

# Using the SOA Gateway with Natural

Natural subprograms can be exposed as "web services" thru the SOA Gateway, a DataView (XRD) maps the parameters passed to the called subprogram.

The following steps are required:

- Define a driver and prepare the environment, described in separate sections for Mainframe, Unix / Linux and Windows platforms.

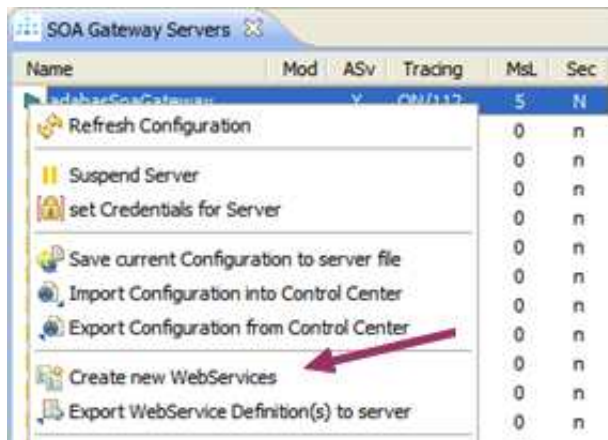
For prerequisites and compatibility information please read [here](#)

- Create the mapping *PDA -> DataView*, the following sections outline the required steps.
- Natural WebService generation
- Other ways of defining a WebService
- Preparing the Natural environment
- Type mapping

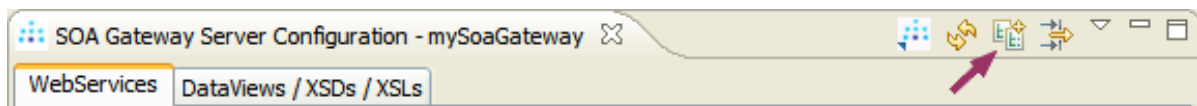
## Natural WebService generation

The preferred way for creating DataView(s), the mapping from a Natural Parameter Data Area (PDA) to the SOA Gateway structures exposing the WebService via a WSDL, is through an automatic "discovery" process as described [here](#).

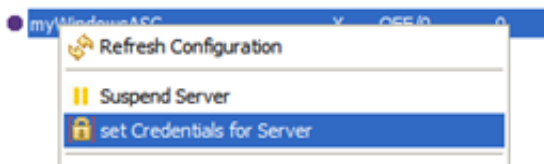
- The WebService creation process can either be started from the server's context menu:



or by clicking the 'Create new WebServices' action button in the title area of the Configuration View:



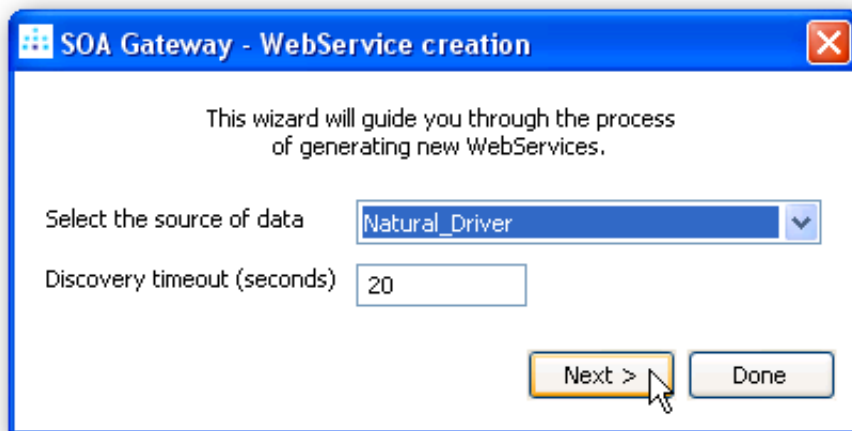
It may be required to provide login credentials, in an environment protected by Natural Security:



Specify the credentials - User ID and Password - in the *SOAP Security* section, click *Set*

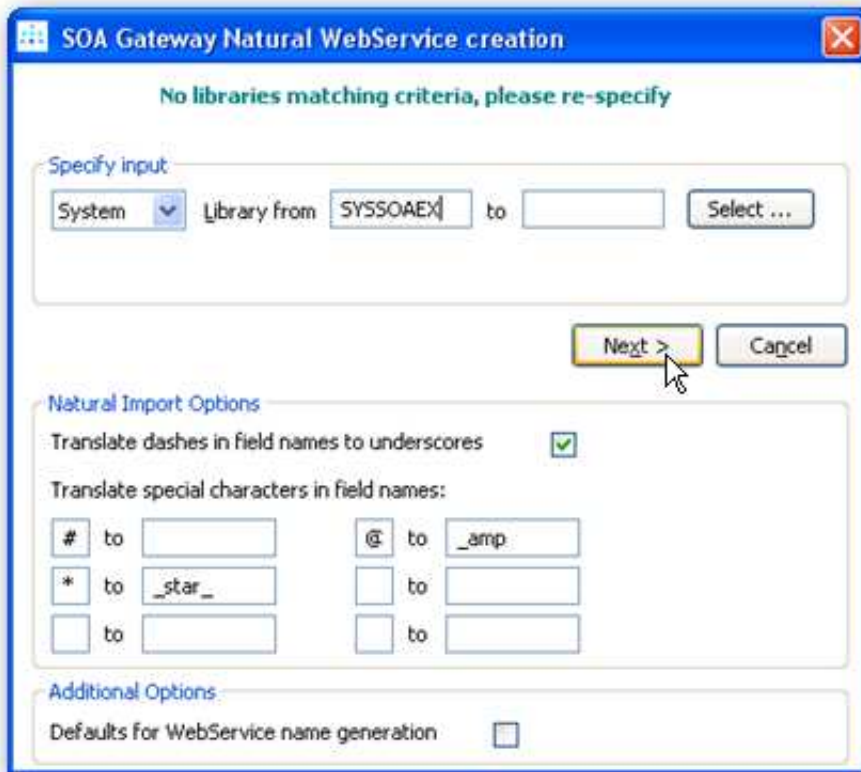


Once the WebService Creation Wizard has been activated, the first step is to select the driver to be used as the source:

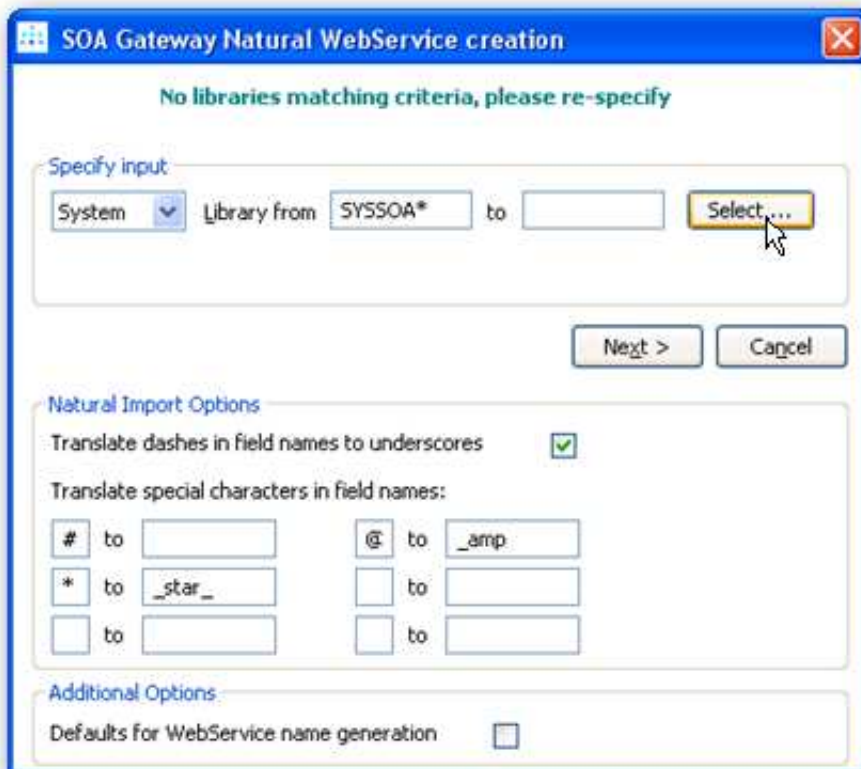


Select a defined driver of type 'natural' from the dropdown box

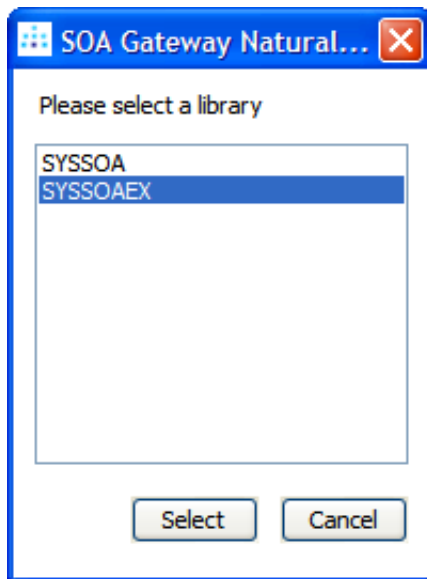
- Click the 'Next >' button
- Specify the name of the Library to be scanned, select if it is a Natural "User" or a "System" library. Click the 'Next >' button:



Alternatively, if the library name is unknown, specify a generic library name, or a from-to range and click the **Select** button. For example, the following input



will result in this additional selection dialog to pop up



Select a library with a double-click, or select a library name and click **Select**, or stop the wizard by clicking the **Cancel** button.

**Note:**

Library SYSSOAEX contains sample subprograms to demonstrate SOA Gateway features.

- Select the name(s) of the object(s) to be turned into WebServices, click the **Next** button. Again, this can be a specific object name, a generic object name, or a range of objects. When a specific object name is entered in the Object field, but the "to" Object name field is left empty, this will result in all objects *starting from the specified name* will be listed

The screenshot shows a dialog box titled "SOA Gateway Natural WebService creation". The main instruction is "Please specify a Natural Object or a range and select".

**Specify input:**

- System:
- Library from:  to:
- Object from:  to:
- Buttons: < Back, Next >, Cancel

**Natural Import Options:**

- Translate dashes in field names to underscores:
- Translate special characters in field names:

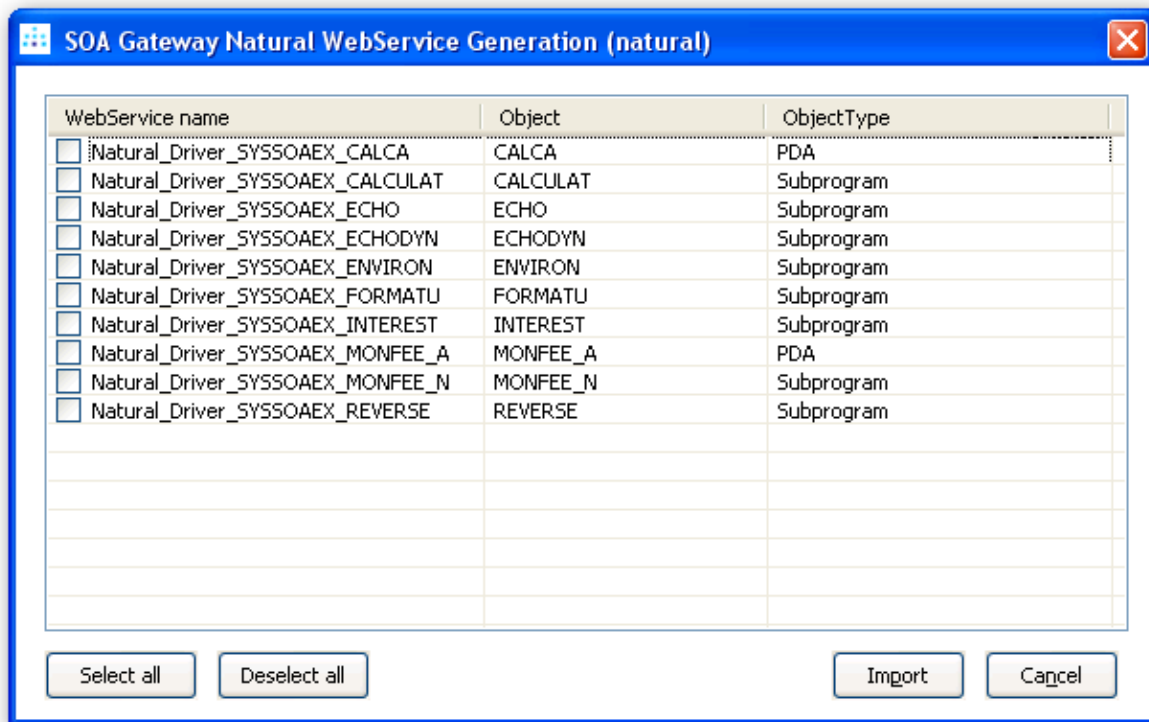
#	to	<input type="text"/>	@	to	<input type="text" value="_amp"/>
*	to	<input type="text" value="_star_"/>		to	<input type="text"/>
	to	<input type="text"/>		to	<input type="text"/>

