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Oracle Database Installation Guide, 10g Release 1 (10.1) for IBM z/OS (OS/390)
Part No.  B13525-01

Oracle welcomes your comments and suggestions on the quality and usefulness of this publication. Your input is an important part of the information used for revision.

- Did you find any errors?
- Is the information clearly presented?
- Do you need more information? If so, where?
- Are the examples correct? Do you need more examples?
- What features did you like most about this manual?

If you find any errors or have any other suggestions for improvement, please indicate the title and part number of the documentation and the chapter, section, and page number (if available). You can send comments to us at the following e-mail address:

    infoibm_us@oracle.com

If you would like a reply, please give your name, address, telephone number, and electronic mail address (optional).

If you have problems with the software, please contact your local Oracle Support Services.
This guide provides instructions for installing and configuring Oracle Database 10g Release 1 (10.1) for IBM z/OS (OS/390).

Intended Audience
This guide is intended for those who are responsible for performing tasks such as:
- Installing Oracle Database 10g Release 1 (10.1) for IBM z/OS (OS/390)
- Migrating or upgrading to Oracle Database 10g Release 1 (10.1) for IBM z/OS (OS/390)

Documentation Accessibility
Our goal is to make Oracle products, services, and supporting documentation accessible, with good usability, to the disabled community. To that end, our documentation includes features that make information available to users of assistive technology. This documentation is available in HTML format, and contains markup to facilitate access by the disabled community. Standards will continue to evolve over time, and Oracle is actively engaged with other market-leading technology vendors to address technical obstacles so that our documentation can be accessible to all of our customers. For additional information, visit the Oracle Accessibility Program Web site at

http://www.oracle.com/accessibility/

Accessibility of Code Examples in Documentation
JAWS, a Windows screen reader, may not always correctly read the code examples in this document. The conventions for writing code require that closing braces should appear on an otherwise empty line; however, JAWS may not always read a line of text that consists solely of a bracket or brace.

Accessibility of Links to External Web Sites in Documentation
This documentation may contain links to Web sites of other companies or organizations that Oracle does not own or control. Oracle neither evaluates nor makes any representations regarding the accessibility of these Web sites.
Product Name

The complete name for the product described in this book is Oracle Database 10g Release 1 (10.1) for IBM z/OS (OS/390). To maintain readability and conciseness in this document, the product is also referred to as Oracle Database for z/OS and the platform as z/OS.

Related Documentation

The documentation set has two parts: platform-specific documentation and product-specific documentation. Your site automatically receives both for the Oracle products that you have purchased. The product-specific documentation is intended to assist you in learning how to use a product, and the platform-specific documentation will provide assistance regarding special requirements or restrictions for using that product on z/OS.

Platform-Specific Documentation

The platform-specific documentation for Oracle Database for z/OS and the Oracle Transparent Gateways for z/OS includes this guide and the following documents:

- Oracle Database Installation Guide 10g Release 1 (10.1) for IBM z/OS (OS/390)
- Oracle Database Messages Guide 10g Release 1 (10.1) for IBM z/OS (OS/390)
- Oracle Database Release Notes 10g Release 1 (10.1) for IBM z/OS (OS/390)
- Oracle Database System Administration Guide 10g Release 1 (10.1) for IBM z/OS (OS/390)
- Oracle Database User’s Guide 10g Release 1 (10.1) for IBM z/OS (OS/390)
- Oracle Transparent Gateway for DB2 Installation and User’s Guide Release 1 (10.1) for IBM z/OS (OS/390)
- Oracle Transparent Gateway for iWay Installation and User’s Guide Release 1 (10.1) for IBM z/OS (OS/390)

Platform-specific documents are referenced in a shorter form throughout this document. For example, Oracle Database Release Notes 10g Release 1 (10.1) for IBM z/OS (OS/390) is referenced as Oracle Database Release Notes for IBM z/OS.

Product Documentation

Product-specific documentation describes how to use Oracle Database products. The information in the product-specific books applies to all operating systems on which the products run.

For information about upgrading from a previous release of Oracle Database, refer to the Oracle Database Upgrade Guide and the Oracle Database System Administration Guide for IBM z/OS.

Other Documentation

The IBM Redbook, Experiences Installing Oracle Database 10g on z/OS (SG24-7055-00), is available from IBM and may be helpful to those installing Oracle Database 10g for z/OS for the first time.
Typographic Conventions

The following typographic conventions are used in this guide:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>italics</td>
<td>Indicates a variable, including variable portions of file names. It is also used for emphasis and book titles</td>
</tr>
<tr>
<td>UPPERCASE</td>
<td>Indicates batch and TSO commands and file names, SQL commands, reserved words, keywords, initialization parameters, and environment variables</td>
</tr>
<tr>
<td>monospace</td>
<td>Indicates z/OS UNIX System Services shell commands and file names, code examples, directory names, and user names</td>
</tr>
<tr>
<td>oracle_hlq</td>
<td>Is the standard example for a high-level data set name qualifier. Substitute your system’s actual high-level qualifier, for example, ORACLE.V10G. These qualifiers may appear in lowercase or UPPERCASE typeface</td>
</tr>
<tr>
<td>&lt;&gt; Angle brackets</td>
<td>Indicate that the enclosed arguments are required and at least one of the arguments must be entered. (Do not enter the brackets, themselves.)</td>
</tr>
<tr>
<td>[] Square brackets</td>
<td>Indicate that the enclosed arguments are optional. (Do not enter the brackets, themselves.)</td>
</tr>
<tr>
<td>{} Braces</td>
<td>Indicate that one of the enclosed arguments is required. Do not enter the braces themselves.</td>
</tr>
<tr>
<td></td>
<td>Vertical lines</td>
</tr>
<tr>
<td>... Ellipses</td>
<td>Indicate that the preceding item can be repeated. You can enter an arbitrary number of similar items</td>
</tr>
<tr>
<td>Other punctuation</td>
<td>Must be entered as shown unless otherwise specified. For example, commas and quotes</td>
</tr>
</tbody>
</table>

Storage Measurements

Storage measurements use the following abbreviations:

- K, for kilobyte, which equals 1,024 bytes
- M, for megabyte, which equals 1,048,576 bytes
- G, for gigabyte, which equals 1,073,741,824 bytes
This chapter describes the different types of Oracle Database 10g for z/OS installations you can perform and issues you should consider before installing the software. It includes information on the following topics:

- Oracle Database 10g for z/OS Installation Overview on page 1-2
- Oracle Database 10g for z/OS Installation Considerations on page 1-4
- Upgrade Issues on page 1-4
- Working in Shell Environments on page 1-4
Oracle Database 10g for z/OS Installation Overview

Oracle products on z/OS are now installed using the Oracle Universal Installer (hereafter referred to as the Installer). This is a Java and X windows application which runs in the z/OS UNIX Systems Services environment. This installation method represents a significant change over previous releases of Oracle Database for z/OS. Oracle recommends that you review the installation process carefully before you begin. The new installation features and tasks are summarized in the following list:

- The Oracle software is compressed into installation files that can be loaded from the product CD-ROMs or downloaded from an Oracle Web site, as described in Chapter 2. The installation files are in a PAX format. This is a method of compressing multiple files into a single object using the z/OS UNIX System Services shell command, `pax`.

- You upload the installation files to z/OS using either FTP or NFS, and then you extract the compressed files to a temporary location on your z/OS UNIX System Services file system. You need to allocate either HFS or zFS temporary disk space for each task. Instructions on transferring the files to your z/OS system, as well as temporary disk space requirements are listed in Chapter 2.

- You will need to allocate permanent disk space for the installed products. This disk space includes HFS or zFS disk space and data set disk space. Permanent disk space requirements are listed in Chapter 2.

- The Installer is a Java application requiring Java to be installed on your system. Software requirements are listed in Chapter 2.

- You may need to configure z/OS UNIX System Services parameters and other system parameters depending on whether you are installing the Oracle software for the first time or upgrading an existing installation. This is described in Chapter 2.

- With the Installer, you can use either an interactive method or a silent method of installation. The interactive method, described in Chapter 3, uses the X server graphical display routines. This method requires you to have the X libraries installed on your z/OS system. In addition, you need to be able to connect to an X server (a PC or UNIX system running the X server software). In this arrangement, the X server is the client and the X client is the z/OS server. Alternatively, the silent method does not require you to have an X server available but does require you to modify a response file, as described in Appendix A.

