Oracle® Database

Quick Installation Guide

12*c* Release 1 (12.1) for IBM AIX on POWER Systems (64-Bit)

E56891-04

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This guide describes how to quickly install Oracle Database 12*c* Release 1 (12.1) on IBM AIX on POWER Systems (64-Bit). It includes information about the following:

- Reviewing Information About This Guide
- Logging In to the System as root
- Configuring Servers for Oracle Database
- Reviewing Operating System Security Common Practices
- About Operating System Requirements
- Operating System Requirements for IBM AIX on POWER Systems (64-Bit)
- Additional Drivers and Software Packages for IBM AIX on POWER Systems (64-Bit)
- Checking the Software Requirements
- Creating Required Operating System Groups and Users
- Configure Shell Limits and System Configuration Parameters
- Creating Required Directories
- Configuring Oracle Software Owner Environment
- Running the rootpre.sh Script
- Mounting the Product Disc
- Installing Oracle Database
- Installing Oracle Database Examples
- What to Do Next?
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1 Reviewing Information About This Guide

This guide describes how to install Oracle Database by using the default installation options.

Tasks Described in This Guide

The procedures in this guide describe how to:

- Configure your system to support Oracle Database

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- Install Oracle Database on a local file system by using the Typical Installation option
- Configure a general-purpose Oracle Database installation that uses the local file system for database file storage

Results of a Successful Installation

After you successfully install Oracle Database:

- The database that you created and the default Oracle Net listener process run on the system.
- Oracle Enterprise Manager Database Express runs on the system and can be accessed using a web browser.

Tasks Not Described in This Guide

This guide covers the Typical Installation scenario and does *not* describe how to complete the following tasks:

- Using the Advanced Installation option to install the software
- Installing the software on a system that has an existing Oracle software installation
- Installing Oracle Clusterware and Oracle Real Application Clusters on a cluster
- Setting UDP and TCP kernel parameters manually
- Using alternative storage options such as Oracle Automatic Storage Management
- Installing and configuring Oracle Grid Infrastructure
- Checking shared memory file system mount
- Enabling I/O Completion Ports

Where to Get Additional Installation Information

For more information about installing Oracle Database, including information about the tasks not described in this guide, refer to one of the following guides:

- If you want to install the software on a single system, then refer to *Oracle Database Installation Guide for IBM AIX on POWER Systems (64-Bit)*.
- If you want to install Oracle Grid Infrastructure for a standalone server, then refer to *Oracle Database Installation Guide for IBM AIX on POWER Systems (64-Bit)*.
- If you want to perform an Oracle Real Application Clusters installation, then refer to *Oracle Grid Infrastructure Installation Guide* and *Oracle Real Application Clusters Installation Guide for Linux and UNIX*. These guides describe how to install Oracle Clusterware and Oracle Real Application Clusters. Oracle Clusterware is a prerequisite for Oracle Real Application Clusters installations.

The product documentation for Oracle Database products is available in both HTML and PDF formats online:

http://docs.oracle.com/

2 Logging In to the System as root

During installation, you must perform tasks as root or as other users on remote terminals. Complete the following procedure for user accounts that you want to enable for remote display.

> **Note:** If you log in as another user (for example, `grid`), then repeat this procedure for that user as well.

To log in as the `root` user and enable remote display, complete one of the following procedures:

- If you are installing the software from an X Window System workstation or X terminal, then:

    1. Start a new X terminal session (`xterm`).

    2. If you are installing the software on another system and using the system as an X11 display, then enter a command using the following syntax to enable remote hosts to display X applications on the local X server:

       ```
       $ xhost + RemoteHost
       ```

       where `RemoteHost` is the fully qualified remote host name. For example:

       ```
       $ xhost + somehost.example.com
       somehost.example.com being added to the access control list
       ```

    3. If you are not installing the software on the local system, then use the `ssh`, `rlogin`, or `telnet` command to connect to the system where you want to install the software:

       ```
       $ ssh -Y RemoteHost
       ```

    4. If you are not logged in as the `root` user, then enter the following command to switch the user to `root`:

       ```
       $ su - root
       password:
       #
       ```

- To install the software from a PC or other system with X server software:

    > **Note:** If necessary, see the X server documentation, or contact your X server vendor or system administrator for more information about completing this procedure. Depending on the X server software that you are using, you may have to complete the tasks in a different order.

    1. Start the X Window System software.

    2. Configure the security settings of the X Window System software to permit remote hosts to display X applications on the local system.

    3. Connect to the remote system where you want to install the software as the oracle software installation owner (`oracle`) and start an X terminal session (`xterm`) on that system.

    4. Open another terminal on the remote system, and log in as the `root` user on the remote system, so you can run scripts as `root` when prompted.

3 Configuring Servers for Oracle Database

This section describes the following operating system tasks you must complete before you install Oracle Database:

- Checking Server Hardware and Memory Configuration
- General Server Minimum Requirements
- Server Storage Minimum Requirements
- Server Memory Minimum Requirements

3.1 Checking Server Hardware and Memory Configuration

Run the following commands to check your current system information:

1. To determine the physical RAM size, enter the following command:

   ```
   # /usr/sbin/lsattr -E -l sys0 -a realmem
   ```

2. To determine the available RAM and swap space, enter the following command:

   ```
   # /usr/sbin/lsps -s
   ```

   > **Note:** Oracle recommends that you take multiple values for the available RAM and swap space before finalizing a value. This is because the available RAM and swap space keep changing depending on the user interactions with the computer.

3. To determine the size of the configured swap space, enter the following command:

   ```
   # /usr/sbin/lsps -a
   ```

   If necessary, see your operating system documentation for information about how to configure additional swap space.

   > **Note:** Contact your operating system vendor for swap space allocation guidance for your server. The vendor guidelines supersede the swap space requirements listed in this guide

4. To determine the amount of space available in the `/tmp` directory, enter the following command:

   ```
   # df -m /tmp
   ```

   If the free space available in the `/tmp` directory is less than what is required, then complete one of the following steps:

   - Delete unnecessary files from the `/tmp` directory to meet the disk space requirement.
   - Set the `TMP` and `TMPDIR` environment variables when setting the `oracle` user's environment.

