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Minimal Required Oracle Solaris Packages for SAP Installation with Oracle Database 11*g*

ORACLE WHITE PAPER | SEPTEMBER 2014

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Introduction

This paper provides instructions and best practices on how to install SAP with Oracle Database 11*g* using the minimum of Oracle Solaris operating system required packages and services. The goal of this document is to increase security features on the Oracle Solaris operating system by minimizing the required packages and disabling unnecessary services on the system. With this strategy, your system is made safer.

The procedure is tested for various SAP, ABAP (Advanced Business Application Programming), and Java releases with Oracle Database 11*g*. Independent of the SAP, Java, and ABAP releases, this document contains information about how you can start the text-only interface of Config Tool and Visual Administrator remotely.

Disable Unnecessary Services

The servers are the most vulnerable part of your network infrastructure, and you should take special care to protect them from unauthorized access. However, there are a number of network services that do allow server access, and you should take appropriate care when using these services. A server machine runs many network services, of which only a few are actually needed for running an SAP system.

Disable any network services on the server network that you do not need. One of the best ways to protect the system against as yet unreported vulnerabilities is to disable services that are not required for that particular system's intended operation or management. Sometimes these services contain known errors that unauthorized users may be able to take advantage of to gain unauthorized access to your network (for example, `sendmail`). In addition, by disabling unused network services, you also decrease the vulnerability of your network to denial-of-service attacks.

The actions in this section of the document provide guidance on which services can be safely disabled, and under which circumstances, to increase security of your server.

Disable Unnecessary Network Services

You can limit network exposure, as SSH is the only network service enabled. Remote logins are initially limited to an authenticated channel through the Secure Shell (SSH) feature of Oracle Solaris for protected encrypted communication with other systems. To increase the security when communicating with other systems, only SSH should be used in place of other communication services such as telnet, ftp, rlogin, tftp, and klogin. SSH automatically encrypts and decrypts the information sent between the sender and the recipient and guarantees the integrity of the data. Please disable the following services with the following command, when they are online:

```
# svcadm disable <name of services>

# svcadm disable svc:/network/ftp:default
# svcadm disable svc:/network/telnet:default
# svcadm disable svc:/network/tftp/udp6:default
# svcadm disable svc:/network/login:rlogin
# svcadm disable svc:/network/login:klogin
```

Disable Local-only `sendmail` Service

In Oracle Solaris 11, the `sendmail` service is set to local-only mode by default. This means that users on remote systems cannot connect to the `sendmail` service, eliminating the possibility of a remote exploit attack against some future `sendmail` vulnerability. Leaving `sendmail` in local-only mode permits mail to be sent out from the local system. If the local system will not be processing or sending any mail, this service can be disabled.

```
# svcadm disable svc:/network/sendmail-client:default
```

Disable NIS Server Services

The NIS server software is not installed by default and is only required on systems that are acting as an NIS server for the local site. Typically there are only a small number of NIS servers on any given network. These services are disabled by default unless the system has been previously configured to act as a NIS server. To disable this service, run the following commands.

```
# svcadm disable svc:/network/nis/server
# svcadm disable svc:/network/nis/domain
```

It is possible that the `svc:/network/nis/server` package may not be installed by default on some systems. In this case, the above commands will indicate that the software is not installed.

Disable NIS Client Services

If the local site is not using the NIS naming service to distribute system and user configuration information, this service may be disabled. This service is disabled by default unless the NIS service has been installed and configured on the system.

```
# svcadm disable svc:/network/nis/client
```

Disable Apache Service

The Apache service provides an instance of the Apache web server. This server should be disabled if it is not required.

```
# svcadm disable svc:/network/http:apache22
```

Install Only Necessary Packages

In cases where the Oracle Solaris 11 installation is of type `group/system/solaris-large-server` or you want to install the SAP release with Oracle Database in the global zone, you don't need to install any additional packages. There are no additional packages required to install Oracle Database 11*g* on Oracle Solaris 11; all the required packages come with default installation.

In cases where the Oracle Solaris 11 installation is of type `group/system/solaris-small-server` type or you want to install the SAP release with Oracle Database in a non-global zone, you have to install `pkg://solaris/developer/assembler` and `pkg://solaris/developer/build/make` packages, as these packages will not get installed by default in this type of installation.

```
# pkg install pkg://solaris/developer/build/make
# pkg install pkg://solaris/developer/assembler
```

The `Solaris-desktop` software package group imports 28 Services to the system: 15 disable services and 13 online services (see Table 1).

