

# Oracle® Fusion Middleware

## System Requirements and Specifications for Oracle Forms and Reports



12c (12.2.1.19.0)

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The Oracle logo, consisting of a solid red square with the word "ORACLE" in white, uppercase, sans-serif font centered within it.

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Oracle Fusion Middleware System Requirements and Specifications for Oracle Forms and Reports, 12c (12.2.1.19.0)

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# Contents

## Preface

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Audience	v
Purpose of this Guide	v
Documentation Accessibility	v
Diversity and Inclusion	v
Conventions	vi

## 1 System Requirements and Specifications

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Using This Document with the Certification Matrix and Product Installation Guides	1-1
Processor Requirements	1-2
Java Development Kit (JDK) Requirements	1-2
General Memory and Disk Space Requirements	1-3
General Memory Requirements	1-3
Minimum Memory Requirement for Installing Oracle Fusion Middleware	1-3
Using a Formula to Determine Memory Requirements for a Specific Deployment	1-4
Example: Determining Memory Requirements for a Development Environment	1-4
Example: Determining Memory Requirements for a Production Environment	1-5
Considering the Impact of Open File and Process Limits on Memory Requirements	1-5
Temporary Disk Space Requirements	1-5
Product-Specific Memory and Disk Space Requirements	1-6
Oracle Universal Installer Requirements	1-6
Startup Requirements	1-7
Modifying the SHMMAX Parameter on Linux Operating Systems	1-7
Repository Creation Utility Requirements	1-8
RCU Supported Platforms	1-8
RCU Requirements for Oracle Databases	1-8
Oracle Fusion Middleware Infrastructure Disk Space Requirements	1-9
Oracle Forms and Reports Disk Space Requirements	1-9
Oracle HTTP Server Disk Space Requirements	1-10
Network Requirements	1-10
Guidelines for a Correct Format of Entries in the /etc/hosts File	1-10
Understanding IPv6 and Oracle Fusion Middleware	1-11

Understanding IPv6 Support by Component	1-11
Understanding IPv6 Support by Topology	1-12
Configuration Requirements for Installing on a DHCP Host	1-14
Configuration Requirements for Installing on a Non-Networked Computer	1-14
Configuration Requirements for Installing on a Multihomed Computer	1-14
Configuration Requirements for Time Synchronization	1-15
UNIX Operating System Requirements	1-15
General UNIX Operating System Requirements	1-15
Enabling Unicode Support	1-16
Setting the Open File Limit and Number of Processes Settings on UNIX Systems	1-17
Linux Operating System Requirements	1-18
Obtaining the openmotif Packages on SUSE 12 and Later Operating System	1-26
Solaris Operating System Requirements	1-26
HP-UX Operating System Requirements	1-28
IBM AIX Operating System Requirements	1-29
Windows Operating Systems Requirements	1-30
Certified Windows Operating Systems	1-30
Disabling Anti-Virus Software	1-31
Installing Microsoft Visual C++ on Windows for System Components	1-31
Enabling User Account Control (UAC)	1-31
Understanding the Required Installation System Privileges for Oracle Forms and Reports	1-32
Virtualization Requirements	1-32
Database Requirements	1-32
Finding a Certified Database	1-32
Configuring Your Oracle Database for the Metadata Services (MDS) Schema	1-33

# Preface

This document lists all the system requirements and the required specifications for the Oracle Forms and Reports software.

- [Audience](#)
- [Purpose of this Guide](#)
- [Documentation Accessibility](#)
- [Diversity and Inclusion](#)
- [Conventions](#)

## Audience

In general, this document is intended for administrators of Oracle Forms and Reports, who need to know the system requirements and specification details in the Oracle Forms and Reports software.

## Purpose of this Guide

The purpose of this guide is to serve as a reference document to use with the Oracle Fusion Middleware Infrastructure installation guides, the Oracle Forms and Reports installation guides, and the Oracle Fusion Middleware 12.2.1.4.0 and 12.2.1.19.0 Certifications. Oracle Fusion Middleware 12c (12.2.1.19.0).

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## Diversity and Inclusion

Oracle is fully committed to diversity and inclusion. Oracle respects and values having a diverse workforce that increases thought leadership and innovation. As part of our initiative to build a more inclusive culture that positively impacts our employees, customers, and partners, we are working to remove insensitive terms from our products and documentation. We are also mindful of the necessity to maintain compatibility with our customers' existing

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technologies and the need to ensure continuity of service as Oracle's offerings and industry standards evolve. Because of these technical constraints, our effort to remove insensitive terms is ongoing and will take time and external cooperation.

## Conventions

The following text conventions are used in this document:

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Convention	Meaning
<b>boldface</b>	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

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# 1

## System Requirements and Specifications

This document contains system and platform-specific information for Oracle Forms and Reports.

The following topics are covered in this document:

- [Using This Document with the Certification Matrix and Product Installation Guides](#)
- [Processor Requirements](#)
- [Java Development Kit \(JDK\) Requirements](#)
- [General Memory and Disk Space Requirements](#)
- [Product-Specific Memory and Disk Space Requirements](#)
- [Network Requirements](#)
- [UNIX Operating System Requirements](#)
- [Windows Operating Systems Requirements](#)
- [Virtualization Requirements](#)
- [Database Requirements](#)

## Using This Document with the Certification Matrix and Product Installation Guides

This document is intended for use in conjunction with the Oracle Fusion Middleware Infrastructure installation guides, the Oracle Forms and Reports installation guides, and the Oracle Fusion Middleware 12.2.1.4.0 and 12.2.1.19.0 Certifications.

Consider the following pre-installation workflow:

### **Task 1 Find Out What is Certified**

The *Oracle Fusion Middleware 12c Certifications* can be found in the table on the [Oracle Fusion Middleware Supported System Configurations](#) page. Find the `.xls` document that includes your products.

Oracle has tested and verified the performance of your product on all certified systems and environments; whenever new certifications occur, they are added to the proper certification document right away. New certifications can occur at any time, and for this reason the certification documents are kept outside of the documentation libraries and are available on Oracle Technology Network.

If you use My Oracle Support, you can reference **My Oracle Support Certifications**, which is a self-service certification application which provides a structured display of most common certification data. Go to

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

and refer to the **Certifications** tab.

### Task 2 Verify the Requirements of the Certification

This document should be used to verify that the requirements of the certification are met. For example, if the certification document indicates that your product is certified for installation on 32-Bit Oracle Linux 5, this document should be used to verify that your Oracle Linux 5 system has met the required minimum specifications, like disk space, available memory, specific platform packages and patches, and other operating system-specific items.

### Task 3 Install Your Software

After you have verified that your environment meets the requirements specified in both the certification documents and system requirements, you are ready to begin your installation.

Your product installation guides contain the step-by-step instructions to get your product physically installed and configured on your system. These guides are available only from the documentation library (<http://docs.oracle.com/>) and therefore are not updated unless there is a subsequent product release. Both the certification and system requirement documents can be updated multiple times in between product releases, depending on whether or not new information is available.