**Additional Options:**

- Defaults for WebService name generation:

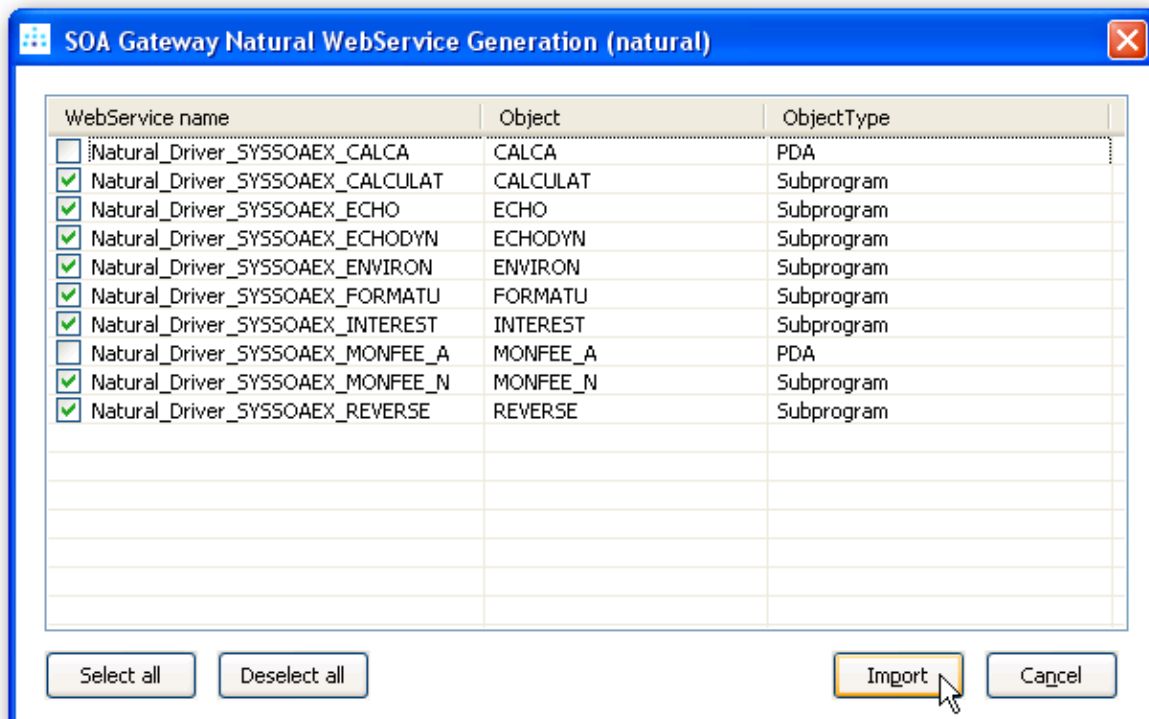
You may return to Library selection mode by clicking the **Back** button.

- A list of objects matching the selection criteria is displayed

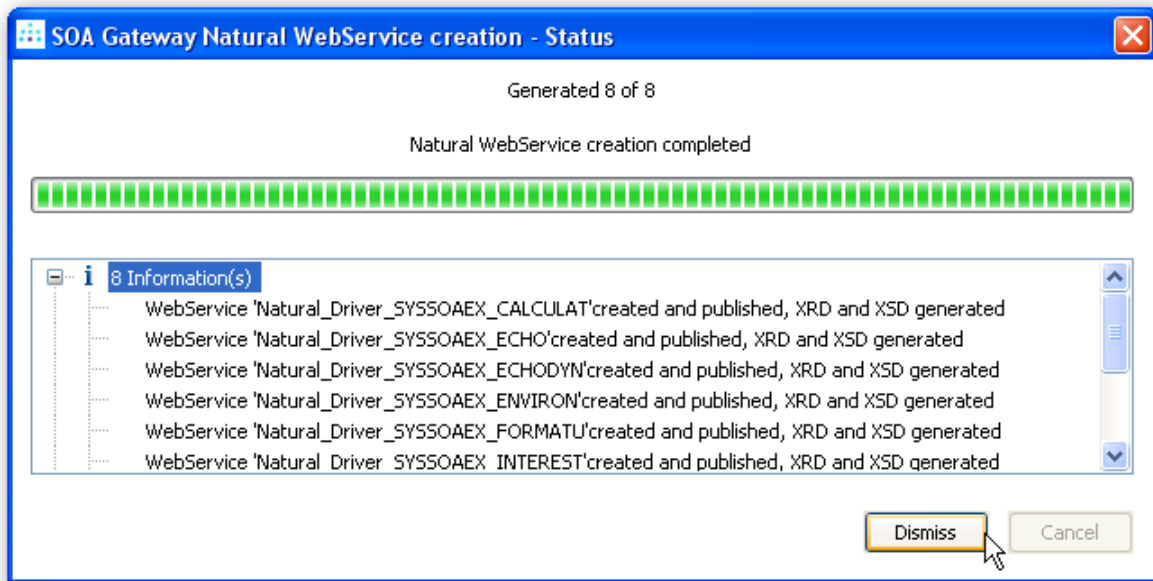


Either select all, or only the one(s) you are specifically interested in, click the **Import** button.

- In this case we select (check the box left to the WebService name) all objects of type subprogram.



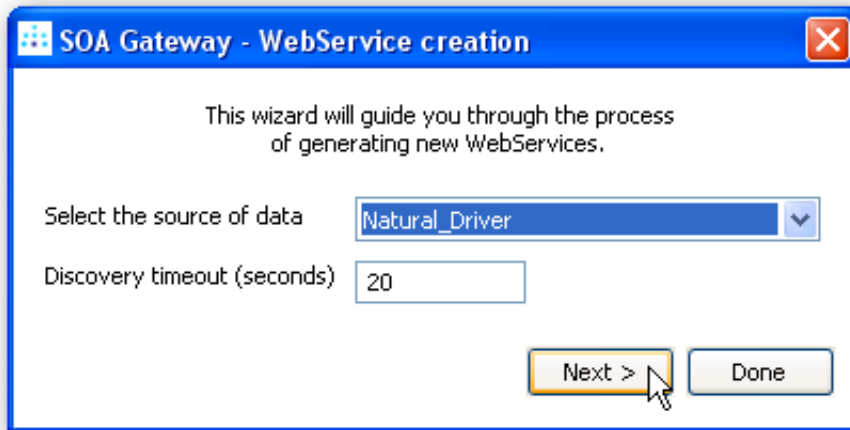
The generation report indicates what has been created:



- The requested WebServices and WebService definition files (DataView(s) and XSD(s)) have been added to your server configuration

Mod	Driver	WebService	DataSource Id	DataView
	Natural_Driver	Natural_Driver_SYSSOAEX_CALCULAT	Library=SYSSOAEX, Program=CALCULAT	Natural_Driver_SYSSOAEX_CALCULAT
	Natural_Driver	Natural_Driver_SYSSOAEX_ECHO	Library=SYSSOAEX, Program=ECHO	Natural_Driver_SYSSOAEX_ECHO
	Natural_Driver	Natural_Driver_SYSSOAEX_ECHODYN	Library=SYSSOAEX, Program=ECHODYN	Natural_Driver_SYSSOAEX_ECHODYN
	Natural_Driver	Natural_Driver_SYSSOAEX_ENVIRON	Library=SYSSOAEX, Program=ENVIRON	Natural_Driver_SYSSOAEX_ENVIRON
	Natural_Driver	Natural_Driver_SYSSOAEX_FORMATU	Library=SYSSOAEX, Program=FORMATU	Natural_Driver_SYSSOAEX_FORMATU
	Natural_Driver	Natural_Driver_SYSSOAEX_INTEREST	Library=SYSSOAEX, Program=INTEREST	Natural_Driver_SYSSOAEX_INTEREST
	Natural_Driver	Natural_Driver_SYSSOAEX_MONFEE_N	Library=SYSSOAEX, Program=MONFEE_N	Natural_Driver_SYSSOAEX_MONFEE_N
	Natural_Driver	Natural_Driver_SYSSOAEX_REVERSE	Library=SYSSOAEX, Program=REVERSE	Natural_Driver_SYSSOAEX_REVERSE

- The Wizard is still active and ready for further discovery, click 'Next >' to start the process again, or 'Done' to dismiss the wizard.

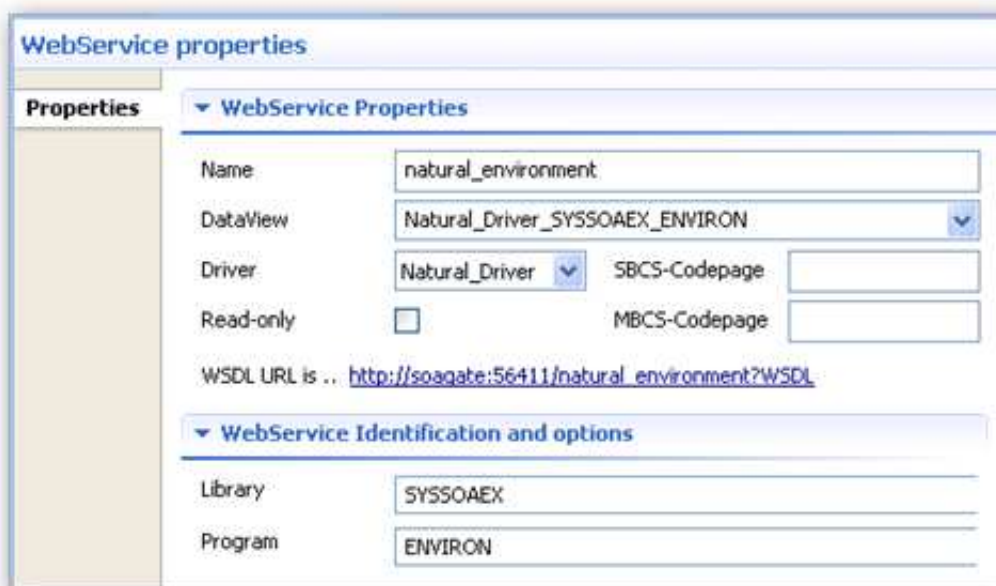


## Other ways of defining a WebService

In addition to the automatic generation process outlined above, Webservices can be created / defined as follows.

### Define a Natural WebService manually

1. Add a new SOA Gateway WebService, specifying the following:



- A WebService name
- Select a driver of type "natural" from the dropdown list
- select a DataView from the "File" dropdown list, if no DataView exists yet, specify the anticipated name of the DataView (XRD) to be created later

- For "WebService Identification and Options":
  - The Natural Library name in the "Library" field
  - The Natural subprogram name in the "Program" field

**Note:**

For Mainframe Natural only the Program name is to be entered, because the library is specified on the driver, not the individual WebService

The screenshot shows two sections of a configuration interface:

- WebService Properties:**
  - Name: natural\_environment
  - DataView: natural\_SYSEXASG\_ASGENVIN
  - Driver: Natural
  - Read-only:
  - WSDL URL is .. [http://ibm2:7741/natural\\_environment?WSDL](http://ibm2:7741/natural_environment?WSDL)
- WebService Identification and options:**
  - Program: ASGENVIN

## Create WebService(s) and DataView(s) from Natural sources or a SYSOBJH unload file

In addition to the manual approach described in detail in the Data Views section, WebServices and DataView(s) for the SOA Gateway can be generated/imported from SYSOBJH extracts or directly from Natural sources.

For a detailed description of the process refer to the Webservice Creation section

## Preparing the Natural environment

Certain steps are required to enable the SOA Gateway server to call Natural subprograms, this section describes them.

- Prepare the Natural environment on Linux / UNIX
- Prepare the Natural environment on Windows
- Prepare the Natural environment on the Mainframe

### Prepare the Natural environment on Linux / UNIX

#### Using the SOA Gateway in an environment protected by Natural Security (NSC)

- Specify a valid *LOGON* <library>, <userid>, <password> in the STACK parameter of the parameter module used with the SOA Gateway Natural driver.

- Library SYSEXT must be defined as a STEPLIB to library SYSSOA.