TABLE 1. IMPORT SERVICES WITH ORACLE SOLARIS-DESKTOP SOFTWARE PACKAGE GROUP

Services	Disable	Online
1	svc:/system/idmap:default	svc:/network/smb:default
2	svc:/network/smb/client:default	svc:/system/postrun:default
3	svc:/system/avahi-bridge-dsd:default	svc:/application/desktop-cache/mime-types-cache:default
4	svc:/application/time-slider:default	svc:/application/opengl/ogl-select:default
5	svc:/application/time-slider/plugin:rsync	svc:/application/desktop-cache/pixbuf-loaders-installer:default
6	svc:/application/time-slider/plugin:zfs-send	svc:/application/desktop-cache/desktop-mime-cache:default
7	svc:/application/upnp/coherence:default	svc:/application/desktop-cache/input-method-cache:default
8	svc:/network/vpanels-http:apache2	svc:/system/device/audio:default
9	svc:/system/filesystem/zfs/auto-snapshot:daily	svc:/application/desktop-cache/gconf-cache:default
10	svc:/system/filesystem/zfs/auto-snapshot:frequent	svc:/application/desktop-cache/icon-cache:default
11	svc:/system/filesystem/zfs/auto-snapshot:hourly	svc:/system/consolekit:default
12	svc:/system/filesystem/zfs/auto-snapshot	svc:/application/pkg/update:default
13	svc:/system/filesystem/zfs/auto-snapshot:weekly	svc:/application/graphical-login/gdm:default
14	svc:/application/x11/xfs:default	
15	svc:/application/x11/xvnc-inetd:default	

Starting `SAPinst` on a Remote Oracle Solaris 11 System

You can use this section to remotely install your SAP system on an x86- or SPARC-based system running Oracle Solaris 11. In this case, the installer and the GUI server run on the remote host, and the installer GUI client runs on the local host. On the local host, you control the installation with the installer GUI client and execute the `sapinstgui` command. On the remote host, you execute the `sapinst -nogui` command.

Before starting the installation:

1. Ensure both local and remote host are in the same network and can ping each other. To test this, log on to your remote host and local host and enter the command `ping <hostname>`.
2. Make sure that the Software Provisioning Manager (SWPM) executable on local and remote host has exactly the same version.

On the remote host:

3. Log in as a `root` user who is a member of the local administration group.
4. Mount the Installation Master DVD in the DVD drive, and unpack the SWPM: `SWPMSP<support_packages_number>_<verison_number>.SAR`.

5. Start the installer from the directory to which you unpacked the `SWPMSP<support_packages_number>_<verison_number>.SAR` file by executing the following command:

```
# /<path to unpack directory>/sapinst -nogui.
```

SAPinst now starts and waits for the connection to the installer GUI. You see the following at the command prompt on the remote host:

```
guiengine: no GUI connected; waiting for a connection on host
<host_name>, port <port_number> to continue with the installation
```

On the local host:

6. Log on as `root` user.
7. Unpack the SWPM: `SWPMSP<support_packages_number>_<verison_number>.SAR`.
8. Execute the following command:

```
# sapinstgui
```

9. The following SAP Software Delivery Tools GUI will be displayed. Enter the IP address of the remote host and choose **Log on**.

Starting Oracle Database in Silent Mode on Oracle Solaris 11

The Oracle Database software is available on installation media or by download from the Oracle Technology Network web site. In most cases, you use the graphical user interface (GUI) provided by Oracle Universal Installer to install the software. However, you can also use Oracle Universal Installer to complete silent-mode installations, without using the GUI.

Silent mode lets you install or uninstall software by supplying input to Oracle Universal Installer in a file, rather than through the Oracle Universal Installer GUI. When using silent mode, you can install the software on a system that does not have X Window System software installed on it.

If you include response for all of the prompts in the response file and specify the `-silent` option when starting Oracle Universal Installer, then Oracle Universal Installer runs in silent mode. During a silent-mode installation, Oracle Universal Installer does not display any graphical output. Instead, it displays progress information in the terminal that you used to start it.