## Processor Requirements

Oracle Fusion Middleware requires a minimum 1-GHz CPU.

## Java Development Kit (JDK) Requirements

To run installers packaged in Java JAR files in the 12c, you must have a certified JDK already installed on your system. Most Fusion Middleware products are available as platform-generic distributions in `.jar` file format. Some products (for example, Oracle HTTP Server) have a `.bin` (for UNIX operating systems) or `.exe` (for Windows operating systems) installer. In the 12c Fusion Middleware products, some platform-specific distributions no longer include and configure a JDK automatically.

For information about the latest certified JDKs, refer to the certification document for your software version listed in [Oracle Fusion Middleware Supported System Configurations](#) page.

#### Note:

It is a best practice to use a separate JDK location than the one installed on the system. One that you can manage and maintain with the Fusion Middleware products. See, Doc ID 1492980.1 **How to Install and Maintain the Java SE Installed or Used with FMW 11g or 12c Products**. This ensures that the Oracle Fusion Middleware software is using the proper version of the JDK software.

For example, if RCU cannot locate the proper JDK software, RCU will fail with the following error: `Cannot Find the File javaw.`

# General Memory and Disk Space Requirements

This section contains the general, minimum memory and disk space requirements for Oracle Fusion Middleware, including Oracle Fusion Middleware Infrastructure and Oracle Forms and Reports.

The following topics are covered:

- [General Memory Requirements](#)
- [Temporary Disk Space Requirements](#)

## General Memory Requirements

The following sections provide general information about how to determine the amount of memory required to run the Oracle Forms and Reports software:

- [Minimum Memory Requirement for Installing Oracle Fusion Middleware](#)
- [Using a Formula to Determine Memory Requirements for a Specific Deployment](#)
- [Example: Determining Memory Requirements for a Development Environment](#)
- [Example: Determining Memory Requirements for a Production Environment](#)
- [Considering the Impact of Open File and Process Limits on Memory Requirements](#)

## Minimum Memory Requirement for Installing Oracle Fusion Middleware

Unless otherwise noted, [Table 1-1](#) lists the general minimum memory requirements for installing Oracle Fusion Middleware products.



### Note:

For the purposes of this document, memory requirements fall into two categories: **physical memory** (the amount of physical RAM installed on host) and the **minimum available memory**, which includes swap space in addition to the physical memory.

The memory requirements listed here are **minimum requirements**. The actual required memory will vary, depending upon the number of Managed Servers and the number of Oracle Fusion Middleware products you configure in the domains on each host. For some guidelines about determining the amount of memory required for a specific deployment, see [Using a Formula to Determine Memory Requirements for a Specific Deployment](#).

If you plan to install and configure a database instance on the same server, you should add at least an additional 2 GB of physical and 2 GB of available memory. For more information about memory requirements for the database, see the documentation for your database software version.

**Table 1-1 Memory Requirements for Installing Oracle Fusion Middleware**

Operating System	Minimum Physical Memory Required	Minimum Available Memory Required
Linux	4 GB	8 GB
UNIX	4 GB	8 GB
Windows	4 GB	8 GB

## Using a Formula to Determine Memory Requirements for a Specific Deployment

Oracle Fusion Middleware installations vary widely in terms of how the Oracle WebLogic Server domains that support them are configured. For example, in some highly available production environments, you might have several Managed Servers running on each host. On the other hand, a single Administration Server, configured in a supported compact domain configuration is adequate for some development purposes.

To estimate the amount of required memory required to run Oracle Fusion Middleware in a particular deployment configuration, you can consider the amount of memory required by the operating system and other software, and then add a set amount of memory that will be required for each Java Virtual Machine (JVM) that you plan to configure on the host. Each Managed Server configured in a domain represents a single JVM instance.

### Note:

It is recommended that for the performance of a well-scaled production environments, the total Java heap memory allocations for all the Managed Servers per host add up to no more than 50% of the total physical memory on the host. If larger JVM heap sizes are required, or more managed servers are needed, physical memory should be increased accordingly.

In general, you can use the following formula as a general guideline to predict the minimum available memory requirements for Oracle Fusion Middleware:

```

3 GB of available memory for the operating system and other software
+ 3 GB of available memory for each Managed Server
-----
Total required available memory

```

It is important to note that this is a general guideline and the actual memory required for the operating system or a specific Managed Server can vary widely, depending on the resources and services targeted to the host or to the Managed Server.

## Example: Determining Memory Requirements for a Development Environment

When determining memory required for a development environment, consider the type of domain you are using to test your applications.

If you are configuring a compact domain for your development system, you can use the general memory formula in [Using a Formula to Determine Memory Requirements for a Specific Deployment](#) as a guideline to determine the initial required memory requirements.

In the compact domain scenario, all resources are targeted to the Administration server, so you need enough memory to support the operating system and one Administration Server:

```
3 GB for the operating system and other software
+ 3 GB for the Administration Server
-----
6 GB of available memory
```

## Example: Determining Memory Requirements for a Production Environment

In a production environment, Oracle recommends as a best practice that you target products and services to specific Managed Servers and clusters, based on the resources required by the products and services.

For example, in a typical enterprise deployment of Oracle SOA Suite, you target Oracle Web Services Manager (OWSM) to one cluster and Oracle SOA Suite to another cluster. This can result in a domain with multiple Managed Servers on each host. As you add additional managed clusters, the memory requirements increase.

For example, if you are planning to configure a Oracle WebLogic Server domain with an Administration Server and two Managed Servers, then you could use the following formula to determine the minimum required available memory:

```
3 GB for the operating system and other software
3 GB for the Admin Server
+ 6 GB for the two Managed Servers
-----
12 GB
```

## Considering the Impact of Open File and Process Limits on Memory Requirements

When determining the memory requirements for a production environment, you should also take into account other operating system settings, including the number of file descriptors (open files) allowed per process and the number of processes required for each product or service that is targeted to a Managed Server.

For information about the recommended minimum open file and process limits for Oracle Fusion Middleware, see [Setting the Open File Limit and Number of Processes Settings on UNIX Systems](#).

For an example of the minimum amount of memory, file descriptors, and processes required for an enterprise deployment in a production environment, see [Typical Memory, File Descriptors, and Processes Required for an Oracle SOA Suite Enterprise Deployment](#) in the *Enterprise Deployment Guide for Oracle SOA Suite*.

## Temporary Disk Space Requirements

The installation program uses a temporary directory into which it extracts the files that are needed to install the software on the target system. During the installation process, your temporary directory must contain sufficient space to accommodate the compressed Java Run-time Environment (JRE) bundled with the installation program and an uncompressed copy of the JRE that is expanded into the temporary directory. The extracted files are deleted

from the temporary directory after the installation process. The files in the temporary directory require approximately 2.5 times the space that is ultimately required for the installation.

By default, the installation program uses the following temporary directories:

- Windows platforms—directory referenced by the `TMP` system variable
- UNIX platforms—system-dependent temporary directory

 **Note:**

If you do not have enough temporary space to run the installation program, you are prompted to specify an alternate directory or exit the installation program.

