

AIX 6 with Technology Level 9

Release Notes

IBM

AIX 6 with Technology Level 9

Release Notes

IBM

Note

Before using this information and the product it supports, read the information in "Notices" on page 21.

Eighth edition (May 2018)

This edition applies to IBM AIX 6.1 with Technology Level 9 and to all subsequent releases and modifications until otherwise indicated in new editions.

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About this document

The Release Notes topics include late technical information that is not included in other topics, and they highlights new functions for the IBM® AIX® 6.1 with Technology Level 8 licensed program.

Highlighting

The following highlighting conventions are used in this document:

| | |
|----------------|---|
| Bold | Identifies commands, subroutines, keywords, files, structures, directories, and other items whose names are predefined by the system. Also identifies graphical objects such as buttons, labels, and icons that the user selects. |
| <i>Italics</i> | Identifies parameters whose actual names or values are to be supplied by the user. |
| Monospace | Identifies examples of specific data values, examples of text similar to what you might see displayed, examples of portions of program code similar to what you might write as a programmer, messages from the system, or information you should actually type. |

Case-sensitivity in AIX

Everything in the AIX operating system is case-sensitive, which means that it distinguishes between uppercase and lowercase letters. For example, you can use the **ls** command to list files. If you type **LS**, the system responds that the command is not found. Likewise, **FILEA**, **FiLea**, and **filea** are three distinct file names, even if they reside in the same directory. To avoid causing undesirable actions to be performed, always ensure that you use the correct case.

ISO 9000

ISO 9000 registered quality systems were used in the development and manufacturing of this product.

What's new

May 2018

The IBM® Systems Director has gone end of service (EOS) and is no longer supported on the AIX operating system. For more information, see the “IBM Systems Director Software” on page 10 section.

March 2018

The AIX operating system supports POWER9™ processor-based servers. For more information, see the “Version of the AIX operating system that support POWER9 processor-based servers” on page 3 section.

October 2017

The following information is new in this version of the release notes:

- Added information about OpenSSH version 7.1p1.
- Added information about OpenSSL version 1.0.2.
- Added information about the IBM License Management Tool (ILMT).

Read this before installing AIX 6 with 6100-09

Before you use this software, you should go to the Fix Central website and install the latest available fixes that address security vulnerabilities and other critical issues.

The AIX 6 with 6100-09 Release Notes include information that helps you install the AIX operating system. To view the most current version, see AIX Release Notes in the Knowledge Center.

Version of the AIX operating system that support POWER9 processor-based servers

The AIX 6 with 6100-09 and Service Pack 11, or later, operating system support the following POWER9 processor-based servers:

- IBM Power® System S914 (9009-41A)
- IBM Power System S924 (9009-42A)
- IBM Power System H922 (9223-22H)
- IBM Power System H924 (9223-42H)
- IBM Power System S922 (9009-22A)
- IBM Power System S922L (9008-22L)

For more information about POWER9 processor-based servers, see the POWER9 Knowledge Center website.

Versions of the AIX operating system that are required to support some POWER8 systems

There are minimum AIX operating system level requirements when you are supporting the following POWER8® systems:

- 8286-41A S814
- 8286-42A S824
- 8284-22A S822

When you support those systems, you must install the following versions of the AIX operating system, or a later version:

- AIX levels that support any I/O configuration:
 - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 3 and APAR IV56366
- AIX levels that support only virtualized I/O configurations:
 - AIX Version 6.1 with the 6100-09 Technology Level and Service Pack 1
 - AIX Version 6.1 with the 6100-08 Technology Level and Service Pack 1
 - AIX Version 6.1 with the 6100-07 Technology Level and service Pack 6

Installation tips

The latest installation hints and tips are available at the IBM Subscription Service website. Complete this procedure to find the AIX hints and tips:

1. Select **System p** in the navigation.
2. Expand **IBM Operating Systems**.
3. Select **AIX** and the version that you are installing.

Software License Agreements

There are instances where the Software License Agreements (SLA) might not be displayed correctly. In this event, the License Agreements can be viewed for all languages at the Software license agreements website.

Software Maintenance Agreement

In AIX 6 with 6100-09, a separate Software Maintenance Agreement (SWMA) acceptance window displays during installation immediately after the license acceptance window. The response to the SWMA acceptance (accept or decline) is stored on the system, and either response allows the installation to proceed, unlike license acceptance which requires an accept to proceed.

The SWMA acceptance window is displayed during a New Overwrite or Preservation installation from base CD media.

