

IBM AIX 7.2 with Technology Level 5  
Expansion Pack

*Release Notes*



**Note**

Before using this information and the product it supports, read the information in [“Notices” on page 11.](#)

**Second Edition (April 2021)**

This edition applies to IBM® AIX® 7.2 with Technology Level 5 and to all subsequent release and modifications until otherwise indicated in new editions.

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## About this document

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The Release Notes topics include late technical information that is not included in other topics, and they highlight new functions for the IBM AIX 7.2 with Technology Level 5 licensed program.

## Highlighting

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The following highlighting conventions are used in this document:

<b>Bold</b>	Identifies commands, subroutines, keywords, files, structures, directories, and other items whose names are predefined by the system. Bold also identifies graphical objects such as buttons, labels, and icons that the you select.
<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 type.

## Case-sensitivity in AIX

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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

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



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# IBM AIX 7.2 with Technology Level 5 Expansion Pack Release Notes

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## Read before installing

Before you use this software, you must go to the [Fix Central](#) website and install the latest available fixes that address security vulnerabilities and other critical issues.

The Expansion Pack DVD contains programs that are provided by IBM and other program suppliers. Each program is licensed under the terms and conditions of that specific program. These terms and conditions can vary depending on the specific program or the program supplier. Specific information about the content of this DVD and the terms and conditions under which these programs are licensed are contained in a readme file on the media.

Following is the procedure to obtain the content and Terms and Conditions information:

1. Log in as the root user.
2. Insert the DVD into the media drive. If your media drive is not `/dev/cd0`, substitute the correct device name and type the following commands:

```
mount -v cdrfs -o io /dev/cd0 /mnt
cp /mnt/README* /tmp
umount /mnt
```

The `/tmp/README` and `/tmp/README.html` files contain the content or the Terms and Conditions under which these programs are licensed. View this information by using a web browser, or run the **more** command or the **pg** command.

Softcopy documentation for each product is included with the product. These Release Notes supplement the product documentation by outlining the steps for getting started and by pointing you to more product information.

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## Installation, migration, upgrade, and configuration

The IBM AIX 7.2 with Technology Level 5 Expansion Pack is included with the IBM AIX 7.2 with Technology Level 5 operating system as a vehicle for delivering new IBM and non-IBM products. Most IBM AIX 7.2 with Technology Level 5 Expansion Pack products can be installed by using normal installation methods. Some Expansion Pack products cannot be installed by using normal installation methods. Their installation procedures are provided under their product descriptions.

The IBM AIX 7.2 with Technology Level 5 Expansion Pack might include products that contain a cryptographic function that is subject to special export-licensing requirements by the US Department of Commerce. Import restrictions can also apply to certain countries. Different packages of the IBM AIX 7.2 with Technology Level 5 Expansion Pack accommodate varying country export or import restrictions. To determine which package is appropriate for you, review the Ordering Information, which is located in the Expansion Pack announcement. Contact your IBM representative or IBM Business Partner to determine which type of encryption you are entitled to receive.

The contents of the Expansion Pack vary over time. New software products can be added, changed, or removed. Changes to the content of the IBM AIX 7.2 with Technology Level 5 Expansion Pack are announced either as part of an AIX announcement or independently of the release announcement.

Unless otherwise indicated, products can be installed from the DVD by using the System Management Interface Tool (SMIT). For more information about installing products, see the [Installation and migration](#) topic.

## Listing and previewing installation software

You can list the available software products, packages, and filesets on AIX media, which can be a DVD or directory. The output shows the available packages and filesets on the media. The descriptions are provided at the fileset level.

You can perform a preview installation before performing the actual installation. A preview installation provides the preinstallation information that occurs during a regular installation, except that no software is installed.

When you select a package or fileset to be installed with the preview installation process, you can view a list that contains all of the requisite packages and filesets that are needed for the successful installation of the selected package or fileset.

Other information that is generated during the preinstallation process is required for the file system-size checking. The file systems are checked to ensure that there is enough free space available to install the selected package or fileset.

You can list the software and use the previewing software functions from the command line or the SMIT interface.