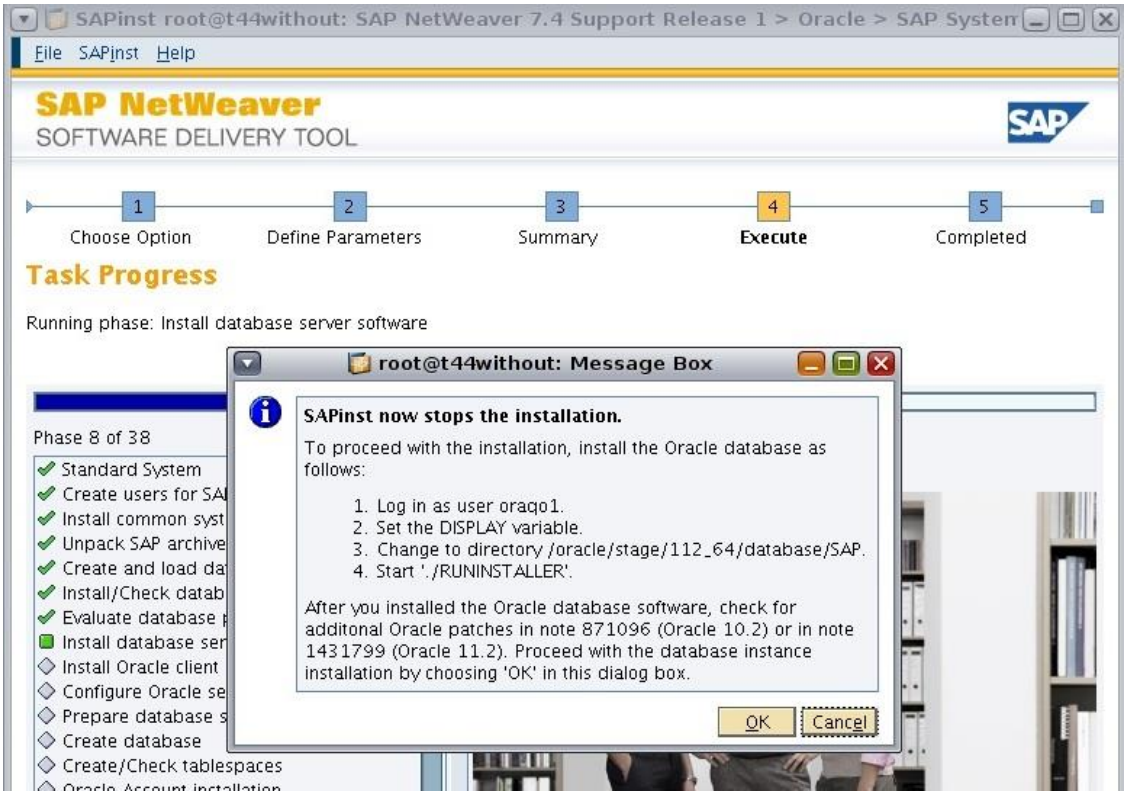


Figure 1. Install the Oracle Database with `./RUNINSTALLER`.

Please check the SAP Note 1524205 “Oracle 11.2.0: Database Software Installation” for the installation of Oracle Database 11*g* Release 2 software in SAP environments (for release 11.2.0.2 and higher) before starting the `RUNINSTALLER` command.

Log in as user `ora<sid>`, change to directory `/oracle/stage/<release>/database/SAP`, and run the following command:

```
./RUNINSTALLER -silent -check
```

The SAP-specific installation scripts `RUNINSTALLER`, `RUNINSTALLER_CHECK` and `11ginstall.sh` are located in the Oracle database software stage in subdirectory `SAP`.

For example: `/oracle/stage/<release>/database/SAP`

With the command `./RUNINSTALLER -silent -check`, you are able to check the product specific prerequisites and to install a new Oracle home with SAP default settings in silent mode. For example:

```
: 1% cd /oracle/stage/112_64/database/SAP
: 2% ls
11ginstall.sh       mopatch-2_1_15.zip  RUNINSTALLER
RUNINSTALLER_CHECK
: 3% ./RUNINSTALLER -silent -check
.
. 11ginstall.sh - Oracle Database 11.2 Software Installation Script
. Version 11.2.0.4.0 Release Date 2013-09-23 Patch Level 043 (rel)
. Copyright (c) Oracle Corporation 2010, 2011. All Rights Reserved.
. SAP note 1524205
. Oracle Database Release: 11.2.0.4.0
.
. Host     : testzone
. Platform : sunos_sun4u (64-bit)
. Date     : 2014_08_21 15:25:46
. User     : oraqo1
. Log dir. : /export/home/oraqo1
. Logfile  : /export/home/oraqo1/11ginstall_11204.log
.
. 11ginstall.sh was called with the following options (command line):
. -caller RUNINSTALLER -oracle_stage /oracle/stage/112_64/database -
ignoreSysPrereqs -silent -check
.
. Performing pre-installation checks ...
.
. (OK)      -  Environment variable <DB_SID> is set to QO1
. (OK)      -  Got value for <DB_SID> from environment.
. (OK)      -  Got location for Oracle base from environment.
. (OK)      -  Got location for Oracle stage from '-oracle_stage' option.
. (WARNING) -  Base directory for runtime Oracle home /oracle/QO1 does not
exist.
. (OK)      -  Oracle base location /oracle exists.
. (OK)      -  Installation location /oracle/QO1/11204 does not exist.
. (OK)      -  Runtime location /oracle/QO1/112_64 does not exist.
. (WARNING) -  Inventory pointer file oraInst.loc is missing. You are
starting your first installation on this host.
. (OK)      -  Group dba is defined.
. (OK)      -  Group oper is defined.
. (OK)      -  OUI version in stage is 11.2.0.4.0.
. (OK)      -  New response file /export/home/oraqo1/.11ginstall_11204.rsp
created.
. (INFO)    -  OUI command line option -ignoreSysPrereqs is used.
.
. Pre-installation checks completed.
.
. Environment settings:
.
. DB_SID                      = QO1
. DISPLAY                     = not set
. ORACLE_BASE                 = /oracle
```

```
. ORACLE_STAGE                 = not set
.
. Installation Settings:
.
. Installation log file        = /export/home/oraqo1/11ginstall_11204.log
. Oracle Release               = 11.2.0.4.0