For base CD media New Overwrite or Preservation installations, if a non-prompted installation is desired, the **ACCEPT_SWMA** field in the control_flow stanza of the **bosinst.data** file should be set to yes (to accept the SMWA terms) or no (to decline the SWMA terms). The **ACCEPT_SWMA** field is set to blank by default.

For NIM installations, if licenses have been accepted either from the choices made when initializing the installation, or using the **ACCEPT_LICENSES** field in a customized **bosinst.data** file, then this will constitute SWMA acceptance.

Service

Fixes and problem-solving databases

You can download AIX fixes and search technical databases (including "APARS" and "Tips for AIX administrators"), at the Fix Central website.

Security advisories

Security subscription services are available at My notifications website.

After you subscribe to the AIX security advisories, you will receive the advisories by email as soon as they are published. You can also view AIX security advisories at the IBM Subscription Service website. Complete this procedure to find the AIX subscriptions:

1. Select **System p** in the navigation.
2. Expand **IBM Operating Systems**.
3. Select **AIX** and the version that you are installing.
4. Click **Support Resources**.

System requirements

Review the following information to determine the minimum and recommended system requirements needed to run AIX 6 with 6100-09.

Required hardware

Only 64-bit Common Hardware Reference Platform (CHRP) machines running selected PowerPC® 970, POWER4, POWER5, POWER6®, and POWER7® processors that implement the Power Architecture® Platform Requirements (PAPR) are supported.

To see if you have a supported machine, log into the machine as the root user, and run the following command:

```
prtconf | grep 'Processor Type'
```

Note: RS64, POWER3, and 604 processors, 32-bit kernel, 32-bit kernel extensions, and 32-bit device drivers are no longer supported.

Firmware

I/O devices IPL limitation

Because of a firmware memory size limitation, only I/O devices in the first 144 I/O slots assigned to a logical partition or single system image partition can be used as an IPL (boot) source.

You can use the HMC to identify which devices are in the first 144 I/O slots by doing the following:

1. Select Partition Properties>Hardware>I/O.
2. Click the Bus column to sort the I/O devices in ascending order.

The first 144 I/O devices in the sorted list are in the bootable adapter slots.

If you are using a partition or single-system image partition with more than 144 assigned I/O slots, the following scenarios and their results and resolutions are possible.

Table 1. Scenarios for partitions with more than 144 assigned I/O slots

| Scenario | Result | Resolution |
|---|--|---|
| Attempting to boot from a device beyond the first 144 I/O slots for installation or diagnostic purposes. | The device is not selectable as a boot source from the SMS menus. | Use a device in the first 144 I/O slots. |
| Booting from a device in the first 144 I/O slots, and then attempt to select a target installation device in a slot beyond the first 144 I/O slots. | The boot will succeed to the installation menus, but devices beyond the first 144 I/O slots will not be listed as bootable installation targets in the AIX menus. | Select a device that is available and marked as bootable. |
| Using an MPIIO configuration where one adapter is in the first 144 I/O slots and another adapter is in a slot beyond the first 144 I/O slots. Both adapters are present at boot time. | The boot will succeed to the installation menus, and the device will be listed as bootable in AIX installation menus. The installation will proceed, but it will fail with the bootlist command failure "unable to set bootpath for all paths." | Use a device in the first 144 I/O slots for all paths. |
| Using DLPAR to add an adapter in a slot beyond the first 144 I/O slots, and then attempting to run the alt_disk_install command for the newly added device. | The device will not be listed as bootable. | Use a device in the first 144 I/O slots. |

Table 1. Scenarios for partitions with more than 144 assigned I/O slots (continued)

| Scenario | Result | Resolution |
|---|---|--|
| Using DLPAR to add an adapter in a slot beyond the first 144 I/O slots, and using the bootlist command to add the device as a bootable device (for example, by dynamically adding a redundant path to a current boot device or setting up for a network boot). Then removing the original adapter and rebooting. | The bootlist command succeeds, but the boot fails from the specified device, and AIX will not receive control. | Use a device in the first 144 I/O slots. |
| Using DLPAR to add an adapter whose probe order will make it displace a current bootable device, and then rebooting. | The boot fails, and AIX will not receive control. | Move the boot device to one of the first 144 I/O slots or remove the previously added device. |
| Selecting a device in a slot beyond the first 144 I/O slots as a dump device for a firmware-assisted dump. | The sysdumpdev command does not allow devices in slots beyond the first 144 I/O slots to be selected as firmware-assisted dump storage devices. An error occurs during the firmware-assisted dump configuration, and a traditional AIX dump automatically becomes available. | Use a device in the first 144 I/O slots for firmware-assisted dumps. |
| Using DLPAR to add an adapter whose probe order will make it displace a currently valid firmware-assisted dump target device, and then rebooting after the dump. | The firmware-assisted dump process fails during the boot process and displays an error message. The traditional AIX dump still runs to retrieve the dump image. | Avoid displacing the selected firmware-assisted dump target device or reconfiguring the sysdumpdev command for the firmware-assisted dump target device selection, and specify a device within the first 144 I/O slots. |
| Using DLPAR to add an adapter whose probe order will make it displace a currently valid firmware-assisted dump target device, and then rebooting. | The sysdumpdev command does not allow devices in slots beyond the first 144 I/O slots to be selected as firmware-assisted dump storage devices. An error occurs during the firmware-assisted dump configuration, and a traditional AIX dump automatically becomes available. | Use a device in the first 144 I/O slots for firmware-assisted dumps. |

