

Oracle® Database

Quick Installation Guide

12c Release 1 (12.1) for Oracle Solaris on x86-64 (64-Bit)

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This guide describes how to quickly install Oracle Database 12c Release 1 (12.1) on Oracle Solaris on x86-64 (64-Bit) systems. It includes information about the following:

- [Reviewing Information About This Guide](#)
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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
- 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

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*.
- If you want to install Oracle grid infrastructure for a standalone server, then refer to the "Oracle Grid Infrastructure" chapter in *Oracle Database Installation Guide*.
- 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 available RAM and swap space, enter the following command to obtain the system activity report:

```
# sar -r n i
```

For example:

```
# sar -r 2 10
```

If the size of the physical RAM installed in the system is less than the required size, then install more memory before continuing.

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

```
# /usr/sbin/swap -l
```

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

Note: Review your Oracle Solaris documentation for swap space allocation guidance for your server. The Oracle Solaris documentation guidelines supersede the swap space requirements listed in this guide.

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

```
# df -k /tmp
```

The `df -k` command displays disk space in 1 kilobyte blocks. On most systems, you can use the `df` command with the `-h` flag (`df -h`) to display output in "human-readable" format.

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 1-19 for more information about setting `TMP` and `TMPDIR`

- Extend the file system that contains the `/tmp` directory.
4. To determine the amount of free disk space on the system, enter one of the following commands:

```
# df -k
# df -h
```

5. To determine the RAM size, enter the following command:

```
# /usr/sbin/prtconf | grep "Memory size"
```

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

```
# /bin/isainfo -kv
```

This command displays the processor type. The following is the expected output of this command:

Oracle Solaris on x86-64 (64-Bit):

```
64-bit amd64 kernel modules
```

If you do not see the expected output, then you cannot install the software on this system. Obtain the correct software for your system architecture before proceeding further

3.2 General Server Minimum Requirements

Ensure the following general minimum requirements on your system:

- Ensure that the system is started with run level 3.
- 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 Oracle Solaris system meets the following storage requirements:

- Ensure that your Oracle Solaris system meets the disk space requirement for software files as described in [Table 1](#).

Table 1 *Disk Space Requirements for Software Files on Oracle Solaris on x86-64 (64-Bit)*

Installation Type	Disk Space
Enterprise Edition	6.4 GB
Standard Edition	6.2 GB
Standard Edition One	6.2 GB
Standard Edition 2	6.2 GB

- 1 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 1-19 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 Oracle Solaris 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 Oracle Solaris

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

See Also: "Consider Memory Allocation and Automatic Memory Management" in *Oracle Database Installation Guide for Oracle Solaris*

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 Oracle Solaris on x86-64 (64-Bit)

The following Oracle Solaris kernels and packages listed are supported on x86-64 (64-bit) systems for Oracle Database and Oracle Grid Infrastructure 12c:

- [Supported Oracle Solaris 11 Releases for x86-64 \(64-Bit\)](#)
- [Supported Oracle Solaris 10 Releases for x86-64 \(64-Bit\)](#)

6.1 Supported Oracle Solaris 11 Releases for x86-64 (64-Bit)

Use the following information to check supported Oracle Solaris 11 releases:

Table 3 x86-64 (64-Bit) Supported Oracle Solaris 11 Operating System Requirements

Item	Requirements
SSH Requirement	Secure Shell is configured at installation for Oracle Solaris.
Oracle Solaris 11 operating system	Oracle Solaris 11 SRU 14.5 or later SRUs and updates
Oracle Solaris 11 packages	The following packages must be installed: <ul style="list-style-type: none">▪ pkg://solaris/system/dtrace▪ pkg://solaris/developer/assembler▪ pkg://solaris/developer/build/make▪ pkg://solaris/system/xopen/xcu4 (if not already installed as part of standard Oracle Solaris 11 installation)▪ pkg://solaris/x11/diagnostic/x11-info-clients▪ pkg://solaris/compress/unzip

6.2 Supported Oracle Solaris 10 Releases for x86-64 (64-Bit)

Use the following information to check supported Oracle Solaris 10 releases:

Table 4 x86-64 (64-Bit) Supported Oracle Solaris 10 Operating System Requirements