     > **See Also:** "Configuring Oracle Software Owner Environment" for more information about setting `TMP` and `TMPDIR`

- Extend the file system that contains the `/tmp` directory.

5. To determine the amount of free disk space on the system, enter one of the following commands:

```
# df -g
# df -m
```

6. To determine if the system architecture can run the Oracle software, enter the following command:

```
# /usr/bin/getconf HARDWARE_BITMODE
```

The expected output of this command is 64. If you do not see the expected output, then you cannot install the software on this system.

To determine if the system is started in 64-bit mode, enter the following command:

```
# /usr/sbin/bootinfo -K
```

The result of this command must be 64, indicating that the 64-bit kernel is enabled.

Verify that the processor architecture matches the Oracle software release to install. If you do not see the expected output, then you cannot install the software on this system.

> **Note:** For AIX Based Systems, Oracle Database supports 64-bit kernel and does not provide support for 32-bit kernel applications

7. To determine the run level enter the following command:

```
/usr/bin/who -r
```

3.2 General Server Minimum Requirements

Ensure the following general minimum requirements on your system:

- Ensure that the system is started with runlevel 2.

- Ensure display cards provide at least 1024 x 768 display resolution, so that Oracle Universal Installer displays correctly while performing a system console-based installation

3.3 Server Storage Minimum Requirements

Ensure that your system meets the following minimum storage requirements.

- Ensure that your system meets the disk space requirements for software files as described in Table 1

Table 1   Disk Space Requirements for for IBM AIX on POWER Systems (64-Bit)

Installation Type	Disk Space for Software Files
Enterprise Edition	9.2 GB
Standard Edition	9.1 GB
Standard Edition One	9.1 GB

Table 1   (Cont.) Disk Space Requirements for for IBM AIX on POWER Systems (64-Bit)

Installation Type	Disk Space for Software Files
Standard Edition 2	9.1 GB

Additional disk space, either on a file system or on an Oracle ASM disk group is required for the fast recovery area.

- 5 GB of space in the `/tmp` directory.

  If the free space available in the `/tmp` directory is less than what is required, then complete one of the following steps:

  - Delete unnecessary files from the `/tmp` directory to meet the disk space requirement.

  - Set the `TMP` and `TMPDIR` environment variables when setting the `oracle` user's environment.

    See Also: "Configuring Oracle Software Owner Environment" on page 1-22 for more information about setting `TMP` and `TMPDIR`

  - Extend the file system that contains the `/tmp` directory.

3.4 Server Memory Minimum Requirements

Ensure that your system meets the following memory requirements:

Minimum: 1 GB of RAM

Recommended: 2 GB of RAM or more

Table 2 describes the relationship between the installed RAM and the configured swap space recommendation:

Table 2   Swap Space Requirement for IBM AIX on POWER Systems (64-Bit)

RAM	Swap Space
Between 1 GB and 2 GB	1.5 times the size of RAM
Between 2 GB and 16 GB	Equal to the size of RAM
More than 16 GB	16 GB

4 Reviewing Operating System Security Common Practices

Secure operating systems are an important basis for general system security. Ensure that your operating system deployment is in compliance with common security practices as described in your operating system vendor security guide.

5 About Operating System Requirements

Depending on the products that you intend to install, verify that you have the required operating system kernel and packages installed.

Requirements listed in this document are current as of the date listed on the title page. To obtain the most current information about kernel requirements, see the online version at the following URL:

http://docs.oracle.com/

Oracle Universal Installer performs checks your system to verify that it meets the listed operating system package requirements. To ensure that these checks complete successfully, verify the requirements before you start OUI.

> **Note:** Oracle does not support running different operating system versions on cluster members, unless an operating system is being upgraded. You cannot run different operating system version binaries on members of the same cluster, even if each operating system is supported.

6 Operating System Requirements for IBM AIX on POWER Systems (64-Bit)

The filesets and Authorized Problem Analysis Reports (APARs) listed in this section are supported on IBM AIX on POWER Systems (64-Bit) systems for Oracle Database and Oracle Grid Infrastructure 12*c*:

- Supported IBM AIX 6.1 Versions

- Supported IBM AIX 7.1 Versions

- Supported IBM AIX 7.2 Versions

6.1 Supported IBM AIX 6.1 Versions

Use the following information to check the minimum supported IBM AIX 6.1 on POWER Systems (64-bit) versions:

Table 3   IBM AIX 6.1 on POWER Systems (64-Bit) Minimum Operating System Requirements

Item	Minimum Requirements
AIX 6.1 Operating System	AIX 6.1 Technology Level 7 Service Pack 3 ("6100-07-03-1207") or later, 64-bit kernel
	Note: You can install on AIX 6.1 Technology Level 7 but Oracle recommends that you install on AIX 6.1 Technology Level 9 Service Pack 3 (6100-09-03-1415) or later. The latter includes all the APARs and operating system fixes listed in this table.