Memory requirements

AIX 6 with 6100-09 minimum current memory requirements vary, based on the configuration.

A general rule for a minimum current memory requirement for AIX 6 with 6100-09 is 512 MB. A smaller minimum current memory might support a configuration with a small number of devices or a small maximum memory configuration. To install the AIX 6 with 6100-09 operating system with only 512 MB, you can overwrite only the existing operating system, and you cannot install any bundles or devices. If you update the AIX operating system with the **install_all_updates** command, your system must have more than 512 MB.

AIX 6 with 6100-09 requires the minimum current memory requirement to increase as the maximum memory configuration or the number of devices scales upward, or both. Larger maximum memory configurations or additional devices scale up the minimum current memory requirement. If the minimum memory requirement is not increased along with the maximum memory configuration, the partition hangs during the initial program load (IPL).

Host Ethernet Adapter memory requirements

Configurations containing a Host Ethernet Adapter (HEA) require more memory than the 512 MB minimum. Each logical HEA port that is configured requires an additional 102 MB of memory. The minimum memory requirement for configurations with one or more HEA ports configured, where *n* is the number of HEA ports, is 512 MB + *n* x 102 MB.

Paging space requirements

AIX 6 with 6100-09 creates a 512 MB paging space (in the `/dev/hd6` directory) for all new and complete overwrite installations.

Disk requirements

AIX Version 6.1 with the recommended AIX 6 with 6100-09 requires a minimum of 10 GB of physical disk space for a default installation, which includes all devices, the Graphics bundle, and the System Management Client bundle.

The following table provides information about disk usage when you install AIX 6 with 6100-09.

| Location | Allocated (Used) |
|-----------------------|-------------------|
| / | 512 MB (278 MB) |
| /usr | 2688 MB (2479 MB) |
| /var | 608 MB (383 MB) |
| /tmp | 128 MB (7 MB) |
| /admin | 128 MB (1 MB) |
| /opt | 416 MB (209 MB) |
| /var/adm/ras/livedump | 256 MB (1 MB) |

Note:

1. If the `/tmp` directory has less than 64 MB, it is increased to 64 MB during a migration installation so that the AIX 6 with 6100-09 boot image is successfully created at the end of the migration.
2. The boot logical volume is required to be 24 MB. The pre-migration script in the `usr/lpp/bos` directory on your media or in your AIX 6 with 6100-09 NIM Shared Product Object Tree (SPOT) will check if you have adequate room. During the migration, `hd5` will be increased if necessary. The logical partitions must be contiguous and within the first 4 GB of the disk.

You must format the SCSI disk properly before you install AIX on it. The AIX operating system requires the disk to be formatted to a sector size supported by the attached SCSI controller. All AIX SCSI controllers support 512 byte sector SCSI disks. The 522 byte sector SCSI disks are only supported when they are attached to SCSI RAID controllers. If the disk has been formatted for SCSI RAID, but is not attached to a SCSI RAID controller, the disk might not configure. If the disk does configure, it might be unreadable in the AIX environment. In some instances, the `certify` function and the `format` function in AIX diagnostics can be used to reformat the disk for the attached SCSI controller.

If any existing file system has a mount point in the `/opt` directory, or a mount point of `/opt` itself, the new logical volume and file system are not created.

Disk capacity

SAS RAID controllers and Fibre Channel controllers support attached arrays and disks with capacities which exceed 2 TB. The maximum supported capacity (beyond 2 TB) is limited by either the attached storage subsystem or the upper level logical storage management.

For additional information about SAS RAID controllers, see the SAS RAID controller for AIX topic.

For information about AIX capacity limitations for logical storage, see the Limitations for logical storage management topic.

Installation, migration, upgrade, and configuration information

Installation

This section contains information about installing AIX 6.1 that supplements the information contained in the Installation and Migration topic.