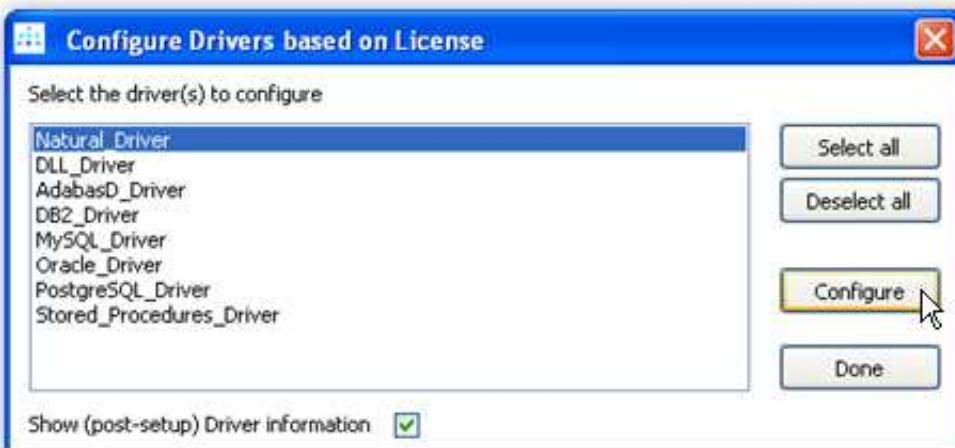
## Defining the driver

### Important:

The SOA Gateway interface to Natural requires the interface library *libnatural.so* in the LD\_LIBRARY\_PATH (LIBPATH on AIX). However, this shared library is contained in *\$NATDIR/\$NATVERS/bin*, and not in the Natural /lib directory. Due to this, either the Natural /bin directory must be added to search path variable, or libnatural.so copied / moved to a directory contained in the search path variable.

In the SOA Gateway Servers View, select the server you want to define a Natural driver for, in the Properties View select the *Drivers* tab, click the *Add...* button.

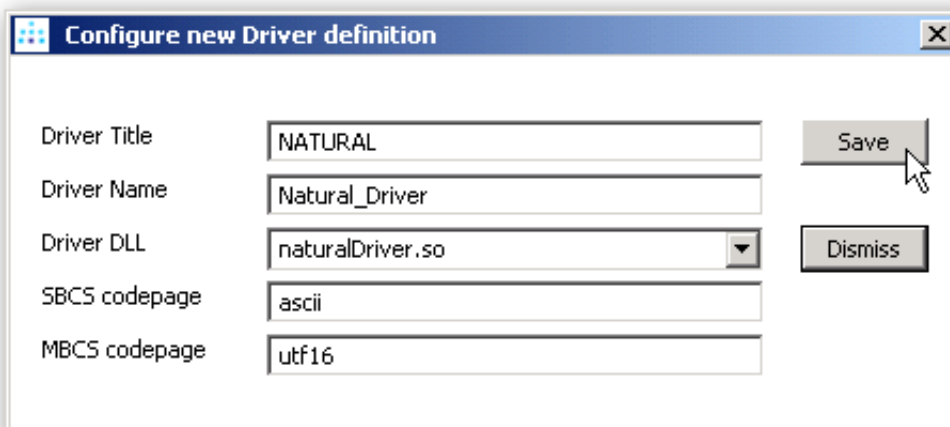
From the Driver Configuration Dialog select "Natural\_Driver"



### Important:

When defining a Natural driver for the first time, make sure to check the "Show (post-setup) Driver Information" box because only this will allow you to extract the INPL file containing the SOA Gateway Natural interface- and example programs.

The following values are preset, change as required:



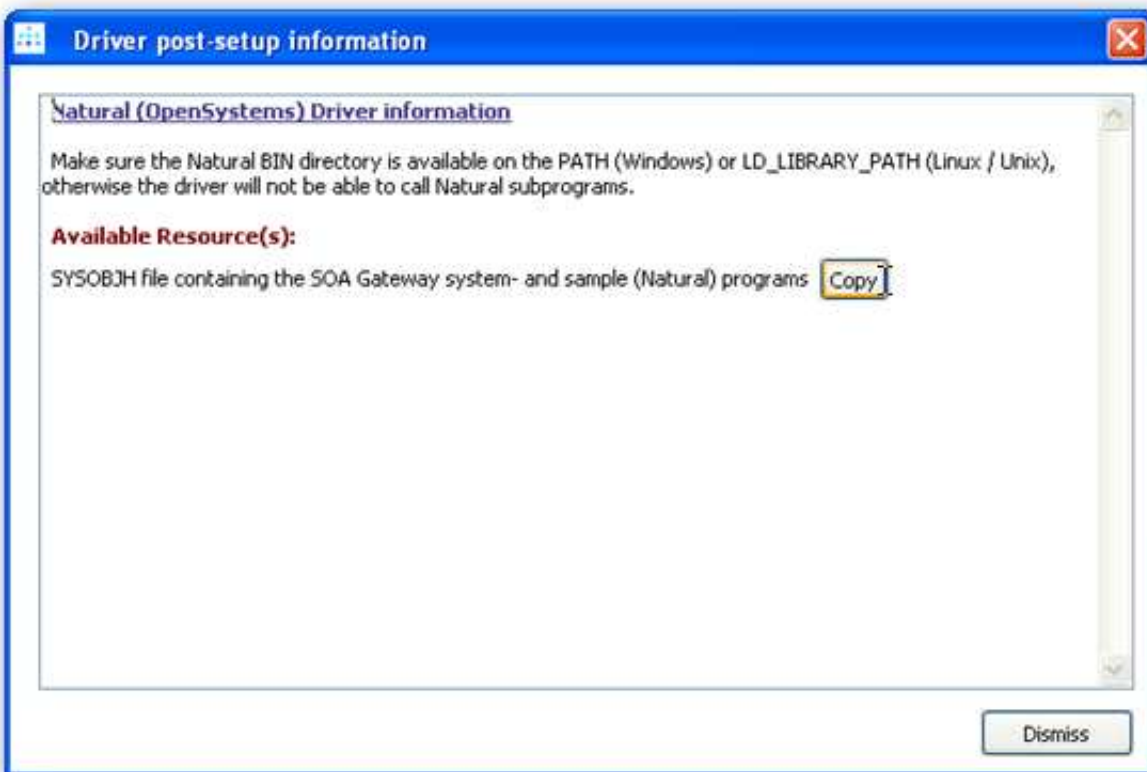
Only the *Driver DLL* parameter is to be entered as is, you are free to choose any *Driver Name* you wish, set the *SBCS codepage* and *MBCS codepage* parameters according to your local or internationalization requirements.

Click the *Save* button, you will now be asked to (optionally) enter Natural initialization parameters, for example *PARAM=MYPARAM* to use a Natural parameter module other than NATPARAM.

Click the *Save* button again, the newly defined driver will appear in the Driver Properties section:

Driver Name	Type	Executable	SBCS Codepage	MBCS Codepage
Natural	natural	naturalDriver.so	ascii	utf16
Odbc	odbc	odbcDriver.so	ascii	utf16
Adabas	adabas	adabasDriver.so	ascii	utf16
DLL Driver	sharedlib	dllDriver.so	ascii	utf16
MySQL Driver	mysql	MySQLDriver.so	ascii	utf16
Natural_Driver	natural	naturalDriver.so	ascii	utf16

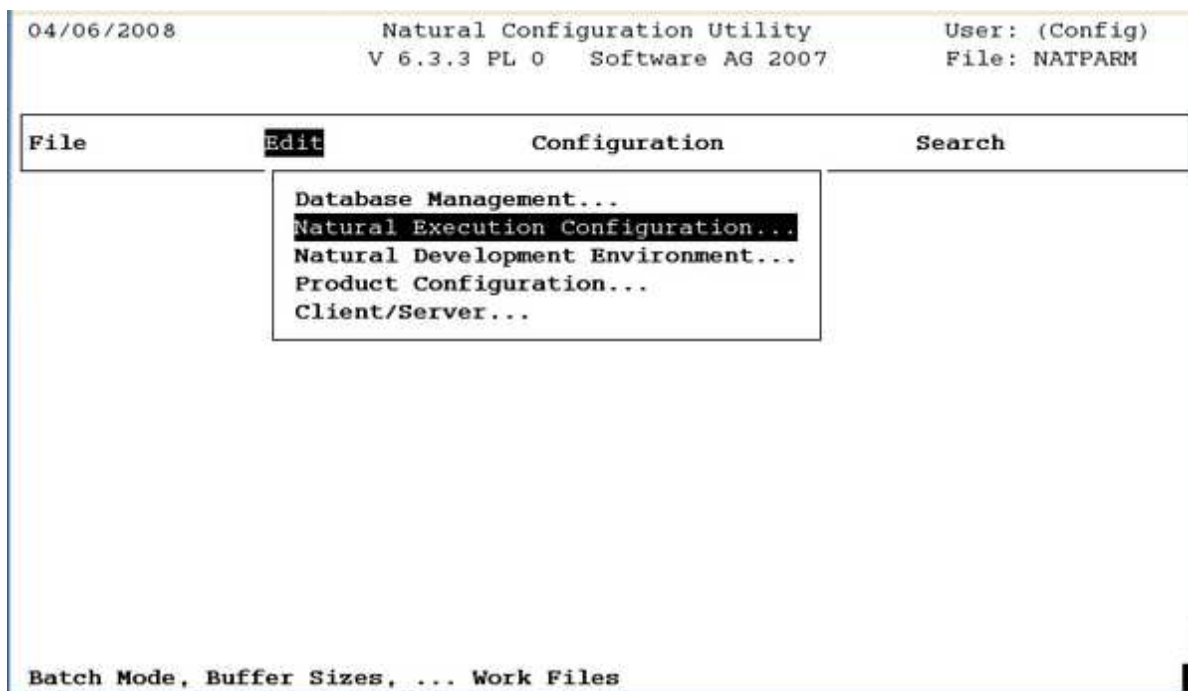
When "Show (post-setup) Driver Information" has been selected, the following information box will be shown, and allow the extraction of the SYSOBJH file containing the SOA Gateway Natural interface- and example programs.



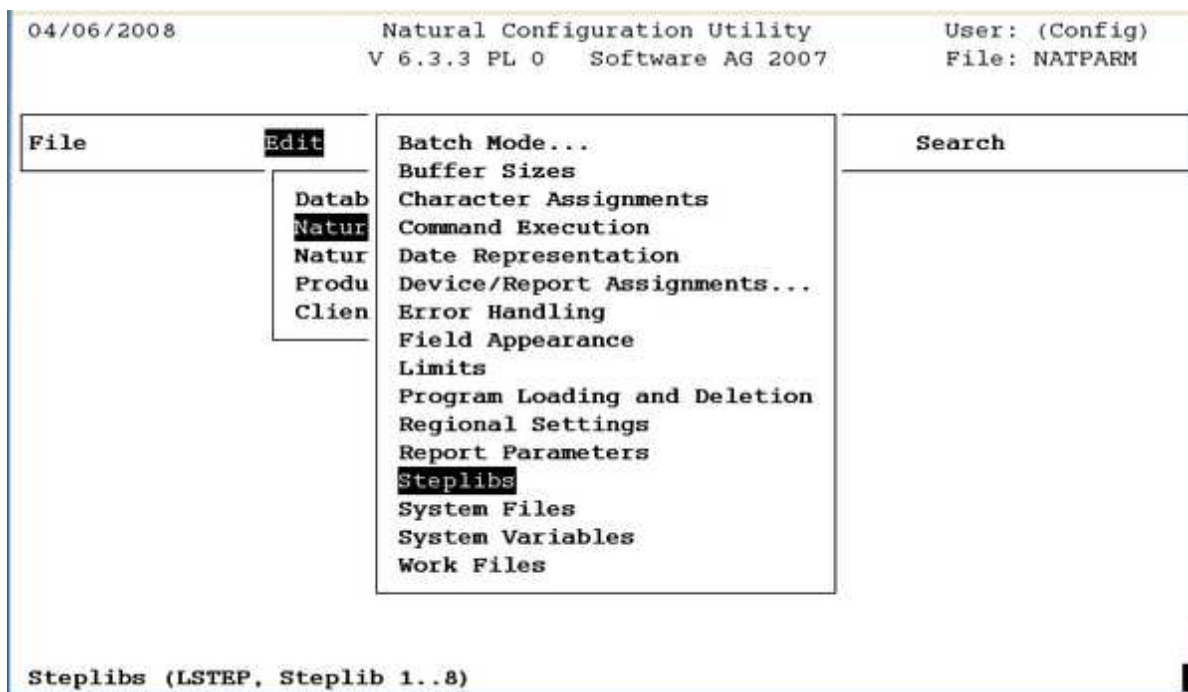
### Loading the SOA Gateway Natural system- and demo programs on Linux / UNIX

The following steps are required to load the SOA Gateway WebService creation and demo programs in a Linux / Unix environment