  The interactive method is based on panels and an interview phase in which you are prompted to answer various questions. Help is available for most of these panels. The non-interactive installation requires that you provide responses to the prompts in the form of a response file.

- After the interview phase, the Installer runs and little interaction is required until the end. In the final stage, you finish setting permissions for the files. After installation is complete, temporary files can be removed.

- The installation process creates an Oracle environment on z/OS UNIX System Services that is complete for the maintenance of Oracle products. This environment is similar that of a UNIX system. On the TSO /Batch side you will have a number of PDS (Partitioned Data Set) and PDSE (Partitioned Data Set - Extended) data sets.

This guide describes the installation process in the following three phases:

1. **Planning your installation**: The current chapter describes the Oracle Database 10g for z/OS products that you can install.
2. **Completing pre-installation tasks:** Chapter 2 describes pre-installation tasks that you must complete before installing Oracle Database 10g for z/OS software.

3. **Installing software:** Chapter 3 describes how to use the Installer to install Oracle Database 10g for z/OS software and complete the database installation process.

**Oracle Database Products for Installation**

During installation, you must choose to install one of the following products:

- Oracle z/OS Database 10g
- Oracle z/OS Client 10g
- Oracle Transparent Gateways
- Oracle z/OS Database and Subsystem Configuration

**Oracle z/OS Database 10g**

Oracle Database is an object-relational database management system. There are three installation types for this option:

- **Complete:** Installs all components of the Oracle RDBMS bundle, including all demonstration examples.
- **Typical:** Installs all components of the Oracle RDBMS bundle required for most installations. Does not install less commonly used utilities and examples.
- **Custom:** Allows you to select individual components of the installation suite for the Oracle RDBMS bundle.

**Oracle z/OS Client 10g**

Oracle Client is software that can be used to run Oracle Database applications. There are three installation types for this option:

- **Complete:** Installs all components of the Oracle RDBMS client bundle, including all demonstration examples. Does not include the components required to run an RDBMS server on z/OS.
- **Typical:** Installs all components of the Oracle RDBMS client bundle required for most installations. Does not install less commonly used utilities and examples.
- **Custom:** Allows you to select individual components of the installation suite for the Oracle RDBMS client bundle.

**Oracle Transparent Gateways**

The Oracle Transparent Gateways are products that provide an interface through which the Oracle Database can direct SQL operations to another database on z/OS. Under this option, you can install the Oracle Transparent Gateway for DB2 or the Oracle Transparent Gateway for iWay, and a configuration utility for each.

**Oracle z/OS Database and Subsystem Configuration**

The Database and Subsystem Configuration utility is an optional component which creates the necessary files for configuring an Oracle database on z/OS. You can run this option after installing the Oracle Database 10g for z/OS software.
Oracle Database 10g for z/OS Installation Considerations

This section contains information that you should consider before deciding how to install Oracle Database software. It contains the following sections:

- Software Certification
- Multiple Oracle Homes

Software Certification

The platform-specific software requirements included in this installation guide were current at the time this guide was published. However, because new platforms and operating system software versions might be certified after this guide is published, review the certification matrix on the Oracle MetaLink Web site for the most up-to-date list of certified operating system versions. The Oracle MetaLink Web site is available at the following URL:

http://metalink.oracle.com

If you do not have a current Oracle Support Services contract, you can access the same information from the following Web site:

http://otn.oracle.com/support/metalink/content.html

Multiple Oracle Homes

Oracle Database 10g for z/OS supports multiple Oracle homes. This means that you can install this release or previous releases of Oracle Database 10g for z/OS software more than once on the same system, in different Oracle home directories.

Upgrade Issues

For information about upgrading a previous release of Oracle Database for z/OS to Oracle Database 10g for z/OS, refer to the Oracle10i Database Upgrade Guide and the Oracle Database System Administration Guide for IBM z/OS.

Working in Shell Environments

Many installation-related tasks are performed in the z/OS UNIX System Services environment and utilize shell commands. Throughout this document, tasks that involve shell commands are prefixed with a dollar sign ($) followed by a space, which is the default prompt for the TTY shell provided by IBM. If you use a different shell (such as the OMVS shell in TSO), the prompt may be different but the commands are generally the same. Be aware that using the OMVS shell requires using an editor other than vi in situations where a file must be edited.
This chapter describes the tasks that you must complete before you start the Installer. It includes information on the following:

- Check the Hardware Requirements on page 2-2
- Check the Software Requirements on page 2-3
- Review System-Level Configuration Considerations on page 2-4
- Choose Oracle Software Locations on page 2-11
- Identify Required Directories for the Installation on page 2-11
- Configure the User Environments Required for the Installation on page 2-12
- Transfer the Oracle Software to Your z/OS System on page 2-15
- Extract the Installation Archive Files on page 2-17
Check the Hardware Requirements

The system must meet the following minimum hardware requirements:

- 100 MB of disk space in the `/tmp` directory
- 1.4 GB to 2.5 GB of disk space for the Oracle software, depending on the installation type
- 2.6 GB of temporary disk space for a temporary work area, including the disk space required for the PAX files that are copied from the product CD-ROM and their expanded contents. The PAX files and expanded installation files can be located in different file systems.
- 1000 cylinders (860 MB) of PDS disk space, including 300 cylinders (244 MB) for the AUTHLOAD library (only 10 cylinders are needed for client-only installations and only 80 cylinders are needed for gateway installations), 450 cylinders (365 MB) for the CMDLOAD library (only 10 cylinders are needed for gateway installations), and 125 cylinders (102 MB) for the MESG PDS. The remaining data sets are less than 5 cylinders (10 MB) each.

Your z/OS system may not have the required disk space already available as an HFS or z/FS file system. In this case, you will need to ask your system administrator to allocate the space. Oracle recommends that you install Oracle software in its own separate zFS file system.

You can use the following command in a z/OS UNIX Systems Services shell to list the file systems which have space available:

```
$ df -k
```

The installation itself requires a maximum of 60 MB of temporary disk space for extracting the files. Normally the installer will use the `/tmp` directory. If there is not enough space in `/tmp` then ask your system administrator to increase the size of `/tmp` or set the TMP and TMPDIR environment variables, as described on page 2-15.

The following table shows the approximate z/OS UNIX System Services disk space requirements for each installation type:

<table>
<thead>
<tr>
<th>Installation Type</th>
<th>Temporary zFS Space</th>
<th>Permanent zFS Space</th>
<th>Permanent Data Set Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle Database 10g for z/OS installations</td>
<td>2.6 GB</td>
<td>2.5 GB</td>
<td>860 MB</td>
</tr>
<tr>
<td>Oracle Database 10g for z/OS Client installations</td>
<td>2.6 GB</td>
<td>1.4 GB</td>
<td>650 MB</td>
</tr>
<tr>
<td>Transparent Gateway for DB2 or Transparent Gateway for iWay</td>
<td>2.6 GB</td>
<td>650 MB</td>
<td>180 MB</td>
</tr>
</tbody>
</table>
Check the Software Requirements

The section lists the software and patches required for Oracle Database 10g for z/OS.

Check for Required Software

Depending on the products that you intend to install, verify that the required software is installed on the system, as listed and described in the following table:

<table>
<thead>
<tr>
<th>Installation Type or Product</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System</td>
<td>z/OS V1.4 or z/OSe V1.4 or above</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> Required for all installations.</td>
</tr>
<tr>
<td>Java</td>
<td>IBMJava2-141 (Java version &quot;1.4.1&quot; Java(TM) 2 Runtime Environment, Standard Edition (build 1.4.1))</td>
</tr>
<tr>
<td></td>
<td>Classic VM (build 1.4.1, J2RE 1.4.1 IBM z/OS Persistent Reusable VM build cm141-20030930 (JIT enabled: jitic))</td>
</tr>
<tr>
<td></td>
<td>(Up to the latest maintenance levels.)</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> Required for all installations.</td>
</tr>
<tr>
<td>IBM REXX</td>
<td>Required for all installations</td>
</tr>
<tr>
<td>CICS TS</td>
<td>V1.3 or higher is required for Oracle Access Manager for CICS TS</td>
</tr>
<tr>
<td>IMS TM</td>
<td>V7 or higher is required for Oracle Access Manager for IMS TM</td>
</tr>
<tr>
<td>z/OS UNIX System Services</td>
<td>X windows libraries</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> Required for all interactive installations.</td>
</tr>
<tr>
<td>TCP/IP</td>
<td>Required for all installations.</td>
</tr>
<tr>
<td>IBM C/C++</td>
<td>IBM C/C++ V1R2 or higher is required for Pro*C and OCI applications</td>
</tr>
<tr>
<td>COBOL compiler</td>
<td>Any currently supported IBM COBOL compiler that uses the LE runtime environment is required for Pro*C/COBOL applications</td>
</tr>
<tr>
<td>PL/I compiler</td>
<td>Any currently supported IBM PL/I compiler that uses the LE runtime environment is required for PRO*PL/I applications</td>
</tr>
<tr>
<td>DB2</td>
<td>IBM DB2 version 6.1 or higher is required for Oracle Transparent Gateway for DB2 installations</td>
</tr>
<tr>
<td>iWay</td>
<td>iWay Server version 5.2.3 or higher is required for Oracle Transparent Gateway for iWay installations</td>
</tr>
</tbody>
</table>