To order these installation guides, contact your point of sale, or in the U.S., call IBM Customer Publication Support at 1-800-879-2755. Give the order number of the book you want to order.

To obtain AIX 6.1 installation hints and tips, go to the IBM Subscription Service website.

Installing AIX 6 with 6100-09

The following methods can be used to install AIX 6 with 6100-09:

- Complete overwrite installation
- Preservation installation
- Migration installation

Note: After you install or migrate a system to AIX 6 with 6100-09, you can install a lower level of AIX by restoring a system backup or by performing a new and complete overwrite with base media. Preservation installations from AIX Version 6.1 to a lower level of AIX are not supported.

If your system is running a previous version of the AIX operating system, you can use the Update media (recommended) or the base media to update the operating system to AIX 6 with 6100-09. To verify the level, run the `oslevel -r` command. To perform the update, run the `smitty update_all` command.

Attention: Using the Update media is recommended for updates. If you use the base media to update, some ODM settings (such as SRC subsystems settings) might be lost.

Note:

1. The minimum size of the boot logical volume is 24 MB. If your current boot logical volume is 16 MB or less, the installation process tries to increase it. However, partitions in a boot logical volume must be contiguous, and within the first 4 GB on the disk. If your system does not have free space that meets these requirements, a message will indicate that there is not enough space to expand `hd5` (the boot logical volume).
2. To install the `devices.common.IBM.sni` package, your system must have 256 MB of disk space available in the `rootvg` volume group.

To install AIX 6 with 6100-09, follow the instructions in the Installing the base operating system topic.

NIM installations with updated LPP_SOURCE

NIM installations using an `LPP_SOURCE` directory that contains base images from a prior release and that contains updates to the current release require that you use an `image_data` resource during operating system installations.

When you use an `LPP_SOURCE` directory that contains base images from a prior release and updates to the current release, create an `image_data` resource to use for any operating system installations. The SPOT must be updated with the updates added to the `LPP_SOURCE` directory, or a new SPOT must be created. In that SPOT, copy the `image.template` file found at `<SPOT_LOCATION>/1pp/bosinst/image.template` to a new location outside of the SPOT. Create a new NIM `image_data` resource that points to that location. Use that NIM `image_data` resource for all operating system installations.

Certain file systems have grown in size, and the default image.data file used during an operating system installation comes from the **bos** image in your LPP_SOURCE directory, which is the prior release image.data file.

IBM License Metric Tool

The IBM License Metric Tool (ILMT) version 7.2 is no longer supported. To learn more about the replacement version of ILMT Version 9.x, go to IBM License Metric Tool 9.2.

Note: If you already have BigFix Lifecycle installed, you can leverage the same BigFix Enterprise Server (BES) for ILMT 9.x.

IBM Systems Director Software

The IBM® Systems Director has gone end of service (EOS) and is no longer supported on the AIX operating system.

The following filesets are no longer supported:

- DirectorCommonAgent (All required files of Director Common Agent, including JRE, LWI)
- DirectorPlatformAgent (Director Platform Agent for IBM Systems Director on AIX)
- sysmgt.cim.providers.metrics (Metrics Providers for the AIX operating system)
- sysmgt.cim.providers.osbase (Base Providers for the AIX operating system)
- sysmgt.cim.providers.scc (Security Control Compliance Providers for the AIX operating system)
- sysmgt.cim.providers.smash (Smash Providers for the AIX operating system)
- sysmgt.cim.smisproviders.hba_hdr (SMI-S HBA&HDR Providers for the AIX operating system)
- sysmgt.cim.smisproviders.hhr (SMI-S HHR Providers for the AIX operating system)
- sysmgt.cim.smisproviders.vblksrv (SMI-S Storage Virtualizer Providers for the AIX operating system)
- sysmgt.cimserver.pegasus.rte (Pegasus CIM Server Runtime Environment)
- cas.agent (Common Agent Services Agent)
- lwi.runtime (Lightweight Infrastructure Runtime)

If you remove the software in the above list, the following dependent software will also be removed:

- bos.aixpert.websm
- bos.net.ipsec.websm
- invscout.websm
- sysmgt.help.<XX_XX>.websm
- sysmgt.help.msg.<XX_XX>.websm
- sysmgt.msg.<XX_XX>.websm.apps
- sysmgt.pconsole.apps.pda
- sysmgt.pconsole.apps.wdcem
- sysmgt.pconsole.apps.websm
- sysmgt.pconsole.apps.wrbac
- sysmgt.pconsole.apps.wsmi
- sysmgt.pconsole.rte
- sysmgt.websm.accessibility
- sysmgt.websm.apps
- sysmgt.websm.diag
- sysmgt.websm.diskarray.fc
- sysmgt.websm.framework

