management-specific or even Entire Output Management-subtask-specific assignments. The naming convention for the prefix which identifies the parameter block is:

```
<Prefix> = NOM + <PREFIX> + (PRT for Print Task)
              (ARC for Archive Task)
              (REV for Revive Task)
```

Parameter Block	Parameter	
SATSTART	MEMBER= <i>name</i>	You can specify a member in which Entire Output Management-specific parameters are located.

#### Example - Contents of "Main" Member for Node 148 - SATP148 or SP00148 in SYSSATU

The member SATP148 in SYSSAT provides an example of a "main" member. You can take this as the basis for your own member: Copy it to SYSSATU and adapt it.

SAT	SATENV	NATTASK=SAT3ST, NSC=YES, NSCUSER=SATMON, NSCPSWD=SATMON	Sets the SAT defaults for all System Automation Tools products.
NOM <i>vrs</i> PRT	SATENV	NSCUSER=NOMPRT NSCPSWD=NOMPRT ←	Indicates that a separate user ID/password can be used for Entire Output Management's Print task.
NOM <i>vrs</i> ARC	SATENV	NSCUSER=NOMARC NSCPSWD=NOMARC	Indicates that a separate user ID/password can be used for Entire Output Management's Archive task.
NOM <i>vrs</i> REV	SATENV	NSCUSER=NOMREV NSCPSWD=NOMREV	Indicates that a separate user ID/password can be used for Entire Output Management's Revive task.
SAT	NATENV	DU=OFF, PROFILE=SATMON	Sets the Natural defaults for all System Automation Tools products: the Natural profile parameters are provided in the profile SATMON.
SAT	SATSTART	PRODUCT=NOM, PREFIX= <i>vrs</i> , TYPE=SUBTASK, APPLIB=SYSNOM, SERVSYSF=(88,51)	Specifies that the server for Entire Output Management is to be started as a subtask.

## Migrating from Previous Versions

- [Migration from Version 3.5.1 to Version 3.5.2 on Mainframes](#)
- [Migration from Version 3.4.3 to Version 3.5.2 on Mainframes](#)
- [Migration on UNIX](#)

Migrations from earlier versions are not supported.

### Migration from Version 3.5.1 to Version 3.5.2 on Mainframes

It is sufficient to perform with Version 3.5.2 the two recatalog steps listed under *Migrating from Previous Versions* in the *Version 3.5.2. Release Notes*. No further migration procedure is necessary.

### Migration from Version 3.4.3 to Version 3.5.2 on Mainframes

#### Important:

- Before you start the migration, make sure that the Entire Output Management Monitor is inactive.
- In addition to the migration procedure described below, you have to perform with Version 3.5.2 the two recatalog steps listed under *Migrating from Previous Versions* in the *Version 3.5.2. Release Notes*.
- As of Entire Output Management Monitor Version 3.4.1 on mainframes, record spanning is required to keep long buffers in Adabas. If the Adabas parameter MIXDSDEV is used in the ADALOD utility, record spanning is not available. Therefore the MIXDSDEV parameter must be omitted.

#### Migration Procedure

Execute the following jobs:

Job	Step(s)	Action
I082	2850, 2852, 2853, 2855	Migration of system-file structure.
	2851, 2854 (*)	Migration of system-file structure.
I200	2811	Start of current system-file version (MIGSTART).
	2812	Migration of printers (MIGPRT).
	2813	Migration of user exits (MIGUEX).
	2814	Migration of the Monitor (MIGMON).
	2815	Check of report identifications (CHECKIDNT).
	2816	Migration of the SAT logs of NOM (MIGSAT).
	2819	Setting of current system file version (MIGEND).

(\*) These steps are only required if you use two Entire Output Management data files, one containing definition data and one containing active data.

## Migration on UNIX

See *Migration* in the *Installation and Customization on UNIX* documentation.

## Starting Entire Output Management for the First Time

---

➤ To start Entire Output Management for the first time:

- 1 Make sure that the Entire System Server node under which the Entire Output Management Monitor runs is active.
- 2 Log on to the library `SYSNOM`.
- 3 Execute the program `INSTALL`.

This program adds the first user ID, modifies some example definitions, and asks you to specify various Entire Output Management parameters.

When you have completed this step, the Entire Output Management **Main Menu** is displayed.

- 4 Enter the command `START MONITOR` in the command line to start the Entire Output Management Monitor online.

For information on how to automatically start the Entire Output Management Monitor when starting Entire System Server, see the section *AUTO-START* in the *System Automation Tools Installation* documentation.

## Installation Verification

---

To verify that Entire Output Management has been installed correctly, perform the following steps.

## Step 1: Verify the Startup Parameters Defined in Library SYSSATU

### ➤ To do so:

- 1 Log on to the library SYSSATU where you keep your master definitions for all servers of the System Automation Tools family.
- 2 Check that the SATnnnnn entry in the member SATDIR points to the correct FNAT for the application SYSSAT.
- 3 Check member SATPnnn or SPnnnnn for the SATSTART entry with PRODUCT=NOM. The TYPE parameter should have the value SUBTASK; the APPLLIB parameter must have the value SYSNOM, and the SERVSYSF parameter must point to the correct Entire Output Management system file where the object definitions are kept.
- 4 Check member SATPnnn or SPnnnnn for the SATENV parameter NATTASK. The value in effect for Entire Output Management must indicate the correct Natural subtask module. This Natural module must be correctly linked and accessible in the run-time environment of the Entire System Server node nnn.
- 5 Check the member SATPnnn or SPnnnnn for the SATENV parameters NSCUSER, NSCPSWD and ESYUSER. If you use Natural Security, <NSCUSER> must be defined as user and must have access to the libraries SYSNOM and SYSNOMU.

If Entire System Server is running with security (i.e.: SECURITY<>NONE), the user ID indicated by <ESYUSER> must be defined in the external security system and have sufficient authorization.

## Step 2: Verify the Monitor Defaults

### ➤ To do so:

- 1 Log on to the library SYSNOM and invoke the program MENU.
- 2 Enter the direct command 8.1. On the **Default Definition Menu**, select Option 1 to verify that the System Default parameters DBID and FNR parameters point to the correct Entire Output Management system file.
- 3 Return to the menu by pressing PF3, and then select Option 2 to verify the Monitor Defaults:
  - node, batch module and system server jobname should be correct;
  - at least one printer task should be specified;
  - at least one output class reserved for Entire Output Management is specified (z/OS, z/VSE);

 **Note:** For JES3, these classes must be defined as HOLD=EXTWTR

  - temporary class is specified;
  - a reserved virtual printer must be specified (BS2000).

### Step 3: Start the Entire Output Management Server Automatically with Entire System Server

If the Entire System Server is active, proceed with *Step 4* below, to start the Entire Output Management Server online.