Item	Requirements
SSH Requirement	Secure Shell is configured at installation for Oracle Solaris.
Oracle Solaris 10 operating system	Oracle Solaris 10 Update 11 (Oracle Solaris 10 1/13 s10x_u11wos_24a) or later updates
Packages and Patches for Oracle Solaris 10	<p>The following packages and patches (or later versions) must be installed:</p> <ul style="list-style-type: none">SUNWarcSUNWbtoolSUNWcs1SUNWdtrcSUNWeu8osSUNWheaSUNWi1cs (ISO8859-1)SUNWi15cs (ISO8859-15)SUNWi1ofSUNWlibCSUNWlibmSUNWlibmsSUNWsprotSUNWtooSUNWxfnt147441-25 <p>Note: You may also require additional font packages for Java, depending on your locale. Refer to the following website for more information:</p> <p>http://www.oracle.com/technetwork/java/javase/solaris-font-requirements-142758.html</p>

7 Additional Drivers and Software Packages for Oracle Solaris

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:

- [Installation Requirements for Open Database Connectivity](#)
- [Installation Requirements for Oracle Messaging Gateway](#)
- [Installation Requirements for Lightweight Directory Access Protocol](#)
- [Installation Requirements for Programming Environments for Oracle Solaris](#)
- [Installation Requirements for Web Browsers](#)

Note: Oracle Database Smart Flash Cache is an Enterprise Edition only feature.

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 Oracle Solaris](#)

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 Oracle Solaris

To use ODBC on Oracle Solaris, you require the following package:

unixODBC-2.3.1 or later

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 Oracle Database.

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

<http://www-01.ibm.com/support/docview.wss?uid=swg21182310>

7.3 Installation Requirements for Lightweight Directory Access Protocol

Review the following sections to install Lightweight Directory Access Protocol:

- [About LDAP and Oracle Plug-ins](#)
- [Installing the LDAP Package](#)

7.3.1 About LDAP and Oracle Plug-ins

Lightweight Directory Access Protocol (LDAP) is an application protocol for accessing and maintaining distributed directory information services over IP networks. You require the LDAP package if you want to use features requiring LDAP, including the Oracle Database scripts `odisrvreg` and `oidca` for Oracle Internet Directory, or `schemasync` for third-party LDAP directories.

7.3.2 Installing the LDAP Package

LDAP is included in a default Solaris operating system installation.

7.4 Installation Requirements for Programming Environments for Oracle Solaris

Review the following sections to install programming environments:

- [About Programming Environments and Oracle Database](#)
- [Configuring Support for Programming Environments](#)

7.4.1 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

7.4.2 Configuring Support for Programming Environments

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

Table 5 *Requirements for Programming Environments for Oracle Solaris*

Programming Environments	Support Requirements
Java Database Connectivity	JDK 6 (Java SE Development Kit release 1.6.0_37 or later updates of 1.6) with the JNDI extension with Oracle Java Database Connectivity. Supported on Solaris 11: JDK 7 (Java SE Development Kit release 1.7.0) Supported on Solaris 10: JDK 7 (Java SE Development Kit release 1.7.0) JDK 1.6 is installed with this release.
Oracle Call Interface (OCI)	JDK 6 (Java SE Development Kit release 1.6.0_37 or later updates of 1.6) with the JNDI extension, and Oracle Call Interface drivers. JDK 1.6 is installed with this release.
Oracle C++ Oracle C++ Call Interface Pro*C/C++ Oracle XML Developer's Kit (XDK)	Oracle Solaris Studio 12 (formerly Sun Studio) Additional patches may be needed depending on applications you deploy. Download Oracle Solaris Studio from the following URL: http://www.oracle.com/technetwork/server-storage/solarisstudio/overview/index.html
Pro*COBOL	Micro Focus Server Express 5.1
Pro*FORTRAN	Oracle Solaris Studio 12 (Fortran 95)

7.5 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, follow these steps:

1. To determine which version of Oracle Solaris is installed, enter the following command:

```
# uname -r
5.11
```

In this example, the version shown is Oracle Solaris 11 (5.11).

2. To determine the release level enter the following command:

```
# cat /etc/release
```

3. To determine if the required packages are installed, enter the following command:

On Oracle Solaris 10

```
pkginfo -i pkg_name
```

On Oracle Solaris 11

```
pkg list pkg_name
```

Where *pkg_name* is the name of the package to check.

For example, to determine if the required Oracle Solaris 10 packages are installed, enter a command similar to the following:

```
# pkginfo -i SUNWarc SUNWbtool SUNWhea SUNWlibC SUNWlibm SUNWlibms SUNWsprout \
SUNWtoo SUNWi1of SUNWi1cs SUNWi15cs SUNWxfnt SUNWcsl SUNWdtrc
```

If a package that is required for your system architecture is not installed, then install it. Refer to your operating system or software documentation for information about installing packages.

See Also: ["Verifying Operating System Packages on Oracle Solaris 11" on page 1-12](#)

Note: There may be more recent versions of packages listed installed on the system. If a listed patch is not installed, then determine if a more recent version is installed before installing the version listed.

