



Operating System Requirements for Red Hat Enterprise Linux

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Operating System Requirements

This chapter provides operating system requirements for installing an Ex Libris application on the Linux operating system.

This section includes:

- **Operating System** on page 5
- **Operation System Kernel** on page 6
- **SELINUX** on page 7
- **Linux Packages** on page 7

Operating System

One of the following Linux x86 operating system versions is required:

- Red Hat Enterprise Linux AS/ES 5 (Update 4 or later)
- Red Hat Enterprise Linux AS/ES 6 (Update 4 or later)
- Red Hat Enterprise Linux 7 (Update 1 or later)

The following table shows the current OS version certifications for each Ex Libris application.

Table 1. Current OS Version Certifications

Application	RH 5.x 64 Bit	RH 6.x 64 Bit	RH 7.x 64 Bit
Aleph 20.x	x		
Aleph 21	x	x	
Aleph 22	x	x	
Aleph 23		x	x
ARC 2.0	x		

Table 1. Current OS Version Certifications

Application	RH 5.x 64 Bit	RH 6.x 64 Bit	RH 7.x 64 Bit
ARC 3.0	x	x	
ARC 4.0	x	x	
ARC 4.5			x
DigiTool 3.x	x	x	
MetaLib 4.x	x	x	x
Primo 4.x	x	x	
SFX 4.0	x	x	x
Verde 2.0	x		
Voyager 9		x	x
Voyager 10		x	x
Rosetta 4		x	x
Rosetta 5		x	x

Operation System Kernel

The system must be running the following kernel version or later:

Table 2. Operation System Kernel

Operating System	Kernel Version
Red Hat Enterprise Linux AS/ES 5 for 64 bits x86 processors	2.6.18-92 or later
Red Hat Enterprise Linux AS/ES 6 for 64 bits x86 processors	2.6.32-358
Red Hat Enterprise Linux 7 for 64 bits x86 processors	3.10.0-229

NOTES:

- Always use the standard OS kernel that comes with the official OS version or update. Recompiled OS kernels are not supported.
- The default basic Red Hat packages must be installed first. Therefore, when you install the Red Hat system, choose the default installation option to ensure that you install these basic mandatory packages. Listed

below are the additional packages to eventually install in addition to the default installation configuration.

- For each of the operating system versions, Ex Libris recommends that you install the latest OS update level.
-

SELINUX

SELINUX and all other internal firewalls must be disabled before installation. Ex Libris recommends using an external firewall instead.

If from some reason SELINUX cannot be disabled, it must be set to permissive mode. Any other SELINUX mode causes problem with Application and Oracle Data Base functionality.

Linux Packages

To verify that the mandatory Linux packages are installed, enter the following commands for Red Hat Operating systems:

```
rpm -q <package_1> <package_2>
```

In this example, the presence of <package_1> <package_2> is verified.