Table 3   (Cont.) IBM AIX 6.1 on POWER Systems (64-Bit) Minimum Operating System Requirements

Item	Minimum Requirements
AIX 6.1 Operating System Filesets	The following operating system filesets are required: ■ `bos.adt.base` ■ `bos.adt.lib` ■ `bos.adt.libm` ■ `bos.perf.libperfstat` ■ `bos.perf.perfstat` ■ `bos.perf.proctools` ■ `xlC.aix61.rte:11.1.0.4` or later ■ `xlC.rte.11.1.0.4` or later

Table 3 (Cont.) IBM AIX 6.1 on POWER Systems (64-Bit) Minimum Operating System Requirements

Item	Minimum Requirements
AIX 6.1 APARs and Other Operating System Fixes	The following, or later, patches are required: If you are using the minimum operating system TL level for AIX 6.1 listed above, then install all the following AIX APAR fixes: ■ IV16716 - java won't instantiate if `prot_none` used for shared `mmap` region ■ IV20880 - system hangs or crashes when app uses shared symtab capability ■ IV21128 - system crash due to freed socket when `socketpair()` call used ■ IV28319 - `shlap` process fails when shared symbol table feature is used ■ IV30712 - thread_cputime() reports incorrect stime ■ IV31203 - chmod -r fails with eoverflow error ■ IV31603 - chown -r fails with eoverflow error ■ IV33433 - runtime linking failed to bind the bss symbol exported from main ■ IV34685 - loading 5.3 tls enabled libs by 5.2 apps caused core dump in 32b ■ IV39104 - link fails with undocumented compiler flag and thread-local stg ■ IV45072 - a special-purpose linker flag works incorrectly ■ IV45073 - add ability to reorder toc symbols in limited circumstances The following, or later, patch is required if you use Oracle Automatic Storage Management Cluster File System (Oracle ACFS): ■ IV39754 - umount fails with device busy error even without active process The following, or later, patch is also required if you use Oracle Automatic Storage Management Cluster File System (Oracle ACFS). At the time of this release, the patch is unavailable for TL7 so the APAR number refers to the base APAR: ■ IV41302 - ld mistakenly dropped 64bit inode object files **Note:** ■ If you are using a later TL level than the minimum level listed for this release, then contact IBM to determine if the required APARs listed in this section are included in the TL level that you have on your system. If they are included, then you do not have to install them. If they are not included, then you must install the equivalent APAR for the appropriate TL level. ■ AIX APAR numbers are tied to AIX versions and technology levels. Download and install the APAR that matches your AIX versions and Technology Levels from the IBM fix central website: http://www.ibm.com

6.2 Supported IBM AIX 7.1 Versions

Use the following information to check the minimum supported IBM AIX 7.1 on POWER Systems (64-bit) versions:

Table 4   IBM AIX 7.1 on POWER Systems (64-Bit) Minimum Operating System Requirements

Item	Minimum Requirements
AIX 7.1 Operating System	AIX 7.1 Technology Level 1 Service Pack 3 ("7100-01-03-1207") or later, 64-bit kernel
	Note: You can install on AIX 7.1 Technology Level 1 but Oracle recommends that you install on AIX 7.1 Technology Level 3 Service Pack 3 (7100-03-03-1415) or later. The latter includes all the APARs and operating system fixes listed in this table.
AIX 7.1 Operating System Filesets	The following operating system filesets are required: ■　`bos.adt.base` ■　`bos.adt.lib` ■　`bos.adt.libm` ■　`bos.perf.libperfstat` ■　`bos.perf.perfstat` ■　`bos.perf.proctools` ■　`xlC.aix61.rte.11.1.0.4` or later ■　`xlC.rte.11.1.0.4` or later

Table 4   (Cont.) IBM AIX 7.1 on POWER Systems (64-Bit) Minimum Operating System Requirements

Item	Minimum Requirements
AIX 7.1 APARs and Other Operating System Fixes	The following, or later, patches are required: If you are using the minimum operating system TL level for AIX 7.1 listed above, then install all the following AIX APAR fixes: ■ IV16737 - java won't instantiate if prot_none used for shared mmap region ■ IV21116 - system hangs or crashes when app uses shared symtab capability ■ IV21235 - system crash due to freed socket when `socketpair()` call used ■ IV28925 - `shlap` process fails when shared symbol table feature is used ■ IV34869 - thread_cputime() returns incorrect values ■ IV35057 - loading 5.3 tls enabled libs by 5.2 apps caused core dump in 32b ■ IV37790 - chmod -r fails with eoverflow error ■ IV39136 - link fails with undocumented compiler flag and thread-local stg ■ IV41380 - chown -r fails with eoverflow error ■ IV41415 - runtime linking failed to bind the bss symbol exported from main ■ IV45072 - a special-purpose linker flag works incorrectly ■ IV45073 - add ability to reorder toc symbols in limited circumstances The following, or later, patch is required if you use Oracle Automatic Storage Management Cluster File System (Oracle ACFS): ■ IV37940 - umount fails with device busy error even without active process The following, or later, patch is also required if you use Oracle Automatic Storage Management Cluster File System (Oracle ACFS). At the time of this release, the patch is unavailable for TL7 so the APAR number refers to the base APAR: ■ IV41302 - ld mistakenly dropped 64bit inode object files **Note:** ■ If you are using a later TL level than the minimum level listed for this release, then contact IBM to determine if the required APARs listed in this section are included in the TL level that you have on your system. If they are included, then you do not have to install them. If they are not included, then you must install the equivalent APAR for the appropriate TL level. ■ AIX APAR numbers are tied to AIX versions and technology levels. Download and install the APAR that matches your AIX versions and Technology Levels from the IBM fix central website: http://www.ibm.com

6.3 Supported IBM AIX 7.2 Versions

Use the following information to check the minimum supported IBM AIX 7.2 on POWER Systems (64-bit) versions:

Table 5   IBM AIX 7.2 on POWER Systems (64-Bit) Minimum Operating System Requirements

Item	Minimum Requirements
AIX 7.2 Operating System	AIX 7.2 Technology Level 0 Service Pack 1 ("7200-00-01") or later, 64-bit kernel **Note:** Service Pack 1 is mandatory.
AIX 7.2 Operating System Filesets	The following operating system filesets are required: ■ `bos.adt.base` ■ `bos.adt.lib` ■ `bos.adt.libm` ■ `bos.perf.libperfstat` ■ `bos.perf.perfstat` ■ `bos.perf.proctools` ■ `xlC.aix61.rte.13.1.2.0` or later ■ `xlC.rte.13.1.2.0` or later
AIX 7.2 APARs and Other Operating System Fixes	The following, or later, patches are required: If you are using the minimum operating system TL level for AIX 7.2 listed above, then install all the following AIX APAR fixes: ■ IV79639 - after live update ifix state may be left as Q; rebooth required ■ IV79848 - mirrorvg/syncvg on minimal and migration install fails ■ IV80412 - system crash application sets signal mask 　　**Note:** Install IV80412m1a as it includes the required fix for IV79441 - possible system crash using procfs to read 32bit process map fil. **Note:** ■ If you are using a later TL level than the minimum level listed for this release, then contact IBM to determine if the required APARs listed in this section are included in the TL level that you have on your system. If they are included, then you do not have to install them. If they are not included, then you must install the equivalent APAR for the appropriate TL level. ■ AIX APAR numbers are tied to AIX versions and technology levels. Download and install the APAR that matches your AIX versions and Technology Levels from the IBM fix central website at the following URL: 　`http://www.ibm.com`