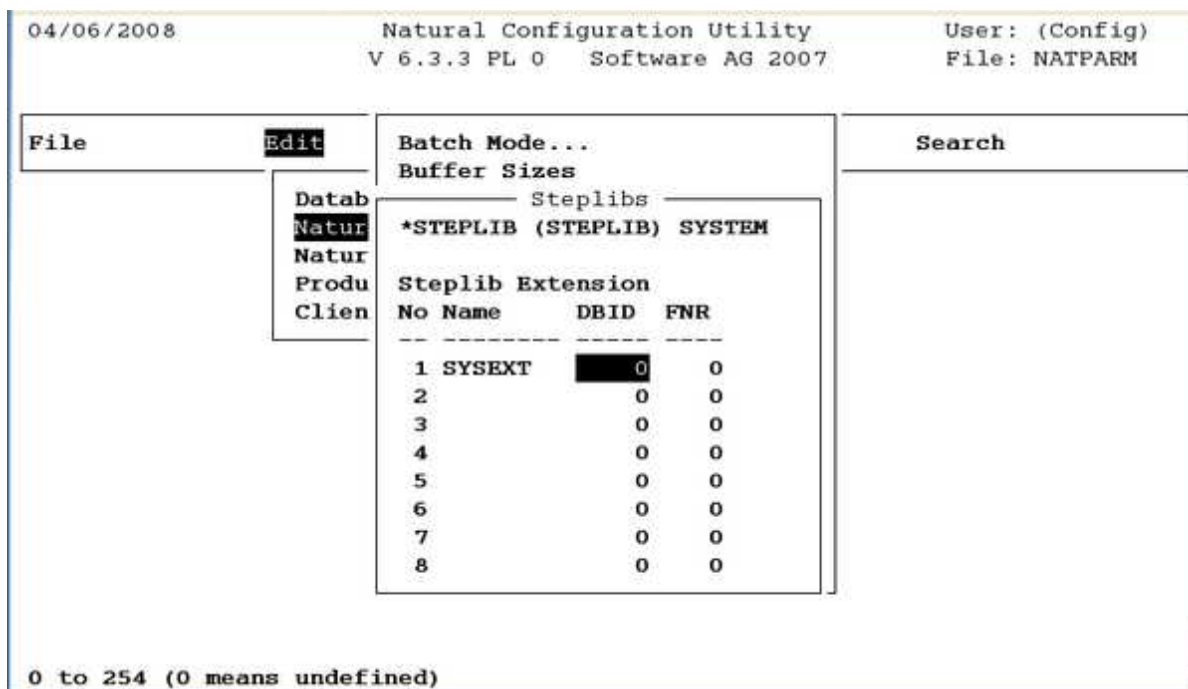
- Start the Natural Configuration Utility (*natparm*)
- For the specific Natural Parameter file to be used when accessing Natural from the SOA Gateway (default: "NATPARM"), select "Edit" -> "Natural Execution Configuration"



- Select “*Steplibs*”

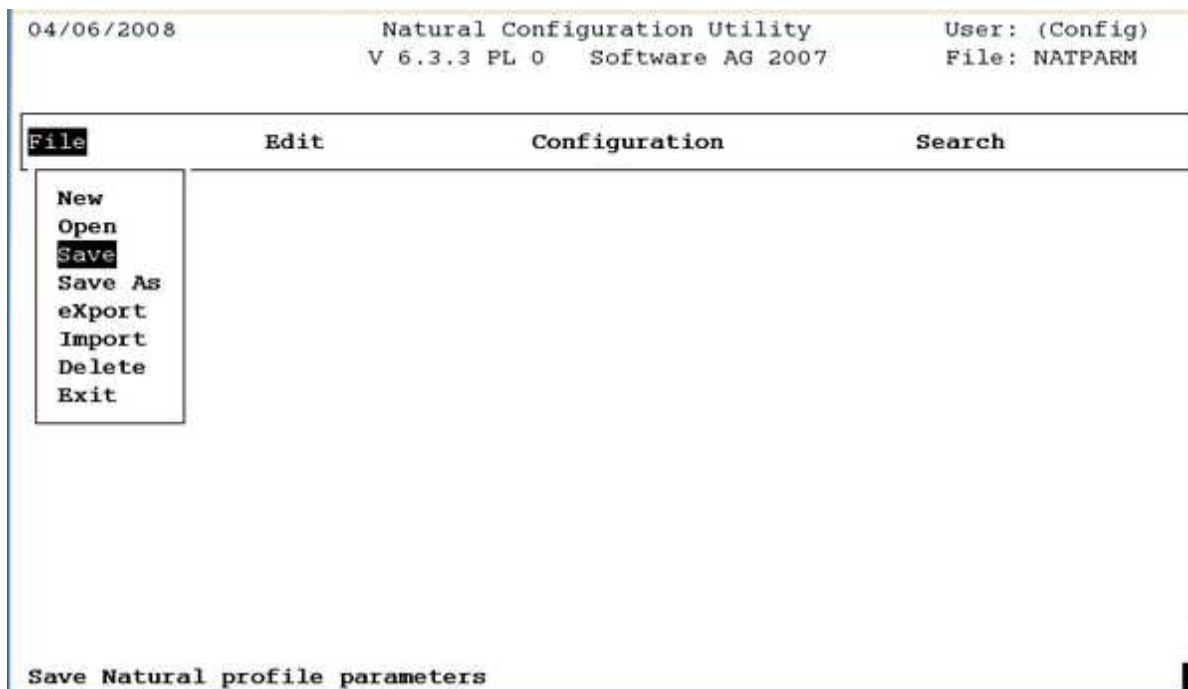


- Define library “*SYSEXT*” as a “*Steplib Extension*”



- Press the “return” key to save the Steplib modification(s), then use the “Esc” key to close all windows.

Select “File” -> “Save” to preserve the adjusted Steplib setting



- Quit the Natural Configuration Utility with “File” -> “Exit”.
- Before entering Natural to load the SOA Gateway system- and demo-programs the environment variable WRKF3 needs to be set to allocate work file 3 for the “Natural Object Handler”

```
/sag/tmp> export WRKF3=network3.sag
```

Here, as an example, the work file name is defined as “network3.sag” in the current working directory.

- Start Natural, tab to the “*Direct*” entry on the main menu, enter “*SYSOBJH*” to start the Natural Object Handler:

2008-06-04	NATURAL	Library: SYSTEM
22:56:25	V 6.3.3 PL 0 Software AG 2007	Mode : REPORT
User: SAG		Work Area : empty

Library	<b>Direct</b>	Services	OS	Fin
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Direct Command

SYSOBJH

Enter Command or NATURAL Program Name

- Select the Object Handler “Load” function

```

23:01:04          ***** Natural Object Handler *****          2008-06-04
User SAG              - Main Menu -

Select the desired function:

_  Unload objects or a whole application from your Natural environment
X  Load objects or an application into your Natural environment
█  Scan work file contents
_  View objects in the Natural environment
_  Administrate the Object Handler environment,
    process Workplans and direct commands

Mark this field to avoid Object Handler wizards:

_  Advanced user

Command ==>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help      Exit Unld Load Scan View Admin      Cnds      Canc

```

- Select “Load objects from Natural work file(s)”

```

23:04:55          ***** Natural Object Handler *****          2008-06-04
User SAG              - Load Wizard -

You can load objects from transfer and non-transfer work files
into the Natural environment or execute a command procedure.

Select the desired function:

█  Load objects from Natural work file(s).
_  Start Object Handler command procedure.

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

```

- Enter the SOA Gateway OBJH “Work file” name and select “Portable work file” and “Set additional options”

```

23:09:50          ***** Natural Object Handler *****          2008-06-04
User SAG          - Load Wizard, Options -

If the work file contains data in Transfer format, mark this field:
  _ Transfer format

If you want to use a portable work file, mark this field:
  X Portable work file

Enter the name of the load file. If the path and the name
do not fit into the field, press PF11 to specify a longer value.
Work file /tmp/ASG411_000003_OBJH.sag_____

Select the desired option to be used.
Mark 'Set additional options', to use additional options.
  X Use default options                      X Set additional options

   Use Option Workplan   Name _____   _ List Option Workplan
                                     _ Select Option Workplan

Please enter options.
Command ===>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10---PF11---PF12---
      Help           Exit  OpSet SelWP LstWP Back  Next           Cmds  WorkF  Canc

```

- Either enter a “Report file” name, or deselect the “Write report” option

```

23:14:36          ***** Natural Object Handler *****          2008-06-04
User SAG          - Load Options -

Work File Options:
Work file:      /tmp/ASG411_000003_OBJH.sag_____

Write report    Start new report
Report file:  $WRKF4_____
_ Write restart information
Restart file:  _____

Replace Options:          XREF Options:          FDIC Settings:
  X Do not replace          _ Yes          DBID/FNR _____ / _____
  _ Replace all            X No          Password
  _ Replace obsolete       _ Force       Cipher
  _ Replace except newer   _ Doc          FSEC Settings:
                          _ Special      DBID/FNR _____ / _____
                          Password
                          Cipher

Number to process:
_____

Command ===>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10---PF11---PF12---
      Help           Exit  WorkF RepoF RestF           Cmds           Canc

```

- Hit the “return” key a number of times, the following screen will finally indicate what Object handler operation will be carried out:

```

23:18:41          ***** Natural Object Handler *****          2008-06-04
User SAG              - Load Wizard -

The following command will be processed.
To change the settings, press PF7 (Back). To confirm the settings and
to execute the command, press ENTER or PF8 (Next).

LOADALL WHERE NOREPORT WORKFILE /tmp/ASG411_000003_OBJH.sag

Please press PF7 (Back) or ENTER/PF8 (Next).
Command ===>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help           Exit           Save           Back Next           Cnds           Canc

```

- Hit the “return” key once again, the SOA Gateway Natural system- and demonstration objects will be loaded, the following message indicates the completion of the load operation.

```

23:18:41          ***** Natural Object Handler *****          2008-06-04
User SAG              - Load Wizard -

The following command will be processed.
To change the settings, press PF7 (Back). To confirm the settings and
to execute the command, press ENTER or PF8 (Next).

LOADALL WHERE NOREPORT WORKFILE /tmp/ASG411_000003_OBJH.sag

Function completed successfully.

Press ENTER to continue.

Press ENTER to continue.
Command ===>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help           Exit           Cnds           Canc

```

- Press the Enter ( = return ) key again, and one more time to quit the load function, followed by the “Esc” key to terminate the Natural Object Handler.

```

23:18:41          ***** Natural Object Handler *****          2008-06-04
User SAG              - Load Wizard -

The following command will be processed.
To change the settings, press PF7 (Back). To confirm the settings and
to execute the command, press ENTER or PF8 (Next).

LOADALL
Function
Press ENT

Do you want to continue the load function?
 Yes  X No

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

```

## Prepare the Natural environment on Windows

The SOA Gateway interface to Natural requires the interface library *natni.dll*.

### Important:

Make sure the *%NATDIR%/%NATVERS/bin* directory, which contains *natni.dll*, is in the path.

## Using the SOA Gateway in an environment protected by Natural Security (NSC)

- Specify a valid *LOGON <library>, <userid>, <password>* in the STACK parameter of the parameter module used with the SOA Gateway Natural driver.
- Library SYSEXT must be defined as a STEPLIB to library SYSSOA.

## Defining the driver

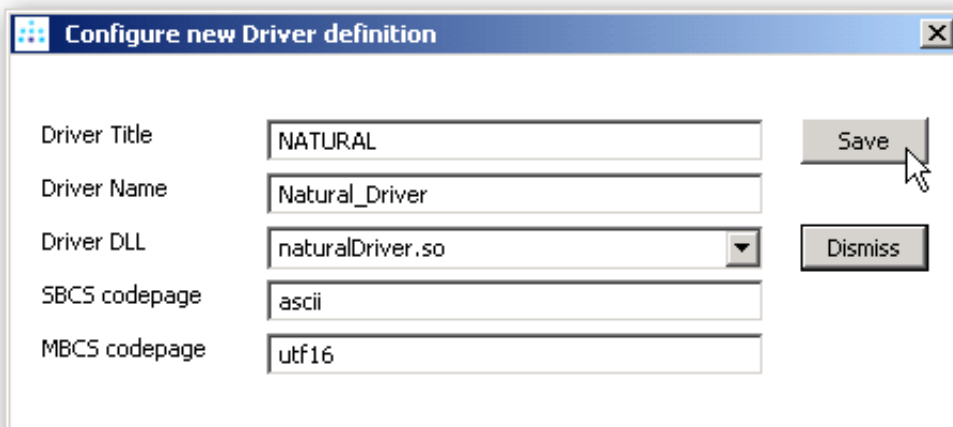
In the SOA Gateway Servers View, select the server you want to define a Natural driver for, in the Properties View select the *Drivers* tab, click the *Add...* button.

From the Driver Configuration Dialog select "Natural\_Driver"

**Important:**

When defining a Natural driver for the first time, make sure to check the "Show (post-setup) Driver Information" box because only this will allow you to extract the INPL file containing the SOA Gateway Natural interface- and example programs.