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

1. To determine which version of z/OS is installed, use the following command:
   
   ```bash
   $ uname -a
   
   The operating system version should appear as follows, where `systemname` is the name of the system and `nnnn` is the hardware model:
   
   OS/390 systemname 14.00 03 nnnn
2. To determine whether Java 1.4.1 is installed in the default PATH, enter the following command:

$ java -version

The Java version should appear as follows:

IBMJava2-141 (java version "1.4.1" Java(TM) 2 Runtime Environment, Standard Edition (build 1.4.1)
Classic VM (build 1.4.1, J2RE 1.4.1 IBM z/OS Persistent Reusable VM build cm141-20030930 (JIT enabled: jitc))

If the Java executable is not found, or if the version displayed is less than 1.4.1, download Java 1.4.1 from the IBM Java Web site and install it:

http://www-1.ibm.com/servers/eserver/zseries/software/java/

Note that you can install IBM Java with or without SMP/E.

3. To determine whether the IBM make program is installed and in the path, enter the following command:

$ make -V

Normally make is located in the /bin directory. You may need to copy the file /samples/startup.mk to /etc/startup.mk in order for make to function correctly. If make is not installed and in the path, you will get an error message.

Check for Required APARS

Depending on the products that you intend to install, verify that the fixes for IBM APARS listed in the following table are installed on the system:

<table>
<thead>
<tr>
<th>Installation Type or Product</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>C++ programs</td>
<td>APAR PQ75251</td>
</tr>
</tbody>
</table>

Review System-Level Configuration Considerations

This section describes configuration considerateness to review for your system.

The following are required for both server and client-only installations:

- Perform Product Security Activities
- Configure BPX Parameters
- Add an APF-Authorized Library

The following are required for server installations only:

- Ensure Adequate Address Space IDs (ASIDs)
- Add Program Properties
- Create and Activate a Resource Class
- Associate Userids with Services
Perform Product Security Activities

Some activities that are related to installing Oracle Database 10g for z/OS can be performed independently, even before the software arrives. All of these activities are related to product security features, and one (which is optional) requires an IPL of your system before it takes effect. Depending on the organization and procedures of your installation, you may need to work with system security personnel or systems programmers to perform these activities.

The descriptions that are presented here are provided in RACF (IBM z/OS Security Server) terms with the assumption that RACF is in use. Any product which fully implements z/OS System Authorization Facility (SAF) can be substituted. If your installation uses a product other than RACF, refer to the documentation for that product for information on how to perform the steps that are discussed in this chapter.

Configure BPX Parameters

The following BPX parameter files need to be modified and activated on the system. They are set in SYS1.PARMLIB(BPXxxx). After doing so, you do not need to IPL the system:

- MAXTHREADTASKS(1000)
- MAXTHREADS(1000)
- MAXCPUTIME(2147483647)
- MAXASSIZE(2147483647)
- MAXSHAREPAGES(131072)
- SHRLIBMAXPAGES(8192)

Check User Virtual Storage

Determine the virtual region size for the user performing the installation. If it is less than the required size, you must increase the maximum allowable size of the virtual region to 512 MB. The method by which you determine the virtual region size depends on whether you entered the z/OS UNIX System Services shell environment through Telnet or rlogin or through TSO OMVS:

- If you entered the z/OS UNIX System Services shell environment through Telnet or rlogin, the virtual storage is the amount set in the SYS1.PARMLIB(BPXPRMxx) field MAXASSIZE. This amount can be limited in the OMVS segment of your RACF profile.
  
  For example, if you do not define ASSIZEMAX in your RACF OMVS segment, and you have MAXASSIZE set to 2147483647, all Telnet or rlogin sessions will get 2 GB of virtual storage.

- If you entered the z/OS UNIX System Services shell environment through TSO OMVS, then the virtual storage is the region size that you set for the REGION field when you logged on to TSO. This value is in KB. This amount can be limited in the TSO segment of your RACF profile.

  You will need to ask your system administrator to issue the following command, which shows the maximum allowed value:

  $ tso listuser username tso
For example:

tso listuser arogers tso
USER=AROGERS  NAME=ANDREW ROGERS  OWNER=RACF  CREATED=96.106
DEFAULT-GROUP=OEG647  PASSDATE=03.356  PASS-INTERVAL=92
...
TSO INFORMATION
---------------
ACCTNUM= NOACCT
PROC= $AROGERS
SIZE= 02048000
MAXSIZE= 02048000
USERDATA= 0000

This shows that you can have up to 2 GB of virtual storage.

You should be aware that the SMF exit IEFUSI can limit virtual storage in either of the previous cases. Therefore, ensure that the SMF exit IEFUSI allows for enough virtual storage to use Oracle products.

Add an APF-Authorized Library

Oracle Database 10g for z/OS requires the database and network region programs to run with APF authorization, which means that the load modules must reside in an APF-authorized library. While it is possible to copy these modules into an existing authorized library, Oracle recommends that you create an authorized library specifically for Oracle Database 10g for z/OS. Because z/OS requires all modules that are loaded by an authorized program to come from authorized libraries, the library will contain a number of modules in addition to the database and network region programs, including the Oracle database kernel. The authorized library must be a PDSE type rather than a PDS type.

A load library can be authorized in either of two ways: one way is to add an entry for the data set to the PROGxx member of SYS1.PARMLIB, the other way is to add an entry for the data set to the IEAAPFxx member of SYS1.PARMLIB. The first way (using the PROGxx member) utilizes a newer mechanism. The second way (using the IEAAPFxx member) utilizes an older mechanism. You may need to talk to your systems programmer to determine which method to use and the correct suffix to substitute for xx. If you plan to name the authorized library ORACLE.V10G.AUTHLOAD, for example, then the following code shows a suitable entry in PROGxx:

APF ADD DSNAME(ORACLE.V10G.AUTHLOAD) SMS

If your installation is using IEAAPFxx instead of PROGxx, a comparable entry there would be:

ORACLE.V10G.AUTHLOAD ,

The comma in the above entry is included only if the entry is not the last record in the member. Omit the comma in the new entry if it is last in the member, and make sure that the preceding entry has a comma.

Changes to PROGxx or IEAAPFxx do not take effect until the next IPL. If your installation has enabled z/OS dynamic APF facilities, a library can be authorized without an IPL by using a SETPROG APF,ADD operator command as shown in the following example:

SETPROG APF,ADD,DSN=ORACLE.V10G.AUTHLOAD, SMS
The authorization that is conferred by the SETPROG command is independent of the PROGxx or IEAAPFxx members and lasts only until the next IPL. This means that you would use this technique only if you expect to install the software and actually configure and run a database service or network service before the next IPL of your system.

Regardless of the technique used, a data set does not need to exist to be authorized. The Installer will prompt you for the location of the data set and can optionally allocate it for you. If you can choose the data set name that you will use, then this step can be performed before the data set is created and populated. However, once you create a data set, you will need to authorize it.

**Ensure Adequate Address Space IDs (ASIDs)**

Oracle Database 10g for z/OS instances can be composed of multiple address spaces and can make extensive use of z/OS Cross Memory Services. When a cross-memory address space is terminated, the address space ID (ASID) that was used for this address space is made unavailable. Eventually, the pool of z/OS ASIDs can become exhausted, which prevents new address spaces from being created. In order to avoid the above condition, the RSVNONR parameter in the IEASYSxx member of SYS1.PARMLIB should be set to a higher value. Refer to the z/OS V1R4.0 MVS Initialization and Tuning Reference (SA22-7592), for details on specifying the RSVNONR parameter.

**Add Program Properties**

The database and network service region programs must run nonswappable and noncancelable, and should not be subject to system time limits. In addition, the database service runs in protect key 7. These attributes are indicated by adding entries for these programs to the z/OS Program Properties Table (PPT), via a member of the SYS1.PARMLIB data set named SCHEDxx, where xx is a 2-letter or 2-digit suffix. You may need to work with your systems programmer to determine the correct member name and to add the entries. The entries that you add should be similar to those in the following example. The comments, which are included for clarity, are allowed but are not required.