7 Additional Drivers and Software Packages for IBM AIX on POWER Systems (64-Bit)

■ Installation Requirements for Open Database Connectivity

- Installation Requirements for Oracle Messaging Gateway
- Installation Requirements for Programming Environments
- Installation Requirements for Web Browsers

You are not required to install additional drivers and packages, but you may choose to install or configure drivers and packages in the following list:

> **See Also:** "Oracle Application Express Installation Requirements" and "Recommended Pre-installation Tasks" in *Oracle Application Express Installation Guide*

7.1 Installation Requirements for Open Database Connectivity

Review the following sections if you plan to install Open Database Connectivity (ODBC):

- About ODBC Drivers and Oracle Database
- Installing ODBC Drivers for IBM AIX

7.1.1 About ODBC Drivers and Oracle Database

Open Database Connectivity (ODBC) is a set of database access APIs that connect to the database, prepare, and then run SQL statements on the database. An application that uses an ODBC driver can access non-uniform data sources, such as spreadsheets and comma-delimited files.

7.1.2 Installing ODBC Drivers for IBM AIX

Oracle ODBC driver on IBM AIX is certified with ODBC Driver Manager 2.3.1. To use ODBC with Oracle Database, you must also install `gcc 4.2.1` or later.

You do not require ODBC drivers for Oracle Clusterware or Oracle Database.

Download and install the ODBC Driver from the following website:

http://www.unixodbc.org/

7.2 Installation Requirements for Oracle Messaging Gateway

Review the following sections to install Oracle Messaging Gateway:

- About Oracle Messaging Gateway
- Installing Oracle Messaging Gateway

7.2.1 About Oracle Messaging Gateway

Oracle Messaging Gateway is a feature of the Oracle database. It enables communication between applications based on non-Oracle messaging systems and Oracle Streams Advanced Queuing.

Oracle Messaging Gateway supports the integration of Oracle Streams Advanced Queuing (AQ) with applications based on WebSphere and TIBCO Rendezvous. For information on supported versions see *Oracle Database Advanced Queuing User's Guide*.

7.2.2 Installing Oracle Messaging Gateway

Oracle Messaging Gateway is installed with the Enterprise Edition of Oracle Database.

For AIX7.1, check My Oracle Support Certification for current requirements:

https://support.oracle.com

If you require a CSD for IBM WebSphere MQ, then see the following website for download and installation information:

http://www.ibm.com

7.3 Installation Requirements for Programming Environments

Review the following sections to install programming environments:

- About Programming Environments and Oracle Database
- Configuring Support for Programming Environments

7.3.1 About Programming Environments and Oracle Database

Oracle Database supports multiple programming languages for application development in different environments. Some languages require that you install additional compiler packages for the operating system.

Programming environments are options. They are not required for Oracle Database.

> **See Also:** *Oracle Database Development Guide* for an overview of programming environments

7.3.2 Configuring Support for Programming Environments

Ensure that your system meets the requirements for the programming environment you want to configure:

Table 6   Requirements for Programming Environments for IBM AIX on POWER Systems (64-Bit)

Programming Environments	Support Requirements
Java Database Connectivity (JDBC) / Oracle Call Interface (OCI)	JDK 6 (Java 6 64-bit 6.0.0.325 SR10 or later) with the JNDI extension with Oracle Java Database Connectivity and Oracle Call Interface drivers.
	JDK 7 (Java 7 64-bit 7.0.0.0 or later) with the JNDI extension with Oracle Java Database Connectivity and Oracle Call Interface drivers.
	JDK 1.6 is installed with this release.
	Note: These are not mandatory for the database installation.

Table 6   (Cont.) Requirements for Programming Environments for IBM AIX on POWER Systems (64-Bit)

Programming Environments	Support Requirements
Oracle C++ Oracle C++ Call Interface Pro*C/C++ Oracle XML Developer's Kit (XDK)	IBM XL C/C++ Enterprise Edition for AIX, V11.1 (11.1.0.9) January 2012 PTF.
	IBM XL C++ Runtime for AIX, V11.1 (11.1.0.4) November 2011.
	Download this software from the following URL:
	http://www-01.ibm.com/support/docview.wss?uid=swg240 31864 http://www-01.ibm.com/support/docview.wss?uid=swg240 31426
	Note: Even if you do not install the IBM XL C/C++ compiler, you require the compiler for the AIX Runtime Environment component. The runtime environment file sets can be downloaded with no license requirements. The minimum recommended runtime environment for IBM AIX is IBM XL C/C++ for AIX V11.1.0.4 Runtime Environment. It is available at the following URL:
	http://www-01.ibm.com/support/docview.wss?uid=swg240 31426
Pro*COBOL	IBM COBOL for AIX Version 4.1.1 (March 2012 PTF)
	Micro Focus Server Express 5.1
Pro*FORTRAN	IBM XL Fortran Runtime for AIX, Version 13.1, January 2012 PTF
ADA	OC Systems PowerAda 5.5
	For more information about OC Systems and PowerAda, go to:
	http://www.ocsystems.com/prod_powerada.html

7.4 Installation Requirements for Web Browsers

Web browsers are required only if you intend to use Oracle Enterprise Manager Database Express and Oracle Enterprise Manager Cloud Control. Web browsers must support JavaScript, and the HTML 4.0 and CSS 1.0 standards. For a list of browsers that meet these requirements see the Enterprise Manager certification matrix on My Oracle Support:

https://support.oracle.com

> **See Also:** *Oracle Enterprise Manager Cloud Control Basic Installation Guide* for steps on how to access the Enterprise Manager certification matrix

8 Checking the Software Requirements

To ensure that the system meets these requirements, perform the following steps:

1. To determine the distribution and version of AIX installed, enter the following command:

```
# oslevel -s
```

If the operating system version is lower than what is listed in Operating System Requirements for IBM AIX on POWER Systems (64-Bit), then upgrade your operating system accordingly to the currently supported or later version and level.