The following values are preset, change as required:



Only the *Driver DLL* parameter is to be entered as is, you are free to choose any *Driver Name* you wish, set the *SBCS codepage* and *MBCS codepage* parameters according to your local or internationalization requirements.

Click the *Save* button, you will now be asked to (optionally) enter Natural initialization parameters, for example *PARAM=MYPARM* to use a Natural parameter module other than NATPARAM.

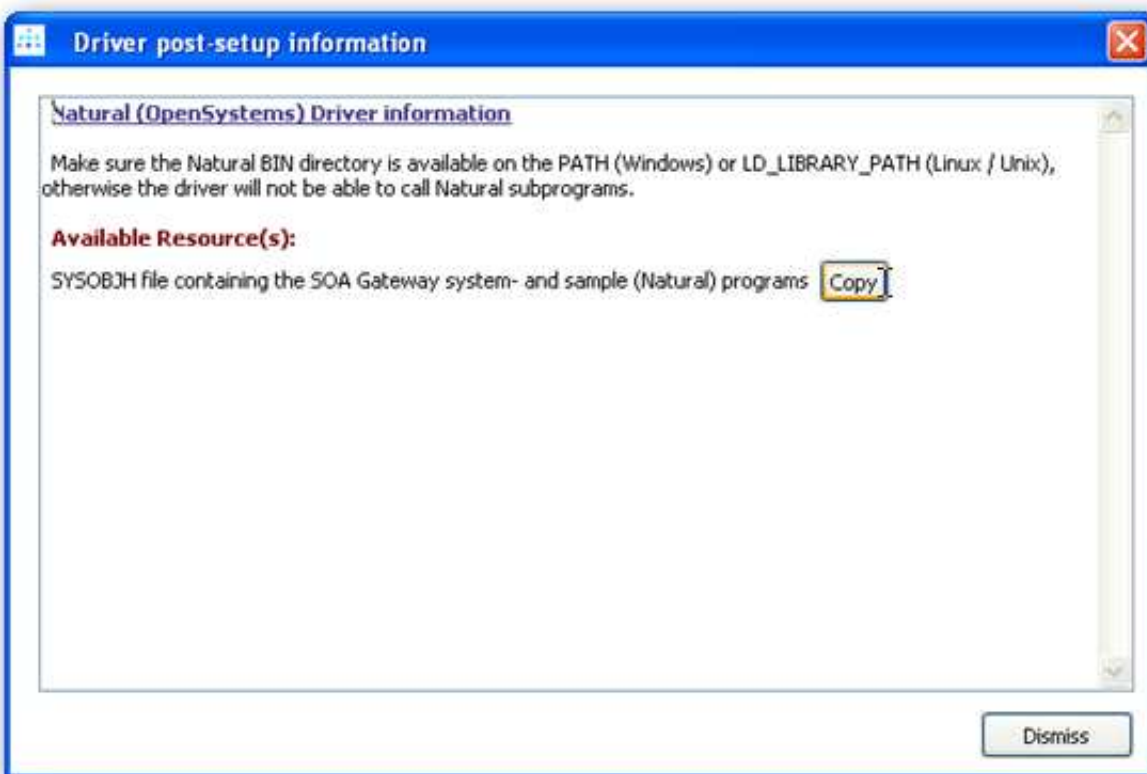
Driver has options (which may be mandatory), please specify and/or click 'Save'

Driver Title	NATURAL	Save
Driver Name	Natural_Driver	
Driver DLL	naturalDriver.so	Dismiss
SBCS codepage	ascii	
MBCS codepage	utf16	
InitParms		

Click the *Save* button again, the newly defined driver will appear in the Driver Properties section:

Driver Name	Type	Executable	SBCS Codepage	MBCS Codepage
Natural	natural	naturalDriver.so	ascii	utf16
Odbc	odbc	odbcDriver.so	ascii	utf16
Adabas	adabas	adabasDriver.so	ascii	utf16
DLL Driver	sharedlib	dllDriver.so	ascii	utf16
MySQL Driver	mysql	MySQLDriver.so	ascii	utf16
Natural_Driver	natural	naturalDriver.so	ascii	utf16

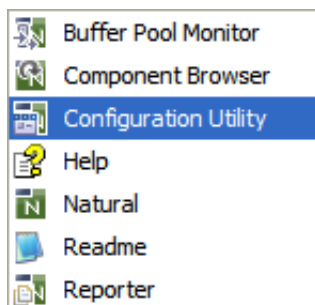
When "Show (post-setup) Driver Information" has been selected, the following information box will be shown, and allow the extraction of the SYSOBJH file containing the SOA Gateway Natural interface- and example programs.



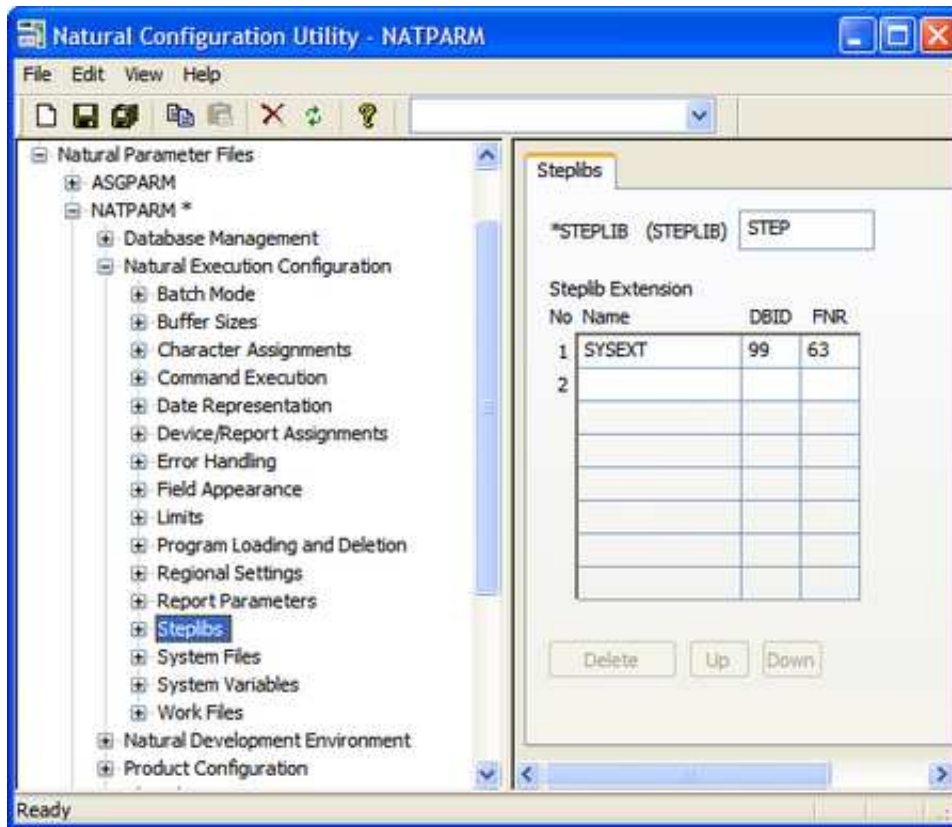
### Loading the SOA Gateway Natural system- and demo programs on Windows

The following steps are required to load the SOA Gateway WebService creation and demo programs in a Windows environment

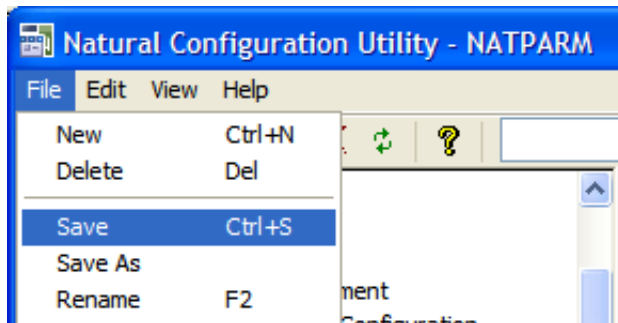
- Start the Natural Configuration utility



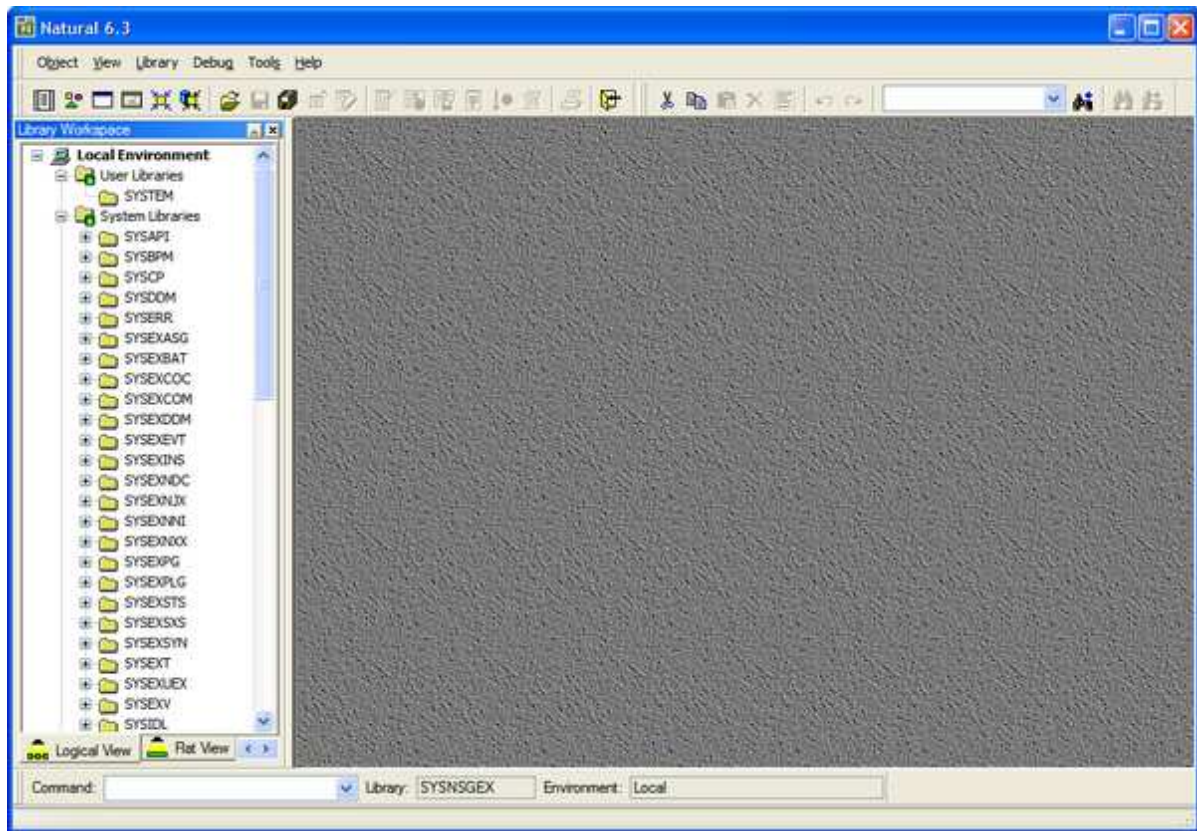
- For the specific Natural Parameter file to be used when accessing Natural from the SOA Gateway (default: "NATPARM"), under "*Natural Execution Configuration*" -> "*Steplibs*", add library "SYSEXT" as a "*Steplib Extension*"



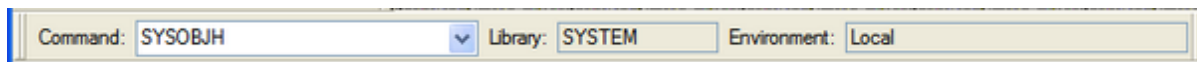
- Click the “Save” button, or select File -> Save