9 Verifying Operating System Packages on Oracle Solaris 11

Use the following command to check if you have the required packages:

```
# /usr/bin/pkg verify [-Hqv] [pkg_pattern ...]
```

The `-H` option omits the headers from the verification output.

The `-q` option prints nothing but return failure if any fatal errors are found.

The `-v` option includes informational messages regarding packages.

If a package that is required for your system architecture is not installed, then download install it from My Oracle Support:

<https://support.oracle.com>

See Also:

- *The Adding and Updating Oracle Solaris 11 Software Packages* guide for more information
- *Oracle Solaris 11 Product Documentation*
- My Oracle Support note 1021281.1 for update information on support repositories:

<https://support.oracle.com/CSP/main/article?cmd=show&type=NOT&id=1021281.1>

10 Verifying Operating System Patches on Oracle Solaris 10

Note: Your system may have more recent versions of the listed patches installed on it. If a listed patch is not installed, then determine if a more recent version is installed before installing the version listed.

Verify that you have the required operating system patches. To ensure that the system meets these requirements, use the following procedure:

1. To determine whether an operating system patch is installed, and whether it is the correct version of the patch, enter a command similar to the following:

```
# /usr/sbin/patchadd -p | grep patch_number
```

For example, to determine if any version of the 119963 patch is installed, use the following command:

```
# /usr/sbin/patchadd -p | grep 119963
```

If an operating system patch is not installed, then download and install it from My Oracle Support:

<https://support.oracle.com>

11 Creating Required Operating System Groups and User

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 /var/opt/oracle/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/oracle/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, enter the following commands to create the oinstall and dba groups:

```
# /usr/sbin/groupadd oinstall
# /usr/sbin/groupadd dba
```

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

```
# id -a oracle
```

If the oracle user exists, 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 necessary, complete one of the following actions:

- If the oracle user exists, but its primary group is not oinstall or it is not a member of the dba group, then enter the following command:

```
# /usr/sbin/usermod -g oinstall -G dba oracle
```

Oracle does not support modifying an existing installation owner. See *Oracle Database Installation Guide* for more information.

- If the oracle user does not exist, enter the following command to create it:

```
# /usr/sbin/useradd -d /export/home/oracle -m -s /bin/bash -g oinstall -G dba oracle
```

This command creates the `oracle` user and specifies `oinstall` as the primary group and `dba` as the secondary group.

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

```
# passwd -r files oracle
```

12 Configuring Kernel Parameters on Oracle Solaris

This section contains the following topics:

- [Minimum Parameter Settings for Installation](#)
- [Requirements for Shared Memory Resources](#)
- [Checking Shared Memory Resource Controls](#)
- [Displaying and Changing Kernel Parameter Values](#)

Note: The kernel parameter values in this section are minimum values only. For production database systems, Oracle recommends that you tune these values to optimize the performance of the system. Refer to your operating system documentation for more information about kernel resource management.

12.1 Minimum Parameter Settings for Installation

During installation, you can generate and run the `fixup` script to check and set the kernel parameter values required for successful installation of the database. This script updates required kernel packages if necessary to minimum values.

If you cannot use the `fixup` script, then review the following table to set the values manually. Verify that the kernel parameters shown in the following table are set to values greater than or equal to the minimum value shown.

Note: On Oracle Solaris 10, you are not required to make changes to the `/etc/system` file to implement the System V IPC. Oracle Solaris 10 uses the resource control facility for its implementation.

Resource Control	Minimum Value
<code>project.max-sem-ids</code>	100
<code>process.max-sem-nsems</code>	256
<code>project.max-shm-memory</code>	This value varies according to the RAM size. See Requirements for Shared Memory Resources for minimum values.
<code>project.max-shm-ids</code>	100
<code>tcp_smallest_anon_port</code>	9000
<code>tcp_largest_anon_port</code>	65500

Resource Control	Minimum Value
udp_smallest_anon_port	9000
udp_largest_anon_port	65500

See Also: "Setting UDP and TCP Kernel Parameters Manually" in *Oracle Database Installation Guide for Oracle Solaris*

Note:

- `project.max-shm-memory` resource control = the cumulative sum of all shared memory allocated on each Oracle database instance started under the corresponding project.
- The `project.max-shm-memory` resource control value assumes that no other application is using the shared memory segment from this project other than the Oracle instances. If applications, other than the Oracle instances are using the shared memory segment, then you must add that shared memory usage to the `project.max-shm-memory` resource control value.
- Ensure that `memory_target` (or `max_sga_size`) does not exceed `process.max-address-space` and `project.max-shm-memory`. For more information, see My Oracle Support Note 1370537.1 at:

<https://support.oracle.com/>

12.2 Requirements for Shared Memory Resources

The resource control `project.max-shm-memory` enables you to set the maximum shared memory for a project.