AIX maintenance packages are available from the IBM fix central website:

http://www.ibm.com

2. To determine if the required filesets are installed and committed, enter a command similar to the following:

```
# lslpp -l bos.adt.base bos.adt.lib bos.adt.libm bos.perf.perfstat \
bos.perf.libperfstat bos.perf.proctools
```

3. To determine the supported kernel mode, enter a command similar to the following:

```
# getconf KERNEL_BITMODE
```

Note:

- The expected output of this command is 64. If you do not see the expected output, then you cannot install the software on this system.

- Oracle Database supports 64-bit kernel and does not provide support for 32-bit kernel applications.

---

4. To determine if an APAR is installed, enter a command similar to the following:

```
# /usr/sbin/instfix -i -k "IV16716 IV20880 IV21128 IV28319"
```

If an APAR is not installed, then download it from the IBM fix central website and install it:

http://www.ibm.com

5. If you require a CSD for WebSphere MQ, then refer to the IBM website for download and installation information:

http://www.ibm.com

9 Creating Required Operating System Groups and Users

The following local operating system groups and users are required if you are installing Oracle Database:

- The Oracle Inventory group (typically, oinstall)

- The OSDBA group (typically, dba)

- The Oracle software owner (typically, oracle)

- The OSOPER group (optional. Typically, oper)

To determine whether these groups and users exist, and if necessary, to create them, follow these steps:

1. To determine whether the oinstall group exists, enter the following command:

```
# more /etc/oraInst.loc
```

If the output of this command shows the `oinstall` group name, then the group exists.

If the `oraInst.loc` file exists, then the output from this command is similar to the following:

```
inventory_loc=/u01/app/oraInventory
inst_group=oinstall
```

The `inst_group` parameter shows the name of the Oracle Inventory group, `oinstall`.

2. To determine whether the `dba` group exists, enter the following command:

```
# grep dba /etc/group
```

If the output from this commands shows the `dba` group name, then the group exists.

3. If necessary, use the following procedure to create the `oinstall` and `dba` groups:

   a. Enter the following command:

   ```
   # smit security
   ```

   b. Choose the appropriate menu items to create the `oinstall` and `dba` groups.

   c. Press **F10** to exit.

4. To determine whether the `oracle` user exists and belongs to the correct groups, enter the following command:

```
# id oracle
```

If the `oracle` user exists, then this command displays information about the groups to which the user belongs. The output should be similar to the following, indicating that `oinstall` is the primary group and `dba` is a secondary group:

```
uid=440(oracle) gid=200(oinstall) groups=201(dba),202(oper)
```

5. If the `oracle` user does not exist or to create the `oracle` user, then use the following procedure:

   a. Enter the following command:

   ```
   # smit security
   ```

   b. Choose the appropriate menu items to create the `oracle` user, specifying the following information:

   In the **Primary GROUP** field, specify the Oracle Inventory group, for example `oinstall`.

   In the **Group SET** field, specify the OSDBA group and if required, the OSOPER group. For example `dba`.

   c. Press **F10** to exit.

6. If the `oracle` user exists, but its primary group is not `oinstall` or it is not a member of the `dba` group, then use the following procedure to modify the `oracle` user:

   a. Enter the following command:

```
# smit security
```

b. Choose the appropriate menu items to modify the `oracle` user, specifying the following information:

In the **Primary GROUP** field, specify the Oracle Inventory group, for example `oinstall`.

In the **Group SET** field, specify the OSDBA group and if required, the OSOPER group. For example `dba`.

c. Press **F10** to exit.

7. Enter the following command to set the password of the `oracle` user:

```
# passwd oracle
```

10 Configure Shell Limits and System Configuration Parameters

This section contains the following topics:

- Configure Shell Limits
- Configure System Configuration Parameters
- Checking Asynchronous Input Output Processes

> **Note:** The parameter and shell limit values shown in this section are recommended values only. For production database systems, Oracle recommends that you tune these values to optimize the performance of the system. See your operating system documentation for more information about tuning kernel parameters.

Oracle recommends that you set shell limits and system configuration parameters as described in this section.

10.1 Configure Shell Limits

Set shell limits for the Oracle Grid Infrastructure installation owner and for `root`. Verify that unlimited is set for both accounts either by using the `smit` utility or by editing the `/etc/security/limits` file. The `root` user requires these settings because the crs daemon (`crsd`) runs as `root`.

For AIX, it is the `ulimit` settings that determine process memory related resource limits. Verify that the shell limits shown in the following table are set to the values shown.

Shell Limit (As Shown in smit)	Recommended Value
Soft File Descriptors	at least 1024 KB
Hard File Descriptors	at least 65536 KB
Number of processes (Soft)	at least 2047
Number of processes (Hard)	at least 16384
Soft STACK size	at least 10240 KB
Hard STACK size	at least 10240 KB; at most 32768 KB

Shell Limit (As Shown in smit)	Recommended Value
Soft FILE size	unlimited
Soft CPU time	unlimited
	Note: This is the default value.
Soft DATA segment	unlimited
Soft Real Memory size	unlimited

To view the current value specified for these shell limits, and to change them if necessary:

1. Enter the following command:

    ```
    # smit chuser
    ```

2. In the **User NAME** field, enter the user name of the Oracle software owner, for example `oracle`.

3. Scroll down the list and verify that the value shown for the soft limits listed in the previous table is -1.

    If necessary, edit the existing value.