Red Hat Linux 5.x 64 Bits

Default RPMs (referred to as the default during the Red Hat installation process; RHEL5-64bit) must be installed. In addition to the default RPMs, the following packages (or later versions) must be installed:

```
binutils-2.17.50.0.6  
bzip2-libs i386  
bzip2-libs-1.0.3-4.el5_2.i386  
compat-db-4.2.52.i386  
compat-gcc-34-3.4.6-4  
compat-gcc-34-c++-3.4.6-4  
compat-libstdc++-296  
compat-libstdc++-296.i386  
compat-libstdc++-33-3.2.3  
compat-libstdc++-33-3.2.3 (32 bit)  
e2fsprogs-libs.i386
```

```
elfutils-libelf-0.125
elfutils-libelf-devel-0.125
expat i386
fontconfig i386
freetype i386
gcc-4.1.1
gcc-c++-4.1.1
gdbm.i386
giflib.x86_64 2
glibc i686
glibc.x86_64
glibc-2.5-12
glibc-common-2.5
glibc-devel-2.5-12 (32 bit)
glibc-headers-2.5-12
gmp.i386
gmp-4.1.4-10.el5.i386
kernel-headers-2.6.18-92.el5.x86_64.rpm
keyutils-libs-1.2-1.el5.i386
krb5-libs-1.6.1-31.el5_3.3.i386
libaio.i386
libaio-devel-0.3.106
libgcc i386
libgcc.x86_64
libgcc-4.1.1
libgcc-4.1.2-44.el5.i386
libgcrypt-1.2.4-1.el5.i386
libgomp-4.1.1-52
libgpg-error-1.4-2.i386
libICE i386
libjpeg.i386
libpng.i386
libselinux-1.33.4-5.1.el5.i386
libsepol-1.15.2-1.el5.i386
libSM i386
libstdc++ i386
```

```
libstdc++.x86_64
libstdc++-4.1.2-42.el5 (i386) (32 bit)
libstdc++-devel 4.1.1
libwmf i386
libX11 i386
libXau i386
libXdmp i386
libXext i386
libxml2-2.6.26-2.1.2.8.i386
libXp-1.0.0-8
libxslt-1.1.17-2.el5_2.2.i386
libXt i386
make-3.81
mt-st-0.9b-2.2.2.x86_64.rpm (for Voyager only)
ncurses-5.5-24.20060715.i386
pcre-6.6-2.el5_1.7.i386
sysstat-7.0.0
unixODBC-2.2.11-7.1.i386.rpm (32 bit)
unixODBC-2.2.11-7.1.x86_64.rpm
unixODBC-devel-2.2.11-7.1.i386.rpm (32 bit)
unixODBC-devel-2.2.11-7.1.x86_64.rpm
zlib i386
```

Red Hat Linux 6.x 64 Bits

Default RPMs (referred to as the default during the Red Hat installation process; RHEL6-64bit) must be installed. In addition to the default RPMs, the following packages (or later versions) must be installed:

```
avahi 64-bit
avahi-glib 64-bit
binutils 64-bit
bzip2-libs.i686
celt051 64-bit
clog-ppl 64-bit
compat-db 64-bit
compat-db42 64-bit
compat-db43 64-bit
compat-expat1.i686
```

compat-expat1.x86_64
compat-gcc-34 64-bit
compat-gcc-34-c++ 64-bit
compat-libstdc++-33 32-bit
compat-libstdc++-33 64-bit
ConsoleKit-x11 64-bit
cpp 64-bit
e2fsprogs-libs.i686
elfutils-libelf-devel 64-bit
expat.i686
gcc 64-bit
gcc-c++ 64-bit
gdbm.i686
GConf2 64-bit
glibc 32-bit
glibc 64-bit
glibc.i686
glibc.x86_64
glibc-common 64-bit
glibc-devel 32-bit
glibc-devel 64-bit
glibc-headers 64-bit
gmp.i686
gnome-vfs2 64-bit
gtk2-engines 64-bit
kernel-headers 64-bit
keyutils-libs.i686
krb5-libs.i686
ksh 64-bit
libaio 32-bit
libaio 64-bit
libaio.i686
libaio-devel 32-bit
libaio-devel 64-bit
libbonobo 64-bit
libdaemon 64-bit

libdmx 64-bit
libgcc 32-bit
libgcc 64-bit
libgcc.i686
libgcrypt.i686
libgnome 64-bit
libgomp 64-bit
libgpg-error.i686
libICE 32-bit
libIDL 64-bit
libmcpp 64-bit
libselinux.i686
libsepol.i686
libSM 32-bit
libstdc++ 32-bit
libstdc++ 64-bit
libstdc++-devel 64-bit
libstdc++.i686
libtool-ltdl 32-bit
libtool-ltdl 64-bit
libtool-ltdl.x86_64
libuuid 32-bit
libuuid.i686
libuuid.x86_64
libX11 32-bit
libXau 32-bit
libxcb 32-bit
libxcb.x86_64
libXext 32-bit
libXi 32-bit
libxml2.i686
libXmu 64-bit
libXp 64-bit
libxslt.i686
libXt 32-bit
libXt 64-bit

