



# Operating System Requirements for Red Hat Enterprise Linux

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# 1

## 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 6 (Update 4 or later)
- Red Hat Enterprise Linux 7 (Update 1 or later)
- Red Hat Enterprise Linux 8

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

Table 1. Current OS Version Certifications

Application	RH 6.x 64 Bit	RH 7.x 64 Bit	RH 8 64 Bit
Aleph 22	x		
Aleph 23	x	x	
ARC 4.0	x		
ARC 4.5		x	
DigiTool 3.x	x		

Table 1. Current OS Version Certifications

Application	RH 6.x 64 Bit	RH 7.x 64 Bit	RH 8 64 Bit
MetaLib 4.x	x	x	
Primo 4.x	x	x	
SFX 4.0	x	x	
Voyager 9	x	x	
Voyager 10	x	x	
Rosetta 7.1		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 6 for 64 bits x86 processors	2.6.32-358
Red Hat Enterprise Linux 7 for 64 bits x86 processors	3.10.0-229
Red Hat Enterprise Linux 8	4.18.0-80.el8.x86_64 or later

### 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 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  
ompatt-1.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
```

## Red Hat Enterprise Linux 8

```
bc
binutils
compat-openssl10
elfutils-libelf
elfutils-libelf-devel
fontconfig-devel
glibc
glibc-devel
ksh
libaio
```

libaio-devel  
libXrender  
libX11  
libXau  
libXi  
libXtst  
libgcc  
libnsl  
librdmacm  
libstdc++  
libstdc++-devel  
libxcb  
libibverbs  
make  
policycoreutils  
policycoreutils-python-utils  
smartmontools  
sysstat  
fontconfig.x86\_64  
freetype.x86\_86  
glibc.i686  
glibc.x86\_64  
keyutils-libs.i686  
krb5-libs.i686  
libaio.i686  
libcom\_err.i686  
libgcc.i686  
libgcc.x86\_64  
libnsl.i686  
libselinux.i686  
libstdc++.i686  
libstdc++.x86\_64  
libuuid.i686  
libuuid.x86\_64  
libxcrypt.i686  
libxml2.i686

```
pcr2.i686  
perl  
tar  
dejavu-sans-fonts  
xz-libs.i686  
zlib.i686  
zlib.x86_64
```





# 2

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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

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### 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
```

# 3

---

## 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 relates to the Oracle software and database files for Oracle versions 11 to 12.

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
Linux x86_64	rw,bg,hard,rsize=32768,wspace=32768,vers=3,nointr,timeo=600,tcp	rw,bg,hard,rsize=32768,wspace=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. The following options are relevant only for dedicated NFS mounts (DB and software only) and not for NFS shared mounts:

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

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## 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	+	+	