4. When you have finished making changes, press **F10** to exit.

10.2 Configure System Configuration Parameters

Verify that the kernel parameters shown in the following table are set to values greater than or equal to the minimum value shown.

Parameter	Recommended Value
`maxuprocs`	16384
`ncargs`	128

The following procedure describes how to verify and set the values manually.

■ To verify that the maximum number of processes allowed per user is set to 16384 or greater, use the following steps:

> **Note:** For production systems, this value should be at least 128 plus the sum of the `PROCESSES` and `PARALLEL_MAX_SERVERS` initialization parameters for each database running on the system.

1. Enter the following command:

    ```
    # smit chgsys
    ```

2. Verify that the value shown for **Maximum number of PROCESSES** allowed per user is greater than or equal to 16384.

    If necessary, edit the existing value.

3. When you have finished making changes, press **F10** to exit.

- To verify that long commands can be executed from shell, use the following steps:

> **Note:** Oracle recommends that you set the `ncargs` system attribute to a value greater than or equal to 128. The `ncargs` attribute determines the maximum number of values that can be passed as command line arguments.

1. Enter the following command:

   ```
   # smit chgsys
   ```

2. Verify that the value shown for **ARG/ENV list size in 4K byte blocks** is greater than or equal to 128.

   If necessary, edit the existing value.

3. When you have finished making changes, press **F10** to exit.

10.3 Checking Asynchronous Input Output Processes

On AIX 6 and AIX 7, the Asynchronous Input Output (AIO) device drivers are enabled by default. For both AIX 6 and AIX 7, increase the number of `aioserver` processes from the default value. The recommended value for `aio_maxreqs` is 64k (`65536`). Confirm this value for both AIX 6 and AIX 7.

Confirm the `aio_maxreqs` value using the following procedure:

```
# ioo –o aio_maxreqs
aio_maxreqs = 65536
```

When performing an asynchronous I/O to a file system, each asynchronous I/O operation is tied to an asynchronous I/O server. Thus, the number of asynchronous I/O servers limits the number of concurrent asynchronous I/O operations in the system.

The initial number of servers that are started during a system restart is determined by the `aio_minservers` parameter. As concurrent asynchronous I/O operations occur, additional asynchronous I/O servers are started, up to a maximum of the value set in the `aio_maxservers` parameter.

In general, to set the number of asynchronous I/O servers, complete the following procedure:

1. Adjust the initial value of `aio_maxservers` to 10 times the number of logical disks divided by the number of CPUs that are to be used concurrently but no more than 80.

2. Monitor the performance effects on the system during periods of high I/O activity. If all AIO server processes are started, then increase the `maxservers` value. Also, continue to monitor the system performance during peak I/O activity to determine if there was a benefit from the additional AIO servers. Too many asynchronous I/O servers increase memory and processor overload of additional processes, but this disadvantage is small. See your operating system vendor documentation for information about tuning AIO parameters.

To monitor the number of AIO server processes that have started, enter the following:

```
# ps -ek|grep -v grep|grep –v posix_aioserver|grep -c aioserver
```

11 Creating Required Directories

Create directories with names similar to the following, and specify the correct owner, group, and permissions for them:

- The Oracle base directory

- An optional Oracle data file directory

The Oracle base directory must have 3 GB of free disk space, or 4 GB of free disk space if you choose not to create a separate Oracle data file directory.

> **Note:**   If you do not want to create a separate Oracle data file directory, then you can install the data files in a subdirectory of the Oracle base directory. However, this is not recommended for production databases.

To create the Oracle base directory:

1. Enter the following command to display information about all mounted file systems:

    ```
    # df -k
    ```

    This command displays information about all the file systems mounted on the system, including:

    - The physical device name

    - The total amount, used amount, and available amount of disk space

    - The mount point directory for that file system

2. From the display, identify either one or two file systems that meet the disk space requirements mentioned earlier in this section.

3. Note the name of the mount point directory for each file system that you identified.

4. Enter commands similar to the following to create the recommended subdirectories in the mount point directory that you identified and set the appropriate owner, group, and permissions on them:

    ```
    # mkdir -p /mount_point/app/
    # chown -R oracle:oinstall /mount_point/app/
    # chmod -R 775 /mount_point/app/
    ```

    For example:

    ```
    # mkdir -p /u01/app/
    # chown -R oracle:oinstall /u01/app/
    # chmod -R 775 /u01/app/
    ```

12 Configuring Oracle Software Owner Environment

You run Oracle Universal Installer from the `oracle` account. However, before you start Oracle Universal Installer you must configure the environment of the `oracle` user. To configure the environment, you must:

- Set the default file mode creation mask (umask) to 022 in the shell startup file.

- Set the `DISPLAY` environment variable.

> **Caution:**   Use shell programs supported by your operating system vendor. If you use a shell program that is not supported by your operating system, then you can encounter errors during installation.

To set the `oracle` user's environment:

1. Start a new X terminal session (`xterm`).

2. Enter the following command to ensure that X Window applications can display on this system:

   ```
   $ xhost + RemoteHost
   ```

   where `RemoteHost` is the fully qualified remote host name. For example:

   ```
   $ xhost + somehost.example.com
   ```

3. If you are not logged in to the system where you want to install the software, then log in to that system as the `oracle` user.

4. If you are not logged in as the `oracle` user, then switch user to `oracle`:

   ```
   $ su - oracle
   ```

5. To determine the default shell for the `oracle` user, enter the following command:

   ```
   $ echo $SHELL
   ```

6. To run the shell startup script, enter one of the following commands:

   - Bash shell:

     ```
     $ . ./.bash_profile
     ```

   - Bourne or Korn shell:

     ```
     $ . ./.profile
     ```

   - C shell:

     ```
     % source ./.login
     ```

7. If you are not installing the software on the local system, then enter a command similar to the following to direct X applications to display on the local system:

   - Bourne, Bash, or Korn shell:

     ```
     $ DISPLAY=local_host:0.0
     ```

   - C shell:

     ```
     % setenv DISPLAY local_host:0.0
     ```

In this example, *local_host* is the host name or IP address of the system to use to display Oracle Universal Installer (your workstation or PC).