- `sysmgt.websm.icons`
- `sysmgt.websm.rte`
- `sysmgt.websm.webaccess`
- `artex.base.agent`
- `sysmgt.websm.security-us`
- `sysmgt.websm.security`

AIX Toolbox Media and NIM lpp_sources

When a Network Install Manager `lpp_source` is used for base system installs, do not copy the contents of the *AIX Toolbox for Linux Applications* CD into the `lpp_source`. This results in multiple copies of **cdrecord** and **mkisofs** software installing during base installation. Neither **cdrecord** or **mkisofs** installs if multiple copies are present.

Network Installation Management

Network Installation Management (NIM) includes a readme file that is installed with the NIM Master **bos.sysmgt.nim.master** fileset. The path name of the file is `/usr/lpp/bos.sysmgt/nim/README`. The readme file contains additional information about the AIX Version 6.1 NIM product and includes the following topics:

- Restrictions on SPOT Creation for Releases Prior to 5.3 (New LPP_SOURCE Directory Structure)
- Web-based System Manager NIM May Have Problems Installing SW on Client Machines
- Restrictions on Customize Operation for RPM Packages
- Steps Necessary For Adding GNOME -or- KDE Desktop Support

When Live Partition Mobility (LPM) is used to migrate a machine (that is, move a machine from one physical server to another) and the machine is defined as a NIM client, the NIM administrator must update the `cupid` attribute for the NIM client to reflect the new hardware value after the LPM migration completes. To update the `cupid` attribute, do the following:

1. On the NIM client, acquire the new `cupid` ID by running the following command:

```
uname -a
```

2. On the NIM master, run the following command:

```
nim -o change -a cupid+<cupid> <client>
```

Java Levels

To remove Java5 from your system, you need to remove the following software if it is installed on your system:

- `ifor_ls.java.gui`
- `ifor_ls.msg.en_US.java.gui`
- `lum.base.gui`
- `lum.msg.en_US.base.gui`
- `csm.hc_utils.csm.gui.dcem`
- `csm.gui.websm`
- `csm.server`

All requisites to Java6 from AIX software are removed. To verify whether Java5 and or Java6 can be removed from your system, preview the software removal for each.

For new and overwrite installs as well as preservation installs of 6100-09-10, the `PATH` variable is changed to point to `java7_64`. If you upgrade to AIX 6100-09-10 or perform a migration operating system install, you will need to change the `/etc/environment` `PATH` variable after you remove all of the Java™ Version 5 and Java Version 6 software from the system.

You can access the IBM Java 6 support extension technical article at [IBM Java for AIX Reference: Java Version 6.0 Support Extension](#).

IBM encourages everyone to switch to java7_64. There is no support for security vulnerabilities in Java Version 5, and limited support for Java Version 6 until November 2017.

To check whether a more recent service refresh is available for a version of Java, see the [AIX Download and service information website](#).

DSM

The **dsm.core** ships a `/etc/ibm/sysmgt/dsm/overrides/dsm.properties` file which allows user to override the SSH configuration. If this file is modified, the file will need to be backed up manually before an update or a migration, as it will be overwritten.

xlC runtime software

When you migrate from an AIX 5L™ operating system to an AIX 6.1 operating system, the **xlC.aix50.rte** fileset is replaced by the **xlC.aix61.rte** fileset. If you upgraded the **xlC.aix50.rte** fileset after you installed your system, the migration may replace your upgraded version with a downlevel version. Before you migrate to an AIX 6.1 operating system, save the level of your **xlC.aix50.rte** fileset. After the migration is complete, compare your saved level of the **xlC.aix50.rte** fileset with the **xlC.aix61.rte** fileset. If the changes that you made to your level of the **xlC.aix50.rte** fileset are not in the **xlC.aix61.rte** fileset, upgrade the **xlC.aix61.rte** fileset.

Thin Servers

If you migrate any previous version of the AIX Common Operating System Image (COSI) and associated AIX Thin Servers to the AIX 6.1 with 6100-05 version, it is recommended that you delete any dump device associated with the migrated Thin Servers and re-create the Thin Servers.

Additionally, you must install the **devices.tmiscsw.rte** fileset on the NIM master for the AIX 6.1 with 6100-05 Thin Server to create a dump device. The **devices.tmiscsw.rte** fileset is available in the AIX Expansion Pack.

Limitations and restrictions

This section lists restrictions and limitations applying to AIX Version 6.1.