If the `SATSTART` block for the Entire Output Management Server in the `SYSSATU` member `SATPnnn` or `SPnnnnn` is provided correctly, the Server is started automatically with the Entire System Server node `nnn`.

➤ **To do so:**

- 1 Start the Entire System Server node `nnn`.

The successful start of the Entire System Server is indicated by the console message:

```
Entire System Server IS READY - X-COM NODE nnn IS INITIALIZED
```

The successful start of the Entire Output Management Server is indicated in the Entire Output Management log (direct command `DLOG MON`):

```
NOM1522 Monitor logged on to NPR UserId = NOMMON.
NOM1510 Monitor initialization completed successfully.
NOM1524 Number of Printer Tasks 2.
NOM1525 Printer task Type ..... SUBTASK.
NOM1503 Monitor minimum wait .. 30.
NOM1504 Monitor maximum wait .. 30 .
NOM1505 Monitor increment ..... 5.
NOM1506 Monitor node ..... 148.
NOM1507 Monitor DBID ..... 1.
NOM1508 Monitor FNR ..... 37.
NOM1527 Operating System Type . MVS/ESA.
NOM1528 Spool Type ..... JES2.
NOM1509 Start monitor initialization.
NOM1511 Monitor startup.
```

The corresponding console messages will be displayed:

```
NOM1510 Monitor initialization completed successfully.
NOM1603 Monitor NOMXTS dbid fnr on node node started.
```

- 2 If this sequence does not appear after a while, check the following:
  - If the Entire System Server node is running under `z/OS`, check the `SYSOUT` files of the node.
  - If the Entire System Server node is running under `z/VSE`, check the `LST` data set of the node.

- If the Entire Output Management Server is running under BS2000, check the `SYSLST` protocol files matching the following naming convention: The file name must contain the substring:  
`L.NOMxxnnn`

where `xx` stands for the Entire Output Management subtask and `nnn` for the server number.  
`xx = XT` for the main task and `02` to `05` for subtasks.

3 Proceed with *Step 5* below.

#### Step 4: Start the Entire Output Management Server Online

➤ To do so:

- In the Entire Output Management online system, enter the direct command `START MON.`

#### Step 5: Produce Sample Output in one of Entire Output Management's Reserved Classes

➤ To do so:

- 1 Run any job which produces output in one of the classes defined as reserved for Entire Output Management.
- 2 When the job has finished, invoke the **Monitor Management** screen, and wake up the Monitor by pressing `PF10`.

The Monitor should now start creating reports derived from the report definition `UEX-DEFAULT`.

- 3 Enter the direct command `LIST AREP`, and then the line command `LI` for the folder `#Inbasket` to list the active reports contained in it.

Then enter the line command `BR` to browse the arrived reports.



# 6 Installing Optional Features

---

- Printing from Natural to Entire Output Management Directly ..... 38
- Natural Advanced Facilities ..... 39
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- Printing Binary Data under BS2000 ..... 41
- 3GL Interface Installation and Verification ..... 42
- Re-Routing VTAM Output to Entire Output Management ..... 48

This section covers the following topics:

## Printing from Natural to Entire Output Management Directly

---

Instead of printing output from Natural programs in a spooling system, you can route it to an Entire Output Management container file (SYS2) in which the trigger data are to be stored, and from which the output can be distributed, bundled or separated. On the Entire Output Management side, NAT reports are handled exactly the same as NAF reports (same report identification attributes, same spool attributes except that the source type is 10 for NAT, and 11 for NAF).

In order to create NAT reports, `NOMPUT`, `NOMADA` and `NOMCOMPR` must be linked with Natural (`NOMADA` has to be assembled the same as for NAF) and `LFILE 206` must specify the appropriate Entire Output Management system file. The report data are written into the trigger container file, which has to be defined and activated (otherwise active reports will not be created); see *Trigger Container File*.

To install the access method, you have to link the following modules to your Natural nucleus:

```
NATAM12
NOMADA
NOMCOMPR
NOMPUT
```

Include the modules in your operating-system environment as described under [Using NOMPUT](#).

### Example - Writing Data to Entire Output Management, where Printer 2 is Defined as NOM Printer:

Start Natural with the profile parameter `PRINT=(2,AM=NOM)`.

Then execute the following program:

```
DEFINE PRINTER (2) OUTPUT 'NOM'
  PROFILE 'PROF'
  FORMS 'FORM'
  NAME 'LISTNAME'
  DISP 'D'
  CLASS 'X'
  COPIES 3

WRITE (2) 'HELLO, THIS IS PRINTER 2.'
CLOSE PRINTER (2)
END
```

Your output will be written directly to the defined Entire Output Management container file, without using any spooling system.

## Natural Advanced Facilities

---

This section is only relevant if you use Natural Advanced Facilities. It covers the following topics:

- [Printing from Natural Advanced Facilities to Entire Output Management](#)
- [Printing from Entire Output Management to Natural Advanced Facilities](#)

### Printing from Natural Advanced Facilities to Entire Output Management

Instead of printing output from Natural programs in the Natural Advanced Facilities (NAF) spool file (FSPOOL), you can route it to an Entire Output Management file (SYS2), from which it can be distributed, bundled or separated.

Here you can define whether the NAF/NOM interface is active and from which Natural Advanced Facilities environments output is to be processed. A separate Entire Output Management container file can be assigned to each FSPOOL file. However, you can also assign the same container file to all FSPOOL files.

To define default parameters for Natural Advanced Facilities for printing to Entire Output Management, see *Natural Advanced Facilities Defaults* in the *System Administration* documentation.

### Printing from Entire Output Management to Natural Advanced Facilities

To print from Entire Output Management to Natural Advanced Facilities:

- Natural Advanced Facilities must be installed in the Natural nuclei used by the monitor and for batch printing.
- The necessary Natural Advanced Facilities modules must be linked.
- The parameter modules must define printers 3 and 4 as type `NAF`, as well as specifying any site-specific parameters such as `NAFSIZE`, `NAFUPF` and `FSPOOL`.

For further information, see the *Natural Advanced Facilities* documentation.

## Report Format Conversion - Additional Requirements

---

If report format conversion - as described under *Converting the Report Format* in the *Concepts and Facilities* documentation - is intended, the utilities Ghostscript and Enscript have to be installed. The corresponding commands - `gs` and `enscript` respectively - must reside on any open systems machine where the conversions will be executed. Entire System Server UNIX has to be installed there as well, and each conversion node must be defined as a UNIX node in Entire Output Management (8.1/13 menu, can be deactivated).

On UNIX, both packages are in most cases already installed.