8. If you determined that the `/tmp` directory has less than 400 MB of free disk space, then identify a file system with at least 400 MB of free space and set the `TMP` and `TMPDIR` environment variables to specify a temporary directory on this file system:

   a. To determine the free disk space on each mounted file system, use the following command:

   ```
   # df -k
   ```

   b. If necessary, enter commands similar to the following to create a temporary directory on the file system that you identified, and set the appropriate permissions on the directory:

   ```
   $ sudo mkdir /mount_point/tmp
   $ sudo chmod a+wr /mount_point/tmp
   # exit
   ```

   c. Enter commands similar to the following to set the `TMP` and `TMPDIR` environment variables:

   * Bourne, Bash, or Korn shell:

      ```
      $ TMP=/mount_point/tmp
      $ TMPDIR=/mount_point/tmp
      $ export TMP TMPDIR
      ```

   * C shell:

      ```
      % setenv TMP /mount_point/tmp
      % setenv TMPDIR /mount_point/tmp
      ```

9. If you have had an existing installation on your system, and you are using the same user account to install this installation, then unset the `ORACLE_HOME`, `ORACLE_BASE`, `ORACLE_SID`, `TNS_ADMIN` environment variables and any other environment variable set for the Oracle installation user that is connected with Oracle software homes.

   Enter the following commands to ensure that the `ORACLE_HOME`, `ORACLE_BASE`, `ORACLE_SID` and `TNS_ADMIN` environment variables are not set:

   ■ Bourne, Bash, or Korn shell:

   ```
   $ unset ORACLE_HOME
   $ unset ORACLE_BASE
   $ unset ORACLE_SID
   $ unset TNS_ADMIN
   ```

   ■ C shell:

   ```
   % unsetenv ORACLE_HOME
   % unsetenv ORACLE_BASE
   % unsetenv ORACLE_SID
   % unsetenv TNS_ADMIN
   ```

   Use the following command to check the `PATH` environment variable:

   ```
   $ echo $PATH
   ```

Ensure that the $ORACLE_HOME/bin path is removed from your PATH environment variable.

> **Note:** If the ORACLE_HOME environment variable is set, then Oracle Universal Installer uses the value that it specifies as the default path for the Oracle home directory. If you set the ORACLE_BASE environment variable, then Oracle recommends that you unset the ORACLE_HOME environment variable and choose the default path suggested by Oracle Universal Installer.

10. To verify that the environment has been set correctly, enter the following commands:

```
$ umask
$ env | more
```

Verify that the umask command displays a value of 22, 022, or 0022 and the environment variables that you set in this section have the correct values.

13 Running the rootpre.sh Script

> **Note:** Do not run the rootpre.sh script if you have a later release of the Oracle Database software installed on this system.

Run the rootpre.sh script:

1. Switch user to root:

```
$ su -
password:
#
```

2. Complete one of the following steps, depending on the location of the installation files:

- If the installation files are on DVD, enter a command similar to the following, where *directory_path* is the disc mount point directory or the path of the db directory on the DVD:

  ```
  # /directory_path/rootpre/rootpre.sh
  ```

- If the installation files are on the hard disk, change the directory to the path where rootpre.sh exists and enter the following command:

  ```
  # ./rootpre.sh
  ```

3. Exit from the root account:

```
# exit
```

14 Mounting the Product Disc

On most systems, the disk mounts automatically when you insert it into the installation media. If the disk does not mount automatically, then follow these steps to mount it:

1. Switch user to root:

    ```
    $ sudo root
    password:
    ```

2. If necessary, enter a command similar to the following to eject the currently mounted disc, then remove it from the drive:

    ```
    # umount /dvd
    ```

3. Insert the disc into the disc drive, then enter a command similar to the following to mount it:

    ```
    # /usr/sbin/mount -rv cdrfs /dev/cd0 /dvd
    ```

    In this example, /dev/cd0 is the device name of the disc drive and /dvd is the mount point directory.

4. If Oracle Universal Installer displays the Disk Location dialog box, enter the disc mount point directory path, for example:

    ```
    /dvd
    ```

15 Installing Oracle Database

After configuring the oracle user's environment, start Oracle Universal Installer and install Oracle Database as follows:

1. Log on as the Oracle software owner user (typically, oracle) to the computer on which to install Oracle components.

2. If you are installing the software from installation media, then mount the disk if it is not mounted.

3. To start Oracle Universal Installer, enter the following command:

    ```
    $ /mount_point/db/runInstaller
    ```

    If Oracle Universal Installer does not start, then refer to *Oracle Database Installation Guide for IBM AIX on POWER Systems (64-Bit)* for information about how to troubleshoot X Window display problems.

4. The following table describes the recommended action for each Oracle Universal Installer screen. Use the following guidelines to complete the installation:

    ■ If you need more assistance, or to choose an option that is not the default, then click **Help** for additional information.

    ■ If you encounter errors while installing or linking the software, then refer to *Oracle Database Installation Guide for IBM AIX on POWER Systems (64-Bit)* for information about troubleshooting.

> **Note:** If you have completed the tasks listed previously, then you can complete the installation by choosing the default values on most screens.