Table 6 shows the installation minimum settings for `project.max-shm-memory`:

Table 6 Requirement for Resource Control `project.max-shm-memory`

RAM	<code>project.max-shm-memory</code> setting
1 GB to 16 GB	Half the size of the physical memory
Greater than 16 GB	At least 8 GB

12.3 Checking Shared Memory Resource Controls

Use the `prctl` command to make runtime interrogations of and modifications to the resource controls associated with an active process, task, or project on the system.

To view the current value of `project.max-shm-memory` set for a project and system-wide, enter the following command:

```
# prctl -n project.max-shm-memory -i project default
```

Where `default` is the project ID obtained by running the `id -p` command.

For example, to change the setting for `project.max-shm-memory` to 6 GB for the project `default` without a system reboot, enter the following command:

```
prctl -n project.max-shm-memory -v 6gb -r -i project default
```

See Also: *Administering Oracle Solaris 11* at:

http://docs.oracle.com/cd/E23824_01/index.html

12.4 Displaying and Changing Kernel Parameter Values

Use the following procedure to display the current value specified for resource controls, and to change them if necessary:

1. To display the current values of the resource control, enter the following commands:

```
$ id -p // to verify the project id
uid=100(oracle) gid=100(dba) projid=1 (group.dba)
$ prctl -n project.max-shm-memory -i project group.dba
$ prctl -n project.max-sem-ids -i project group.dba
```

2. If you must change any of the current values, then:

- a. To modify the value of max-shm-memory to 6 GB:

```
# prctl -n project.max-shm-memory -v 6gb -r -i project group.dba
```

- b. To modify the value of max-sem-ids to 256:

```
# prctl -n project.max-sem-ids -v 256 -r -i project group.dba
```

Note: When you use the `prctl` command (Resource Control) to change system parameters, you do not have to restart the system for these parameter changes to take effect. However, the changed parameters do not persist after a system restart.

Use the following procedure to modify the resource control project settings, so that they persist after a system restart:

1. By default, Oracle instances are run as the `oracle` user of the `dba` group. A project with the name `group.dba` is created to serve as the default project for the `oracle` user. Run the command `id` to verify the default project for the `oracle` user:

```
# su - oracle
$ id -p
uid=100(oracle) gid=100(dba) projid=100(group.dba)
$ exit
```

2. To set the maximum shared memory size to 2 GB, run the `projmod` command:

```
# projmod -sK "project.max-shm-memory=(privileged,2G,deny)" group.dba
```

Alternatively, add the resource control value `project.max-shm-memory=(privileged,2147483648,deny)` to the last field of the project entries for the Oracle project.

3. After these steps are complete, check the values for the `/etc/project` file using the following command:

```
# cat /etc/project
```

The output should be similar to the following:

```
system:0:::
```



```

user.root:1:::
noproject:2:::
default:3:::
group.staff:10:::
group.dba:100:Oracle default project :::
project.max-shm-memory=(privileged,2147483648,deny)

```

4. To verify that the resource control is active, check process ownership, and run the commands `id` and `prctl`:

```

# su - oracle
$ id -p
uid=100(oracle) gid=100(dba) projid=100(group.dba)
$ prctl -n project.max-shm-memory -i process $$
process: 5754: -bash
NAME                PRIVILEGE    VALUE    FLAG    ACTION    RECIPIENT
project.max-shm-memory privileged    2.00GB   -       deny

```

Note: The value for the maximum shared memory depends on the SGA requirements and should be set to a value greater than the SGA size.

For more information, see the Oracle Solaris Tunable Parameters Reference Manual.

13 Configuring Shell Limits for Oracle Solaris

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

Note: The shell limit values in this section are minimum 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 configuring shell limits.

The `ulimit` settings determine process memory related resource limits. Verify that the shell limits displayed in the following table are set to the values shown:

Shell Limit	Description	Soft Limit (KB)	Hard Limit (KB)
STACK	Size of the stack segment of the process	at most 10240	at most 32768
NOFILES	Open file descriptors	at least 1024	at least 65536
MAXUPRC or MAXPROC	Maximum user processes	at least 2047	at least 16384

To display the current value specified for these shell limits enter the following commands:

```

ulimit -s
ulimit -n

```

14 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

Before you create an Oracle base directory, you must identify an appropriate file system with sufficient free disk space.