On Windows, it is recommended that the entire "gnuwin32" package be installed. You can find download pages at:

- <http://sourceforge.net/projects/ghostscript/>
- <http://sourceforge.net/projects/gnuwin32/>

The following utilities all of which, except Ghostscript, are GNU software, will be used:

```
ghostscript
enscript
file
find
sed
pdftk (optional)
```

The package `pdftk` is used if a report or a printer requires a mask file which is to be overlaid to the original report. It is available for UNIX and Windows systems.

The existence of the utilities will be checked using the execution path. This means that the path of both utilities has to be added to the current execution path (environment variable `PATH`).

If the module names are different from `gs` and `enscript`, two additional environment variables are required. The following environment variables of the user ID which is used in the UNIX node definition of Entire Output Management can be defined:

- If Ghostscript is not invoked with `gs`, define the environment variable `GSMOD`. In the following example, Ghostscript 9.06 for Windows has been installed. `GSMOD` contains: `gswin64c.exe`
- If Enscript is not invoked with `enscript`, enter the correct name in the environment variable `ENMOD` in a similar way.



**Note:** The above-mentioned the UNIX utilities are invoked by Entire Output Management, but are not part of it; they are third-party products which Software AG neither delivers nor provides support for.

## Printing Binary Data under BS2000

This section is only relevant under BS2000. It covers the following topics:

- [BS2000 File Attributes](#)
- [Physical Printer Definition in BS2000](#)
- [Using Binary FTP Outside of Entire Output Management](#)

### BS2000 File Attributes

To print binary data transparently without changing the data, some prerequisites are necessary in BS2000.

In addition, the format of the work file has to be "SAM".

Ensure that the format in the appropriate file command (the example, the JCL for binary printing is contained in SYSPBBS2 in the library SYSNOMS) is set correctly:

```
/FILE TEST.PRN,FCBTYPE=SAM
```

The code-character-set has to be ISO 7 Bit:

```
/MODIFY-FILE-ATT FILE-NAME=TEST.PRN,COD-CHAR-SET=ISO88591<<
```

### Physical Printer Definition in BS2000

When you define a physical printer in BS2000, you have to set the following parameters for the printing of binary data:

```
SHIFT: 0
SYNCHRONIZATION: NETWORK
```

### Using Binary FTP Outside of Entire Output Management

Entire Output Management uses a JCL skeleton to operate printouts. If you wish to pass the data to another system for further processing, consider the following hints for binary FTP.

The following commands can be entered if you are logged in to your BS2000 account via FTP.

➤ **To prepare an SAM file for binary processing:**

- ftp> quote file <yourfilename>,fcctype=sam

➤ **To set the transfer of SAM files to binary format:**

- ftp> quote site ftyp binary  
ftp> bin

➤ **To set the code character set to ISO88591:**

- ftp> quote site MOD-FI-AT FILE-NAME=<yourfilename>,C-C-SET=ISO88591

➤ **The PRINT-DOCUMENT command for binary printing:**

- The document must be printed with the \*SPECIAL-FORMAT parameter:

```
/PRINT-DOCUMENT FROM-FILE=<yourfilename>,  
DOCUMENT-FORMAT=*SPECIAL-FORMAT,  
TO-PRINTER=*PARAMETERS(PRINTER-NAME=<yourprinter>)
```

## 3GL Interface Installation and Verification

---

- [3GL Interface Defaults \(1 and 2\)](#)
- [SYSERR - Display Short Messages](#)
- [Report Definition - General Attributes and 3GL ID \(3\)](#)
- [Using NOMPUT](#)

This section describes how to define a 3GL interface and how to test it with the supplied sample programs.

1. Load a container file (SYS2) with no records. The output will be stored in this file.
2. Define the 3GL interface defaults, as described under *3GL Interface Maintenance* in the *System Administration* documentation:

**3GL Interface Defaults (1)**

```

11:40:31          **** Entire Output Management ****          05/05/2017
UserId XYZ          - 3GL Interface Defaults -

```

```
3GL Interface 104
```

```

active ..... Y
Time Limit ..... _
Description ..... User-defined Spool (3GL Interface 104)_____

```

```
NOM container file
```

```

DBID ..... 1__
FNR ..... 138

```

```
Identifying Attributes
```

Prompt	Offset	Length	Order	Generic (*)
1040_____	1__	8__	1_	Y
1041_____	9__	8__	2_	N
1042_____	17_	8__	3_	N
_____	___	___	__	-

```
File identification
```

```
1043_____ 33_ 8__
```



**SYSERR - Display Short Messages**

```

11:55:13          ***** NATURAL SYSERR Utility *****          05/05/2017
                   - Display Short Messages -

Number           Short Message (English)
-----
SYSNOMU0001     User Id
SYSNOMU0002     Name
SYSNOMU0003     First Name
SYSNOMU0004     Birth date
SYSNOMU1040     User ID
SYSNOMU1041     Terminal ID
SYSNOMU1042     Program
SYSNOMU1043     List-Name
SYSNOMU1044     Description
SYSNOMU1045     List ID
SYSNOMU1234     testprompt

```

4. Create a default report for your 3GL interface. Enter an asterisk (\*) for the identifying attribute that you defined with Generic=Y in the definition. For further information, see *Report Identification for 3GL Interface* in the *User's Guide*.

**Report Definition - General Attributes**

```

12:12:40          **** Entire Output Management ****          05/05/2017
User ID XYZ      - Report Definition >General Attributes -

Report
Name ..... USR104-DEFAULT___
Description ..... Default definition for 3GL interface 104_____
Type ..... D

Keywords ..... _____
Master Owner ..... MRS_____
Store in NOM DB ..... N
Archive directly ..... N

Retention           Report      Archive      Revive
Number ..... 1___      _____      _____
Unit ..... A           -           -
Calendar ..... _____
Action ..... P

```



16. Modify the member RUNEX3CO and run the sample program.
17. Check the Monitor Log to see whether a report has been created.

## Using NOMPUT

### Installing an Entire Output Management Logical Printer in Natural Advanced Facilities

1. The delivered module NOMADA is assembled with the following parameters and will be valid for use with Natural and Natural Advanced Facilities. If you want to use NOMPUT with Natural, proceed with Step 4. If you are using 3GL languages, adapt the parameters to suit your requirements:

Parameter	Explanation
AUTOET=0	Do not perform ETs.
CICS=YES/NO	CICS environment required / not required (see below).
NATURAL=NO	Natural/Adabas not required.
NATVERS= <i>vr</i>	Version of Natural.
NOMDBID=0	Database ID of Entire Output Management container file.
NOMFNR=0	File number of Entire Output Management container file.