## Listing and previewing software from the command line

1. Log in as the root user.
2. To list the software on the first DVD of the base media, insert the DVD into the media drive, and type the following command:

```
installp -ld/dev/cd0 | pg
```

A list similar to the following is displayed:

fileset Name	Level	I/U	Q	Content
ICU4C.adt	2.8.0.0	I	N	usr
# ICU Application Developer's Toolkit				
ICU4C.man.en_US	2.8.0.0	I	N	usr
# ICU Manual Pages - U.S. English				

3. To perform a preview installation at the command line, use the **-p** flag with the **installp** command. For example, to preview the installation of the ICU4C.adt fileset, enter the following command from the command line:

```
installp -aXgq -p -d/dev/cd0 ICU4C.adt
```

The preview option displays the requisite filesets that are to be installed and the system resources that are being used.



## Listing and previewing software from the ASCII SMIT interface

1. Log in as the root user.
2. From the command line, enter `smitty install_update`.
3. Select **Install Software**.
4. Press F4 (List) to list the available input devices and select the appropriate device, or type the input device name in the blank field. Press Enter to continue.
5. In the **SOFTWARE to Install** field, press F4 (List) to list all available software on the selected media.
6. Scroll through the list of software by using the arrow keys or the Page Up and Page Down keys.

**Note:** The following listing shows the available software packages and filesets for that software product.

If the fileset is preceded by a plus sign (+), it is available to be installed. If the fileset is preceded by an at sign (@), the fileset is already installed.

In the following example output, the software product is ICU4C:

```
ICU4C.adt                                ALL
+ 2.8.0.0  ICU Application Developer's Toolkit

ICU4C.man.en_US                          ALL
+ 2.8.0.0  ICU Manual Pages - U.S. English

ICU4C.rte                                 ALL
+ 2.8.0.0  International Components for Unicode
```

The three packages are `ICU4C.adt`, `ICU4C.man.en_US`, and `ICU4C.rte`. The fileset in the `ICU4C.adt` package is the ICU Application Developer's Toolkit at level 2.8.0.0. The descriptions for the software product are provided at the fileset level. A package often consists of more than one fileset.

7. Select the package or fileset that you want to install and press the F7 (Edit). Press Enter to continue.
8. To preview the installation of the package or fileset that you selected, press the Tab key and select **yes** in the **PREVIEW only?** field. Press Enter to continue.

**Note:** To obtain detailed information about the installation, select **yes** in the **DETAILED output?** field. The filesets that are being installed are displayed in parentheses.

## Apache HTTP Server and Samba for AIX

The software for Apache HTTP Server and Samba for AIX changed from the **installp** format to the **rpm** format. The software is removed from the expansion pack and it is now available in the **AIX Toolbox**. To determine whether an installation of this software is installed, enter the following commands in the command line:

```
# lsllpp -Lc | grep httpd
# lsllpp -Lc | grep samba
```

Remove the **installp** formatted packages before installing the newer **rpm** formatted packages. To preview your removal and save the log file in the `/tmp/preview.log` directory, enter the following command:

```
# installp -e /tmp/preview.log -pu httpd samba
```

To remove and save the output in the `/tmp/remove.log` directory, enter the following command:

```
# installp -e /tmp/remove.log -u httpd samba
```

To install **rpm** formatted software, use the **rpm** or **geninstall** command or the **SMIT installation** menu options.

## AIX 7 with 7200-05 Expansion Pack security

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This section lists security restrictions and limitations for the AIX 7 with 7200-05 Expansion Pack.

### 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 1.0.2.2100 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. 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 1.0.2.2100 fileset to continue to use the supported version of OpenSSL.

### Hardware cryptography capability and OpenSSL version 1.0.2.2100

The OpenSSL version 1.0.2.2100 fileset and AIX 7 with 7200-05 can use the in-core cryptographic function that is available with POWER8 processor-based systems, or later. 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 1.0.2.2100 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 libraries.

The following algorithms are implemented in OpenSSL version 1.0.2 that can use the in-core cryptographic capabilities of POWER8 processor-based systems, or later:

- 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 processor-based systems, or later.