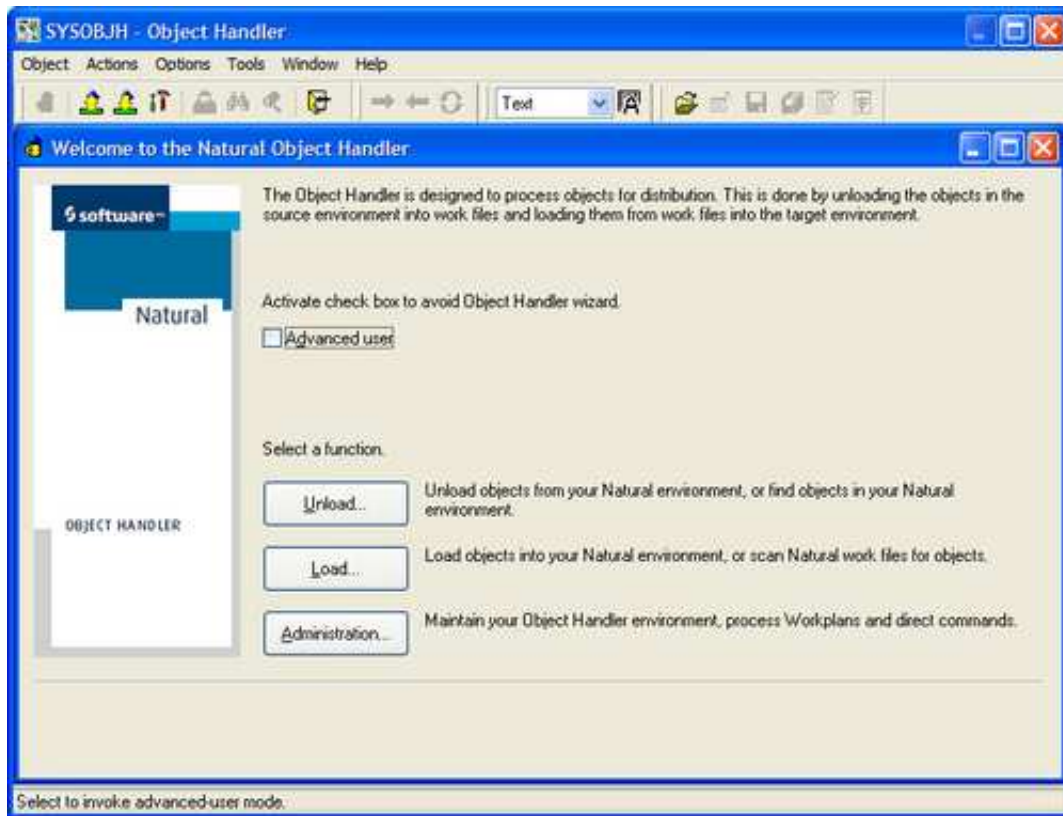
- Start Natural Studio, the initial display will be something like this



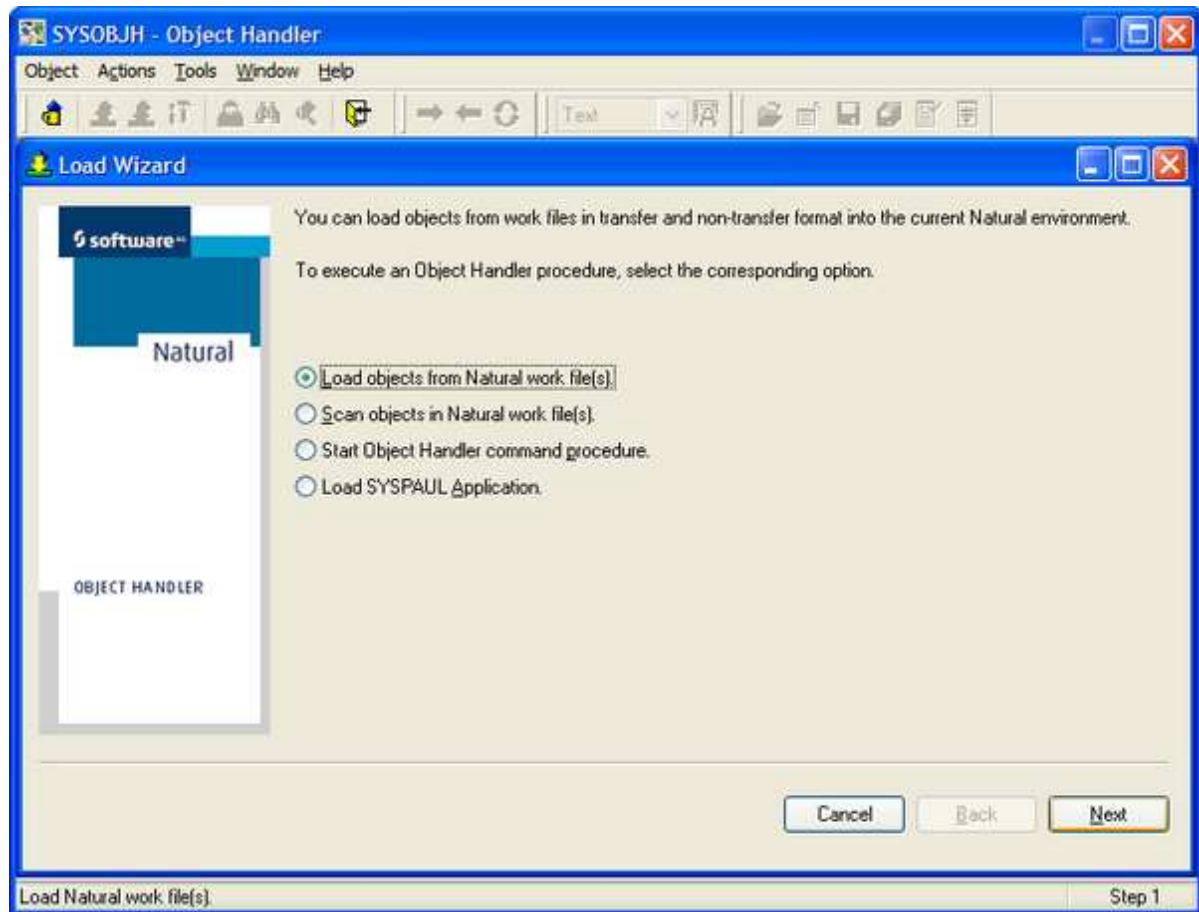
- Import the SOA Gateway Natural interface and the demo programs. For this, start the Natural Object Handler – enter the command “SYSOBJH” in Natural Studio’s Command line



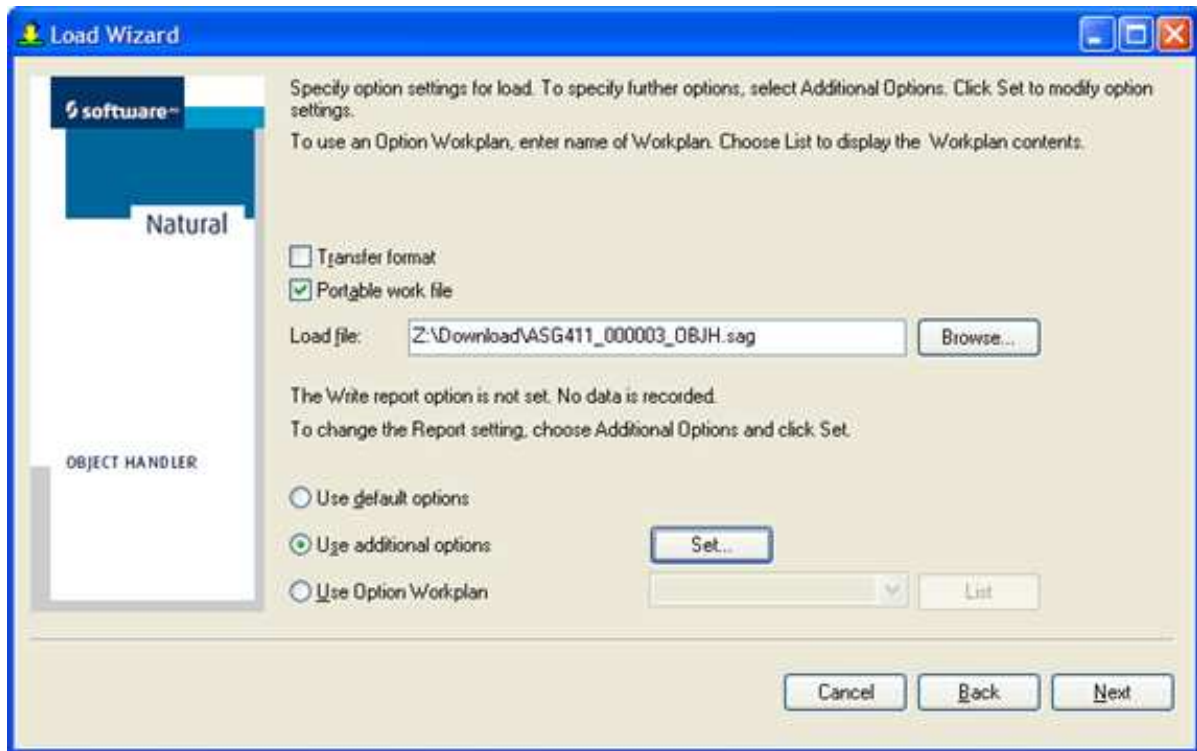
- Select the *Load* function



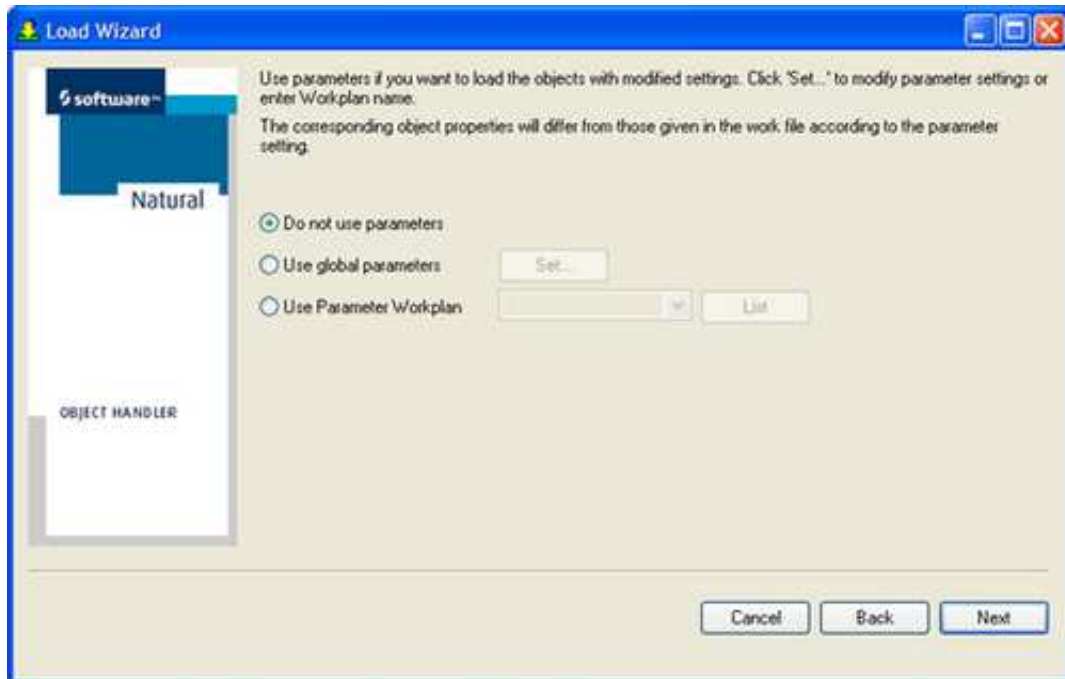
- Select “Load objects from Natural work file(s)”



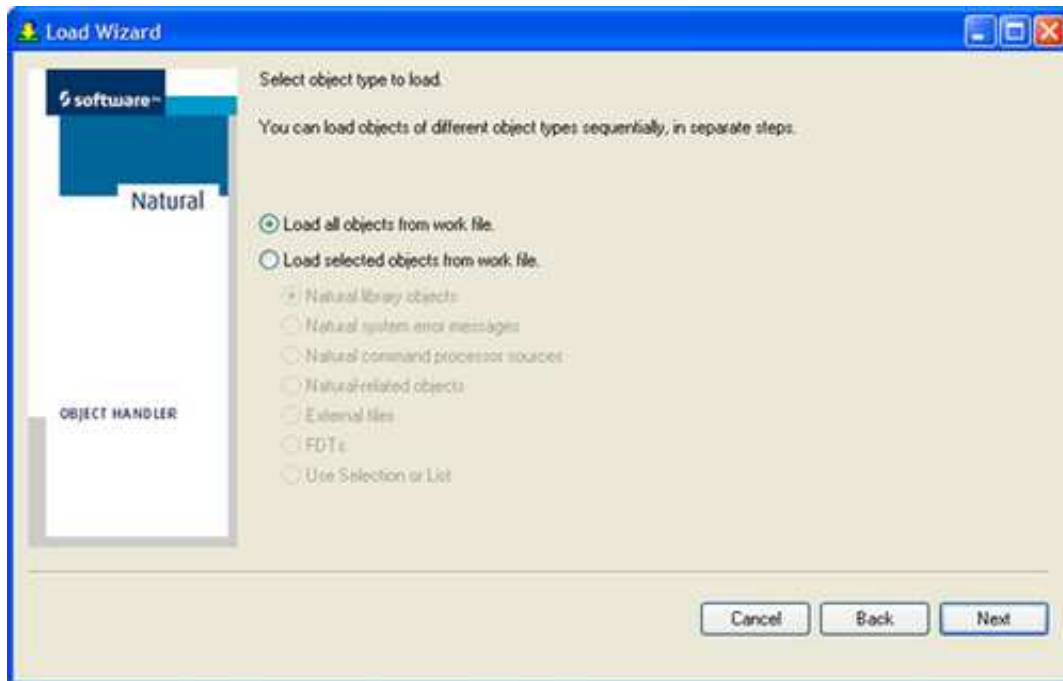
- Specify (or browse for) the SOA Gateway OBJH unload file, check “*Portable work file*”, select “*Use additional options*”, click “*Next*”