NOMADA is the interface between NOMPUT and Adabas, and it can be used by:

- 3GL batch programs, in which case CICS=NO must be set;
  - 3GL programs running under CICS, in which case CICS=YES must be set.
2. Assemble NOMADA using Entire Output Management, Natural and Adabas source libraries as steplib; for example, see z/OS sample job ASMNOM:
  3. INCLUDE the modules NOMPUT and NOMADA to the nucleus where NAFNUC is included (usually the shared nucleus):
  4. For printing from Natural Advanced Facilities, define the Natural Advanced Facilities printers as follows:

```
NTPRINT(m-n),AM=NAF
```

5. Define a logical printer in Natural Advanced Facilities with type NOM.
6. Edit the Natural Advanced Facilities defaults in Entire Output Management to link the Natural Advanced Facilities spool file and Entire Output Management container file and activate the Natural Advanced Facilities interface with "Y".
7. Direct the output of your Natural program to Entire Output Management using:

```
DEFINE PRINTER (n) OUTPUT logical-NAF-printername
```

Output of this type is stored in the specified Entire Output Management container file. Note that container files must be located on the local system where Entire Output Management runs; remote container files accessed via Network are not possible.

## Re-Routing VTAM Output to Entire Output Management

It is possible to re-route output from a VTAM application to Entire Output Management. This applies, for example, to reports generated by a user in a VTAM application (for example, Complete or CICS) which are written to VTAM printers. These reports can be the results of hardcopy requests, print requests, a Natural Advanced Facilities report, etc.

For this purpose, the VTAM virtual-printer application `NOMVPRNT` is provided, which simulates a VTAM printer. `NOMVPRNT` can run as a started task, or as a sub-task under Entire System Server. The output can be re-routed either to the JES/POWER spool or to the Entire Output Management container file. In Entire Output Management, the output will be processed according to the corresponding report definitions.

To use this feature, you have to make the following definitions:

- [Definitions in VTAM](#)
- [Definitions in Entire Output Management](#)
- [Running NOMVPRNT Under Control of Entire System Server](#)

### Definitions in VTAM

In VTAM, you define each virtual printer as follows:

```
printer-name APPL AUTH=NVPACE,EAS=1,PARSESS=NO,DLOGMOD=DSC2K,SESSLIM=YES
```

The following startup parameters have to be specified for `NOMVPRNT`:

Parameter	Explanation
<code>PRINTER=<i>printer-name</i></code>	Specify an entry for each printer whose printouts are to be handled by Entire Output Management.
<code>STORE=DB/SP</code>	Specify the destination of the re-routed output:  STORE=DB - Output is written to the Entire Output Management container file.  STORE=SP - Output is written to the JES/POWER spool.
<code>NOM-DBID=<i>nnnnn</i></code>	If STORE=DB, specify the database ID of the container file.  If STORE=SP, specify the database ID of the Entire System Server node for Entire Output Management.
<code>NOM-FNR=<i>nnnnn</i></code>	Only applicable with STORE=DB: Specify the file number of the container file.

Parameter	Explanation
NOM-CLASS= <i>c</i>	Only applicable with STORE=SP: Specify the JES/POWER class which is to be handled by the Entire Output Management monitor.
NOM-USER= <i>uuuuuuuu</i>	Only applicable with STORE=SP: Specify the user ID to be used by Entire System Server. For this Entire System Server node, you specify the startup parameter STDUSER= <i>uuuuuuuu</i> .
ADA-SVC= <i>nnn</i>	Specify the number of the Adabas SVC. The default value is 249.
SNAP=YES/NO	For tracing, specify YES. The default is NO.
WTOTRACE=YES/NO	For tracing, specify YES. The default is NO.

Under z/OS, the DD-card NOMSPRM points to the startup parameters.

If NOMVPRNT runs under control of Entire System Server (see below), this DD-card can be omitted.

### Sample JCL - z/OS:

```
//EXEC  PGM=NOMVMAIN,TIME=1440
//STEPLIB DD DSN=nom.load,DISP=SHR
//      DD DSN=adabas.loadlib,DISP=SHR
//NOMSPRM DD DSN=parm-file,DISP=SHR
//NOMPRSNP DD SYSOUT=X
```

### Sample JCL - z/VSE:

```
//LIBDEF PHASE,SEARCH=(nomvprnt.load,adabas.loadlib),TEMP
//DLBL  PARMNOM,'parm-file',0,SD
//EXTENT  SYS040,volser
//ASSGN  SYS040,DISK,VOL=volser,SHR
//EXEC  NOMVMAIN
```

## Definitions in Entire Output Management

- [Output to JES/POWER Spool](#)

- [Output to Container File](#)

### Output to JES/POWER Spool

If the output is to be re-routed to the JES/POWER spool, the JES/POWER report definitions in Entire Output Management apply.

The following report definitions are required:

- On the **Report Definition > General Attributes** screen, the field **Store in NOM DB** must be set to "Y". This ensures that the report can be viewed even if the spool file in JES/POWER is deleted.
- On the **Report Definition > JES Identification** screen, the *printer-name* must be specified in the **Writer** field.
- On the **Report Definition > POWER Identification** screen, the *printer-name* must be specified in the **Jobname** field.

### Output to Container File

If the output is to be re-routed to Entire Output Management container file, the following definitions are required:

- **System defaults:**

On the **3GL Interface Defaults** screen, set the field **active** to "Y", and in the fields **NOM Container File DBID/FNR**, specify the same database ID and file number as in the VTAM startup parameters (see above).

See Example A below.

- **Report definition for each report:**

On the **Report Definition > 3GL Identification** screen (which is invoked by pressing PF7 on the **Report Definition > General Attributes** screen, and then PF8 and then selecting the desired 3GL interface), specify the printer name (NOMPRT *nn*) in the **3GL Interface *nnn* Attributes** field.

See Example B below.

**Example A - Define 3GL interface 105 (function 8.1.12 on the Main Menu):**

```

23:55:10          **** ENTIRE OUTPUT MANAGEMENT ****          2017-07-07
UserId XYZ          - 3GL Interface Defaults -

3GL Interface 105
  active ..... Y
  Time Limit ..... _
  Description ..... NOMVPRNT to container_____

NOM container file
  DBID ..... 9_
  FNR ..... 246_

Identifying Attributes
  Prompt          Offset  Length  Order  Generic (*)
  1234_____    1_     8_     1_     N
  _____      _     _     _     -
  _____      _     _     _     -
  _____      _     _     _     -

File identification
  *_____       1_     8_

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

```

**Example B - with selected interface 105:**

```

User ID XYZ          - Report Definition >3GL Identification -

Report
  Name ..... REP2112_____

3GL Interface 105 Attributes
  ..... NOMPRT42

```

**Running NOMVPRNT Under Control of Entire System Server**

NOMVPRNT can run under control of Entire System Server as follows:

- [NOMVPRNT As Subtask](#)
- [NOMVPRNT As Started Task](#)
- [NOMVPRNT As Batch Job](#)

If NOMVPRNT runs under control of Entire System Server, the file which contains the startup parameters is specified in SATENV with the keyword DATASET.