```plaintext
/* SCHEDxx PPT entry for Oracle database region */
PPT PGNAME(ORARASC) /* Program (module) name */
    NOCANCEL /* Not cancelable */
    KEY(7) /* Protection key */
    NOSWAP /* Not swappable */
    SYST /* Not subject to timing */
/* SCHEDxx PPT entry for Oracle network region */
PPT PGNAME(MINMAIN) /* Program (module) name */
    NOCANCEL /* Not cancelable */
    NOSWAP /* Not swappable */
    SYST /* Not subject to timing */
```

The entries in the SCHEDxx member are normally read at z/OS IPL. You can cause z/OS to re-read the member without an IPL by using the SET SCH operator command. The PPT entries must take effect before Oracle database and network services are started.

For details on the SCHEDxx member, the PPT, and the SET SCH command, refer to the following IBM documents: z/OS V1R4.0 MVS Initialization and Tuning Reference (SA22-7592-06) and z/OS V1R4.0 MVS System Commands (SA22-7627-07).
Create and Activate a Resource Class

The authorization-checking mechanism of SAF is based on resource names, which are simply character strings that identify the data, interface, or other entity that is protected. Resource names are organized into classes. A resource class is a name for a group of resources with similar name structure and attributes. RACF has a number of predefined resource classes for items such as data sets, tape volumes, and terminals.

Oracle Database 10g for z/OS has three types of resources that are subject to authorization checking:

1. OSDI commands
2. The client-service bind interface
3. The database server SYSOPER/SYSDBA connection privilege

These resources must have an associated resource class. By default, Oracle Database 10g for z/OS is set up with the assumption that the resources are in the FACILITY class, which is a predefined RACF class. FACILITY is a general-use class whose resource name structure accommodates all three of the resource types of Oracle Database 10g for z/OS. If you use the default FACILITY class, then you may need to activate the class if your installation has not previously defined resources in the class. For directions on activating the FACILITY class, refer to the IBM document z/OS V1R4.0 Security Server RACF Security Administrator’s Guide (SA-7683-03). This is done with a SETROPTS CLASSACT RACF command and does not require a z/OS IPL. For a description of this command, refer to the IBM document z/OS V1R4.0 Security Server RACF Command Language Reference (SA22-7687-03).

The security standards or procedures of your installation may make it preferable to create distinct resource classes for Oracle Database 10g for z/OS resources. RACF allows security administration privileges to be granted on a resource class basis. If you create distinct classes for Oracle Database 10g for z/OS, those RACF administration privileges can be granted to users without enabling administrative privileges on other (non-Oracle Database 10g for z/OS) resources that may be associated with the FACILITY class.

If you decide to create resource classes for Oracle Database 10g for z/OS, then two classes should be created: one for OSDI commands and one that is shared by both bind and database SYSOPER/SYSDBA connect authorizations. For information on adding installation-defined resource classes, refer to the following IBM documents: z/OS V1R4.0 Security Server RACF System Programmer’s Guide (SA22-7681-03) and z/OS V1R4.0 Security Server RACF Macros and Interfaces (SA22-7682-03). The procedure involves coding Assembler Language macro instructions that are assembled to create non-executable load modules that are the class table and router table, and an IPL of z/OS is required to activate the change.

---

**Note:** This is the only pre-installation activity that requires an IPL.
If you choose to add new resource classes for Oracle Database 10g for z/OS, then the ICHERCDE macro that you code for the class table entries should specify parameters as in the following example, which defines the classes $ORACMD and $ORACONN.

$ORACMD ICHERCDE CLASS=$ORACMD,
     GROUP=$ORACONN,
     ID=192,                     Some number between 128 & 255
     MAXLNTH=19,
     RACLIST=ALLOWED,
     FIRST=ALPHANUM,
     OTHER=ANY,
     POSIT=42,                   Probably unique to this class
     OPER=NO,
     DFTUACC=NONE

$ORACONN ICHERCDE CLASS=$ORACONN,
     MEMBER=$ORACMD,
     ID=191,                     Some number between 128 & 255
     MAXLNTH=19,
     FIRST=ALPHANUM,
     OTHER=ANY,
     POSSIT=42,                  Probably unique to this class
     OPER=NO,
     DFTUACC=NONE

Note: In this example, the continuation indicators that are required in position 72 of each continued record are omitted.

You must also add entries to the installation-supplied router table module ICHRFR01, as in the following example:

ICHRFRTB CLASS=$ORACMD,ACTION=RACF
ICHRFRTB CLASS=$ORACONN,ACTION=RACF

After the class table is updated and the system is IPLed, the new classes can be activated with the SETROPTS CLASSACT command. For more information, refer to the IBM document z/OS V1R4.0 Security Server RACF Security Administrator’s Guide (SA-7683-03) and the RACF CLR. You must also provide Oracle Database 10g for z/OS with the class names. This is done in the subsystem parameter file discussed in the Oracle Database System Administration Guide for IBM z/OS.

Associate Userids with Services

Oracle Database 10g for z/OS-managed services execute as system address spaces, similar to started tasks or STCs. Some of the z/OS system functions that are invoked by Oracle Database 10g for z/OS services perform authorization checks based on the z/OS userid that is associated with the service address space. Depending on the security configuration and standards of your installation, those system functions may fail if no userid is associated with the address space. You, or security personnel for your installation, may need to take steps to ensure that Oracle Database 10g for z/OS services have an associated userid that can be authorized for system functions that are invoked by the database and network services.

If you are already running the TNS programs of previous releases as started tasks (as opposed to submitting them as batch jobs), then your installation probably already has STARTED or USER profiles for the associated JCL procedures. You should not rely on those for Oracle Database 10g for z/OS because the Oracle Database 10g for z/OS procedures should have different names. Plan to create at least two new STARTED or
USER profiles, one for the database service and one for the network service. These may be all that you need, because different instances of a type of service can generally share the same JCL procedure. You may want to create additional profiles, though, if you want different instances of a service to run with different userids. Note that this requires using distinct JCL procedures even though the procedures themselves may be otherwise identical.

For details on the STARTED and USER resource classes, refer to the IBM document *RACF Security Administrator’s Guide*. The RDEFINE command that is used to add profiles is described in the RACF CLR.

With RACF, it is also possible to associate a userid with a started task using a started procedures table that is built with Assembler macros somewhat like the resource class table discussed in the previous section. Activating such changes requires an IPL, however, and is not the preferred method. Refer to the IBM document *RACF Security Administrator’s Guide* for more information.

Certain database features are implemented using z/OS UNIX System Services (formerly called Open Edition). These features including Java, XML, Oracle Text, Spatial Data Option, UTL_FILE package, and external LOB(BFILE) support. In order for these features to work, the database service address space must be capable of being "dubbed" as a z/OS UNIX System Services process. This requires that the z/OS userid that is associated with the address space have a default z/OS UNIX System Services segment that is defined to the security subsystem. For additional information, refer to the Oracle Database System Administration Guide for IBM z/OS.

In addition, certain utilities run only in a z/OS UNIX System Services shell environment, such as the Installer, Enterprise Manager, and some client-side Java applications. For users requiring these applications, an OMVS RACF segment must be defined. The OMVS RACF segment can be defined to a group and then the users who are likely to require these Oracle Java applications can be associated with the group. Such users are typically Oracle DBAs and Oracle operators.

Depending on whether this is the first time Oracle software is being installed on this system and on the products that you are installing, you may need to create several groups and users who will be responsible for the installation, maintenance and operation of the oracle database.

**Installation User/Group Considerations**

The Installer requires that all users performing Oracle software installation and maintenance belong to the same group. Oracle recommends that you define a user group for all users performing installation and maintenance.

The user who performs the installation becomes the owner of the files created as part of the installation. You may want to define a z/OS user who will be the software owner. Any user performing an Oracle installation must have an OMVS RACF segment defined. This user must be able to create and update the Oracle PDS/PDSE data sets.

For maintenance, only the software owner is granted write access to the archive libraries. You may need to change the permissions for the archive libraries to allow anyone in the group write access after the installation has completed.

**Determine Whether the Oracle Inventory Group Exists**

When you install Oracle software on the system for the first time, the Installer creates the `oraInst.loc` file. This file is located in the `/var/opt/oracle` directory. Alternatively, this directory can contain a pointer to a different inventory location.
Users who are performing installation and maintenance tasks must have RACF authority to create and update the directory /var/opt/oracle and its contents, as well as the Oracle file systems created by the installation and the PDS data sets required for the installation.

This file identifies the name of the Oracle Inventory group. To determine whether the Oracle Inventory group exists, enter the following command:

```
$ more /var/opt/oracle/oraInst.loc
```

If the `oraInst.loc` file exists, 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.

**Choose Oracle Software Locations**

The Oracle software is installed in different types of file systems on z/OS. These file systems are: z/OS UNIX System Services for the Oracle executable code, samples, and maintenance structure; PDSE data sets for the Oracle executable code required for the Oracle Database server and TSO / batch clients.

Subsequent sections in this chapter describe how to configure the system depending on the location you choose for the software.

**Identify Required Directories for the Installation**

You must identify or create three directories for all Oracle installations, as follows:

- Oracle base directory
- Oracle inventory directory
- Oracle home directory

The following subsections describe the requirements for these directories.

**Oracle Base Directory**

The Oracle base directory acts as a top-level directory for Oracle software installations. Generally, you will need to allocate a zFS file system for the Oracle installation files. Oracle recommends that you allocate a high-level directory (for example, `/oracle`) as the root directory for the installation, which can be fairly small. Allocate another file system under this directory for each product being installed, (for example, `/oracle/v10.1.0.2`). This corresponds to the Oracle home directory.

**Oracle Inventory Directory**

The Oracle inventory directory (`oraInventory`) stores an inventory of all software installed on the system. It is required by, and shared by, all Oracle software installations on a single system. The inventory should be placed in a location which is Oracle-version independent, as multiple versions of Oracle Database will use this inventory. The first time you install Oracle software on a system, the Installer prompts you to specify the path to this directory. Oracle recommends that you choose the following path:

`oracle_base/oraInventory`
This inventory directory needs to be 20-40 MB, as it holds the installation logs and parameter files. If you do not allocate a separate file system for this directory, then the space used is taken from the `oracle_base` directory.

If this directory does not exist, then the Installer will try to interactively create it at installation time. The `/var/opt/oracle` directory points to this inventory directory.

**Oracle Home Directory**

The Oracle home directory is the directory where you choose to install the software for a particular Oracle product. You must install different Oracle products, or different releases of the same Oracle product, in separate Oracle home directories. When you run the Installer, it prompts you to specify the path to this directory, as well as a name that identifies it. The directory that you specify must be a subdirectory of the Oracle base directory. Oracle recommends that you define this directory as a separate zFS file system mounted under the `/oracle` directory. In addition, you should specify a path similar to the following for the Oracle home directory:

```
/oracle/v10.1.0.2
```

Each new release of an Oracle product typically requires a separate Oracle home directory. Oracle recommends that you keep your Oracle home to less than 50 characters. This is because the path is placed in the sample JCL and has a line length of 80.

**Oracle PDS and PDSE Data Sets**

During installation, a number of files are placed into PDS and PDSE data sets. The Installer can create these data sets if the user performing the installation has RACF authority to create them, or it can use pre-existing data sets under a high-level qualifier supplied at installation. The Installer requires that all Oracle installation and executable files are kept under one high-level qualifier. The required sizes for these data sets are provided in Appendix B, "Installation Reference".

You need to determine a naming convention for high-level and second-level data set name qualifiers. For more information, refer to Appendix B, "Installation Reference". In addition, you need to determine a convention for naming Oracle software data files and database data files. For example, try to use a naming convention for the Oracle executable modules in data sets which includes the version. For example, `ORACLE.V10G` or `ORACLE.V10102`.

Database files should not include the version number. This is because the database is likely to exist across multiple versions or patch sets of the Oracle software.

**Configure the User Environments Required for the Installation**

There are two separate environments required for an interactive installation of the Oracle software: the client X server environment and the z/OS user environment. Both need to be configured before starting the installation.

**Client X Server Environment**

This environment is required for an interactive installation. It is a non-z/OS environment and will normally be a UNIX system running X windows or a PC or other system with X windows software installed.
If you are installing the software from an X windows workstation, X terminal, or PC running an X server application, you need to enable this X server to accept X client (z/OS) applications. To do this, perform the following steps:

1. Start a local terminal session, for example, an X terminal (xterm).
2. To enable remote hosts to display X windows applications on the local X server, enter the following command:

   ```
   $ xhost +
   ```

### z/OS User Environment

The z/OS user environment is required for an interactive or non-interactive installation. It is a z/OS UNIX System Services shell environment running under the user who will be performing the installation. You must Telnet to this z/OS UNIX System Services shell environment using a VT terminal, or you can use the command OMVS from a TSO user who is logged on to the system, as described in the following steps:

1. On the z/OS (X client) system, connect to z/OS UNIX System Services using Telnet. Enter a command similar to the following, using the port number for z/OS UNIX System Services:

   ```
   $ telnet remote_host port
   ```

   If you are using a 3270 terminal emulator, you need to enter the OMVS shell command to access z/OS UNIX System Services.

2. If you are not logged on to the remote system as an authorized user, enter the following commands at the prompts:

   ```
   EZYTE27I logon: username
   EZYTE27I logon: username
   Password: password
   ```

Before you start the Installer you must configure the environment of the user performing the installation. To configure this environment, you must perform the following tasks:

- Set the default file mode creation mask (umask) to 002 in the shell startup file.
- Set the JAVA_HOME, PATH, LIBPATH, CLASSPATH and DISPLAY environment variables.

To set the user’s environment, follow these steps:

1. In any text editor, create an environment file similar to the following, specifying the appropriate values for the environment variables:

   ```
   export JAVA_HOME=/usr/lpp/java/1.4
   export PATH=/bin:/usr/local/bin
   export LIBPATH=$JAVA_HOME/lib:$LIBPATH
   export CLASSPATH=$JAVA_HOME/lib/libjitc.so:$CLASSPATH
   export DISPLAY=nn.nn.nn.nn:0
   ```

---

**Note:** Unless you intend to complete a silent installation, you must install the software from an X windows workstation, an X terminal, or a PC or other system with X server software installed. For more information on non-interactive and silent installations, see Appendix A.
Configure the User Environments Required for the Installation

The PATH environment variable must include Java, make, and ORACLE_HOME/bin. The JAVA_HOME environment variable must point to the Java home directory, and the LIBPATH environment variable must point to the JAVA_HOME/lib directory.

2. If necessary, specify in the environment file the environment variables listed in the following table. If you must specify several values for an environment variable, for example PATH, separate the values with a colon (:).

<table>
<thead>
<tr>
<th>Environment Variable</th>
<th>Required By</th>
<th>Sample Setting and Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>JAVA_HOME</td>
<td>The Installer must point to the Java installation location (directory or directories containing the Java executables)</td>
<td>/usr/lpp/java/J1.4</td>
</tr>
<tr>
<td>PATH</td>
<td>All applications running in the z/OS UNIX System Services shell environment</td>
<td>/bin</td>
</tr>
</tbody>
</table>

Note: On most systems, the /usr/local/bin directory is included in the default setting of the PATH environment variable.

<table>
<thead>
<tr>
<th>LIBPATH</th>
<th>Path for library files</th>
<th>This should concatenate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$ JAVA_HOME/lib: LIBPATH</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CLASSPATH</th>
<th>Path for class files</th>
<th>This should concatenate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$ JAVA_HOME/lib/libjitc.so: CLASSPATH</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DISPLAY</th>
<th>Interactive installation</th>
<th>This is the TCP/IP address of the X server (the UNIX system or PC) where you want the installation panels to appear. It is in the form of a TCP/IP address followed by :port_number. The TCP/IP address can be a host name if you have DNS service on your z/OS system.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Open the user’s shell startup file in any text editor:

$ vi .profile

4. Enter or edit the following line, specifying a value of 022 for the default file creation mask:

umask 002

5. Save the file and exit from the editor.

6. To run both the shell startup script and the environment script, enter commands similar to the following:

$ . ./.profile

7. 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.

8. For interactive installations, enter a command similar to the following to direct X applications to display on your X server system:

   ```
   $ DISPLAY=local_host:0.0 ; export DISPLAY
   ```

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

9. If you determined that the `/tmp` directory has less than 100 MB of free disk space, identify or create a file system with at least 100 MB of free space and set the TMP and TMPDIR environment variables to specify a temporary directory on this file system.

   Enter commands similar to the following to set the TEMP and TMPDIR environment variables:

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

---

**Transfer the Oracle Software to Your z/OS System**

The Oracle Database 10g for z/OS software is available on the Oracle Database 10g for z/OS product CD-ROMs or you can download it from the Oracle Technology Network Web site (OTN). Before you can install the software, you must first transfer the installation archive files to your z/OS system using one of the following two methods:

- **Load Oracle Database 10g for z/OS Software from the Product CD-ROMs**
- **Download Oracle Database 10g Software from the OTN Web Site**

**Load Oracle Database 10g for z/OS Software from the Product CD-ROMs**

z/OS does not have direct CD-ROM support. Therefore, the software must be copied to a temporary location on the system before you can install it. In order to simplify this process, the installation directories have been compressed using PAX.

Each product CD-ROM contains an installation archive file labeled `Disk1.pax` or `Disk2.pax`. Approximately 900 MB of temporary disk space is required for the contents of the two archive files.

To load the installation archive files from the product CD-ROMs, perform the following steps:

1. Mount the first product CD-ROM on a system which has a CD-ROM drive and has either FTP or NFS access to the z/OS system where you will be installing the software. If you NFS-mount the CD-ROM, then it needs to be mounted in binary mode. Ask your system administrator for the mount instructions specific to your system.

2. FTP the installation archive files in binary mode to a temporary location on the z/OS system. Ask your system administrator for the FTP instructions specific to your system.

Repeat the previous steps for each product CD-ROM. When the installation archive files `Disk1.pax` and `Disk2.pax` are on your z/OS system, you no longer need the CD-ROMs.
The next step is to extract the installation archive files. Refer to the section "Extract the Installation Archive Files" on page 2-17.

Download Oracle Database 10g Software from the OTN Web Site

This section describes how to download the installation archive files from OTN and extract them on your hard disk.

To download the installation archive files, perform the following steps:

1. Use any browser to access the software download page on OTN at:
   
   http://otn.oracle.com/software/products/oracle10g/

2. Choose the link for the software that you want to download.

3. On the Oracle Technology Network Developer License Terms page, answer all questions.

4. On the download page, identify the required disk space by adding the file sizes for each required file.
   The file sizes are listed next to the filenames.

5. Select a file system with enough free space to store and expand the installation archive files.
   In most cases, the available disk space must be at least twice the size of the installation archive files.

6. On the file system that you selected in step 5, create a parent directory, for example oracle10g, to hold the installation archive files.

7. Download the installation archive files to the directory that you created in step 6. Verify that the files you downloaded are the same size as the corresponding files on OTN.

8. Unzip the installation archive files using the unzip utility, as follows:
   Unzip each file on a PC or UNIX system, using a command similar to the following:
   
   $ unzip filename.zip

   The preceding command creates the following files:
   
   Disk1.pax
   Disk2.pax
   doc/
   welcome.htm

   FTP the unzipped files, Disk1.pax and Disk2.pax, in binary mode to your z/OS system. Ask your system administrator for the FTP instructions specific to your system.

   The result should be that there are two files, Disk1.pax and Disk2.pax, on your z/OS system.

   The next step is to extract the installation archive files. Refer to the following section "Extract the Installation Archive Files".
**Extract the Installation Archive Files**

This section describes how to extract the installation archive files you loaded onto your system from the product CD-ROMs or downloaded from the OTN Web site.

The files `Disk1.pax` and `Disk2.pax` now exist in a temporary location on your z/OS system. The files need to be extracted in preparation for installation.

To extract the installation archive files, perform the following steps:

1. Change the working directory to the directory where you want the installation files to reside. This can be a temporary space, but it is required until you have finished installing all the Oracle products.

2. Extract the installation files, using commands similar to the following:

   ```
   $ pax -rvf directory_location/Disk1.pax
   $ pax -rvf directory_location/Disk2.pax
   ```

   The preceding commands extract the contents of `Disk1.pax` and `Disk2.pax` into the current directory.

3. Check the current directory to make sure the files were extracted properly, using the following command:

   ```
   $ ls -l
   ```

   The directory structure should look similar to the following:

   ```
   drwxr-xr-x   3 AROGERS  OEQA1        288 Mar 10 14:54 Disk1
   drwxr-xr-x   3 AROGERS  OEQA1        288 Mar 16 10:27 Disk2
   drwxr-xr-x   3 AROGERS  OEQA1        288 Mar 10 14:54 Translations
   drwxr-xr-x   3 AROGERS  OEQA1        864 Mar 30 07:56 install
   -rwxr-xr-x   1 AROGERS  OEQA1        772 Mar 15 11:20 runInstaller
   ```

   The extraction should create five directories (`/Disk1`, `/Disk2`, `/Translations`, `/install`, and `/doc`), and two files, one called `runInstaller`, and one called `welcome.htm`. If the extraction process did not succeed, then the files may be corrupted. Repeat the process of loading or downloading the installation archive files onto your z/OS system, and then unzip and extract the files. If the extraction is still unsuccessful, then contact Oracle Support Services to obtain a new copy of the installation archive files.

4. You can now delete the `Disk1.pax` and `Disk2.pax` files.

When you have finished extracting the files, you are ready to install the software. Depending on the product you plan to install, refer to the following installation instructions:

- To install the Oracle Database or Oracle Client, refer to the instructions in Chapter 3, "Database Installation Tasks".

- To install the Oracle Transparent Gateways, refer to the Installation and User’s Guide for your Gateway product.
This chapter describes how to start the Installer and install Oracle Database 10g for z/OS products on your system. Review the information in Chapter 1, "Installation Overview" and complete the tasks listed in Chapter 2, "Pre-installation Tasks" before beginning the installation.

This chapter includes information on the following topics:

- Introduction on page 3-2
- Install the Oracle Database 10g for z/OS Software on page 3-2
- After Installing the Oracle Database 10g for z/OS Software on page 3-3
Introduction

This chapter describes how to install the Oracle Database software. These installation instructions apply to the Oracle Database products. To install the Oracle Transparent Gateways, refer to the Installation and User’s Guide for your Gateway product.

Before you can install the software, you must first perform the necessary pre-installation tasks, including transferring the software to your z/OS system and extracting the files. For more information, refer to Chapter 2, “Pre-installation Tasks”.

In most cases, you use the graphical user interface (GUI) provided by the Installer to install the software. However, you can also use the Installer to complete non-interactive installations, without using the GUI. See Appendix A for information on non-interactive installations.

Install the Oracle Database 10g for z/OS Software

To start the Installer and install the software, perform the following tasks:

---

**Note:** Do not use the Installer from an earlier Oracle Database release to install components from this release.

---

1. If necessary, log in as the user who will install the Oracle software, set the DISPLAY environment variable, and run the environment shell script or the environment variables created earlier.

2. To start the Installer, enter the following commands where directory_path is the path of the Disk1 directory on the hard disk:

   ```
   $ /directory_path/runInstaller
   ```

   If the Installer does not appear, see the “X Windows Display Errors” section on page C-2 for information troubleshooting.

3. Use the following guidelines to complete the installation:

   - Follow the instructions displayed in the Installer windows. If you need additional information, click Help.
   - During installation, blank lines will be written to the Telnet session display. This is normal.
   - When the Installer prompts you to run a script with administrator privileges (which permits you to update the /usr/local/bin directory and set the extattr for the Enterprise Manager management agent nmo executable), the administrator must run the root.sh shell script which is located in the ORACLE_HOME directory. This script is not required unless you want to permit users in the z/OS UNIX System Services shell to use the oraenv utility and you want to use the Enterprise Manager management agent.

     Enter a command similar to the following in a terminal where you are logged in as the root user, then click Continue or OK:

     ```
     $ /oracle/v10g/root.sh
     ```

   - If you encounter errors while installing or linking the software, see Appendix C for information on troubleshooting.
4. When the installation is complete, click Exit, then click Yes to exit from the Installer.

At this stage, the following will have been created:
- A z/OS UNIX System Services file system populated with client executables and the necessary files to maintain them
- PDS and PDSE files which contain the executable files
- An ENV file in the Oracle home directory which can be used to configure your default environment settings

**After Installing the Oracle Database 10g for z/OS Software**

You must perform the tasks described in the following sections after completing an installation:
- Downloading and Installing Patches
- Performing System Administrator Tasks
- Configuring Other Oracle Products

**Downloading and Installing Patches**

Check the OracleMetalink Web site for required patches for your installation. To download required patches:

1. Use a Web browser to view the OracleMetalink Web site:
   
   http://metalink.oracle.com

2. Log in to OracleMetalink.

   **Note:** If you are not an OracleMetalink registered user, click Register for MetaLink! and follow the registration instructions.

3. On the main OracleMetalink page, click Patches.
4. Use the Simple Search feature to search by Product or Family.
5. Specify the following information, then click Go:
   - In the Product or Family field, specify RDBMS Server
   - In the Release field, specify the current release number
   - In the Patch Type field, specify Patchset/Minipack

**Performing System Administrator Tasks**

Before you can use your Oracle database, you need to perform various configuration tasks. You need to do the following before using your Oracle database for the first time:
- APF-authorize the AUTHLOAD library.
- Move load modules from the AUTHLOAD library to a system linklist PDSE and activate them. This can be done by configuring and running the batch job COPYPROC which has been provided as a sample in the INSTLIB PDS.
After running COPYPROC, you need to refresh the linklist library, by issuing the following command to a z/OS console:

`F LLA REFRESH`

For detailed information on configuring your database, refer to the *Oracle Database System Administration Guide for z/OS*.

**Configuring Other Oracle Products**

Many other Oracle products and options must be configured before you use them for the first time. To configure the Oracle Transparent Gateways, refer to the Installation and User’s Guide for your Gateway product. Before using other Oracle Database 10g for z/OS products or options, refer to product-specific administration and tuning guides for detailed configuration and tuning information. For more information, refer to the section "Related Documentation" in the Preface.
This chapter describes how to completely remove an Oracle database and the Oracle software. It includes information on the following topics:

- Removing an Oracle Database on page 4-2
- Removing Oracle Software on page 4-2

**Note:** If you want to remove an individual product, check the product-specific documentation for requirements and restrictions.
Removing an Oracle Database

To completely remove Oracle Database 10g for z/OS software, you must remove any installed databases. To remove an Oracle database, do the following:

---

**Caution:** Removing an Oracle database deletes all the data in the database.

- Delete the VSAM data sets under the high-level qualifier for the database
- Delete the Oracle executable PDSE files that were created during the installation (for example, AUTHLOAD and CMDLOAD files)
- Delete the subsystem modules that were placed into any linklist libraries.
- Remove any JCL procedures that were created for the Oracle services and placed in your PROCLIB library.

---

Removing Oracle Software

The following steps describe how use the Installer to remove Oracle software:

---

**Note:** Always use the Installer to remove Oracle software. Do not delete any Oracle home directories without first using the Installer to remove the software.

1. Start the Installer as follows:
   
   `$ $ORACLE_HOME/oui/bin/runInstaller`

2. In the Welcome window, click Deinstall Products.
   
   The Inventory window appears, listing all of the Oracle homes on the system and the products installed in each Oracle home.

3. In the Inventory window, select the Oracle home and the products that you want to remove.

   **Note:** If you choose to remove Oracle JVM, the Installer removes all installed products that depend on Oracle JVM, including Oracle Database.

4. Click Remove.
   
   The Installer displays a confirmation window asking you to confirm that you want to deinstall the products and their dependant components.

5. Click Yes.
   
   The Installer displays a progress indicator as it removes the software.

6. Exit the Installer.

7. After using the Installer to remove Oracle software, you must remove the PDSE files which were created during the installation process. This must be done manually.
This chapter describes how to install and configure Oracle Database 10g for z/OS non-interactively using response files. It includes information on the following topics:

- **Introduction** on page A-2
- **Create the oralInst.loc File** on page A-2
- **Prepare Response Files** on page A-3
- **Run the Installer Non-interactively** on page A-4
Introduction

You can install Oracle Database non-interactively by specifying a response file when you start the Installer. The Installer uses the values contained in the response file to provide answers to some or all of the Installer prompts. If you include responses for all of the Installer prompts in the response file, then you can run a completely non-interactive installation without seeing the Installer windows.

To install and configure Oracle products non-interactively, complete the following steps:

1. Create the oraInst.loc file.
2. Prepare response files.
3. Run the Installer non-interactively.
4. Run configuration assistants non-interactively.

These steps are described in the following sections.

Create the oraInst.loc File

If you plan to install Oracle products non-interactively, you must manually create the oraInst.loc file if it does not already exist. This file specifies the location of the oraInventory directory where the Installer creates the inventory of Oracle products installed on the system.

Note: If Oracle software has been installed previously on the system, the oraInst.loc file might already exist. If the file does exist, you do not need to create a new file.

To create the oraInst.loc file, perform the following steps:

1. Create the /var/opt/oracle directory if it does not exist
   $ mkdir /var/opt/oracle

2. Change directory as follows, depending on your operating system:
   $ cd /var/opt/oracle

3. Use a text editor to create the oraInst.loc file, containing the following lines:
   
   inventory_loc=ORACLE_BASE/oraInventory
   inst_group=

   In the preceding example, ORACLE_BASE is the path specified in the ORACLE_BASE environment variable.

4. Enter the following command to set the appropriate owner, group, and permissions on the oraInst.loc file:
   $ chmod 664 oraInst.loc
Prepare Response Files

Oracle provides response file templates for each installation category and type, and for each configuration tool. These files are located in the /directory_location/Disk1stage/Response directory, where directory_location is the location to which you extracted the installation files.

The following table lists and describes the response files included in the /directory_location/Disk1stage/Response directory.

<table>
<thead>
<tr>
<th>Response File Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>oracle.mvsosdi.server.Complete.rsp</td>
<td>Oracle z/OS Database 10g - Complete Install</td>
</tr>
<tr>
<td>oracle.mvsosdi.server.Custom.rsp</td>
<td>Oracle z/OS Database 10g - Custom Install</td>
</tr>
<tr>
<td>oracle.mvsosdi.server.Typical.rsp</td>
<td>Oracle z/OS Database 10g - Typical Install</td>
</tr>
<tr>
<td>oracle.mvsosdi.client.Complete.rsp</td>
<td>Oracle z/OS Client 10g - Complete Install</td>
</tr>
<tr>
<td>oracle.mvsosdi.client.Custom.rsp</td>
<td>Oracle z/OS Client 10g - Custom Install</td>
</tr>
<tr>
<td>oracle.mvsosdi.client.Typical.rsp</td>
<td>Oracle z/OS Client 10g - Typical Install</td>
</tr>
<tr>
<td>oracle.mvsosdi.config.Typical.rsp</td>
<td>Oracle z/OS Database and Subsystem Configuration Utility</td>
</tr>
<tr>
<td>oracle.mvsosdi.tg.one_or_more.rsp</td>
<td>Oracle Transparent Gateways</td>
</tr>
</tbody>
</table>

To prepare a response file, perform the following steps:

1. Change directory to the response file directory, using the following command:
   
   ```
   $ cd directory_location/Disk1stage/Response
   ```

2. Copy the response file from the response file directory to a directory on your system, using the following command:

   ```
   $ cp oracle.mvsosdi.server.Typical.rsp local_directory
   ```

3. Open the response file in a text editor, using the following command:

   ```
   $ vi oracle.mvsosdi.server.Typical.rsp
   ```

   **Note:** Some installation response files allow you to run configuration assistants automatically in silent mode. If you choose to do this, ensure that you configure the appropriate response files for the configuration assistants before using the installation response file.

4. Edit the file, following the instructions in the file.

   **Note:** The Installer or configuration assistant fails if you do not correctly configure the response file. See "Non-interactive Response File Error Handling" on page C-3 for more information on troubleshooting a failed non-interactive installation.
Run the Installer Non-interactively

To run the Installer non-interactively, enter a command similar to the following:

```
$ /directory_location/runInstaller -silent -responseFile filename
```

Variables for the previous example are defined as follows:

- `directory_location` is the path of the `Disk1` directory on the hard drive.
- The `-silent` parameter specifies a completely non-interactive installation.
- `filename` is the full path and filename of the installation response file that you configured.

**Note:** Do not use a relative path to the response file. If you use a relative path, the Installer fails.
This appendix documents additional installation information that is referenced in the installation sections. It includes information on the following topics:

- Choosing Data Set Name Qualifiers on page B-2
- Oracle Library Data Sets on page B-2
Choosing Data Set Name Qualifiers

The Oracle Database for z/OS installation setup and initialization process creates the first of several z/OS data sets. Later in the installation, you can specify the high-level and second-level data set name qualifiers that are used for subsequently created data sets.

Oracle recommends that you use the same qualifiers for all of the installation-related data sets. At this time, you need to choose and use the qualifiers that were selected during the installation process.

While choosing qualifiers, remember the following requirements:

- You must choose unique qualifiers.
  
  Using different qualifiers ensures that the products in the product set are maintained in separate libraries as required.

---

**Caution:** Do not use the same qualifiers that you have used for any other Oracle Database for z/OS product set that you have previously installed. If you do, the installation procedures will delete and reallocate your current Oracle libraries. In addition, do not concatenate these libraries with any existing libraries that you are running for previously installed product sets.

- In most z/OS systems, some preparation is required before creating data sets with a new high-level data set name qualifier.
  
  If you intend to use a new high-level qualifier for your Oracle data sets, then you must define an ALIAS before running the job that loads the installation JCL. If in doubt, ask your z/OS systems programmer for assistance.

Oracle Library Data Sets

This section describes the Oracle library data sets that were created during the installation process. You might not have all of these data sets on your system, depending on which products you selected to install.

Oracle Library Data Sets and their sizes are described in the following table:

<table>
<thead>
<tr>
<th>Name</th>
<th>CYLS</th>
<th>Dsorg</th>
<th>Recfm</th>
<th>Lrecl</th>
<th>Blksz</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTHLOAD</td>
<td>300</td>
<td>PDSE</td>
<td>U</td>
<td>0</td>
<td>27998</td>
</tr>
<tr>
<td>CMDLOAD</td>
<td>450</td>
<td>PDSE</td>
<td>U</td>
<td>0</td>
<td>27998</td>
</tr>
<tr>
<td>H</td>
<td>6</td>
<td>PDS</td>
<td>FB</td>
<td>80</td>
<td>8880</td>
</tr>
<tr>
<td>INSTLIB</td>
<td>2</td>
<td>PDSE</td>
<td>FB</td>
<td>80</td>
<td>27920</td>
</tr>
<tr>
<td>MACLIB</td>
<td>2</td>
<td>PDS</td>
<td>FB</td>
<td>80</td>
<td>27920</td>
</tr>
<tr>
<td>MESG</td>
<td>125</td>
<td>PDS</td>
<td>U</td>
<td>0</td>
<td>27998</td>
</tr>
<tr>
<td>OBJLIB</td>
<td>1</td>
<td>PDS</td>
<td>FB</td>
<td>80</td>
<td>27920</td>
</tr>
<tr>
<td>SQL</td>
<td>5</td>
<td>PDSE</td>
<td>VB</td>
<td>2048</td>
<td>27998</td>
</tr>
<tr>
<td>SGLLIB</td>
<td>1</td>
<td>PDSE</td>
<td>U</td>
<td>0</td>
<td>27798</td>
</tr>
<tr>
<td>SRCLIB</td>
<td>2</td>
<td>PDSE</td>
<td>FB</td>
<td>80</td>
<td>27920</td>
</tr>
</tbody>
</table>
The following Oracle libraries can be created on your system depending on which products you select during the installation process.

- `oracle_h1q.AUTHLOAD`
  
  This data set contains programs that must have APF authorization (normally you identify this as an authorized library. For more information, refer to the "Add an APF-Authorized Library" section on page 2-6).

- `oracle_h1q.CMDLOAD`
  
  This data set contains all other executable Oracle utilities, tools, and supporting modules, including Oracle Net and Oracle Access Manager for CICS and IMS TM.

- `oracle_h1q.H`
  
  This data set contains the header files and includes files that are used by the precompilers.

- `oracle_h1q.MACLIB`
  
  This data set contains the CICS and IMS TM macros.

- `oracle_h1q.MESG`
  
  This data set contains the NLS data objects and message files.

- `oracle_h1q.OBJLIB`
  
  This data set contains the object files necessary for linking Oracle Call Interface or Oracle Precompiler programs.

- `oracle_h1q.PARMLIB`
  
  This data set contains sample initialization and parameter files.

- `oracle_h1q.SQL`
  
  This data set contains SQL scripts that create and initialize database tables and PL/SQL sample scripts. The PL/SQL sample script names are documented in the PL/SQL User’s Guide and Reference.

- `oracle_h1q.SQLLIB`
  
  This data set contains the program objects necessary for linking Oracle Call Interface or Oracle Precompiler programs.

- `oracle_h1q.SRCLIB`
  
  This data set contains files to run the demo scripts for Oracle tools and Programmatic Interfaces. It also contains SMF examples, PL/SQL samples, OCI samples, Oracle Precompiler samples, and sample JCL and source code for Oracle Access Manager for CICS and IMS TM.
  
  The PL/SQL sample source names are the same as those that are documented in the Oracle Database PL/SQL User’s Guide and Reference.
This appendix contains information on troubleshooting. It includes information on the following topics:

- X Windows Display Errors on page C-2
- Reviewing a Log of an Installation Session on page C-2
- Non-interactive Response File Error Handling on page C-3
- Cleaning Up After a Failed Installation on page C-3
**X Windows Display Errors**

When you run the Installer, you might see error messages similar to the following:

"Failed to connect to server"
"Connection refused by server"
"Can't open display"

If you see one of these error messages, perform the following tasks:

1. In the session on your workstation, enter the following command:
   
   ```bash
   $ xhost +
   ```

2. From the workstation where you will run the Installer, log in to the server where you intend to install Oracle Database.

3. Enter the following commands, where `workstation_name` is the name of your workstation:
   
   ```bash
   $ DISPLAY=workstation_name:0.0
   $ export DISPLAY
   ```

4. To determine whether your X Window system is working properly on your local system, enter the following command:
   
   ```bash
   $ xclock
   ```

   The X clock should appear on your monitor.

**Reviewing a Log of an Installation Session**

During an installation, the Installer records all of the actions that it performs in a log file. If you encounter problems during the installation, review the log file for information about possible causes of the problem.

To view the log file, follow these steps:

1. If necessary, enter the following command to determine the location of the `oraInventory` directory:
   
   ```bash
   $ more /var/opt/oraInst.loc
   ```

   The `inventory_loc` parameter in this file specifies the location of the `oraInventory` directory.

2. Enter the following command to change directory to the Installer log file directory, where `orainventory_location` is the location of the `oraInventory` directory:
   
   ```bash
   $ cd /orainventory_location/logs
   ```

3. Enter the following command to determine the file name of the log file:
   
   ```bash
   $ ls -ltr
   ```

   This command lists the files in the order of creation, with the most recent file shown last. Installer log files have names similar to the following, where `date_time` indicates the date and time that the installation started:

   ```bash
   installActionsdate_time.log
   ```
4. To view the most recent entries in the log file, where information about a problem is most likely to appear, enter a command similar to the following:

```
$ tail -50 installActionsdate_time.log | more
```

This command displays the last 50 lines in the log file.

5. If the error displayed by the Installer or listed in the log file indicates a relinking problem, see the following file for more information:

```
$ORACLE_HOME/install/make.log
```

---

**Non-interactive Response File Error Handling**

To determine whether a non-interactive installation succeeds or fails, see the following log file:

```
/oraInventory_location/logs/silentInstalldate_time.log
```

If necessary, see the previous section for information on determining the location of the `oraInventory` directory.

A non-interactive installation fails if:

- You do not specify a response file
- You specify an incorrect or incomplete response file
- The Installer encounters an error, such as insufficient disk space

The Installer or configuration assistant validates the response file at runtime. If the validation fails, the non-interactive installation or configuration process ends. The Installer treats values for parameters that are of the wrong context, format, or type as if no value was specified in the file. Variables that are outside any section are ignored.

---

**Cleaning Up After a Failed Installation**

If an installation fails, you must remove files that the Installer created during the attempted installation and remove the Oracle home directory. Perform the following steps to remove the files:

1. Start the Installer as described in the "Install the Oracle Database 10g for z/OS Software" section on page 3-2.

2. Click **Deinstall Products** on the Welcome window or **Installed Products available** on any Installer window. The Inventory window appears, listing installed products.

3. Select any products that you want to remove, then click Remove.

   **Note:** If you have more than one installation on the system, products installed in other Oracle homes appear in the Inventory window. If you select products from other Oracle homes, they are deinstalled.

4. Manually remove the Oracle home directory used by the failed installation.
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