. Oracle stage location        = /oracle/stage/112_64/database
.
. Oracle base location         = /oracle (exists)
. Oracle home install. location= /oracle/QO1/11204 (not existing // not
shared )
. Oracle home runtime  location= /oracle/QO1/112_64(not existing/not
installed )
. Inventory group              = dba
. SYSDBA    group              = dba
. SYSOPER   group              = oper
.
. OUI Settings:
.
. OUI version                  = 11.2.0.4.0
. OUI temporary directory      = /export/home/oraqo1/.11ginstall_11204.tmp
. OUI response file            = /export/home/oraqo1/.11ginstall_11204.rsp
. OUI output log file          = /export/home/oraqo1/.11ginstall_11204.oui
. OUI options                  = -waitForCompletion -silent -showProgress -
ignoreSysPrereqs -executePrereqs
. OUI inventory location       = INVENTORY_LOCATION=/oracle/oraInventory
.
. Post Installation Settings:
.
. Create symbolic link         = yes - relative path
. Install MOPatch              = yes
. Clean up temp. files         = yes
.
. OUI command line:
.
. LANG=C TMP=/export/home/oraqo1/.11ginstall_11204.tmp
/oracle/stage/112_64/database/runInstaller -responseFile
/export/home/oraqo1/.11ginstall_11204.rsp -waitForCompletion -silent -
showProgress -ignoreSysPrereqs -executePrereqs | tee
/export/home/oraqo1/.11ginstall_11204.oui
.
. (INFO)    -  Starting Oracle Universal Installer in silent mode - please
wait ...
.
Starting Oracle Universal Installer...

Checking Temp space: must be greater than 180 MB.   Actual 161043 MB
Passed
Checking swap space: must be greater than 150 MB.   Actual 472554 MB
Passed
Preparing to launch Oracle Universal Installer from
/export/home/oraqo1/.11ginstall_11204.tmp/OraInstall2014-08-21_03-25-46PM.
Please wait ...A log of this session is currently saved as:
/export/home/oraqo1/.11ginstall_11204.tmp/OraInstall2014-08-21_03-25-
46PM/installActions2014-08-21_03-25-46PM.log. Oracle recommends that if you
want to keep this log, you should move it from the temporary location to a
more permanent location.
.
. (INFO)    -  Oracle Universal Installer finished.
. (INFO)    -  OUI install session log file is Preparing to launch Oracle
Universal Installer from
```

```
/export/home/oraqo1/.11ginstall_11204.tmp/OraInstall2014-08-21_03-25-46PM.
Please wait ...A log of this session is currently saved as:
/export/home/oraqo1/.11ginstall_11204.tmp/OraInstall2014-08-21_03-25-
46PM/installActions2014-08-21_03-25-46PM.log. Oracle recommends that if you
want to keep this log, you should move it from the temporary location to a
more permanent location.
. (INFO)    -  OUI install session log file does not exist any more - can not
determine OUI exit code.
.
. Performing clean up tasks ...
. Clean up tasks completed.
.
. Post-installation tasks are not executed.
. Reason: -executePrereqs /
. Post-installation tasks have been skipped.
.
. Check Results
. (INFO)    -  Software installation prerequisite checks finished.
. (INFO)    -  You can find the installation summary log at
/export/home/oraqo1/11ginstall_11204.log
. (EXIT)    -  Exiting with exit code 4.
```