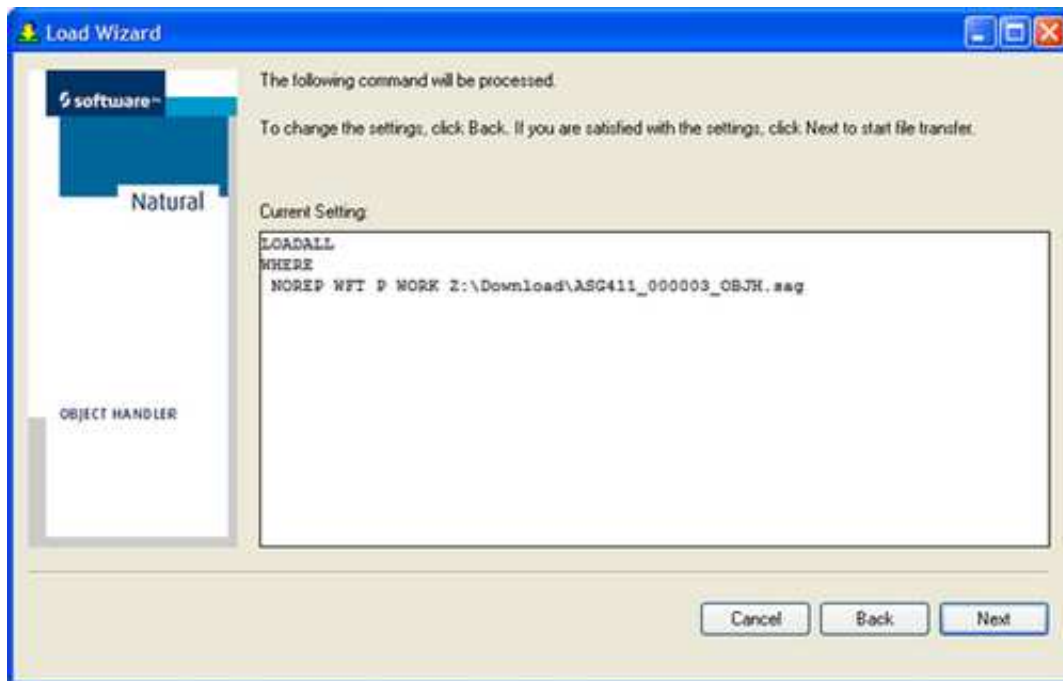
- click “Next”



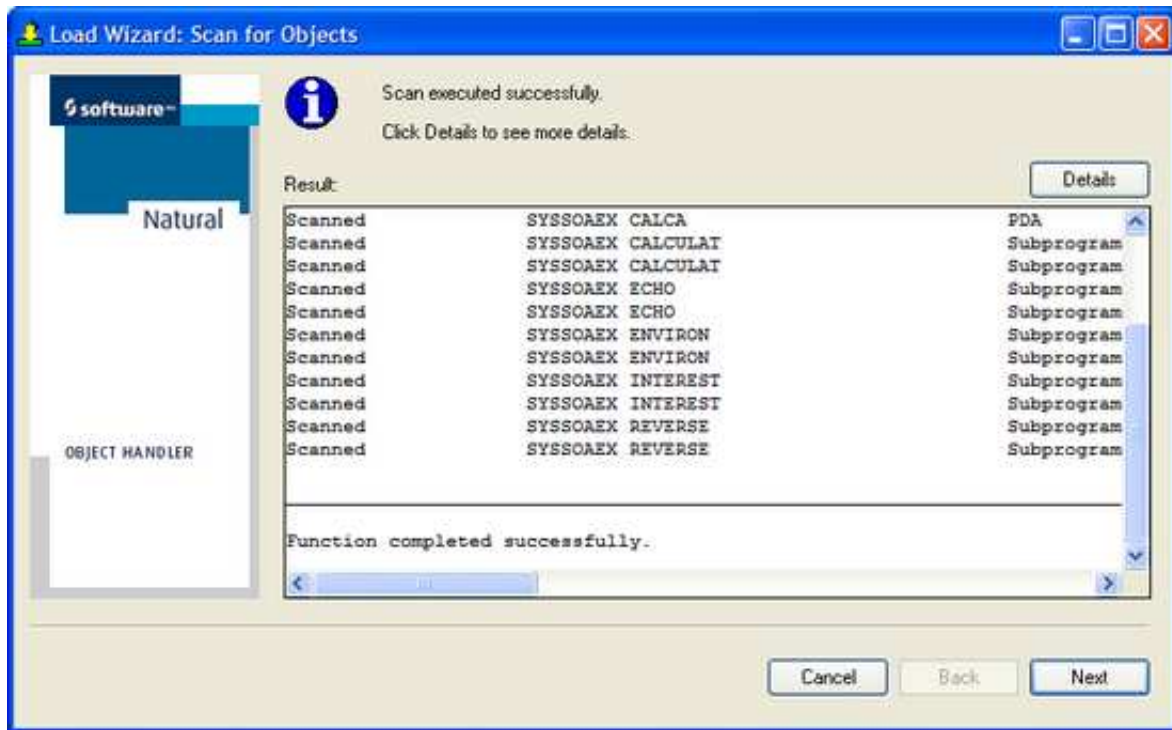
- Click “Next” to “Load all objects from work file”



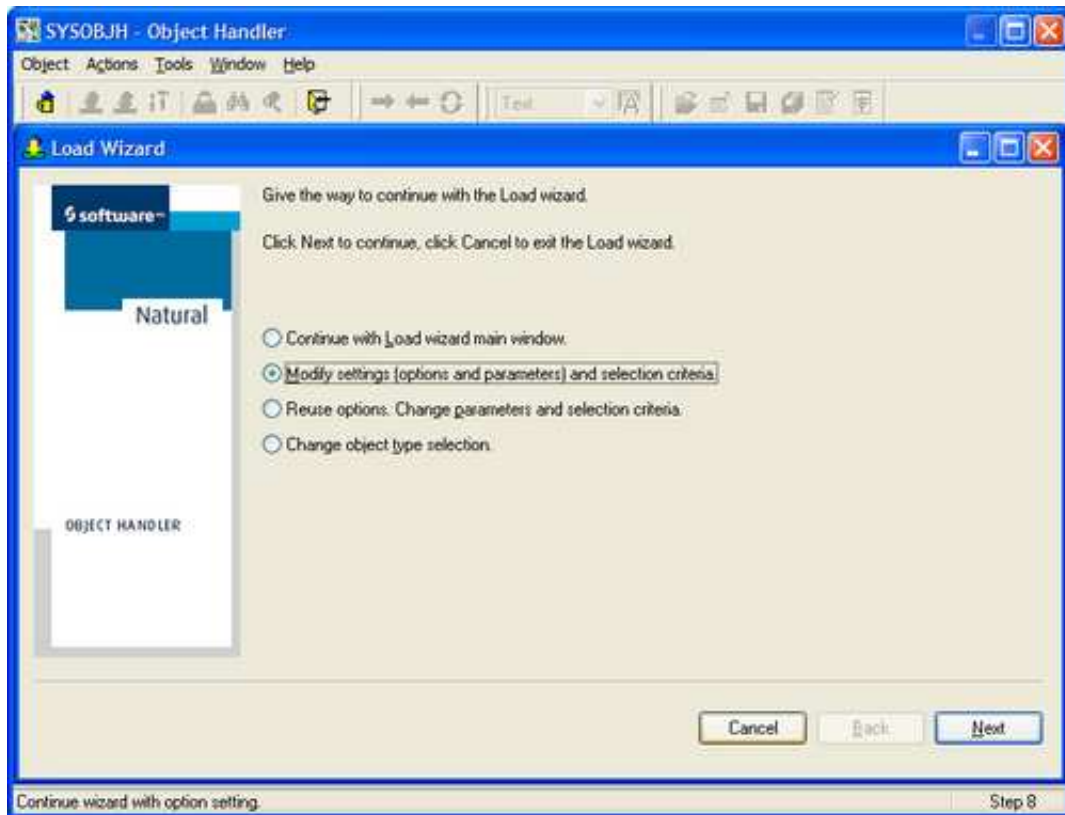
- Click “Next” again to start the actual load process.



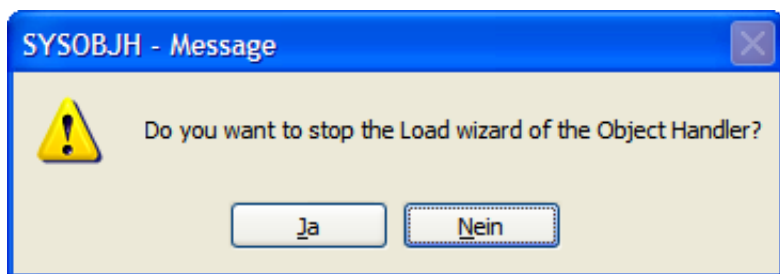
- The SOA Gateway System- and Demo-programs have been loaded. Click “Next”.



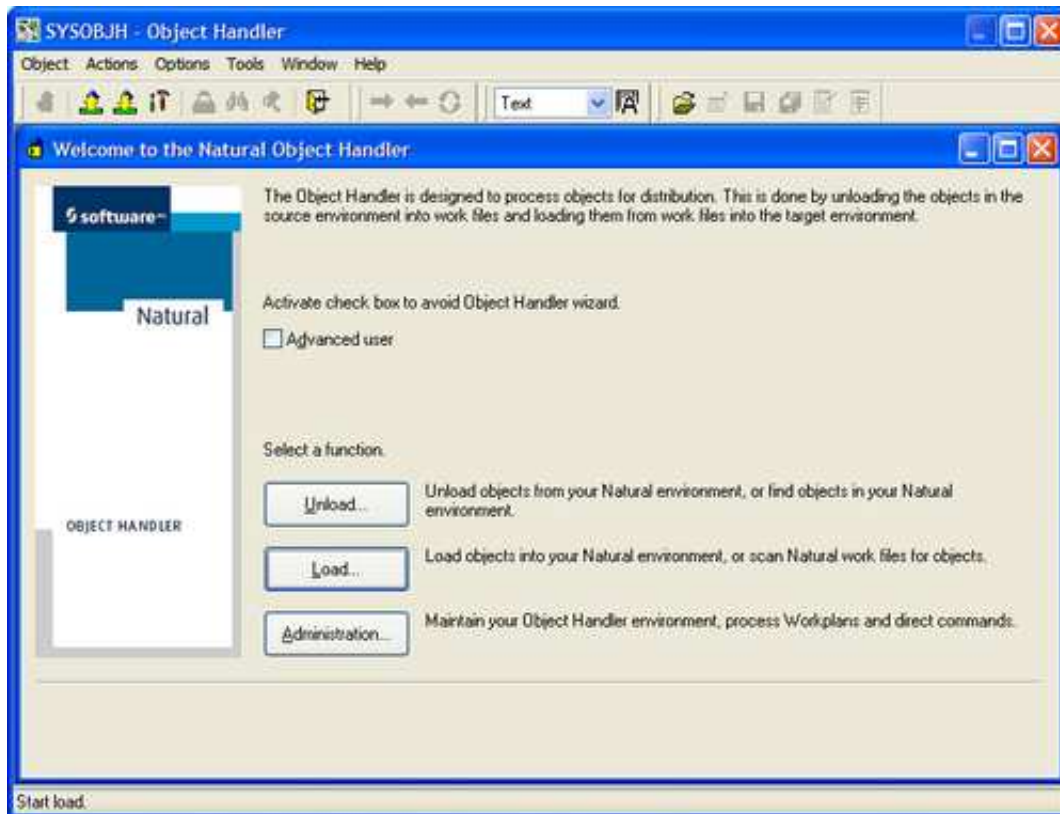
- Click “Cancel” to terminate the Object Handler load function



- Confirm termination of the Object Handler load function by clicking “Yes”



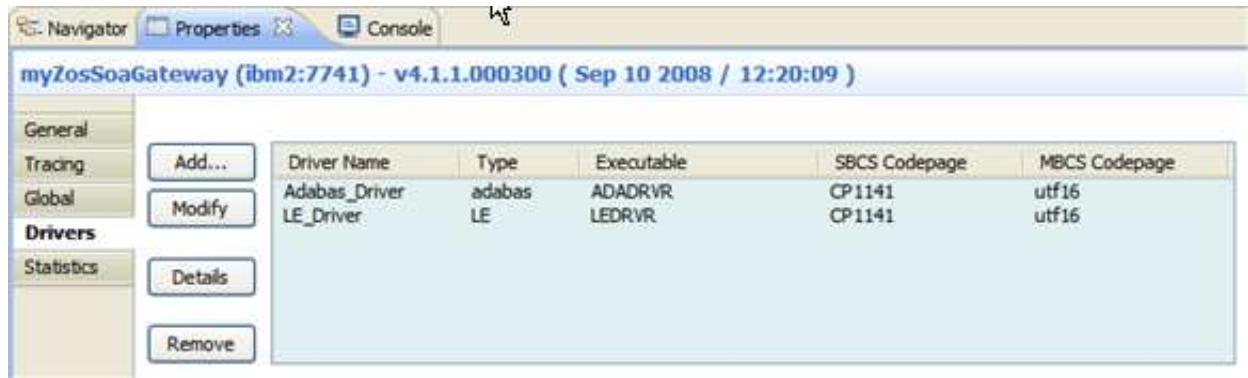
- Dismiss the Object Handler “the Windows way” by clicking the “close” icon in the upper right hand corner.