All output from NOMVPRNT will be written into a separate SYSOUT file under the DD-name NMVvrsMS.

If AUTO=OFF is specified in the SATSTART parameter block, NOMVPRNT can be started and stopped from Entire Output Management, menu 8.11.

For details on the parameter blocks and startup parameters mentioned above and in the three sections below, see also [Define Environment for Entire Output Management Server](#).

### NOMVPRNT As Subtask

If NOMVPRNT is to run as a subtask, you have to specify the following System Automation Tools startup parameters.

The parameter block SATENV must be specified as follows:

```
NMVvrs SATENV DATASET=dataset(member) [/volser]
```

For z/VSE, the definitions have to be stored in a sequential file with LRECL=80.

The parameter block SATSTART must be specified as follows:

```
SAT SATSTART PRODUCT=NMV ,  
              TYPE=SUBTASK ,  
              PREFIX=vrs  
              SERVSYSF=(dbid,fnr)  
*              AUTO=OFF
```

where *vrs* must be the same as specified in SATENV, and *dbid* and *fnr* must be the same as specified for LFILE 206.

The parameter block NATENV can be omitted.

### NOMVPRNT As Started Task

If NOMVPRNT is to run as a started task, you have to specify the following System Automation Tools startup parameters.

The parameter block SATENV must be specified as follows:

```
NMVvrs SATENV DATASET=dataset(member)
          STC=started-task-name
```

The parameter block SATSTART must be specified as follows:

```
SAT SATSTART PRODUCT=NMV,
              TYPE=BATCH,
              PREFIX=vrs
              SERVSYSF=(dbid,fnr)
*              AUTO=OFF
```

where *dbid* and *fnr* must be the same as specified for LFILE 206.

The parameter block NATENV can be omitted.

### NOMVPRNT As Batch Job

If NOMVPRNT is to run as a batch job, you have to specify the following System Automation Tools startup parameters.

The parameter block SATENV must be specified as follows:

```
NMVvrs SATENV DATASET=dataset(member)
          NATSKEL=job-skeleton-name
```

The library SYSNOMS contains the job skeletons JNMVMVS1 and JNMVVSE1, which you can adapt to suit your requirements.

The parameter block SATSTART must be specified as follows:

```
SAT SATSTART PRODUCT=NMV,
              TYPE=BATCH,
              PREFIX=vrs
              SERVSYSF=(dbid,fnr)
*              AUTO=OFF
```

The parameter block NATENV can be omitted.



# 7 Installing the Open Print Option

---

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This documentation describes the installation of the Open Print Option (OPO) component of Entire Output Management on a Windows or Linux platform.

OPO is installed using the Software AG Installer, which you download from the Software AG Empower website at <https://empower.softwareag.com/>.

This documentation provides product-specific instructions for installing OPO. It is intended for use with *Using the Software AG Installer*. That guide explains how to prepare your machine to use the Software AG Installer, and how to use the Software AG Installer and Software AG Uninstaller to install and uninstall your products. The most up-to-date version of *Using the Software AG Installer* is always available at <http://documentation.softwareag.com/> (Empower login required).

This documentation is organized under the following headings:

## Installation Prerequisites

---

Before you install OPO, make sure that the desired EntireX broker is accessible.

In the EntireX broker, the appropriate RPC server parameters must be defined.

## Important Information

---

### Administrator Status

The person performing the installation must have administrator rights.

### Installation Directory

During the installation, you are asked to specify an installation directory. Specify the installation directory in which to install your Software AG products. We recommend that you use the SoftwareAG directory as the location for OPO. But any other directory is also possible.



**Important:** It is recommended that you do not install into a directory which is a subdirectory of a previous installation. Such a previous installation may have been created either with the Software AG Installer or by an installation tool that was used in the past.

## Side-by-Side Installations

For information regarding side-by-side installations, see *Installation* in the Natural for UNIX documentation. What is said there about Natural also applies to OPO.

## Log Files

By default, the OPO installation procedure uses the following log files for additional information during the installation/uninstallation, especially in case of errors:

- `installLog.txt` and `uninstallLog.txt` in the directory `install/logs` below the installation directory;
- the Windows event log on Windows.

## Installation on Windows and Linux

- [Installation](#)
- [Configuration](#)
- [Using Software Distribution Tools to Install OPO](#)
- [RPC Time-Out](#)

## Installation

### ➤ To install OPO:

- 1 Start the Software AG Installer GUI as described in *Using the Software AG Installer*.
- 2 When the first page of the Software AG Installer GUI (the so-called Welcome panel) is shown, choose the **Next** button repeatedly (and specify all required information on the shown panels as described in *Using the Software AG Installer*) until the panel containing the product selection tree appears. This tree lists the products you have licensed and which can be installed on the operating system of the machine on which you are installing.
- 3 To install OPO with all of its product components, expand the **Natural Products** node and select **Entire Systems Management > Entire Output Management Open Print Option**.



The installer automatically selects any additional components which are also required. This includes EntireX Libraries, if not already installed.



**Note:** If an instance of EntireX is already installed on your machine, you can use this instance by specifying the path to its 32-bit libraries in the environment variable

OPO\_EXX\_LIB\_PATH. Please note that even on 64-bit platforms the OPO executable `nomrpt.exe` is only available as a 32-bit application.

- 4 Choose the **Next** button.
- 5 Read the license agreement, select the check box to agree to the terms of the license agreement, and choose the **Next** button.



**Note:** If you are installing other products together with OPO, several panels may appear that are not explained in this documentation. See the documentation for these products for more information.

- 6 On the last panel, review the list of products and items you have selected for installation. If the list is correct, choose the **Next** button to start the installation process.
- 7 In the case of a first-time installation, then proceed as described under [Configuration](#) below.