Next, you run the following command to install a new Oracle home with SAP default settings in silent mode and ignoring warnings.

```
./RUNINSTALLER -silent -nocheck
```

For example:

```
: 3% ./RUNINSTALLER -silent -nocheck
.
. 11ginstall.sh - Oracle Database 11.2 Software Installation Script
. Version 11.2.0.4.0 Release Date 2013-09-23 Patch Level 043 (rel)
. Copyright (c) Oracle Corporation 2010, 2011. All Rights Reserved.
. SAP note 1524205
. Oracle Database Release: 11.2.0.4.0
.
. Host     : testzone
. Platform : sunos_sun4u (64-bit)
. Date     : 2014_08_21 16:28:20
. User     : oraqo1
. Log dir. : /export/home/oraqo1
. Logfile  : /export/home/oraqo1/11ginstall_11204.log
.
. 11ginstall.sh was called with the following options (command line):
. -caller RUNINSTALLER -oracle_stage /oracle/stage/112_64/database -
ignoreSysPrereqs -silent -nocheck
.
. Performing pre-installation checks ...
.
. (OK)      -  Environment variable <DB_SID> is set to QO1
. (OK)      -  Got value for <DB_SID> from environment.
. (OK)      -  Got location for Oracle base from environment.
. (OK)      -  Got location for Oracle stage from '-oracle_stage' option.
. (WARNING) -  Base directory for runtime Oracle home /oracle/QO1 does not
exist.
. (OK)      -  Oracle base location /oracle exists.
```

```
. (OK)      -  Installation location /oracle/QO1/11204 does not exist.
. (OK)      -  Runtime location /oracle/QO1/112_64 does not exist.
. (WARNING) -  Inventory pointer file oraInst.loc is missing. You are
starting your first installation on this host.
. (OK)      -  Group dba is defined.
. (OK)      -  Group oper is defined.
. (OK)      -  OUI version in stage is 11.2.0.4.0.
. (OK)      -  New response file /export/home/oraqo1/.11ginstall_11204.rsp
created.
. (INFO)    -  OUI command line option -ignoreSysPrereqs is used.
. (WARNING) -  OUI command line option -ignorePrereq is used. OUI
prerequisite check failures will be ignored.
.
. Pre-installation checks completed.
.
.
. Environment settings:
.
. DB_SID                        = QO1
. DISPLAY                       = not set
. ORACLE_BASE                   = /oracle
. ORACLE_STAGE                  = not set
.
. Installation Settings:
.
. Installation log file         = /export/home/oraqo1/11ginstall_11204.log
. Oracle Release                = 11.2.0.4.0
. Oracle stage location         = /oracle/stage/112_64/database
.
. Oracle base location          = /oracle (exists)
. Oracle home install. location= /oracle/QO1/11204 ( not existing / / not
shared )
. Oracle home runtime  location= /oracle/QO1/112_64 ( not existing / not
installed )
. Inventory group               = dba
. SYSDBA    group               = dba
. SYSOPER   group               = oper
.
. OUI Settings:
.
. OUI version                   = 11.2.0.4.0
. OUI temporary directory       = /export/home/oraqo1/.11ginstall_11204.tmp
. OUI response file             = /export/home/oraqo1/.11ginstall_11204.rsp
. OUI output log file           = /export/home/oraqo1/.11ginstall_11204.oui
. OUI options                   = -waitForCompletion -silent -showProgress -
ignoreSysPrereqs -ignorePrereq
. OUI inventory location        = INVENTORY_LOCATION=/oracle/oraInventory
.
. Post Installation Settings:
.
. Create symbolic link          = yes - relative path
. Install MOPatch               = yes
. Clean up temp. files          = yes
.
. OUI command line:
.
. LANG=C TMP=/export/home/oraqo1/.11ginstall_11204.tmp
/oracle/stage/112_64/database/runInstaller -responseFile
/export/home/oraqo1/.11ginstall_11204.rsp -waitForCompletion -silent -
showProgress -ignoreSysPrereqs -ignorePrereq | tee
/export/home/oraqo1/.11ginstall_11204.oui
```

```
.
. (INFO)    -  Starting Oracle Universal Installer in silent mode - please
wait ...
.
Starting Oracle Universal Installer...

Checking Temp space: must be greater than 180 MB.   Actual 161023 MB
Passed
Checking swap space: must be greater than 150 MB.   Actual 472554 MB
Passed
Preparing to launch Oracle Universal Installer from
/export/home/oraqo1/.11ginstall_11204.tmp/OraInstall2014-08-21_04-28-20PM.
Please wait ... [WARNING] [INS-32055] The Central Inventory is located in the
Oracle base.
   CAUSE: The Central Inventory is located in the Oracle base.
   ACTION: Oracle recommends placing this Central Inventory in a location
outside the Oracle base directory.
You can find the log of this install session at:
 /oracle/oraInventory/logs/installActions2014-08-21_04-28-20PM.log

Prepare in progress.
.................................................   9% Done.

Prepare successful.

Copy files in progress.
.................................................   16% Done.
.................................................   22% Done.
.................................................   27% Done.
.................................................   32% Done.
.................................................   37% Done.
.................................................   42% Done.
.................................................   48% Done.
.................................................   53% Done.
.................................................   58% Done.
.................................................   63% Done.
.................................................   68% Done.
.................................................   73% Done.
.................................................   78% Done.
.................................................   83% Done.
.............................
Copy files successful.

Link binaries in progress.
..........
Link binaries successful.

Setup files in progress.
.................................................   88% Done.
.................................................   94% Done.

Setup files successful.
The installation of Oracle Database 11g was successful.
Please check '/oracle/oraInventory/logs/silentInstall2014-08-21_04-28-
20PM.log' for more details.

Execute Root Scripts in progress.

As a root user, execute the following script(s):
        1. /oracle/oraInventory/orainstRoot.sh
        2. /oracle/QO1/11204/root.sh
```

```
.............................................   100% Done.

Execute Root Scripts successful.
Successfully Setup Software.
.
. (INFO)    -  Oracle Universal Installer finished.
. (INFO)    -  OUI install session log file is
/oracle/oraInventory/logs/installActions2014-08-21_04-28-20PM.log
. (INFO)    -  Oracle Universal Installer finished with exit code '0'
.
. Performing clean up tasks ...
. Clean up tasks completed.
.
. Performing post-installation tasks ...
. (OK)      -  Symbolic link /oracle/QO1/11204/lib/libnnz10.so -> libnnz11.so
successfully created.
. (OK)      -  Symbolic link /oracle/QO1/112_64 -> 11204 successfully
created.
. (OK)      -  A new version of OPatch was not installed.
. (OK)      -  New MOPatch version 2.1.15 successfully installed (mopatch-
2_1_15.zip).
. (SUCCESS) -  All post-installation steps finished successfully.
. Post-installation tasks completed.
.
. Installation Results
. (WARNING) -  Oracle Database software installation finished successfully
with warnings.
. (INFO)    -  Installation Oracle home is /oracle/QO1/11204
. (INFO)    -  Runtime      Oracle home is /oracle/QO1/112_64
. (INFO)    -  Symbolic link /oracle/QO1/112_64 has been created.
. (INFO)    -  Warnings occurred during installation.
.              [WARNING] [INS-32055] The Central Inventory is located in the
Oracle base.
. (INFO)    -  You can find the OUI log file for this install session at
/oracle/oraInventory/logs/installActions2014-08-21_04-28-20PM.log
. (INFO)    -  You can find the installation summary log at
/export/home/oraqo1/11ginstall_11204.log
. (EXIT)    -  Exiting with exit code 1.
```

SAP Administration Tools

There are different tools that are used to do certain SAP administration tasks. Independent of Java or ABAP release, these SAP administration tasks are implemented in the tools provided for administration: Visual Admin and Config Tool. This section provides details about each tool and describes how can you start a text-only interface and remote version of these tools.