To make sure that you have adequate temporary space, you may want to allocate an alternate directory for this purpose by doing one of the following (depending on your operating system):

- On Windows operating systems, set the `TMP` system variable to a directory of your choice.
- Run the installation program from the command line and include the `-Djava.io.tmpdir=tmpdirpath` option, replacing `tmpdirpath` with the full path of the directory you want to designate as a temporary storage area for the installation program.

For example, to set up the temporary directory while running the Oracle Fusion Middleware Infrastructure installer for Windows, run the following command:

```
java -Djava.io.tmpdir=C:\Temp -jar fmw_12.2.1.4.0_infrastructure.jar
```

Similarly, to set up the temporary directory while running a platform-specific installer, such as the Oracle HTTP Server installer on a Linux system, run the following command:

```
./ohs_linux64.bin -J-Djava.io.tmpdir=/scratch/<temp dir>
```

## Product-Specific Memory and Disk Space Requirements

This section provides memory and disk space requirements for specific Oracle Fusion Middleware products:

- [Oracle Universal Installer Requirements](#)
- [Repository Creation Utility Requirements](#)
- [Oracle Fusion Middleware Infrastructure Disk Space Requirements](#)
- [Oracle Forms and Reports Disk Space Requirements](#)
- [Oracle HTTP Server Disk Space Requirements](#)

### Oracle Universal Installer Requirements

This section contains prerequisite information for the Oracle Universal Installer (OUI). The requirements in this section must be met in order for the installer to start:

- [Startup Requirements](#)
- [Modifying the SHMMAX Parameter on Linux Operating Systems](#)

## Startup Requirements

The items in [Table 1-2](#) are verified as the installer is being started:

**Table 1-2 Oracle Universal Installer Startup Requirements**

Category	Accepted or Minimum Values
Platforms	For a complete list of supported platforms, refer to Oracle Fusion Middleware Supported System Configurations page, as described in <a href="#">Using This Document with the Certification Matrix and Product Installation Guides</a> .
CPU Speed	At least 300MHz.
Monitor	At least 256 colors (this is a requirement for the graphical mode installer only).
Swap Space	At least 512MB.
JDK	See <a href="#">Java Development Kit (JDK) Requirements</a> for more information about JDK verification on your system.
Temp Space	At least 300MB.

 **Note:**

The temporary space noted here is in addition to the temporary space required for installer extraction as mentioned in [Temporary Disk Space Requirements](#).

## Modifying the SHMMAX Parameter on Linux Operating Systems

If you are running Oracle Universal Installer on a certified Linux operating system, you must modify the value of the SHMMAX kernel parameter to avoid seeing errors generated by the Oracle Universal Installer.

 **Note:**

The following examples are for Linux operating systems. Consult your operating system documentation to determine the commands to be used on your system.

To set the SHMMAX kernel parameter:

1. Change the value of SHMMAX to 4294967295 by including the following line in `/etc/sysctl.conf`:  

```
kernel.shmmax = 4294967295
```
2. Activate the new SHMMAX setting by running the command:  

```
/sbin/sysctl -p
```
3. Start the Oracle Universal Installer and install your software.

## Repository Creation Utility Requirements

This section contains the following topics:

- [RCU Supported Platforms](#)
- [RCU Requirements for Oracle Databases](#)

### RCU Supported Platforms

You can run RCU from any machine to connect to any certified local or remote database in order to create the schemas required by your Oracle Fusion Middleware product. The database can be running on any operating system platform that is supported by that particular database.

### RCU Requirements for Oracle Databases

RCU checks for the following on Oracle databases:

- Database version is: Equal to or higher than 19.14.0

 **Note:**

Always refer to the appropriate certification document for your release on the [Oracle Fusion Middleware Supported System Configurations](#) page for the latest certification information.

In some cases, additional database certifications may be added before RCU is updated. When you run RCU, you may receive a warning that the database on which you are installing the schemas is not supported; as long as the database version is listed in the certification document, you can safely ignore this warning.

- Database supported type is Oracle Enterprise Edition.

 **Note:**

Oracle Enterprise Edition is certified for Oracle Fusion Middleware.

- Database is installed with Oracle JVM enabled. Refer to your database documentation for information about how to do this.
- Character set is AL32UTF8.

If your database does not use the AL32UTF8 character set, you will see the following warning when running RCU:

```
The selected Oracle database is not configured to use the AL32UTF8 character set.
Oracle strongly recommends using the AL32UTF8 character set for databases that
support Oracle Fusion Middleware.
```

User can proceed with this warning but it is highly recommended to use the AL32UTF8 character set to avoid any error with RCU.

- The following database parameters are set as specified:

Parameter	Minimum Required Value
SHARED_POOL_SIZE	147,456 KB
SGA_MAX_SIZE	147,456 KB
DB_BLOCK_SIZE	8 KB
session_cached_cursors	100
processes	1000
open_cursors	1600
db_files	600

For details on Database Requirements, see [Database Requirements](#).

## Oracle Fusion Middleware Infrastructure Disk Space Requirements

[Table 1-3](#) shows the disk space requirements for Oracle Fusion Middleware Infrastructure.

**Table 1-3 Oracle Fusion Middleware Infrastructure Disk Space Requirements**

Installation Type	Disk Space required
Fusion Middleware Infrastructure	2.2 GB
Fusion Middleware Infrastructure With Examples	2.3 GB

## Oracle Forms and Reports Disk Space Requirements

[Table 1-4](#) shows the disk space requirements for Oracle Forms and Reports.

**Table 1-4 Oracle Forms and Reports Disk Space Requirements**

Installation Type	Disk Space required
Standalone Forms Builder	3.5 GB
Forms and Reports Deployment (includes Fusion Middleware Infrastructure)	6.5 GB

**Note:**

Depending on the platform and configuration options you choose, the space requirements might vary slightly.

## Oracle HTTP Server Disk Space Requirements

Table 1-5 shows the disk space requirements for Oracle HTTP Server.

**Table 1-5 Oracle HTTP Server Disk Space Requirements**

Installation Type	Disk Space Required
Colocated HTTP Server	3.5 GB

## Network Requirements

Typically, the computer on which you want to install Oracle Fusion Middleware is connected to the network. The computer has local storage to store the Oracle Fusion Middleware installation and also contains a display monitor and DVD drive (if you do not prefer to install from the downloaded media).

It describes the following cases:

- [Guidelines for a Correct Format of Entries in the /etc/hosts File](#)
- [Understanding IPv6 and Oracle Fusion Middleware](#)
- [Configuration Requirements for Installing on a DHCP Host](#)
- [Configuration Requirements for Installing on a Non-Networked Computer](#)
- [Configuration Requirements for Installing on a Multihomed Computer](#)
- [Configuration Requirements for Time Synchronization](#)

## Guidelines for a Correct Format of Entries in the /etc/hosts File

To ensure that both forward lookup (find the IP address given the hostname) and reverse lookup (finding the hostname given the IP address) return the same results, make sure your `/etc/hosts` file is formatted correctly using the following guidelines:

- The host name may contain only alphanumeric characters, hyphen, and period. The name must begin with an alphabetic character and end with an alphanumeric character.
- Host names should be specified as fully qualified host names (host name with the appended domain name).
- Lines cannot start with a blank space or tab character, but fields may be separated by any number of space or tab characters.
- Comments are allowed and designated by a pound sign (#) preceding the comment text.
- Trailing blank and tab characters are allowed.