## Configuration

The directory of the Open Print Option you have installed contains the configuration file `nomrptConf.xml`. Adjust this file in accordance with your environment. It contains the following parameters:

Parameter	Explanation
BlockName	The name of the parameter block (see also below).
EXX_Server	The name of the broker.
EXX_User	The user ID for the broker.
EXX_Password	The password of this user.
EXX_Ciphered_Password	<p>The encrypted password of this user.</p> <p>The encrypted password can be generated with the executable <code>nprpwc</code>, which is delivered in the OPO product directory. <code>nprpwc</code> allows a maximum password length of 16 characters. The 32-character string generated by <code>nprpwc</code> should be specified as the value of this parameter.</p> <p>If both <code>EXX_Password</code> and <code>EXX_Ciphered_Password</code> are specified, the value of the latter will be used.</p>
RPC_Server	The name of the Entire Output Management RPC server which logs on the broker as RPC server.
RPC_User	<p>The user ID for the Natural logon to the RPC server.</p> <p>This user ID must also be specified in the <code>*USER</code> field under Natural Attributes in the definition of any report to be printed via OPO. Further Natural Attributes are not required.</p>

Parameter	Explanation
	<p>If Natural Security is installed, this user ID must be a valid Natural Security user ID.</p> <p>See <i>Report Identification for Natural</i> in the <i>User's Guide</i>.</p>
RPC_Password	The password for this user.
RPC_Ciphered_Password	<p>The encrypted password of this user.</p> <p>The encrypted password can be generated with the executable <code>nprpwc</code>, which is delivered in the OPO product directory. <code>nprpwc</code> allows a maximum password length of 16 characters. The 32-character string generated by <code>nprpwc</code> should be specified as the value of this parameter.</p> <p>If both <code>RPC_Password</code> and <code>RPC_Ciphered_Password</code> are specified, the value of the latter will be used.</p>
Nat_Library	The Natural library to which the logon is performed (SYSSAT).
Trace_Level	<p>0 = no trace;  1 = settings (database, file);  2 = settings and metadata;  3 = settings, metadata and data blocks.</p> <p>For <code>nomrpt.exe</code>, you can change the trace writing mode from overwrite mode to append mode; to do so, you specify a minus sign before the trace level (for example, -1).</p>
Input_Format	<p>Possible values:</p> <ul style="list-style-type: none"> <li>■ blank or B = binary;</li> <li>■ X = text in a code page;</li> <li>■ T = pure ASCII text.</li> </ul> <p>If you use <code>Input_Format T</code> to transfer text data to Entire Output Management on a mainframe computer, you have make sure that the EntireX translation table used supports the transfer of the form-feed character <code>X'0C'</code> and any relevant language-specific special characters. With <code>Input_Format X</code>, the special characters are already part of the code page. Therefore it is recommended that <code>X</code> be used for non-binary data.</p> <p>For binary data, see also <a href="#">Transferring Binary Data</a> below.</p>
Input_Codepage	<p>The name of the code page which contains the text data. This has to be specified only if <code>Input_Format X</code> is used.</p> <p>The name of the code page must be made known to Natural on the server, as described in the section <i>SYSCP Utility - Code Page Administration</i> of the Natural documentation.</p>
Container_DB	The database ID of the container file used.
Container_FNR	The file number of the container file used.

Parameter	Explanation
Block_Size	The OPO block size in bytes related to the RPC MAXBUFF value. The recommended maximum is: 4000000.
Compression_Level	The compression level value according to zlib/DEFLATE data compression. Possible values are from 0 (do not attempt compression) to 9 (representing the maximum capability). The recommended value is 6.
Run_Mode	Optional. If this parameter is set to B, error messages will not be output in GUI windows/message boxes on Windows platforms, but in stdout instead. This is useful if nomrpt.exe is invoked via a batch script to avoid stopping at the error box and waiting for user confirmation.

When invoking `nomrpt.exe`, you can use Parameter 2 to specify which parameter block within `nomrptConf.xml` is to be used. If Parameter 2 is empty, the block `DEFAULT` will be used.

If you invoke `nomrpt` as follows:

```
nomrpt.exe nomrpt.xml NOMvrSRV
```

the file `nomrpt.xml` will be used as the meta data file, and `NOMvrSRV` will be used as the block name to select the predefined parameters in the configuration file `nomrptConf.xml`.

When you invoke `nomrpto.exe`, no meta data file has to be specified. You can use Parameter 1 to specify which parameter block within `nomrptConf.xml` is to be used. If Parameter 1 is empty, the block `DEFAULT` will be used. According to above example, invoke `nomrpto` as follows:

```
nomrpto.exe NOMvrSRV
```

### Using Software Distribution Tools to Install OPO

You can use the Software AG Installer to create an installation package which can then be distributed automatically to any number of computers in your environment. You can use any third-party distribution tool for this purpose.

For details, see the section *Using Software Distribution Tools to Install Natural* in the *Natural Installation* documentation. What is said there, also applies to OPO.

In the section **To adapt the script**, an example of using environment variables as part of the path specification for OPO would be:

```
imageFile=$IMAGEDIR$\\OP034.zip
```

## RPC Time-Out

If the RPC server environment has not been used for a long time, Adabas will issue return code 9 (Natural error NAT3009) to the Natural RPC server. To avoid this error, you activate the RPC user exit 39 (NATRPC39), which is provided in the library SYSRPC. See the *Natural RPC* documentation for details.

## Configuring Entire Output Management for OPO

---

### For Entire Output Management on Mainframes

The following Natural parameters have to be specified for XML processing:

```
XML=(ON,PARSE=ON),CP=ON,CFICU=ON
```

### For Entire Output Management on UNIX

Natural has to be relinked using the option `sax2`.

### Customizing the RPC Server and Entire Output Management

The server has to perform a logon to the library `SYSNOM`, and the Entire Output Management libraries have to be defined as steplibs of the library `SYSSAT` in Natural Security.

In an environment without Natural Security, the server has to perform a logon to the library `SYSSAT` and the steplibs should be defined with the module `SATSLS-P`; for example:

```
STACK=(LOGON SYSSAT;SATSLS-P)
```

For the RPC communication, it may in some cases be necessary to open a TCP port in the Firewall.

### Setting Up Entire Output Management for the Data Transfer

Invoke Entire Output Management > System Defaults (menu 8.1) > Trigger Container File and User Exits (menu item 10) to activate the trigger queue, by specifying the database ID and file number of the installed container file in the appropriate fields.

It is highly recommended to install a separate Entire Output Management data file to serve as a container file for documents transferred via the Open Print Option. *Do not* use the Entire Output Management data file (`NOMvrs-SYSF`) for transferring data.

Generate a Natural RPC server by starting Natural in batch mode with the following parameters (sample):

```
RCA=BROKER,RCALIAS=(BROKER,BKIMBTSO),
RPC=(SERVER=ON,ACIVERS=9,SIZE=32,SRVNODE='BKR034:3800:TCP',
RPCSIZE=4100,TIMEOUT=30,TRACE=0,MAXBUFF=4096,NTASKS=2,SRVUSER='*NSC',
SRVNAME=NOMvrSRV,LOGONRQ=ON)
```

The above sample assumes the broker name to be `BKR034`, listening on port 3800, the RPC server name to be `NOMvrSRV`, and that the server is started with 2 replicas. However, you can choose your own values for these parameters. Be sure to configure a maximum buffer size of at least 4096 KB and the TCP transport mechanism.