Start Text-Only Interface Configuration Tool Console (Config Tool)

The Config Tool provides offline configuration of the Application Server for Java (AS Java). You use the Config Tool to maintain the settings for SAP NetWeaver AS Java in the database. When you run the Config Tool via GUI or command console interface, it connects to the database and scans the server configuration. The information provided is passed to the corresponding interface that is used for configuration. It allows you to modify the properties of all services, managers and applications on a template and an interface level. It also enables you to manage log configuration, add filters and edit JVM parameters.

The command line (text-only) Config Tool uses a console-based interface. It enables you to edit JVM settings, modify server properties, configure the shared memory, export the system configuration to an XML file, and so on.

After installing SAP Web AS Java, a `configTool` directory is created under `usr/sap/<system_ID>/<central instance>/J2EE/configtool/`, containing a `./consoleconfig.sh` script file. Start this tool as user `<sid>adm`. You are able to configure, manage and edit all services with the text-only interface of Config Tool as well as with the GUI. For example:

```
: 1% ./consoleconfig.sh
Connecting to database ... OK
Scanning cluster data ... OK
Initializing menus ... OK
1) Connect to DB
-------------------------
6) Global dispatcher configuration ...
7) Global server configuration ...
8) Instance ID432793 ...
-------------------------
13) Exit
Your choice: 6
1) Connect to DB
-------------------------
6) Global dispatcher configuration ...
7) Managers ...
8) Services ...
9) Global server configuration ...
10) Instance ID432793 ...
-------------------------
12) Back to the previous menu
13) Back to the main menu
-------------------------
15) Exit
Your choice: 8

1) Connect to DB
-------------------------
6) Global dispatcher configuration ...
7) Managers ...
8) Services ...
9) Get service info
10) Edit service info

11) Global server configuration ...
12) Instance ID432793 ...
-------------------------
14) Back to the previous menu
15) Back to the main menu
-------------------------
17) Exit
```

Start Remote J2EE Engine Visual Administrator

The J2EE Engine Visual Administrator is a graphical user interface (GUI) that enables administration of all cluster elements and all modules running on them. It provides remote monitoring and management of managers, services, libraries, and interfaces working on each element in a single GUI. It requires the Java engine to be running. You can find the Visual Administrator path under `usr/sap/<SID>/<central instance>/J2EE/admin`.

SAP Note 758298 contains details on offline Installation of J2EE Engine Visual Administrator.

1. Copy and extract the `visual-admin.sda` file with `unzip` to an arbitrary directory in a remote host. You can get this `.sda` file from the local host under:

```
/usr/sap/<SID>/<centralinstace>/SDM/root/origin/sap.com/com.sap.engine.visualadmin/SAP AG/<latest-version>/visual-admin.sda
```

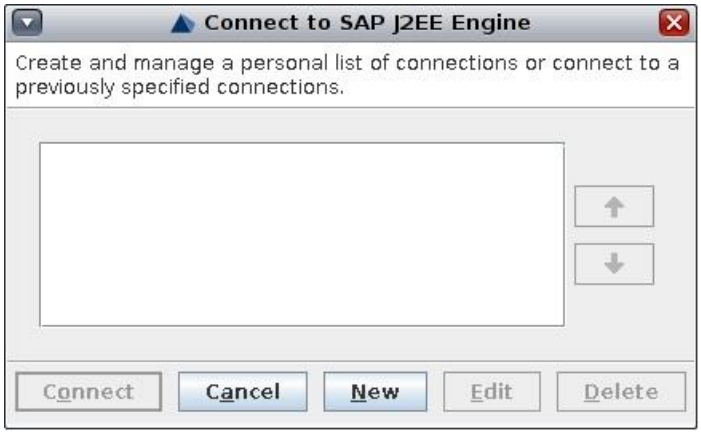
2. Once extracted, change execute permission of the file `go` with the command `chmod +x go`, and set `JAVA_HOME=/usr/java`.
3. If the SAP Central Services (SCS) Instance number in your J2EE Engine installation is different than the default value "01", update the *<INSTALL_DIR>*`/cfg/adminCFG.properties` file, where *<INSTALL_DIR>* is the directory where `visual-admin.sda` on the remote server was extracted. Set `connection.0.Port=`*<NEW_VALUE>*, where *<NEW_VALUE>* is equal to 8100 + SCS Instance Number. For example:

```
connection.0.Port=8105
```

4. Set the `DISPLAY` variable on your remote host before calling the `./go` command.

```
sun@blade4:~/visual-admin$. /go
java version "1.7.0_45"
Java(TM) SE Runtime Environment (build 1.7.0_45-b18)
Java HotSpot(TM) Server VM (build 24.45-b08, mixed mode)
```

5. When the Visual Administrator tool starts, the Connection dialog will appear. Choose **New** to create a new connection.