Screen	Recommended Action
Configure Security Updates	Enter your e-mail address, preferably your My Oracle Support e-mail address or user name in the **Email** field. You can select the **I wish to receive security updates via My Oracle Support** check box to receive security updates. Enter your My Oracle Support password in the **My Oracle Support Password** field. Click **Next**.
Select Installation Option	Select **Create and configure a database** from the following list of available options, then click **Next**: ■ Create and configure a database ■ Install database software only ■ Upgrade an existing database
System Class	Select **Server Class** from the following options to install the database, and click **Next**. ■ Desktop Class: Choose this option if you are installing on a laptop or desktop class system. ■ Server Class: Choose this option if you are installing on a server class system, such as what you would use when deploying Oracle in a production data center.
Grid Installation Options	Select **Single instance database installation** for the type of database installation you want to perform, and click **Next**. ■ Single instance database installation: This option installs the database and the listener. ■ Real Application Clusters database installation: This option installs Oracle Real Application Clusters. ■ Oracle RAC One Node database installation: This option installs the Oracle RAC One Node database.
Select Install Type	Select **Typical Install** as the installation type from the following options, and click **Next**: ■ Typical Install: This installation method is selected by default. It lets you quickly install Oracle Database using minimal input. ■ Advanced Install: This installation method enables to perform more complex installations.

Screen	Recommended Action
Typical Install Configuration	Enter the following information according to your requirements:
	Oracle base: The Oracle base path appears by default. You can change the path based on your requirement.
	Software location: In the **Software Location** section, accept the default value or enter the Oracle home directory path in which you want to install Oracle components. The directory path should not contain spaces.
	Storage Type: Select **File System**, or **Oracle Automatic Storage Management** as the database storage option.
	Database file location: If you select File System as your storage type, then click **Browse** and specify a database file location.
	Database edition: Select the database edition to install.
	OSDBA Group: The OSDBA group is selected by default. You can also select the OSDBA group from the list.
	Global database name: Specify the Global Database Name using the following syntax:
	database_name.domain
	For example, `sales.us.example.com`
	Administrative password: Enter the password for the privileged database account.
	Confirm Password: Reenter, and confirm the password for the privileged database account.
	Select the **Create as Container database** option to create the database as a multitenant container database (CDB) that can support one or more pluggable databases (PDBs). If you want Oracle Universal Installer to create a PDB when it creates the CDB, specify the PDB name in the **Pluggable Database Name** field.
	Click **Next** to continue.
Create Inventory	This screen is displayed only during the first installation of Oracle products on a system.
	Specify the full path of the Oracle Inventory directory. Ensure that the operating system group selected is `oinstall`. Click **Next** to continue.
Perform Prerequisite Checks	Verify that all the prerequisite checks succeed, and then click **Next**.
	Oracle Universal Installer checks the system to verify that it is configured correctly to run Oracle software. If you have completed all the preinstallation steps in this guide, all the checks should pass.
	If a check fails, then review the cause of the failure listed for that check on the screen. If possible, rectify the problem and rerun the check. Alternatively, if you are satisfied that your system meets the requirements, then you can select the check box for the failed check to manually verify the requirement.
	Note: Oracle recommends that you use caution in checking the Ignore All option. If you check this option, then Oracle Universal Installer may not confirm if your system can install Oracle Database successfully.
Summary	Review the information displayed on this screen, and then click **Install.**
	Note: You can save all the installation steps into a response file by clicking **Save Response File.** Later, this file can be used for a silent installation.

Screen	Recommended Action
Install Product	This screen displays the progress of a database installation. During this process, the Execute Configuration Scripts window appears. Do not click OK until you run the scripts mentioned in this screen as the `root` user. Click **Next**.
	This screen then displays the status information for the configuration assistants that configure the software and create a database.
	A message is displayed at the end of Database Configuration Assistant process. Review the database information, specially the Oracle Enterprise Manager Database Express URL, and click **OK**.
Finish	This screen is displayed automatically when all the configuration tools are successful.
	Click **Close**.

16 Installing Oracle Database Examples

If you plan to use the following products or features, then download and install the products from the Oracle Database Examples media:

- Oracle JDBC Development Drivers

- Oracle Database Examples

- Oracle Text Knowledge Base

- Various Oracle product demonstrations

For information about installing software and various Oracle product demonstrations from the Oracle Database Examples media, refer to *Oracle Database Examples Installation Guide*.

17 What to Do Next?

To become familiar with this release of Oracle Database, it is recommended that you complete the following tasks:

- Log in to Oracle Enterprise Manager Database Express using a web browser.

  Oracle Enterprise Manager Database Express 12*c* is a web-based management tool built into Oracle Database without any need for special installation or management. You can use Oracle Enterprise Manager Database Express to manage a single Oracle Database installation. The default URL for Oracle Enterprise Manager Database Express is similar to the following:

  ```
  http://host.domain:1158/em/
  ```

  To log in, use the user name SYS and connect as SYSDBA. Use the password that you specified for this user during the Oracle Database installation.

- Refer to *Oracle Database Installation Guide for IBM AIX on POWER Systems (64-Bit)* for information about required and optional postinstallation tasks, depending on the products to use.

- Refer to *Oracle Database Installation Guide for IBM AIX on POWER Systems (64-Bit)* for information about how to use Oracle Enterprise Manager Database Express to learn about the configuration of your installed database.

- To learn more about using Oracle Enterprise Manager Database Express to administer a database, refer to *Oracle Database 2 Day DBA*.

18 Additional Information

This section contains information about the following:

- Product Licenses
- Purchasing Licenses and Version Updates
- Contacting Oracle Support Services
- Locating Product Documentation

Product Licenses

You are welcome to install and evaluate the products included in this media pack for 30 days under the terms of the Trial License Agreement. However, you must purchase a program license if you want to continue using any product after the 30 day evaluation period. See the following section for information about purchasing program licenses.

Purchasing Licenses and Version Updates

You can purchase program licenses and updated versions of Oracle products from the Oracle Store website:

https://shop.oracle.com

Contacting Oracle Support Services

If you have purchased Oracle Product Support, you can call Oracle Support Services for assistance 24 hours a day, seven days a week. For information about purchasing Oracle Product Support or contacting Oracle Support Services, go to the Oracle Support Services website:

http://www.oracle.com/us/support/index.html

Locating Product Documentation

Product documentation includes information about configuring, using, or administering Oracle products on any platform. The product documentation for Oracle Database products is available in both HTML and PDF formats online:

http://docs.oracle.com/

19 Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.