To download the latest version of the OpenSSL fileset, go to the [AIX Web Download Pack Programs](#) website.

## Data Encryption Standard kernel extension 64-bit

You can now use 64-bit kernels with the Data Encryption Standard (DES) kernel extension `nfs_kdes_full.ext`. This extension uses secure Network File System (NFS) by encrypting time stamps that are sent between the client and the server, which allows each Remote Procedure Call (RPC) message to be authenticated.

For more information about the DES extension, see the [Network File Systems security](#) topic.

The DES encryption kernel extension is available from the `des` fileset on the AIX Expansion Pack.

## Certificate Authentication Services

Certificate Authentication Services are not included with the AIX 7 with 7200-05 operating system.

## IP Filter converted to the AIX operating system

IP Filter, Version 5.3.0.7 open source software is converted to the AIX operating system. The IP Filter software package can be used to provide network address translation (NAT) or firewall services.

## Network security options TCP Wrapper 1.1.0.0

TCP Wrapper is a simple open source tool to monitor and control incoming network traffic. For more information about the TCP Wrapper, see the [Wietse's tools and papers](#) website.

## AIX Network Data Administration Facility

The AIX Network Data Administration Facility (AIX NDAF) for AIX 7 with 7200-05 is not available on the Expansion Pack media. It is available on the base media.

## IBM Security Verify Directory

IBM Security Directory Server (ISDS) is no longer available with the AIX 7.3 Technology Level 2 and AIX 7.2 Technology Level 5 expansion packs.

IBM Security Verify Directory (ISVD) Version 10.0 is available on the AIX 7.3 Technology Level 2 and AIX 7.2 Technology Level 5 base packs. If you have ISDS Version 6.4, you must upgrade to ISVD Version 10.0. For more information about upgrading to ISVD Version 10.0, see [Upgrade an instance of IBM Security Verify Directory](#) page.

**Note:** To support clients who are using AIX 7.2 with supported Technology Levels, ISVD Version 10.0 will be provided as part of the AIX 7.2 base pack as ISDS version 6.4 reaches end of support (EOS) in September 2024.

The following cryptography filesets for Security Directory Server Version 6.2 and Version 6.3 are no longer provided on the AIX expansion packs:

- `idsldap.clt_max_crypto32bit62`
- `idsldap.clt_max_crypto64bit62`
- `idsldap.srv_max_cryptobase64bit62`
- `idsldap.webadmin_max_crypto62`

## Modern Cryptographic Library

The Modern Cryptographic Library is updated from version 6.1.0.3 to version 6.1.0.4.

The updates for Modern Cryptographic Library version 6.1.0.4 include the following `modcrypt` filesets:

- `modcrypt.base.lib`
- `modcrypt.base.includes`

The `modcrypt` filesets are required if the ACF and PKCS11 device driver version 7.1.3.30 (`security.acf` fileset) is installed on your system and if you are using a Network File System (NFS) with Kerberos 5 authentication. If your system does not meet these requirements, the system fails when the NFS `gssd` daemon starts.

The `modcrypt` fileset is compatible with Kerberos NAS 1.6.0.x, which is available in Expansion Pack and [AIX Web Download Program](#) web page, and the latest Kerberos version 1.16.1.x, which is available in the [AIX Web Download Program](#).

## IBM Network Authentication Service Version 1.16.1.5 for AIX

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IBM Network Authentication Service (NAS) Version 1.16.1.5 for the AIX environment is a network-authentication protocol based on the IETF RFC 1510 standards protocol for the Kerberos V5 IBM NAS. The IBM NAS includes the Generic Security Service API (GSSAPI) and the Key Distribution Center (KDC) server. With IBM Network Authentication Service, AIX middleware and external application writers can use authenticated and optionally encrypted message flow between their respective components.

The IBM NAS fileset is updated with AIX VRMF 1.16.1.5. Some of the fileset enhancements are as follows:

- The fileset includes the Simple and Protected GSS-API Negotiation Mechanism (SPNEGO) feature.
- All of the impacted vulnerabilities reported until MIT Kerberos version 1.16.1 is back ported to this fileset.
- Other packaging-related changes are done in this fileset to remove redundant dependency on `bos.net.tcp.client`.