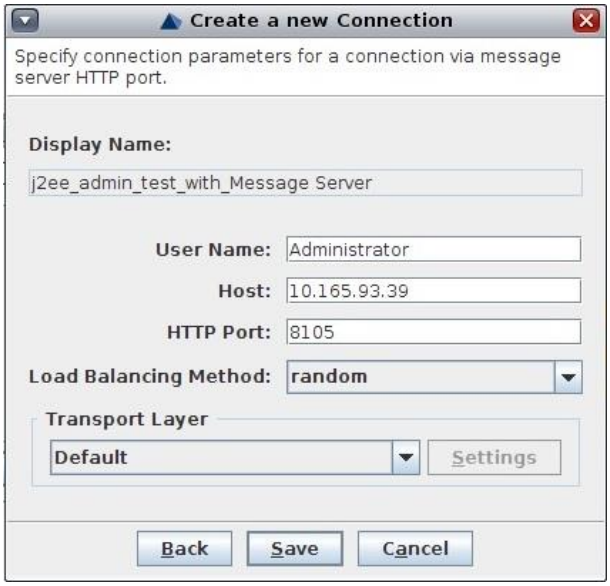
6. The dialog for creating a new connection appears. You have two options to create a new connection and select a lookup method:
   - Lookup Connection via Message Server
   - Direct Connection To a Dispatcher Node

   The following two sections step through creating a new connection with these two methods.

Creating a New Connection with Message Server

7. On the Create a new Connection dialog, enter a name and choose the option to create a new connection with Message Server:

8. At the next step you specify connection parameters via Message Server HTTP port:
   - Username: administrator
   - Host: IP address of the server name of your remote host
   - HTTP Port: 81$$ (See Table 2 on page 15 for more information about Standard TCP/IP Ports in AS Java)
   - Choose a load balancing method for the connection – specifies whether the dispatcher to connect to will be selected random or manually



Note: You will need to insert the name of local host and IP address in the `/etc/hosts` file on remote host as follows:

```
127.0.0.1       localhost   loghost
10.165.93.32    solaris     solaris.de.oracle.com
```

9. The name of the new connection is now displayed in the logon dialog. Select it from the list and choose Connect to log on to the J2EE admin via Message Server:

10. When prompted, enter the login information and choose **Connect**.

TABLE 2. IMPORTANT STANDARD TCP/IP PORTS IN AS JAVA

Service	Port Number	Process
HTTP	5$$00	ICM
P4	5$$04	ICM
IIOP	5$$07	ICM
Telnet	5$$08	ICM
HTTP	5$$13	Sapstartsrv
HTTP	81$$	MS

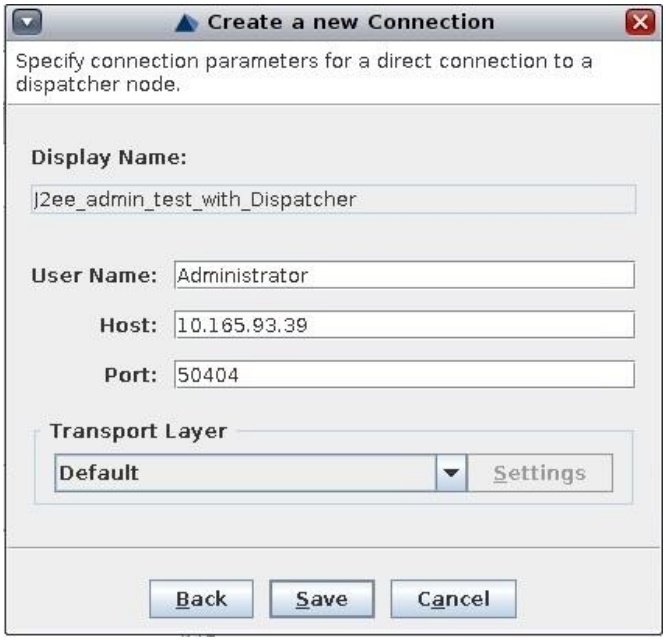
You can find a complete of the ports used by SAP applications on SAP Service Marketplace under Quick Link `http://service.sap.com /security` and under Security in Detail ➔ Infrastructure Security ➔TCP/IP Ports Used by SAP Applications.

Creating a New Connection with Dispatcher

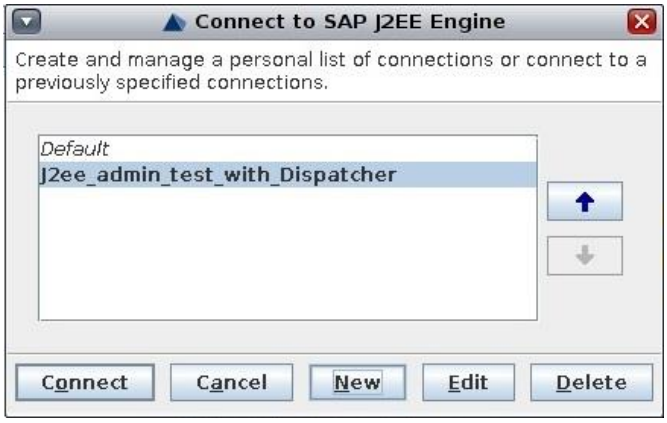
You can also choose to create a new connection with Dispatcher rather than via Message Server.