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

To determine where to create these directories:

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, in kilobytes
 - 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.

In the following examples, /u01 is the mount point directory used for the software, and /u02 is the mount point directory used for the Oracle data file directory. You must specify the appropriate mount point directories for the file systems on your system.

To create the required directories and specify the correct owner, group, and permissions for them:

Note: In the following procedure, replace /u01 and /u02 with the appropriate mount point directories that you identified in Step 3 previously.

1. Enter the following command to create subdirectories in the mount point directory that you identified for the Oracle base directory:

```
# mkdir -p /u01/app/oracle
```

2. If you intend to use a second file system for the Oracle Database files, then create an `oradata` subdirectory in the mount point directory that you identified for the Oracle data file directory (shown as `/u02` in the examples):

```
# mkdir /u02/oradata
```

3. Change the owner and group of the directories that you created to the `oracle` user and the `oinstall` group:

```
# chown -R oracle:oinstall /u01/app/oracle
# chown -R oracle:oinstall /u02/oradata
```

4. Change the permissions on the directories that you created to `775`:

```
# chmod -R 775 /u01/app/oracle
# chmod -R 775 /u02/oradata
```

15 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.

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.

16 Mounting the Product Disc

On most Oracle Solaris systems, the product disc mounts automatically when you insert it into the drive. If the disc does not mount automatically, then follow these steps to mount it:

1. Switch user to root:

```
$ su - root
```

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

```
# eject
```

3. Insert the disc into the disc drive.

4. To verify that the disc mounted automatically, enter a command similar to the following:

```
# ls /dvd/dvd0
```

5. If this command fails to display the contents of the disc, then enter a command similar to the following:

```
# /usr/sbin/mount -r -F hsfs /dev/dsk/cxytdzs2 /dvd
```

In this example, `/dvd` is the disc mount point directory and `/dev/dsk/cxytdzs2` is the device name for the disc device, for example `/dev/dsk/c0t2d0s2`.

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

- Disc mounted automatically:

```
/dev/dvd0
```

- Disc mounted manually:

```
/dvd
```

17 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 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 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 : <ul style="list-style-type: none">■ Create and configure a database■ Install database software only■ Upgrade an existing database

Screen	Recommended Action
System Class	<p>Select Server Class from the following options to install the database, and click Next.</p> <ul style="list-style-type: none"> ■ 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	<p>Select Single instance database installation for the type of database installation you want to perform, and click Next.</p> <ul style="list-style-type: none"> ■ 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	<p>Select Typical Install as the installation type from the following options, and click Next:</p> <ul style="list-style-type: none"> ■ 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.
Typical Install Configuration	<p>Enter the following information according to your requirements:</p> <p>Oracle base: The Oracle base path appears by default. You can change the path based on your requirement.</p> <p>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.</p> <p>Storage Type: Select File System, or Oracle Automatic Storage Management as the database storage option.</p> <p>Database file location: If you select File System as your storage type, then click Browse and specify a database file location.</p> <p>Database edition: Select the database edition to install.</p> <p>OSDBA Group: The OSDBA group is selected by default. You can also select the OSDBA group from the list.</p> <p>Global database name: Specify the Global Database Name using the following syntax:</p> <p><i>database_name.domain</i></p> <p>For example, <i>sales.us.example.com</i></p> <p>Administrative password: Enter the password for the privileged database account.</p> <p>Confirm Password: Reenter, and confirm the password for the privileged database account.</p> <p>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.</p> <p>Click Next to continue.</p>
Create Inventory	<p>This screen is displayed only during the first installation of Oracle products on a system.</p> <p>Specify the full path of the Oracle Inventory directory. Ensure that the operating system group selected is <code>oinstall</code>. Click Next to continue.</p>

Screen	Recommended Action
Perform Prerequisite Checks	<p>Verify that all the prerequisite checks succeed, and then click Next.</p> <p>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.</p> <p>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.</p> <p>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.</p>
Summary	<p>Review the information displayed on this screen, and then click Install.</p> <p>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.</p>
Install Product	<p>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.</p> <p>This screen then displays the status information for the configuration assistants that configure the software and create a database.</p> <p>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.</p>
Finish	<p>This screen is displayed automatically when all the configuration tools are successful.</p> <p>Click Close.</p>

18 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*.

19 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 12c 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 information about required and optional postinstallation tasks, depending on the products to use.
- Refer to *Oracle Database Installation Guide* 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*.

20 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/support>

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/>

21 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.

Oracle Database Client Installation Guide, 12c Release 1 (12.1) for Oracle Solaris on x86-64 (64-Bit)
E55102-03

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