### Note:

- To download the latest version of the NAS fileset, see the [AIX Web Download Pack Programs website](#).
- The NAS version 1.5.0.xxxx is no longer supported on AIX.

## Network Authentication Service Documentation

Read the `README.lang` file for IBM Network Authentication Service (NAS), Version 1.5 before you configure or use the program, where *lang* is one of the following language locales:

- Chinese (Simplified)
- Chinese (Traditional)
- English
- Korean
- Portuguese (Brazilian)

The `README.lang` file for the AIX environment is located in the `/usr/lpp/krb5` directory after the `krb5.client.rte` fileset is installed from the `krb5.client` client installation package. The `README.lang` file can also be viewed by using the SMIT `list_media_info` command to list supplemental fileset information about the installation media for the `krb5.client.rte` fileset.

Documentation for IBM Network Authentication Service is available in the `README.lang` installation packages, where *lang* is one of the following language locales:

- `en_US` (US English)
- `Ja_JP` (Japanese)
- `ko_KR` (Korean)
- `zh_CN` (Simplified Chinese)

The documentation is available in both HTML and PDF formats. Install the `krb5.doc.lang.html` fileset to access HTML documents and the `krb5.doc.lang.pdf` fileset to access PDF documents.

The IBM Network Authentication Service Version 1.5 Administrators and User's Guide is installed in the following directories:

- HTML

`/usr/lpp/krb5/doc/html/lang/ADMINGD`

- PDF

`/usr/lpp/krb5/doc/pdf/lang/ADMINGD`

The IBM Network Authentication Service Version 1.5 Application Development Reference is installed in the following directories:

- HTML

`/usr/lpp/krb5/doc/html/lang/APDEVREF`

- PDF

`/usr/lpp/krb5/doc/pdf/lang/APDEVREF`

>|As mentioned in the `ADMINGD.pdf`, which is provided in the `krb5.doc.en_US.pdf` fileset, the **config.krb5** command is used to configure secondary server with the LDAP backend server. However, in Network Authentication Service 1.16.1.5 version, arguments that are specified with the **-L** flag are not accepted and hence you do not need to specify these arguments. |<

>|More commands, like the **kdb5\_ldap\_util** command, is provided in Network Authentication Service 1.16.1.5 version, which can be used to configure NAS server with the LDAP backend server. The usage of the **kdb5\_ldap\_util** command is available in [MIT admin command](#) document. |<

## New features

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### **zlibNX data compression library**

The zlibNX library is an enhanced version of the zlib compression library that supports hardware-accelerated data compression and decompression by using co-processors that are called Nest accelerators (NX) on IBM POWER9 processor-based servers. The zlibNX library is based on the zlib compression library version 1.2.11. For more information, see the [Data compression by using the zlibNX library](#) topic.

### **Server Message Block (SMB) client file system**

AIX Version 7.2 supports the SMB client file system that is based on the SMB protocol version 3.0.2 and 2.1. The SMB server runs on Windows™ Server 2012 or Windows Server 2016 server operating system. In each of these server operating system types, a directory can be exported as a *share*. This *share* can then be mounted on an AIX logical partition by using the SMB client file system. You can use the SMB client system to access shares on SMB servers as local file systems on the AIX logical partition.

The SMB client file system in the AIX operating system requires Kerberos-based GSSAPI to start the user-authenticated session by using the SMB protocol version 3.0.2 or 2.1, based on the selection. In the AIX operating system, the GSSAPI is provided by a Userspace Library in the IBM Network Authentication Service (NAS) version 1.16.1.0, or later fileset. This fileset is included in the AIX Expansion Pack.

The SMB protocol version 3.0.2 uses AIX OpenSSL library to generate keys to sign and encrypt the fileset. You must have `openssl.base` fileset version 1.0.2.2002, or later installed in the AIX operating system to use the SMB protocol. This fileset is included in the AIX Expansion Pack.