- Blank line entries are allowed.
- Only one host entry per line is allowed.

For example: 11.111.11.11 server.example.com server

## Understanding IPv6 and Oracle Fusion Middleware

Oracle Fusion Middleware products support Internet Protocol Version 4 (IPv4) and some also support Internet Protocol Version 6 (IPv6). The following sections provide more information.

An IPv6 address is expressed as 8 groups of 4 hexadecimal digits. For example:

```
2001:0db8:85a3:08d3:1319:8a2e:0370:7334
```

This section contains the following additional topics to help you understand IPv6 in Oracle Fusion Middleware:

- [Understanding IPv6 Support by Component](#)
- [Understanding IPv6 Support by Topology](#)

## Understanding IPv6 Support by Component

[Table 1-6](#) describes support for IPv6 by Oracle Fusion Middleware components:

- The column **IPv6 Only**, indicates whether a component supports using IPv6 for all communication and does not require the availability of IPv4
- The column **Dual Stack** indicates whether a component supports using both IPv6 and IPv4 for communication at the same time. For example, if the component using IPv6 must communicate with another component not capable of communicating with IPv6, then IPv4 must be used when that communication becomes necessary. In this case, both IPv6 and IPv4 must be available on the server.

**Table 1-6 IPv6 Support in Oracle Fusion Middleware**

Component	IPv6 Only	Dual Stack	Comments
Oracle Application Development Framework	Yes	Yes	None
Oracle Business Intelligence	No	Yes	None
Oracle HTTP Server	Yes	Yes	To configure Oracle HTTP Server for IPv6, see <i>Configuring Oracle HTTP Server for IPv6</i> in <i>Administering Oracle Fusion Middleware</i> .
Oracle WebLogic Server	Yes	Yes	The Oracle WebLogic Server Web Server plug-ins support IPv6, beginning with the 11g release.
Oracle Data Integrator	No	Yes	Requires a dual stack because Oracle Database requires IPv4 addresses. The Agent requires IPv4 addresses. The Oracle Data Integrator server can be on a dual-stack host. The browser client can be on either IPv4 or IPv6 hosts.
Oracle Forms Services	No	No	Oracle Forms and Reports are configured with Oracle HTTP Server and <code>mod_wl_ohs</code> to proxy requests, which can be configured for IPv6.

**Table 1-6 (Cont.) IPv6 Support in Oracle Fusion Middleware**

Component	IPv6 Only	Dual Stack	Comments
Oracle Information Rights Management	No	Yes	Requires a dual stack but the client (the browser) can be on a host configured for IPv6.
Oracle Platform Security Services	No	Yes	Requires a dual stack because Oracle Database requires IPv4 addresses.
Oracle Reports	No	No	Uses reverse proxy to communicate with Oracle HTTP Server, which can be configured for IPv6.
Oracle SOA Suite	No	Yes	Requires a dual stack because Oracle Database requires IPv4 addresses.
Oracle WebCenter Content: Imaging	No	Yes	Requires a dual stack, but the client (the browser) can be on a host configured for IPv6.
Oracle WebCenter Portal	No	Yes	Requires a dual stack because Oracle Database requires IPv4 addresses.
Oracle Internet Directory	Yes*	Yes	Limited support for IPv6. <ul style="list-style-type: none"> <li>Linux: Full support for IPv6.</li> <li>*Windows: Requires a dual stack because Oracle Database requires IPv4 addresses.</li> </ul> See, Introduction to Managing IP Addresses in <i>Administering Oracle Internet Directory</i> .
Oracle Unified Directory and Directory Integration Platform	Yes	Yes	None

## Understanding IPv6 Support by Topology

[Table 1-7](#) shows the supported topologies for IPv4 and IPv6 (dual-stack means that the host is configured with both IPv4 and IPv6):

**Table 1-7 Supported IPv6 Topologies**

Topology	Description
Topology A	This topology includes: <ul style="list-style-type: none"> <li>Oracle Database on an IPv4 protocol host</li> <li>Oracle WebLogic Server on a dual-stack host</li> <li>Clients on an IPv4 protocol host</li> <li>Clients on an IPv6 protocol host</li> </ul>
Topology B	This topology includes: <ul style="list-style-type: none"> <li>Oracle Database on an IPv4 protocol host</li> <li>One or more of Oracle WebLogic Server or Fusion Middleware Control on dual-stack hosts</li> <li>Oracle HTTP Server with <code>mod_wl_ohs</code> on an IPv6 protocol host</li> </ul>

Table 1-7 (Cont.) Supported IPv6 Topologies

Topology	Description
Topology B	<p>This topology includes:</p> <ul style="list-style-type: none"> <li>• Oracle Database on an IPv4 protocol host</li> <li>• One or more of Oracle WebLogic Server, Fusion Middleware Control, Oracle SOA Suite, Oracle WebCenter Portal, or Oracle Business Activity Monitoring on dual-stack hosts</li> <li>• Oracle HTTP Server with <code>mod_wl_ohs</code> on an IPv6 protocol host</li> </ul>
Topology C	<p>This topology includes:</p> <ul style="list-style-type: none"> <li>• Database, such as MySQL, that supports IPv6 on an IPv6 protocol host</li> <li>• Oracle WebLogic Server on an IPv6 protocol host</li> <li>• Clients on an IPv6 protocol host</li> </ul>
Topology D	<p>This topology includes:</p> <ul style="list-style-type: none"> <li>• Oracle Database on an IPv4 protocol host</li> <li>• One or more of Oracle WebLogic Server or Fusion Middleware Control on dual-stack hosts</li> <li>• Clients on an IPv4 protocol host</li> <li>• Clients on an IPv6 protocol host</li> </ul>
Topology E	<p>This topology includes:</p> <ul style="list-style-type: none"> <li>• Oracle Database on an IPv4 protocol host</li> <li>• One or more of Oracle Forms Services or Oracle Reports on dual-stack hosts</li> <li>• Oracle HTTP Server with <code>mod_proxy</code> on a dual stack host</li> <li>• Clients on an IPv6 protocol host</li> </ul>
Topology F	<p>This topology includes the following:</p> <ul style="list-style-type: none"> <li>• Oracle Access Manager Release 10.1.4.3 and applications, such as SOA composite applications, on an IPv4 protocol host</li> <li>• Oracle HTTP Server with <code>mod_proxy</code> on a dual stack host</li> <li>• Clients on an IPv6 protocol host</li> </ul>
Topology D	<p>This topology includes:</p> <ul style="list-style-type: none"> <li>• Oracle Database on an IPv4 protocol host</li> <li>• One or more of Oracle Identity Management, Fusion Middleware Control, Oracle SOA Suite, Oracle WebCenter Portal, or Oracle Business Activity Monitoring on dual-stack hosts</li> <li>• Clients on an IPv4 protocol host</li> <li>• Clients on an IPv6 protocol host</li> </ul>
Topology G	<p>This topology includes:</p> <ul style="list-style-type: none"> <li>• Oracle Database on an IPv4 protocol host</li> <li>• One or more of Oracle WebLogic Server or Fusion Middleware Control on an IPv4 protocol host</li> <li>• Oracle HTTP Server with <code>mod_wl_ohs</code> on a dual-stack host</li> <li>• Clients on an IPv6 protocol host</li> </ul>