1. At the Create a new Connection dialog, enter a name and choose the option to connect with Dispatcher:

2. At the next step you specify connection parameter via Direct Connection to a Dispatcher Node:
   - Username: administrator
   - Host: IP address of the server name of your local host.
   - Port: 5$$04 (See Table 2 on page 15 for more information about Standard TCP/IP Ports in AS Java)
   - Choose the connection transport layer type: Default



3. The name of the new connection entry is now displayed in the logon dialog. Select it from the list and choose **Connect** to log on to the J2EE Engine.



4. Enter the login information and choose **Connect**:

5. The Visual Administrator GUI is displayed:

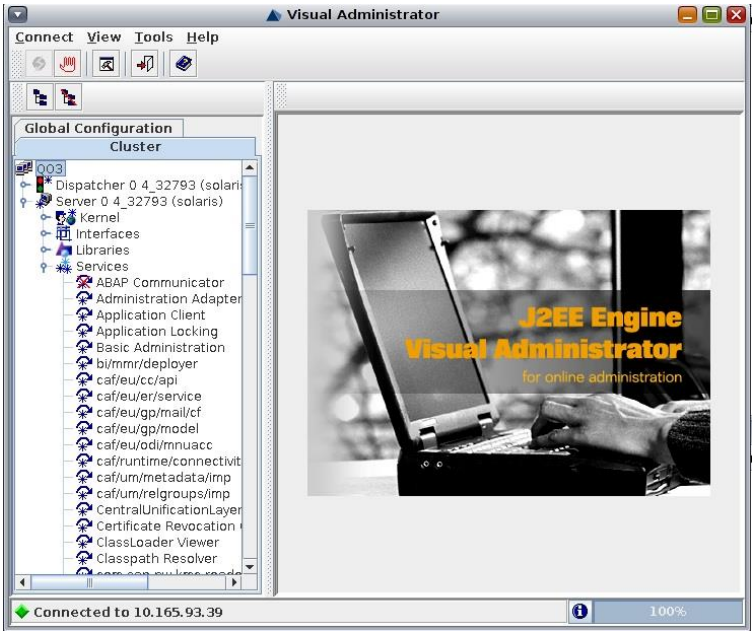


Table 3 contains more details about creating a new connection using the Message Server and using a direct connection to the dispatcher.

TABLE 3. CREATING A CONNECTION

Using the Message Server	Using a Direct Connection to the Dispatcher
1. Specify the user name 2. Specify the host and the HTTP port of the Message Server. 3. Choose a load balancing method for the connection – specifies whether the dispatcher to connect to will be selected random or manually. 4. Specify the transport layer type and modify its settings if required. a. Default – the connection is done using RMI/P4 protocol b. NI – the SAP Network Interface (NI) 5. Choose Save.	1. If you want to obtain a direct connection to the dispatcher, then specify: a. user name b. password c. host d. port number 2. Specify the connection transport layer type: a. Default b. SSL – use this option if you want to enable encrypted client-server communication c. HTTP Tunneling – use this option if the communication is via a proxy or firewall d. HTTP e. HTTPS f. You can specify the HTTP Tunneling proxy host and port by choosing Settings. g. Choose Save

About the Author

This document is based on Motahareh Kardeh's experience with minimal required Oracle Solaris packages for SAP installation with Oracle Database 11*g*. Motahareh Kardeh is a Software Developer in Oracle's ISV-Engineering teams for SAP and Security.

References

For more information about Oracle Solaris and SAP products, see the following documents:

- Security Configuration Benchmark For Solaris 11 11/11
  https://benchmarks.cisecurity.org/tools2/solaris/CIS_Solaris_11_Benchmark_v1.0.0.pdf
- SAP Note 1704753 – Inst. Systems based on NetWeaver 7.1 and higher: UNIX
- SAP Note 1714491 – Inst. Systems based on NetWeaver 7.0 / 7.0 EHP 1-1 - UNIX
- Starting SAPinst on the Remote Host (Optional)
  http://help.sap.com/saphelp_nwes72/helpdata/DE/67/08ce8b384cbd4a92a49d11d3f0af3a/content.htm
- Oracle Database Installation Guide11*g* Release 1 (11.1) for Solaris Operating System
  http://www.oracle.com/technetwork/documentation/index.html#database
- SAP Note 1915301 – Oracle 12c: Database Software Installation on Unix
- SAP Note 1524205 – Oracle 11.2.0: Database Software Installation
- SAP Note 758298 – Offline Installation of J2EE Engine Visual Administrator
- J2EE Administration Tools (Config Tool, Visual Admin, NWA)
  http://wiki.scn.sap.com/wiki/pages/viewpage.action?pageId=16635
- Command Console Config Tool
  http://help.sap.com/saphelp_nw73/helpdata/de/74/9d74ab01274c979fb43007bdfbc2f3/content.htm?frameset=/de/47/c5978ee5d92d65e10000000a42189c/frameset.htm
- Config Tool
  http://help.sap.com/saphelp_nw70ehp2/helpdata/en/e8/f48b33f9a3423c9e688dfa56330e79/frameset.htm
- Creating a New Connection Entry
  »http://help.sap.com/erp_mdg_addon70/helpdata/en/35/06472c8c7e4d60abffdfff3eb1050f/content.htm

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