The SMB client file system facilitates compatibility of SMB protocol version 3.0.2 with the SMB protocol version 2.1 and supports all functions of SMB protocol version 2.1 along with the additional

features of the SMB protocol version 3.0.2. Earlier filesets (version 7.1.0.\*) of SMB protocol is not supported.

To install the SMB client file system on the AIX LPAR, download the SMB client file system package from the [AIX Web Download Program](#) web page. Install the `smc . rte` package on the AIX LPAR. For more information, see the [SMB client file system](#) topic.

## > | **Berkeley Internet Name Domain (BIND) version 9.16**

AIX 7.2 supports BIND version 9.4.1 in the base media package. Starting with AIX 7.2, Technology Level 5, BIND version 9.16 is included in the `bind . rte` fileset in the Expansion Pack. During the installation of the `bind . rte` fileset, the `bos . net . tcp . bind` and `bos . net . tcp . bind_utils` fileset are automatically removed. For compatibility with earlier versions of BIND, the symbolic links point to BIND version 9.16 binary files to ensure that the same commands continue to work.

**Note:** Starting with AIX 7.2, Technology Level 5, the `/usr/bin/hostnew` binary file is removed.

The following list contains a mapping of BIND binary directories when `bind . rte` fileset is installed:

<i>Table 1. Mapping of BIND 9.16 binary directories</i>	
<b>BIND binary files in /usr/sbin/bind_9_16 directory</b>	<b>Default symbolic link to BIND version 9.16 binary files</b>
<code>named-checkconf</code>	<code>/usr/sbin/named-checkconf--&gt;/usr/sbin/bind_9_16/named-checkconf</code>
<code>named-checkzone</code>	<code>/usr/sbin/named-checkzone--&gt;/usr/sbin/bind_9_16/named-checkzone</code>
<code>rndc-confgen</code>	<code>/usr/sbin/rndc-confgen--&gt;/usr/sbin/bind_9_16/rndc-confgen</code>
<code>dig</code>	<code>/usr/bin/dig--&gt;/usr/bin/bind_9_16/dig</code>
<code>host9</code>	<code>/usr/bin/host9--&gt;/usr/bin/bind_9_16/host9</code>
<code>nslookup</code>	<code>/usr/bin/nslookup--&gt;/usr/bin/bind_9_16/nslookup</code>
<code>dnssec-keygen</code>	<code>/usr/sbin/dnssec-keygen--&gt;/usr/sbin/bind_9_16/dnssec-keygen</code>
<code>dnssec-signzone</code>	<code>/usr/sbin/dnssec-signzone--&gt;/usr/sbin/bind_9_16/dnssec-signzone</code>
<code>named9</code>	<code>/usr/sbin/named9--&gt;/usr/sbin/bind_9_16/named9</code>
<code>nsupdate</code>	<code>/usr/sbin/nsupdate--&gt;/usr/sbin/bind_9_16/nsupdate</code>
<code>rndc</code>	<code>/usr/sbin/rndc--&gt;/usr/sbin/bind_9_16/rndc</code>

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## **Java Technology Edition**

The following versions of Java™ Technology Edition are available on the AIX Expansion Pack media:

Table 2. Java versions

Java Version	32-bit	64-bit
Java Version 6	Yes	Yes
Java Version 7	Yes	No (on base media)
Java Version 7.1	Yes	Yes
Java Version 8	Yes	No (on base media)

**Note:** Java 5 is not available on the AIX 7 with 7200-05 base media or Expansion Pack media.

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

## Reliable Scalable Cluster Technology (RSCT) CIM resource manager

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The Common Information Model (CIM) resource manager is no longer shipped with AIX Version 7.2. If you have an older `rsct.exp` package that is installed from a previous release, you must uninstall it from AIX Version 7.2.

## Rocket-fast System for log processing (rsyslog) 8.2212.0 for AIX

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Starting with AIX 7.2 Technology Level 5, the `rsyslog.base` fileset is updated in the AIX 7.2 Technology Level 5 expansion pack to support the open source `rsyslog` version 8.2212.0 system. The open source `rsyslog` system is used to forward the log messages over an IP network.





## Notices

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