Table 1-7 (Cont.) Supported IPv6 Topologies

Topology	Description
Topology G	<p>This topology includes:</p> <ul style="list-style-type: none"> <li>• Oracle Database on an IPv4 protocol host</li> <li>• One or more of Oracle SOA Suite, Oracle WebCenter Portal, Oracle Business Activity Monitoring or Fusion Middleware Control on an IPv4 protocol host</li> <li>• Oracle HTTP Server with <code>mod_wl_ohs</code> on a dual-stack host</li> <li>• Clients on an IPv6 protocol host</li> </ul>

## Configuration Requirements for Installing on a DHCP Host

Dynamic Host Configuration Protocol (DHCP) assigns dynamic IP addresses on a network. Dynamic addressing allows a computer to have a different IP address each time it connects to the network. In some cases, the IP address can change while the computer is still connected. You can have a mixture of static and dynamic IP addressing in a DHCP system.

In a DHCP setup, the software tracks IP addresses, which simplifies network administration. This lets you add a new computer to the network without having to manually assign that computer a unique IP address. However, before installing Oracle Fusion Middleware products onto a computer that uses the DHCP protocol, you must install a loopback adapter to assign a static, non-routable IP address to that computer.

If you are installing your Oracle Fusion Middleware products on a DHCP host, refer to your operating system documentation for instructions on how to properly configure a loopback adapter.

## Configuration Requirements for Installing on a Non-Networked Computer

You can install your Oracle Fusion Middleware product on a non-networked computer, such as a laptop. Because a non-networked computer has no access to other computers, you have to install all the components that you need on the computer.

In addition, you must follow the instructions in [Configuration Requirements for Installing on a DHCP Host](#) to install a loopback adapter and modify the `hosts` file on your system.

## Configuration Requirements for Installing on a Multihomed Computer

You can install your Oracle Fusion Middleware product on a multihomed computer. A multihomed computer is associated with multiple IP addresses. This is typically achieved by having multiple network cards on the computer. Each IP address is associated with a host name; additionally, you can set up aliases for each hostname.

The installer picks up the fully qualified domain name from the first entry in `/etc/hosts` (on UNIX operating systems) or `%SYSTEMROOT%\system32\drivers\etc\hosts` (on

Windows operating systems) file. So if your file looks like the following (IPv4 example shown below):

```
127.0.0.1 localhost.localdomain localhost
10.1.1.1 examplehost1.example.com examplehost1
10.2.2.2 examplehost2.example.com examplehost2
```

examplehost1.example.com would be picked for configuration.

For specific network configuration of a system component, refer to the individual component's configuration documentation.

In any situation where you change any combination of the host name, domain name, or IP address of a host, you also change the information for your Oracle Fusion Middleware components. See ["Changing the Network Configuration of Oracle Fusion Middleware"](#) in *Administering Oracle Fusion Middleware* for more information about additional steps that need to be performed.

## Configuration Requirements for Time Synchronization

To ensure proper interoperability between Oracle Fusion Middleware services, databases, and storage, it is critical that all of the computers have synchronized clocks. A common way to achieve this is to use the Network Time Protocol (NTP) and configure redundant synchronization to multiple time servers. Optionally, to achieve fail-safe redundancy, consider configuring the local servers as NTP peers as well.

See [Configuring a Host to Use an NTP \(time\) Server in an Oracle Fusion Middleware Enterprise Deployment Guide for Oracle WebCenter Portal](#).

## UNIX Operating System Requirements

This section contains system requirement information for UNIX operating systems.

In some cases, a particular platform may be de-supported for use with Oracle Fusion Middleware products. While this particular platform's requirements may remain in this document for legacy purposes, it would no longer be listed in the certification information and would no longer be considered a *certified* platform.

See, [Using This Document with the Certification Matrix and Product Installation Guides](#).

All packages listed are minimum versions.

The following topics are covered in this section:

- [General UNIX Operating System Requirements](#)
- [Linux Operating System Requirements](#)
- [Solaris Operating System Requirements](#)
- [HP-UX Operating System Requirements](#)
- [IBM AIX Operating System Requirements](#)

## General UNIX Operating System Requirements

This section contains the following topics:

- [Enabling Unicode Support](#)

- [Setting the Open File Limit and Number of Processes Settings on UNIX Systems](#)

## Enabling Unicode Support

Your operating system configuration can influence the behavior of characters supported by Oracle Fusion Middleware products.

On UNIX operating systems, Oracle highly recommends that you enable Unicode support by setting the `LANG` and `LC_ALL` environment variables to a locale with the UTF-8 character set. This enables the operating system to process any character in Unicode. [Table 1-8](#) describes these environment variables.



### Note:

Ensure that the required locales for the UTF-8 character set are installed on the host computer. This is a prerequisite for the Oracle Business Intelligence software.

**Table 1-8 Language Environment Variables on UNIX Operating Systems**

Variable	Description
<code>LANG</code>	This environment variable sets the installation default locale. For example:  <code>setenv LANG en_US.UTF-8</code>
<code>LC_ALL</code>	This environment variable overrides the value of the <code>LANG</code> environment variable and the values of any other <code>LC_*</code> environment variables. For example:  <code>setenv LC_ALL en_US.UTF-8</code>

To check your current locale settings, use the `locale` command on your system. Below is an example:

```
locale
LANG=en_US.UTF-8
LC_CTYPE=en_US.UTF-8
LC_NUMERIC=en_US.UTF-8
LC_TIME=en_US.UTF-8
LC_COLLATE=en_US.UTF-8
LC_MONETARY=en_US.UTF-8
LC_MESSAGES=
LC_PAPER="POSIX"
LC_NAME="POSIX"
LC_ADDRESS="POSIX"
LC_TELEPHONE="POSIX"
LC_MEASUREMENT="POSIX"
LC_IDENTIFICATION="POSIX"
LC_ALL=
```

If the operating system is configured to use a non-UTF-8 encoding, Oracle SOA Suite components may function in an unexpected way. For example, a non-ASCII file name can make the file inaccessible and cause an error. Oracle does not support problems caused by operating system constraints.

In a design-time environment, if you are using Oracle JDeveloper, select **Tools -> Preferences -> Environment -> Encoding -> UTF-8** to enable Unicode support.