libXtst 32-bit
libXv 64-bit
libXxf86dga 64-bit
libXxf86misc 64-bit
libXxf86vm 64-bit
make 64-bit
mcpp 64-bit
mpfr 64-bit
ncurses-devel 64-bit
ncurses-libs 32-bit
ncurses-libs.i686
nss-softokn-freebl 32-bit
nss-softokn-freebl.i686
ompat-expat1.i686
ORBit2 64-bit
pcre.i686
ppl 64-bit
readline 32-bit
readline-devel 64-bit
shared-mime-info 64-bit
sysstat 64-bit
unixODBC 32-bit
unixODBC 64-bit
unixODBC.i686
unixODBC.x86_64
unixODBC-devel 32-bit
unixODBC-devel 64-bit
xorg-x11-server-utils 64-bit
xorg-x11-utils 64-bit
xorg-x11-xauth 64-bit
xorg-x11-xinit 64-bit
zlib.i686
zlib.x86_64
compat-readline5.i686

Red Hat Enterprise Linux 7

avahi-glib.x86_64
avahi.x86_64
binutils.x86_64
celt051.x86_64
compat-db.x86_64
compat-gcc-44-c++.x86_64
compat-gcc-44.x86_64
compat-glibc-headers.x86_64
compat-libcap1-1.10-7.el7.x86_64
compat-libstdc++-33.i686
compat-libstdc++-33.x86_64
cpp.x86_64
dos2unix.x86_64
elfutils-libelf-devel.x86_64
expat.i686
expat.x86_64
fontconfig.i686
fontconfig.x86_64
freetype.x86_64
gcc-c++.x86_64
gcc.x86_64
GConf2.x86_64
gdbm.i686
giflib.x86_64
glibc-common.x86_64
glibc-devel.i686
glibc-devel.x86_64
glibc-headers.x86_64
glibc.i686
glibc.x86_64
gmp.i686
gnome-vfs2.x86_64
gtk2-engines.x86_64
kernel-headers.x86_64
ksh.x86_64

libaio-devel.i686
libaio-devel.x86_64
libaio.i686
libaio.x86_64
libbonobo.x86_64
libdaemon.x86_64
libdmx.x86_64
libgcc.i686
libgcc.x86_64
libgnome.x86_64
libgomp.x86_64
libICE.i686
libICE.x86_64
libicu-devel.i686
libIDL.x86_64
libidn.i686
libjpeg-turbo.x86_64
libSM.i686
libSM.x86_64
libstdc++-devel.i686
libstdc++-devel.x86_64
libstdc++.i686
libstdc++.x86_64
libtool-ltdl.i686
libtool-ltdl.x86_64
libuuid.i686
libuuid.x86_64
libX11.i686
libX11.x86_64
libXau.i686
libXau.x86_64
libxcb.i686
libxcb.x86_64
libXext.i686
libXi.i686
libXi.x86_64

libXmu.x86_64
libXp.x86_64
libXt.i686
libXtst.i686
libXtst.x86_64
libXt.x86_64
libXv.x86_64
libXxf86dga.x86_64
libXxf86misc.x86_64
libXxf86vm.x86_64
make.x86_64
mpfr.x86_64
ncurses-devel.x86_64
ncurses-libs.i686
nss-softokn-freebl.i686
ORBit2.x86_64
readline-devel.x86_64
readline.i686
shared-mime-info.x86_64
sysstat.x86_64
unixODBC-devel.i686
unixODBC-devel.x86_64
unixODBC.i686
unixODBC.x86_64
xorg-x11-server-utils.x86_64
xorg-x11-utils.x86_64
xorg-x11-xauth.x86_64
xorg-x11-xinit.x86_64
xz-libs.i686
zlib-devel.i686
zlib.i686
zlib.x86_64

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Performing a System Requirements Verification

This section includes:

- **Operating System Information** on page 17
- **Determining RAM** on page 18
- **Determining Swap Space** on page 18
- **Determining Configured Disk Space** on page 18
- **Determining Installed Linux Packages** on page 18

NOTES:

- The commands included in this chapter are intended to help you perform the necessary verification.
 - Depending on the test results, the Installation Team can determine whether the system is ready for the installation of the application. For more specific installation details, refer to the appropriate installation requirements documentation (for example, *Requirements for ALEPH Installation*).
-

Operating System Information

To determine your current operating system, enter the following commands:

```
cat /etc/redhat-release  
  
/bin/uname -a
```