The following parameters of the Broker must be adapted in the Broker attribute file:

Parameter	Value for OPO
MAX-MSG or MAX-MESSAGE-LENGTH	16000000
NUM-COMBUF	3000
NUM-LONG-BUFFER	5000

## Data Transfer Interface

---

- [Invoking nomrpt.exe](#)
- [XML Meta Data File](#)
- [XML Tags](#)

### Invoking nomrpt.exe

The Open Print Option redirects data from a print driver to Entire Output Management. The data are redirected to `nomrpt.exe`, which receives binary data from `stdin`, are then converted to BASE64 and via the RPC server written to an Entire Output Management container file.

The type of data is irrelevant for `nomrpt.exe`. In fact, the data need not necessarily be print data from a Windows printer driver. If you specify in `nomrptConf.xml` that the data are text data (with the parameter `Input_Format=T`), it is even possible to send print data to a predefined report (as identified by the report name and the report identification attribute for Natural \*USER) within Entire Output Management with a simple Windows `echo` command:

```
echo "Hello, world."|nomrpt.exe
```

`nomrpt.exe` can be invoked with the following parameters:

Parameter	Meaning
-m <i>file-id</i>	With this parameter, you specify the XML file which is to be passed to Entire Output Management via the XML tags as described below. This file is primarily intended to supply meta data, but can also be used to supply print data.
-b <i>block-id</i>	With this parameter, you specify the section (block) of the configuration file <code>nomrptConf.xml</code> which is to be used to build up the connection to Entire Output Management via a defined RPC server.
-h	This parameter can be specified to invoke command-line help on <code>nomrpt.exe</code> and information on further parameter options available.

The `echo` command could then look as follows:

```
echo "Hello, world."|nomrpt.exe -m c:\test\nomrpt.xml -b MYSECTION
```

### Return Codes

The possible return codes issued by `nomrpt.exe` are:

Return Code	Meaning
1	Sending source name failed.
2	Sending sender name failed.
3	Sending user name failed.
4	Loading key from meta data failed.
5	Sending meta data in first put failed.
6	Sending document name failed.
7	Invalid meta data tag ignored.
8	Sending CLOSE call failed.
51	Locating <code>NomrptConf.xml</code> failed.
52	Loading of configuration file failed.
53	Loading of ERX DLLs failed.
54	Loading of input file failed.
55	Logon to ERX failed.
56	Start of conversation failed.
57	Close of conversation failed.
58	Opening ERX failed.
59	Loading of meta data failed.
60	Reading meta data file from <code>nomrpt.so</code> failed.
61	Sending print data failed.
62	Sending meta data failed.
63	Sending data failed.

Return Code	Meaning
66	Invalid trace level.

## XML Meta Data File

`nomrpt.exe` converts the print and meta data passed to the program via the first parameter of the `nomrpt.exe` call into an XML data stream and sends them to the Entire Output Management RPC server as defined in the configuration file (`RPC_Server`). The print data stream (`stdin`) itself cannot contain any XML data. This XML file is always evaluated before the print data stream is read, as meta data for the print data stream are expected to be supplied from there.

If the configuration parameter (see `nomrptConf.xml`) `Input_Format` is set to "B" or not at all, the print data are converted into the format BASE64. If `Input_Format` is set to "T", the text - which then must not contain any non-printable characters - will be passed in text lines, as shown in the above "Hello, world" example.

They are read from the file via Parameter 1 of the `nomrpt.exe` call. This XML file is always evaluated before the print data stream is read, as meta data for the print data stream are expected to be supplied from there.

## XML Tags

The XML tags are evaluated as explained in the table below.

Any unknowns tags will not be interpreted as print data, but as "extended spool attributes" (meta data). They supply information which can be evaluated via an Entire Output Management separation exit or the user exit `NOMEX014`, if activated. The exit will receive the meta data in the variable `#SPOOL-ATTR-EXTENDED` using the following format:

```
key(1)=value(1);key(2)=value(2);...;key(n)=value(n)
```

These meta data can be displayed in Entire Output Management via PF2 (Meta) on the **Display Active Reports > Spool Attributes** screen (PF10). When using the Entire Output Management GUI Client from a Windows front-end, select **Control Functions > Folders > Active Reports** and then select **Spool** from the pull-down menu of the appropriate active report. The meta data will be displayed in the **Spool** tab.

For extended spool attributes, 28,900 characters per document are available. The value of one tag plus its opening and closing tag must not exceed 248 characters. The meta data tags must not contain German umlauts or any other special characters.

The following meta-data tags are reserved and must not be used by the user application:

Tag	Explanation	Example
During the OPEN command:		
parms	The group tag which indicates the parameter block during the OPEN command.	<parms>
rpc_user	The user ID for the RPC login.	User
rpc_server	The RPC server name.	Server
exx_user	The user ID for the broker login.	User
exx_server	The name of the broker	Broker
nat_lib	The Natural library to log on to.	SYSNOM
sender	The ID of the user who initiated the print operation in OPO.	User
domain	The domain of the user ID.  With a local user ID and on Linux systems, the domain corresponds to the name of the source machine.	Domain
source	The name of the source machine.	CLIENTPC
During PUT commands:		
document	The group tag for document properties.	
source	The name of the source machine.	CLIENTPC
sender	The ID of the user who initiated the print operation in OPO.	User
domain	The domain of the user ID.  With a local user ID and on Linux systems, the domain corresponds to the name of the source machine.	Domain
title	The title of the document being printed (for example, if the printing was initiated by Microsoft Word).	Document
data	Printout data, either in BASE64 (binary) or text format.	
multi_data	The group tag which contains several <'data'> tags or any other tags treated as meta-data tags.	

Some special tags are interpreted and used to control further processing. The following table lists the tags which are evaluated:

Tag	Explanation	Example
db	This tag specifies the database number of the Entire Output Management container file, as defined in <b>System Defaults &gt; Trigger Container File and User Exits</b> (menu 8.1 > menu item 10).  The value specified with this tag overrides the corresponding value in the configuration file <code>nomrptConf.xml</code> .	<db>9</db>

Tag	Explanation	Example
fnr	<p>This tag specifies the file number of the Entire Output Management container file, as defined in <b>System Defaults &gt; Trigger Container File and User Exits</b> (menu 8.1 &gt; menu item 10).</p> <p>The value specified with this tag overrides the corresponding value in the configuration file nomrptConf.xml.</p>	<fnr>246</fnr>
filename	This tag specifies the file name to be associated with the print data stream.	<filename>document</filename>
filetype	This tag specifies the file type to be associated with the print data stream.	<filetype>pdf</filetype>
path	This tag specifies the path of the file to be associated with the print data stream.	<path>test/output</path>
canceltag	<p>This tag can be used to simultaneously cancel several printouts which contain the same tag value.</p> <p>When a user selects a printout to be cancelled, and its meta data contain the <code>canceltag</code>, all other printouts which contain the same tag value will also be deleted from the print queue.</p> <p><b>Example:</b></p> <p>The OPO user selects for cancellation a printout whose meta data contain <code>&lt;canceltag&gt;ordernumber&lt;/canceltag&gt;</code>.</p> <p>The selected printout will be scanned for the tag <code>&lt;ordernumber&gt;</code>. Let us assume that <code>&lt;ordernumber&gt;123&lt;/ordernumber&gt;</code> is found.</p> <p>The selected printout and all other printouts which contain <code>&lt;ordernumber&gt;123&lt;/ordernumber&gt;</code> will be deleted from the user's print queue.</p> <p>All of these printouts must have the status "ready to print"; if any of them has not, none of them will be deleted. This means that either all or none of these printouts will be deleted.</p> <p>If the meta data of the selected printout contain no <code>&lt;ordernumber&gt;</code> tag with a tag</p>	<canceltag>ordernumber</canceltag>