## Setting the Open File Limit and Number of Processes Settings on UNIX Systems



### Note:

The following examples are for Linux operating systems. Consult your operating system documentation to determine the commands to be used on your system.

For more information, see the following topics:

- [Viewing the Number of Currently Open Files](#)
- [Setting the Operating System Open File and Processes Limit](#)

### Viewing the Number of Currently Open Files

You can see how many files are open with the following command:

```
/usr/sbin/lsof | wc -l
```

To check your open file limits, use the commands below.

#### C shell:

```
limit descriptors
```

#### Bash:

```
ulimit -n
```

### Setting the Operating System Open File and Processes Limit

To change the Open File Limit:

1. Log in as `root` and edit the following file:

```
/etc/security/limits.conf
```

2. Add the following lines to the `limits.conf` file.

```
* soft nofile 4096
* hard nofile 65536
* soft nproc 2047
* hard nproc 16384
```

The `nfiles` values represent the open file limit; the `nproc` values represent the number of processes limit.

3. Save the changes, close the `limits.conf` file.
4. If you are running Oracle Enterprise Linux 7 or Red Hat Linux 7, locate the following operating system configuration file:

```
/etc/security/limits.d/20-nproc.conf
```

5. Make sure the same values are added to the `20-nproc.conf` file; otherwise, the values in the `20-nproc.conf` file can override the values in the `limits.conf` file.
6. Reboot the host computer.

## Linux Operating System Requirements

[Table 1-9](#) lists the platform, operating system, package, and patch information for Linux operating systems that are either currently supported or were supported in a previous release.

Use the following links to go directly to the row of your choice:

- x86-64 [Oracle Linux 8 \(UL6+\) and Red Hat Linux 8 \(UL6+\)](#)
- x86-64 [Oracle Linux 7 \(UL9+\) and Red Hat Linux 7 \(UL9+\)](#)
- x86-64 [SUSE Linux Enterprise Server 15 \(SP4+\)](#)
- x86-64 [SUSE Linux Enterprise Server 12 \(SP5+\)](#)

**Table 1-9 Minimum Requirements for the Linux Operating System**

Processor	Operating System Version	Required Packages	Required Kernel Version
x86-64	Oracle Linux 8 (UL6+) and Red Hat Linux 8 (UL6+)	binutils-2.30-113.0.3 .e18.x86_64 gcc-8.5.0-10.1.0.1.e1 8_6.x86_64 gcc-c+ +-8.5.0-10.1.0.1.e18_ 6.x86_64 glibc-2.28-189.5.0.1. e18_6.x86_64 glibc- devel-2.28-189.5.0.1. e18_6.x86_64 ksh-20120801-255.0.1. e18_6.x86_64 libaio-0.3.112-1.e18. x86_64 libaio- devel-0.3.112-1.e18.x 86_64 libgcc-8.5.0-10.1.0.1 .e18_6.x86_64 libnsl-2.28-189.5.0.1 .e18_6.x86_64 libstdc+ +-8.5.0-10.1.0.1.e18_ 6.x86_64 libstdc++- devel-8.5.0-10.1.0.1. e18_6.x86_64 libX11-1.6.8-5.e18.x8 6_64 libXtst-1.2.3-7.e18.x 86_64 libXtst- devel-1.2.3-7.e18.x86 _64 make-4.2.1-11.e18.x86 _64 motif-2.3.4-17.e18_6. 1.x86_64 motif- devel-2.3.4-17.e18_6. 1.x86_64 openssl-1.1.1k-7.e18_ 6.x86_64	See <a href="#">How to Obtain the Required Kernel Version for Linux Operating Systems.</a>

**Table 1-9 (Cont.) Minimum Requirements for the Linux Operating System**

Processor	Operating System Version	Required Packages	Required Kernel Version
		redhat- lsb-4.1-47.0.1.e18.x8 6_64 redhat-lsb- core-4.1-47.0.1.e18.x 86_64 sysstat-11.7.3-7.e18. x86_64 xorg-x11- utils-7.5-28.e18.x86_ 64	

**Table 1-9 (Cont.) Minimum Requirements for the Linux Operating System**

Processor	Operating System Version	Required Packages	Required Kernel Version
X86-64	Oracle Linux 7 (UL9+) and Red Hat Linux 7 (UL9+)	binutils-2.27-44.base .0.3.e17_9.1.x86_64 compat- libcap1-1.10-7.e17.x86_64 compat-libstdc++-33-3.2.3-72.e17.x86_64 gcc-4.8.5-44.0.3.e17.x86_64 gcc-c++-4.8.5-44.0.3.e17.x86_64 glibc-2.17-326.0.1.e17_9.x86_64 glibc-devel-2.17-326.0.1.e17_9.x86_64 ksh-20120801-144.0.1.e17_9.x86_64 libaio-0.3.109-13.e17.x86_64 libaio-devel-0.3.109-13.e17.x86_64 libgcc-4.8.5-44.0.3.e17.x86_64 libstdc++-4.8.5-44.0.3.e17.x86_64 libstdc++-devel-4.8.5-44.0.3.e17.x86_64 make-3.82-24.e17.x86_64 motif-2.3.4-14.e17_5.x86_64 motif-devel-2.3.4-14.e17_5.x86_64 openssl-1.0.2k-25.e17_9.x86_64 redhat-lsb-4.1-27.0.1.e17.x86_64	See <a href="#">How to Obtain the Required Kernel Version for Linux Operating Systems</a> .

**Table 1-9 (Cont.) Minimum Requirements for the Linux Operating System**

Processor	Operating System Version	Required Packages	Required Kernel Version
		redhat-lsb-core-4.1-27.0.1.el7.x86_64 sysstat-10.1.5-19.0.3.el7.x86_64 xorg-x11-utils-7.5-23.el7.x86_64	

**Table 1-9 (Cont.) Minimum Requirements for the Linux Operating System**

Processor	Operating System Version	Required Packages	Required Kernel Version
x86-64	SUSE Linux Enterprise Server 15 (SP4+)	bc-1.07.1-11.37.x86_64 - 4 binutils-2.37-150100. 7.29.1.x86_64 compat-libpthread- nonshared-0-150300.3. 6.1.x86_64 gcc7-7.5.0+r278197-4. 30.1.x86_64 gcc-7-3.9.1.x86_64 gcc7-c+ +-7.5.0+r278197-4.30. 1.x86_64 glibc-2.31-150300.20. 7.x86_64 glibc- devel-2.31-150300.20. 7.x86_64 insserv- compat-0.1-4.6.1.noar ch libaio1-0.3.109-1.25. x86_64 libaio- devel-0.3.109-1.25.x8 6_64 libcap-ng- utils-0.7.9-4.37.x86_ 64 libcap- progs-2.63-150400.1.7 .x86_64 libgcc_s1-12.2.1+git4 16-150000.1.7.1.x86_6 4 libnsl2-1.2.0-2.44.x8 6_64 libstdc+ +6-12.2.1+git416-1500 00.1.7.1.x86_64 libstdc++- devel-7-3.9.1.x86_64 libX11-6-1.6.5-3.21.1 .x86_64 libXtst6-1.2.3-1.24.x 86_64	