EMC PowerPath support for traditional and firmware assisted dump

To complete a traditional assisted dump or a firmware assisted dump, you must have installed EMC PowerPath Version 5.5.0.2, or earlier.

Performing an internal or external snapshot of a JFS2 filesystem

The **snapshot** command fails in the following instances:

- The **snapshot** command fails with a Not owner error if you are trying to create an internal snapshot and the filesystem already has an external snapshot and vice versa. In this instance, the **fsctl** system call returns -1 and the **errno** parameter has the EPERM value.
- The **snapshot** command fails with a Not owner error if trying to create an internal or an external snapshot and the filesystem is HSM enabled. In this instance, the **fsctl** system call returns -1 and the **errno** parameter has a EPERM value.
- The **chfs** command fails with a A system call received a parameter that is not valid error if trying to enable HSM for a filesystem that has an internal or an external snapshot. In this instance, the **finfo** system call returns -1 and the **errno** parameter has a EINVAL value.
- The **snapshot** command fails with a No space left on device error when trying to create an internal snapshot and the snapshot limit is exceeded. In this instance, the **fsctl** system call returns -1 and the **errno** parameter has a ENOSPC value.

Xterm with locale support limitations

Xterm, the terminal emulator for the X Window System, is enabled for locale support, except for bidirectional locales. This emulator requires ISO 10646-1 encoded fonts to display results. These fixed-width fonts are shipped with AIX CDs. Install the **X11.fnt.xorg.misc-misc** fileset to properly display locale text. The fixed-width fonts are limited to two sizes: default and large.

All Latin languages, Japanese, and Korean languages are supported. The Chinese language is not supported.

Note: Japanese support is provided only for JISX0201 and JISX0208 characters.

Messages from the **xterm** application are not displayed in locale-specific languages.

GSKit version requirement for NIST compliance

You must use GSKit version 8.0.50.10, or later, when you use IP Security with Rivest-Shamir-Adleman (RSA) key lengths that are greater than 2048 bits. The minimum RSA key length of 2048 bits is a requirement for complying with the National Institute of Standards and Technology (NIST) standard as defined in Special Publication 800-131A. GSKit version 8.0.50.10 is provided on the AIX 6 with 6100-09 Expansion Pack media.

Java version 5

Java 5 went end of service (EOS) in September 2015. If you want to remove Java 5 from your system, you must remove the following software:

- ifor_ls.java.gui
- ifor_ls.msg.en_US.java.gui
- lum.base.gui
- lum.msg.en_US.base.gui
- csm.hc_utils
- csm.gui.dcem
- csm.gui.websm
- csm.server

To identify if there is software from other sources on your system with requisites to Java 5, complete a preview uninstall of Java5. If you remove Java 5, you must also change the PATH variable to java6 in the /etc/environment file.

Java version 7.1 SR1 support in the POWER8 environment

Java version 7.1 SR1 is provided on the AIX Expansion Pack media. This version of Java is tested in the POWER8 environment.

IBM Security Directory Server and GSKit fix for SSL issue

IBM Security Directory Server, formerly known as IBM Tivoli[®] Directory Server, is affected by a problem that is related to the Secure Sockets Layer (SSL) implementation. Some conditions can cause the processor utilization to rapidly increase, resulting in a denial of service.

If your GSKit is older than the corresponding levels that are in the following list, update your GSKit to the specified version, or later. To determine which version of the GSKit component is installed, enter the following command:

```
ls|pp -l |grep -i gsk
```

You can download the fixes for the following GSKit versions:

- GSKit V7.0.4.50
- GSKit V8.0.14.43

When you are using GSKitV8, your IBM Security Directory Server or IBM Tivoli Directory Server must be at version 6.3.0.26 or higher. This version avoids a compatibility issue between the IBM Security Directory Server component and the new GSKitV8 fix packs. To determine the installed version of the IBM Security Directory Server, enter the following command:

```
ls|pp -l |grep idsldap
```

OpenSSL version 1.0.2

OpenSSL 0.9.8 shared objects (libcrypto.so.0.9.8 and libssl.so.0.9.8) are also included in the OpenSSL 1.0.2.1100 fileset libraries for compatibility with earlier versions of OpenSSL.

OpenSSL versions 0.9.8 and 1.0.1 are no longer supported by IBM. The OpenSSL 0.9.8 shared objects are retained in the libraries as is. You should update your applications to use the newer version of the OpenSSL libraries.

Applications must use OpenSSL version 1.0.2 shared objects (libcrypto.so or libcrypto.so.1.0.0, and libssl.so or libssl.so.1.0.0) that are included in libraries of OpenSSL 1.0.2.1100 fileset to continue using the supported version of OpenSSL.