Tag	Explanation	Example
	<p>value, only the selected printout itself, but no other printouts, will be deleted.</p> <p>Each deletion will be logged in the Entire Output Management monitor log. In addition, a message will be issued indicating the tag value which caused the deletion.</p>	
showproperties	<p>This tag specifies the tags which are to be shown to the OPO user.</p> <p><b>Note:</b> This only applies to OPO, but has no effect on the tags shown to users of Entire Output Management or the Entire Output Management GUI Client.</p>	<showproperties>tag1,tag2,tag3</showpropere
encoding	This tag specifies the encoding of the meta data.	utf-8
mime-type	This tag specifies the mime type in the meta data.	application/pdf

The print data stream is not automatically associated with a file name. If the print data are to be written to a file when they are printed from Entire Output Management, the file name and file type can be supplied via tags. The examples in the table above create a PDF file `test/output/document.pdf` if the binary data stream is written to a target directory, or when the binary data are loaded into the Entire Output Management GUI Client for browsing. In the latter case, because of the file type, the Adobe Reader which interprets PDF files will be invoked as external viewer.

## Transferring Binary Data

Transfer of text data is active if the configuration parameter `Input_Format` is set to X or T. Binary conversion is active if `Input_Format` is set to B.®

Defining the file type: The transfer of documents in other formats than print formats can be achieved by using the command `type`.

For example:

```
type TestOPO.doc |nomrpt.exe TestOPO-doc.xml NOMvrSRV
```

The type of binary conversion depends on the file type (`tag <filetype>`) which can be defined in the meta data file. An example file of the meta data file (`nomrpt.xml`) is delivered with the product. If the file or tag are not available, an error message will be displayed.

## Interface from Natural on Linux to Entire Output Management

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On mainframe platforms, output from Natural modules can be passed to Entire Output Management. On a Linux platform, this functionality is provided by an interface from Natural to OPO which passes the output to Entire Output Management.

In the Natural source code, it is only necessary to define a corresponding printer, write the output data this printer, and then close it.

Example:

```
DEFINE PRINTER (1) OUTPUT 'NOM'  
  PROFILE 'NATOPO'  
  FORMS 'FORM'  
  PRTY 1  
  NAME 'LISTNAME'  
  DISP 'D'  
  CLASS 'X'  
  COPIES 3  
  ...  
WRITE (1) *DATE *TIME  
  ...  
CLOSE PRINTER (1)  
END
```

In Natural Configuration Utility you will need to declare the printer profile in **Configuration / Printer Profile ... / Printer Profiles** by first creating a printer profile with the Method NOM. Then you have to specify the parameters to call OPO in **Configuration / Printer Profiles ... / NOM Printer Profiles**. For the example above, you may specify the parameters as:

Profile name: NATOPO  
Config block: DEFAULT  
Meta file: nomrpt.xml

## Installation Verification

---

After establishing a Natural RPC service, define `nomrptConf.xml` as described above. In this example, it is assumed that the `BlockName` in the `nomrptConf.xml` file is the same as the `RPC_Server name: NOMvrSRV`. A Natural user with access rights to the `Nat_Library` logon library is to be defined as the `RPC_User`.

Define a report in Entire Output Management (in this example named `OPO-Report`), ensuring that the defined `RPC_User` is defined in the **Report Definitions >Identification (PF7)** under **Natural Attributes (PF9)** as `*USER`.

### Test for viewing files from an Entire Output Management GUI Client:

Select a small Windows doc file, giving it the name `TestOPO.doc`.

Use Notepad or another editor to create the following files:

#### 1. Create the meta data file `TestOPO-doc.xml`:

```
<?xml version="1.0" ?>
<document>
  <filetype>doc</filetype>
</document>
```

This example, which shows the minimum requirements for transferring data, assumes that the values for the tags `<db>` and `<fnr>` are defined in the configuration file `nomprtConf.xml` (Container\_DB and Container\_FNR) and that the default value "B" is used for the configuration parameter `Input_Format`.

#### 2. Create a command file `TestOPO.cmd`:

```
echo off
echo start testing OPO
echo TEST file type DOC
echo Date: %DATE% Time: %TIME%
REM the date and time values aids the tracing of
REM this specific data transfer
echo *****
REM change to the Open Print Option directory
REM *****
cd "C:\Software AG\Open Print Option"
echo on

type TestOPO.doc |nomrpt.exe TestOPO-doc.xml NOMvrSRV

echo after nomrpt.exe EOJ!
pause ↵
```

By using a command file, it is possible to control the output in case of any (typing) errors. By using the date and time values, the data transfer can be verified.

Start the command file `TestOPO.cmd`. Your file `TestOPO.doc` can be viewed from an Entire Output Management GUI Client by selecting the first active report `OPO-Report` and the the **Browse** function.

If the required file (here `TestOPO.doc`) is not delivered to the predefined report, verify that the user ID used to define the OPO configuration parameter `RPC_USER` in the configuration file `nomprtConf.xml` is also defined in the Entire Output Management predefined report. If necessary, the `Trace_Level` option in `nomprtConf.xml` can be set to "1". This will enable the tracing of the transferred data within the `SYSOUT` files of the RPC job of your RPC server.

## Uninstallation

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You uninstall OPO using the Software AG Uninstaller. For detailed information on how to use the uninstaller, see the *Using the Software AG Installer* guide.

In short: to uninstall OPO, proceed as follows:

1. Open a command window and go to the *bin* directory of your main installation directory.
2. Run the command `uninstall`. This starts the Software AG Uninstaller.

When you uninstall OPO, your customized OPO configuration files will not be deleted, but remain in the installation folder.

These configuration files may contain user-related authentication data such as user IDs and passwords added by your own administrator. The deletion of these data from the configuration files in compliance with the General Data Protection Regulation (GDPR), when applicable, is also your own administrator's responsibility.

If OPO is installed again in the same folder, these files will be re-used instead of the default configuration files delivered with the installation routine.