**Table 1-9 (Cont.) Minimum Requirements for the Linux Operating System**

Processor	Operating System Version	Required Packages	Required Kernel Version
		libXtst- devel-1.2.3-1.24.x86_ 64 make-4.2.1-7.3.2.x86_ 64 mksh-56c-1.10.x86_64 motif-2.3.4-3.3.1.x86_ 64 motif- devel-2.3.4-3.3.1.x86_ 64 rdma- core-38.1-150400.4.6. x86_64 smartmontools-7.2-150 300.8.5.1.x86_64 sysstat-12.0.2-3.33.1 .x86_64 openssl-1_1-1.1.11-15 0400.5.14.x86_64 xorg- x11-7.6_1-1.22.noarch	

Table 1-9 (Cont.) Minimum Requirements for the Linux Operating System

Processor	Operating System Version	Required Packages	Required Kernel Version
x86-64	SUSE Linux Enterprise Server 12 (SP5+)	bc-1.06.95-6.56.x86_64 - 4 binutils-2.32-9.36.1.x86_64 gcc-4.8-6.189.x86_64 gcc-c++-4.8-6.189.x86_64 glibc-2.22-100.15.4.x86_64 glibc-devel-2.22-100.15.4.x86_64 libaio1-0.3.109-17.15.x86_64 libaio-devel-0.3.109-17.15.x86_64 libgcc_s1-8.2.1+r264010-1.3.3.x86_64 libcap2-2.22-13.1.x86_64 libcap1-1.10-61.1.x86_64 libstdc++-devel-4.8-6.189.x86_64 4 libstdc++48-devel-4.8.5-31.20.1.x86_64 libstdc++6-8.2.1+r264010-1.3.3.x86_64 libstdc++6-locale-8.2.1+r264010-1.3.3.x86_64 make-4.0-4.1.x86_64 mksh-50f-5.1.x86_64 motif-2.3.4-4.15.x86_64 openssl-1_0_0-1.0.2p-3.11.1.x86_64 rdma-core-22.3-2.21.x86_64 smartmontools-6.6-6.6.3.x86_64	

**Table 1-9 (Cont.) Minimum Requirements for the Linux Operating System**

Processor	Operating System Version	Required Packages	Required Kernel Version
		xorg-x11- libs-7.6-45.14.noarch xz-5.0.5-6.3.1.x86_64	

### How to Obtain the Required Kernel Version for Linux Operating Systems

For default kernel information, see the Shipped Kernels Chapter in the release notes mentioned below. The Red Hat Compatible kernel and the Unbreakable Enterprise kernel (default kernel) mentioned for x86–64 are supported.

To identify the required Kernel version for each supported version of Oracle Linux, refer to the following resources:

- [Oracle Linux 8 Documentation Library](#)
- [Oracle Linux 7 Documentation Library](#)

For Oracle Linux 8 (UL6+) and Oracle Linux 7 (UL9+) Containers, refer to Table 1 on [Supported Virtualization and Partitioning Technologies for Oracle Fusion Middleware](#) on the Oracle Technology Network.

- [Obtaining the openmotif Packages on SUSE 12 and Later Operating System](#)

## Obtaining the openmotif Packages on SUSE 12 and Later Operating System

The `openmotif` package is not included by default on SUSE 12 and SUSE 15 operating system.

If you need to obtain this package, you must go to the Novell website to obtain the package and then perform the installation using the instructions provided by Novell.

If you need to obtain this package, go to the [opensuse](#) website to obtain the package. Follow the provided instructions to complete the installation.

## Solaris Operating System Requirements

[Table 1-10](#) lists the platform, operating system, package, and patch information for Solaris operating systems.

Table 1-10 Solaris Operating System Requirements

Processor	Operating System Version	Required Packages
Solaris x86-64	Oracle Solaris 11.4 (Oracle Solaris 11.4.2.0.1.3.0) or later SRUs and updates Oracle Solaris 11.3 SRU 31 (Oracle Solaris 11.3.31.6.0) or later SRUs and updates	<p>pkg://solaris/system/library/openmp</p> <p>pkg://solaris/compress/unzip</p> <p>pkg://solaris/developer/ assembler</p> <p>pkg://solaris/developer/build/make</p> <p>pkg://solaris/system/dtrace</p> <p>pkg://solaris/system/header</p> <p>pkg://solaris/system/library</p> <p>pkg://solaris/system/linker</p> <p>pkg://solaris/system/xopen/xcu4 (If it is not already installed as part of standard the Oracle Solaris 11 installation)</p> <p>pkg://solaris/x11/diagnostic/x11-info-clients</p> <p>pkg://solaris/system/kernel/oracka</p> <p><b>Note:</b> From Oracle Solaris 11.2 onwards, if you have performed a standard Oracle Solaris 11 installation and installed the Oracle Database prerequisites group package <code>oracle-database-preinstall-19c</code>, then you do not have to install these packages, as <code>oracle-database-preinstall-19c</code> installs them for you.</p>

**Table 1-10 (Cont.) Solaris Operating System Requirements**

Processor	Operating System Version	Required Packages
SPARC64	Oracle Solaris 11.4 (Oracle Solaris 11.4.2.0.1.3.0) or later SRUs and updates Oracle Solaris 11.3 SRU 31 (Oracle Solaris 11.3.31.6.0) or later SRUs and updates	<p>pkg://solaris/system/library/openmp</p> <p>pkg://solaris/compress/unzip</p> <p>pkg://solaris/developer/ assembler</p> <p>pkg://solaris/developer/ build/make</p> <p>pkg://solaris/system/dtrace</p> <p>pkg://solaris/system/header</p> <p>pkg://solaris/system/library</p> <p>pkg://solaris/system/linker</p> <p>pkg://solaris/system/xopen/xcu4 (If it is not already installed as part of standard the Oracle Solaris 11 installation)</p> <p>pkg://solaris/x11/diagnostic/x11-info-clients</p> <p>pkg://solaris/system/kernel/oracka</p> <p><b>Note:</b> From Oracle Solaris 11.2 onwards, if you have performed a standard Oracle Solaris 11 installation and installed the Oracle Database prerequisites group package <code>oracle-database-preinstall-19c</code>, then you do not have to install these packages, as <code>oracle-database-preinstall-19c</code> installs them for you.</p>

## HP-UX Operating System Requirements

Table 1-11 lists the platform, operating system, package, and patch information for HP-UX operating systems that are either currently supported or were supported in a previous release.