POWER8 hardware cryptography capability and OpenSSL version 1.0.2.1100

The OpenSSL version 1.0.2.1100 fileset and AIX 6 with 6100-09 can use the in-core cryptographic function that is available with POWER8 systems. To use this function, the following conditions must be met:

- Any existing applications that use an older version of the OpenSSL fileset must be recompiled with the latest headers and relinked to the newer 1.0.2 libraries that are included with the OpenSSL 1.0.2.1100 fileset.
- Applications that use the **dlopen** function to load the 0.9.8 version of the OpenSSL shared objects must be reconfigured to load the 1.0.2 version of the OpenSSL shared object.
- A future OpenSSL release that is incompatible must be recompiled with the latest headers and relinked with the newer binaries.

The following algorithms are implemented in OpenSSL version 1.0.2 that can use the POWER8 in-core cryptographic capabilities:

- AES-128-CBC
- AES-192-CBC
- AES-256-CBC
- AES-128-ECB
- AES-192-ECB
- AES-256-ECB
- AES-128-GCM
- AES-192-GCM
- AES-256-GCM
- AES-128-XTS
- AES-192-XTS
- AES-256-XTS
- SHA1
- SHA224
- SHA256
- SHA384
- SHA512

Note: Applications that use earlier versions of the OpenSSL fileset continue to function and use the OpenSSL default software cryptographic modules on the POWER8 system.

To download the latest version of the OpenSSL fileset, see the AIX Web Download Pack Programs website.

OpenSSH Version 7.1p1

The OpenSSH file set has been updated to open source community 7.1p1 release with AIX VRMF 7.1.102.1100.

- The OpenSSH file set includes the patch for GSSAPI Key Exchange feature.
- The OpenSSH file set has been compiled with openSSL 1.0.2k version.

Note: This file set can be installed on either versions of openSSL because of the compatibility between openSSL 1.0.1 and 1.0.2.

- All of the vulnerabilities reported in the higher version of openSSH (including 7.5p1 release) have been back ported to this file set.

OpenSSH 6.0p1 with VRMF 6.0.0.6204, or earlier, are longer supported. To download the latest version of the OpenSSH fileset, go to the AIX Web Download Pack Programs website.

InfiniBand EEH limitation

The 4X IB Dual Port DDR Exp CD, CFF/PCIE adapter (feature 8258) and aix_ib stack type of 2 port 10GbE RoCE adapter (feature EC27, EC28, EC29, and EC30) do not support full EEH recovery. If you get a bus error (MXIB_EEH_TEMP_ERR in the error log), you might have to manually perform the recovery steps. These steps might include manually reconfiguring the adapter or replacing the adapter. To manually reconfigure the adapter, complete the following steps:

1. Stop any applications using IB or roce devices.
2. Unconfigure the adapter by using the **rmdev** command (for example, `rmdev -l iba0` or `rmdev -l roce0`).
3. Configure the adapter by using the **mkdev** command (for example, `mkdev -l iba0` or `mkdev -l roce0`).

Notes:

1. If the adapter instance is busy (a program or kernel extension has called open on the adapter), you might not be able to unconfigure the adapter. If you cannot unconfigure the adapter, you must reboot the system.
2. If the bus error (MXIB_EEH_HARDWARE_ERROR) is present after a successful manual recovery, you must replace the adapter.

Additional information

IBM Knowledge Center

To view the most current version of IBM Knowledge Center, see the IBM Knowledge Center website. IBM Knowledge Center content can be installed from or be viewed directly from the DVD on any AIX or Microsoft Windows systems that are capable of reading a DVD.

If you require a translated version of the documentation and cannot access the website or use a DVD, then you might be able to download a copy of the DVD contents from the "Entitled Software Service" site under the terms of your AIX Software Maintenance Agreement if electronic download is offered in your country.

For information about using the electronic software delivery, see the My entitled software website and click **Help**. The electronic install image is provided in a **tar.gz** format. After downloading the compressed tar image, decompress, unpack, and run **install_aix** to start the installation wizard.

Cluster Aware AIX

The Cluster Aware function is part of the AIX operating system. Using Cluster Aware for AIX you can create a cluster of AIX nodes and build a highly available solution for a data center.

Migration is not supported for AIX 6 with 6100-09 or for AIX 7 with 7100-01. To upgrade from AIX 6.1 with 6100-06 of Cluster Aware AIX (CAA) or from AIX 7 with 7100-00 of CAA to AIX 6 with 6100-09 or to AIX 7 with 7100-01, first remove the cluster, and then install AIX 6 with 6100-09 or install AIX 7 with 7100-01 on all nodes that will be included in the new cluster.