Determining RAM

To determine the amount of random-access memory (RAM) installed on your system, enter the following command:

```
cat /proc/meminfo | grep MemTotal
```

Determining Swap Space

To determine how many bytes of swap space are currently configured on your system, enter the following command and multiply the BLOCKS column by 512:

```
/sbin/swapon -s
```

Determining Configured Disk Space

To determine the amount of disk space currently configured on your system, enter the following command:

```
/bin/df -k
```

Determining Installed Linux Packages

For example, in RH 4, to determine that the operating system package `gcc` is installed, enter the following command:

```
rpm -qa |grep gcc
```

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NFS Mount Options for Ex Libris Products

This section includes:

- **Overview** on page 19
- **Oracle Mount Options** on page 19
- **Additional Mount Options for Ex Libris Software** on page 20

Overview

To install Ex Libris products with NFS mounts under Unix/Linux OS requires you to use the correct mount options.

Using the correct mount option is also mandatory for Oracle database files. If the correct option is not used, Oracle fails to mount the database files located on the NFS mounts.

Note that the requirements are different for software mounts and for Oracle data files. Using the Oracle database mount options on a software disk may work, but performance may be affected.

Oracle Mount Options

The Oracle requirements for NFS mounts may change periodically and can be checked in Oracle support note 359515.1.

The following table related to the Oracle software and database files for Oracle versions 10.2 to 11.1.

In the table below:

- Binaries is the shared mount points where the Oracle Home and CRS_HOME are installed.
- Datafiles includes online logs, control files, and data files.

The following table is for a single instance installation.

Table 3. Mount Options

Operating System	Mount Options for Binaries	Mount Options for Oracle Datafiles
Sun Solaris (8, 9, 10)	rw,bg,hard,rsize=32768,wsiz=32768,vers=3,nointr,proto=tcp,suid	rw,bg,hard,rsize=32768,wsiz=32768,vers=3,[forcedirectio or llock],nointr,proto=tcp,suid
AIX (5L)	rw,bg,hard,rsize=32768,wsiz=32768,vers=3,intr,timeo=600,proto=tcp	rw,bg,hard,rsize=32768,wsiz=32768,vers=3,cio,intr,timeo=600,proto=tcp
Linux x86	rw,bg,hard,rsize=32768,wsiz=32768,vers=3,nointr,timeo=600,tcp	rw,bg,hard,rsize=32768,wsiz=32768,vers=3,nointr,timeo=600,tcp,actimeo=0
Linux x86_64	rw,bg,hard,rsize=32768,wsiz=32768,vers=3,nointr,timeo=600,tcp	rw,bg,hard,rsize=32768,wsiz=32768,vers=3,nointr,timeo=600,tcp,actimeo=0

In addition to the Oracle requirements, the `nolock` option is required in Linux and the `llock` option is required in Solaris to prevent locked issues that might cause database file locks and severe performance issues.

Additional Mount Options for Ex Libris Software

For most purposes, Ex Libris products work with the same mount options as the Oracle binaries. Note the following:

- The `nolock` (Linux) `llock` (Solaris) options are required to prevent file locks and severe performance issues.
- Do not use the `noac` options in a shared installations.
- Make sure that `actimeo` is larger than 0, but under 60 to prevent `jobd/ batchd` sync issues.

NOTE:

For mixed environments (binaries and database files on the same mount) Oracle recommends the use of Oracle DNFS - see Oracle document ID 762374.

Appendix – List of Applications/Versions Certified in Virtual Environments

The certification is relevant for Solaris 2.10 / 11 Zones, VMware ESX version 4.x / 5.x, and later, and Redhat KVM.

Application	Product Version	VMware Support	Solaris Zones Support	Redhat KVM (RHEV-M)
Aleph	18.01 and later	+	+	+ Aleph v20.x and later
DigiTool	3.x and later	+	+	
MetaLib	4.x and later	+	+	
Primo	2.0 and later	+	+	+ Primo v4.x and later
SFX	3.0 and later	+	+	+ SFX v4.x and later
Verde	2.0 and later	+	+	
Voyager		+ 7.2 and later	+ 6.2 and later	+ 8.x and later
Rosetta	1.0 and later	+	+	