**Note:**

On HP\_UX systems, you can verify what Motif packages are installed on the machine using the following command:

```
/usr/sbin/swlist -l fileset | grep -i motif
```

**Table 1-11 HP-UX Operating System Requirements**

Processor	Operating System Version	Required Packages	Required Operating System Patches
Itanium	HP-UX 11.31 May 2019 B.11.31.1905.441b or later	Motif 2.1 (Version 2.1)	PHCO_43503 - 11.31 diskowner(1M) cumulative patch PHKL_44248 - 11.31 SCSI cumulative I/O patch PHSS_37042 - 11.31 hppac PHSS_42686 - 11.31 assembler patch PHSS_42981 - 11.31 OS patch PHSS_43205 - 11.31 Math Library Cumulative Patch PHSS_43733 - 11.31 LIBCL patch PHSS_43740 - 11.31 Integrity Unwind Library

## IBM AIX Operating System Requirements

[Table 1-12](#) lists the platform, operating system, package, and patch information for IBM AIX operating systems that are either currently supported or were supported in a previous release.

**Table 1-12 IBM AIX Operating System Requirements**

Processor	Operating System Version	Required Packages
POWER	AIX 7.1 Technology Level 5 Service Pack 1 (7100-05-01-1731) or later, 64-bit kernel	bos.adt.base bos.adt.lib bos.adt.libm bos.perf.libperfstat bos.perf.perfstat bos.perf.proctools rsct.compat.clients.rte security.pkcs11.7.1.3.15 or later xlC.aix61.rte:13.1.0.1 or later xlC.rte:13.1.0.1 or later xlfrte.aix61-15.1.0.9 or later

**Table 1-12 (Cont.) IBM AIX Operating System Requirements**

Processor	Operating System Version	Required Packages
POWER	AIX 7.2 Technology Level 2 Service Pack 1 (7200-02-01-1731) or later, 64-bit kernel	bos.adt.base 7.2.0.0 bos.adt.lib 7.2.0.0 bos.adt.libm 7.2.0.0 bos.perf.libperfstat 7.2.0.0 bos.perf.perfstat 7.2.0.0 bos.perf.proctools 7.2.0.0 xlC.aix61.rte:13.1.0.1 or later xlC.rte:13.1.0.1 or later xlfрте.aix61-15.1.0.9 or later
POWER	AIX 7.3 Technology Level 0 Service Pack 1 (7300-00-01-2148) or later, 64-bit kernel	bos.adt.base bos.adt.lib bos.adt.libm bos.perf.libperfstat bos.perf.perfstat bos.perf.proctools xlC.aix61.rte.13.1.2.0 or later xlC.rte.13.1.2.0 or later xlfрте

## Windows Operating Systems Requirements

This section contains the following information regarding Microsoft Windows operating systems:

- [Certified Windows Operating Systems](#)
- [Disabling Anti-Virus Software](#)
- [Installing Microsoft Visual C++ on Windows for System Components](#)
- [Enabling User Account Control \(UAC\)](#)
- [Understanding the Required Installation System Privileges for Oracle Forms and Reports](#)

### Certified Windows Operating Systems

Refer to the certification document for 12c (12.2.1) on the [Oracle Fusion Middleware Supported System Configurations](#) page for the latest information on certified Windows operating systems.

## Disabling Anti-Virus Software

If you encounter issues related to anti-virus software during your Fusion Middleware product installation, disable your anti-virus software for the entire duration of the installation. If the system is restarted before the installation is complete, ensure the anti-virus software was not restarted before continuing with the installation.

Anti-virus software can be re-enabled when the installation is complete.

## Installing Microsoft Visual C++ on Windows for System Components

This includes:

- Oracle HTTP Server
- Forms and Reports

On the Windows platform, these components require the Microsoft Visual C++ run-time libraries to be installed on the system.

If these libraries are not installed on your Windows operating system, then you will receive an error during the prerequisite check phase of these components.

To meet this system requirement, download the correct version of Visual C++ Redistributable for Visual Studio by referring to [Table 1-13](#) below.

You can download the software from [Microsoft Visual C++ Redistributable latest supported downloads](#).

**Table 1-13 MS Visual C++ version for Windows Operating System**

Fusion Middleware Products	Visual Studio (VC++) Version
Oracle HTTP Server	Visual Studio 2017 (VC++ 14.34)
Forms and Reports	Visual Studio 2017 (VC++ 14.34)

## Enabling User Account Control (UAC)

On Microsoft Windows, you must enable User Account Control (UAC) so that the correct permissions are applied to the `cwallet.sso` file.

To enable UAC:

1. Run `secpol.msc` from the command prompt.
2. Select **Security Settings > Local Policies > Security Options**.
3. Set the **User Account Control:Run all Administrator in Admin Approval Mode** option to enabled.
4. Restart the host.
5. Restart the servers.

## Understanding the Required Installation System Privileges for Oracle Forms and Reports

In order to install **Oracle Forms and Reports**, or to use **Oracle Forms and Reports Builders**, after installation on a Microsoft Windows, you must have Windows *Administrator* privileges and launch these executable files from an elevated shell (that is, *Run as administrator*).

To do so, you can do either one of the following:

- Find the Command Prompt icon (for example, from the Start menu or from the Desktop), right-click on the icon, and select **Run as Administrator**. Then you can run the executables (for example, the WebLogic Server installer) from the command line.
- Start Windows Explorer, find the executable you want to run (for example, `rcu.bat` for RCU, `config.bat` for the Configuration Wizard, or `setup.exe` for the installer), right-click on the executable, and select **Run as Administrator**.

## Virtualization Requirements

Every Oracle Fusion Middleware product that is certified on Linux, Windows, or Oracle Solaris as physical operating system is also certified and supported when running as virtual guest on Oracle VM as long as the respective operating system is supported by Oracle VM.

See [Supported Virtualization and Partitioning Technologies for Oracle Fusion Middleware](#) on the Oracle Technology Network.

## Database Requirements

This sections lists the database requirements for the Fusion Middleware products. For details on the RCU requirements specific for Oracle Database, see [RCU Requirements for Oracle Databases](#).

This section contains the following topics:

- [Finding a Certified Database](#)
- [Configuring Your Oracle Database for the Metadata Services \(MDS\) Schema](#)

## Finding a Certified Database

Refer to the certification document for 12c on the [Oracle Fusion Middleware Supported System Configurations](#) page for the latest information on certified databases.

 **Note:**

If the database for this environment is configured using the multi-tenant architecture (that is CDB or PDB), both the FWM Infrastructure schemas and application data must be stored in the PDB. Storing these objects or data in the CDB is not supported.

## Configuring Your Oracle Database for the Metadata Services (MDS) Schema

On Oracle databases, the MDS database user created by Repository Creation Utility (RCU) requires `EXECUTE` privilege on `DBMS_OUTPUT`, `DBMS_STATS`, and `DBMS_LOB`. When you create a metadata repository using RCU, if `PUBLIC` does not have `EXECUTE` privilege on `DBMS_OUTPUT` and `DBMS_STATS`, the RCU user must have the privilege to grant `EXECUTE` privilege on `DBMS_OUTPUT` and `DBMS_STAT` to the MDS user. The RCU user must have the privilege to grant `EXECUTE` privilege on `DBMS_LOB` to the MDS user.

To ensure that you have the correct privileges, login to RCU as a `SYSDBA` or as a `DBA` user who has `EXECUTE` privilege with `GRANT OPTION` on `DBMS_OUTPUT` and `DBMS_LOB`.