## Prepare the Natural environment on the Mainframe

### Defining the driver

In the SOA Gateway Servers View, select the server you want to define a Natural driver for, in the Properties View click the *Driver Definition Wizard* button.



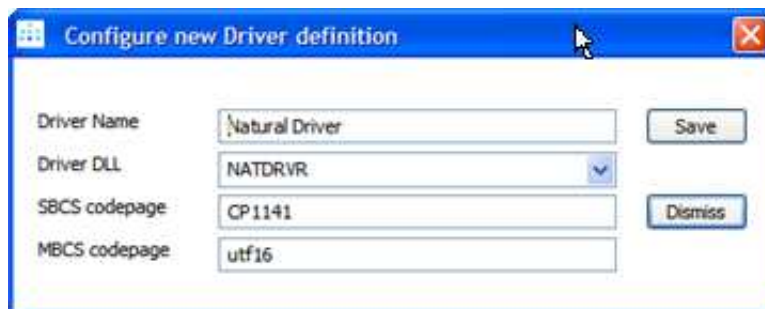
Select the *Natural Driver*, click the **Configure** button



### Important:

When defining a Natural driver for the first time, make sure to check the "Show (post-setup) Driver Information" box because only this will allow you to extract the INPL file containing the SOA Gateway Natural interface- and example programs.

The Driver Definition Dialog will be pre-set with the following values, change according to your needs and preferences, click the **Save** button



As the Natural driver requires a number of additional parameters, the dialog will expand and prompt for more input. Again, fill these parameters as required, you are free to choose any *Driver Name* you wish, set the *SBCS codepage* and *MBCS codepage* parameters according to your local or internationalization requirements. Click **Save** again.

Configure new Driver definition

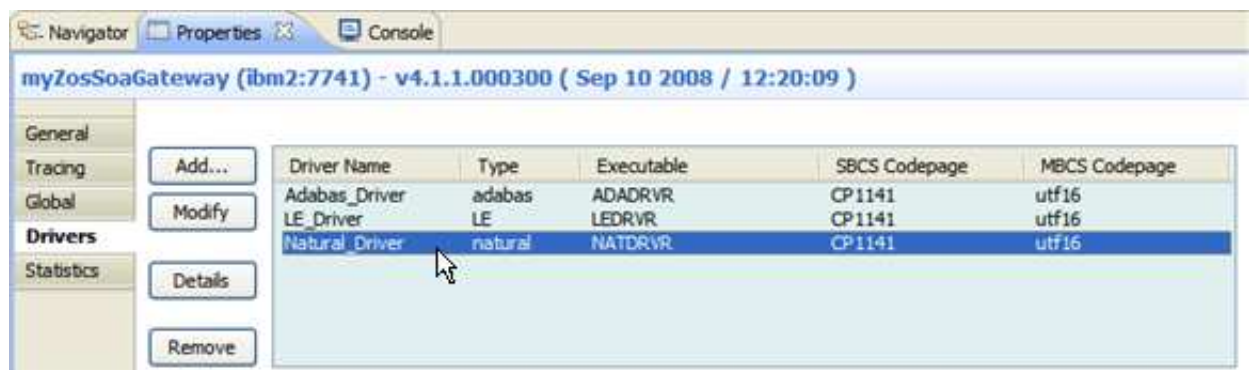
Driver has options (which may be mandatory), please specify and/or click 'Save'

Driver Name	Natural	Save
Driver DLL	NATDRVR	
SBCS codepage	CP1141	Dismiss
MBCS codepage	utf16	
NaturalBatchPgm	NATBATCH	
InitParms	ETID=OFF	
PreInitSessions	2	
MaxSessions	8	
NaturalLibrary	SYSSOA	
NaturalStepibs	SYSSOAEX,SYSEXT	
NaturalSecurity	No	
naturalUserId		
naturalPassword		

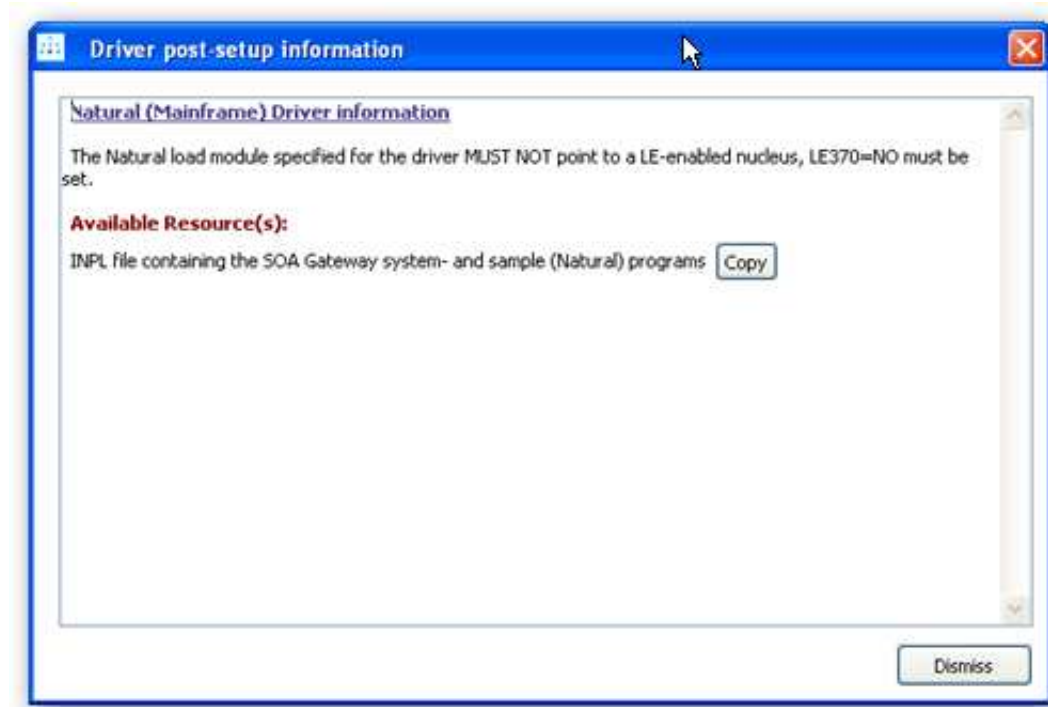
The parameters are as follows

Parameter	Value
NaturalBatchPgm	The name of the Natural Batch nucleus load module. A standard Batch-Natural is used, no modifications or additions to the Natural nucleus are required.  <b>Important:</b> This MUST refer to a Natural batch nucleus with NATOS compiled with LE370=NO.
InitParms	Natural initialization parameters. Specify any required parameters overriding the Natural parameter module settings, all Natural profile parameters are allowed here.
PreInitSessions	The number of sessions in the session pool to be pre-initialized.
MaxSessions	The overall size of the session pool, this parameter should be set to a value high enough to accomodate the peak number of parallel sessions expected.
NaturalLibrary	The Natural Library to log on.
NaturalSteplibs	Specify up to 7 Natural library names, in a comma-separated list, to be set as STEPLIB(s). When the NaturalLibrary parameter is not specified as "SYSSOA", include it in the list of Steplibs if you intend to use the "WebService creation" feature to import PDA structures and expose them as SOA Gateway WebService(s).  <b>Note:</b> When running with Natural Security, the Steplib(s) specified here are ignored, they are set by Natural Security based on the logon library and logon user id.
NaturalSecurity	Specify <i>Yes</i> or <i>No</i> , depending on if your environment is protected by Natural Security or not.  <b>Important:</b> A logon will be made to the specified NaturalLibrary, with the specified naturalUserId and naturalPassword. It is essential that library SYSEXT as well as any required application libraries are defined as STEPLIBs to that library in Natural Security
naturalUserId	Specify a Natural userid defined to Natural Security
naturalPassword	Specify the password valid for the user defined on the naturalUserid parameter

Once saved, the newly defined driver will appear in the Driver Properties section:



When "Show (post-setup) Driver Information" has been selected, the following information box will be shown, and allow the extraction of the INPL file containing the SOA Gateway Natural interface- and example programs.



### The SOA Gateway server Job / STC

1. Add the Natural load library, or more specifically the load library containing the Natural batch nucleus specified in the driver's *NaturalBatchPgm* parameter and the modules *NATXCAL* and *NATXCAL4* (contained in the Natural distribution load library), to the SOA Gateway server Job's / STC's STEPLIB.
2. You may want to add a CMPRINT DD statement to your server JCL, in case of an error during Natural session initialization or execution Natural will write its error messages to this dataset.
3. Ensure the SOA Gateway server region is sufficiently sized to cope for Natural's storage requirements, including the local bufferpool(s) if it is used.

### Loading the SOA Gateway Natural system- and demo programs on the Mainframe

Any standard Natural INPL job can be used to load the SOA Gateway system- and demo-programs from the supplied dataset *ASGvrm.INPL*, for example (as usual, replace the library names, database parameters etc. to match your environment):

```
//SMAI061 JOB SAG,MSGLEVEL=1,
//          CLASS=O,MSGCLASS=X,REGION=8M
//*JOBPARM LINES=9999
//*
//* LOAD NATURAL PROGRAMS INTO ADABAS SYSTEMFILE
//* INPL SOA Gateway 411 SYSTEM FILE
//*      FROM FILE ASGvrm.INPL
//*
//NATB0100 EXEC PGM=NAT423BA,
```

```

//      TIME=1400,COND=(0,LT)
//STEPLIB  DD DSN=SAGLIB.SMALOAD,DISP=SHR
//      DD DSN=SAGLIB.ADA813.LOAD,DISP=SHR
//*
//CMPRMIN  DD *
STACK=INPL
IM=D,INTENS=1,XML=OFF,CFICU=OFF
NAFSIZE=0,DLISIZE=0,DB2SIZE=0,MADIO=0,MAXCL=0,MT=0
AUTO=ON
FUSER=(,8)
//*
//DDPRINT  DD SYSOUT=*
//DDDRUCK  DD SYSOUT=*
//MPMDUMP  DD DUMMY
//SYSUDUMP DD DUMMY
//DDKARTE  DD DUMMY
//DDCARD   DD *
ADARUN DB=001,DE=3390,SVC=249,MODE=MULTI
//CMPRINT  DD SYSOUT=*
//CMWKF01  DD DSN=ASGVrm.INPL,DISP=OLD
B
FIN
/*
//

```

## Type mapping

The WebService Creation ("Discovery") process generates a DataView (XRD) and optionally a XML Schema (XSD) from either a Natural PDA (Parameter Data Area) or a parameter data definition (either an inline DEFINE DATA PARAMETER and/or referenced external PDA(s)) within a Natural subprogram.

These bits of mapping information are assembled into a WSDL *in real time* by the SOA Gateway server when a WSDL is requested through the

*http://<server>:<port>/<webservice>?WSDL* URI for a specific WebService.

When the signature (parameters) of a subprogram change, only the DataView needs to be recreated (via "discovery") and the WebService "refreshed" (the DataView cleared out of the cache), with the next access to the WSDL it will automatically reflect the changed parameters.

### NATURAL to WSDL XML Schema Data Type mapping

Natural Type	DataView	WSDL / XML Schema	Notes
A	sbcS (space padded)	xs:string	Dynamic variables allowed
W	mbcs (space padded)	xs:string	
B	hex.Binary	xs:hexBinary	Dynamic variables allowed
F4	float	xs:float	
F8	double	xs:double	
I1	byte	xs:byte	
I2	short	xs:short	
I4	int	xs:int	
L	Natural logical	xs:boolean	0, false / 1, true
N	zoned decimal	xs:decimal	
P	packed decimal	xs:decimal	
D	date	xs:date	YYYY-MM-DD
T	date + time	xs:dateTime	YYYY-MM-DDTHH:MM:SS(.s)