Removal of solidDB CAA no longer uses an embedded IBM solidDB database. The `bos.cluster.solid` fileset still exists, but it is now obsolete. The `solid` and `solidhac` daemons are no longer used by CAA.

clusterconf command

CAA commands no longer support forced cleanup options.

The following is a list of options, by command, that are not supported in AIX 6 with 6100-09 or in AIX 7 with 7100-01.

```
chcluster -f
clusterconf -f, -s, -u
rmcluster -f
```

The `clctrl` command can be used for tuning the cluster subsystem. Only tune the cluster subsystem at the direction of IBM customer support.

Vendor disk support The CAA infrastructure now provides limited support for some disks that are managed by vendor disk drivers. No disk events are available for these disks, but they can be configured into a cluster as a repository or as shared disks. See the documentation for the clustering product that you are using, such as IBM PowerHA® SystemMirror® for AIX, for a complete list of vendor disk devices that are supported for your environment.

DB2 migration

You can upgrade your DB2[®] environment with DB2 Version 9.5, DB2 Version 9.1, or DB2 UDB Version 8 copies to DB2 Version 9.7. For more information about upgrading to DB2 Version 9.7, see the Upgrade to DB2 Version 9.7 topic.

Note: The DB2 High Availability feature is not included in the DB2 version 9.7 FP2. The DB2 HA feature is available in the DB2 Version 9.7 from FP3.

The `devices.artic960` fileset

The `devices.artic960` fileset provides support for the IBM ARTIC960Hx 4-Port Selectable PCI Adapter (FC 2947). This includes EEH support and 64-bit support for the FC 2947 adapter. If an additional fileset is installed to access the IBM ARTIC960 FC 2947 adapter, full EEH and 64-bit support depends on the ability of the additional fileset to support EEH and 64-bit.

Included with the `devices.artic960` fileset are the following filesets:

- `devices.artic960.rte`, IBM ARTIC960 Runtime Support
- `devices.artic960.unicode`, IBM ARTIC960 Adapter Software
- `devices.artic960.diag`, IBM ARTIC960 Adapter Diagnostics

When a PCI I/O error occurs on an IBM PCI ARTIC960 adapter, the adapter slot becomes frozen and the IBM ARTIC960 adapter can be reset. Following an EEH error, the adapter software needs to be downloaded to the adapter again.

To determine if an EEH error occurred on an IBM ARTIC960 adapter, inspection of the error log is necessary. A temporary EEH error on an IBM ARTIC960 adapter is logged as a temporary EEH error followed by I/O errors specific to the IBM ARTIC960 adapter. Recovery from a temporary EEH error is accomplished by removing and making the IBM ARTIC960 device driver using the `rmdev` and `mkdev` command. This process loads the necessary adapter software onto the adapter.

If the error log shows a permanent EEH error, it is necessary to use the hot plug manager to remove and make the adapter again.

The `devices.artic960` fileset does not support interprocess communication through mailboxes on AIX Version 6.1.

The `devices.pci.14108c00` fileset

The `devices.pci.14108c00` fileset provides support for SDLC and bi-synchronous protocols on the IBM ARTIC960Hx 4-Port Selectable PCI Adapter (FC 2947). When combined with the installation of the `devices.artic960` fileset, Enhanced Error Handling (EEH) support is provided. Either 32-bit or 64-bit kernel mode is supported. 32-bit applications are supported.

Error log labels for Fibre Channel adapters have changed in AIX 6.1

The error log templates are in the `devices.common.IBM.fc.rte` fileset. The `devices.pci.df1000f7.com` driver fileset that references the error log templates has changed. The following changes were made in the error logs:

- Errors previously logged using the `FCS_ERRn` template label (where *n* is between 0 and 10, inclusive) are now logged using the `FCA_ERRn` template label (where *n* is between 0 and 15, inclusive).
- Errors previously logged using the `FSCSI_ERRn` template label (where *n* is between 0 and 10, inclusive) are now logged under the `FCP_ERRn` template label (where *n* is between 0 and 15, inclusive).

The new templates also provide 1024 bytes of detailed date where as the previous templates had only 228 bytes.

AIXLink/X.25 LPP

AIXLink/X.25 LPP Version 2.1 is supported on AIX Version 6.1.

Lightweight Infrastructure

The following AIX components rely on and incorporate Lightweight Infrastructure (LWI) v7.1:

- Electronic Service Agent™ (eSA)
- IBM Systems Director Console for AIX
- Common Agent Services (CAS) Agent

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