IBM AIX 7.2 with Technology Level 4
Expansion Pack

Release Notes

IBM

Note

Before using this information and the product it supports, read the information in "Notices" on page 9.

Contents

About this document

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 4 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. Bold also identifies graphical objects such as buttons, labels, and icons that the you select.
Italics	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

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.

IBM AIX 7.2 with Technology Level 4 Expansion Pack Release Notes

Read before installing

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 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.

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 ro /dev/cd0 /mnt
cp /mnt/README*  /tmp
unmount  /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.

Installation, migration, upgrade, and configuration

The IBM AIX 7.2 with Technology Level 4 Expansion Pack is included with the IBM AIX 7.2 with Technology Level 4 operating system as a vehicle for delivering new IBM and non-IBM products. Most IBM AIX 7.2 with Technology Level 4 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 4 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 4 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 4 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 needed for the successful installation of the selected package or fileset.

Other information generated during the preinstallation process are 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 consist of more than one fileset.

7. Select the package or fileset 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 has changed from the **installp** format to the **rpm** format. The software has been 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:

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

You must 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 7200-04 Expansion Pack security

This section lists security restrictions and limitations for the AIX 7 with 7200-04 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 1.0.2.1801 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 1.0.2.1801 fileset to continue using the supported version of OpenSSL.

Hardware cryptography capability and OpenSSL version 1.0.2.1801

The OpenSSL version 1.0.2.1801 fileset and AIX 7 with 7200-04 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 1.0.2.1801 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 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 ues 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 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 7200-04 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 7200-04 is not available on the Expansion Pack media. It is available on the base media.

IBM Security Directory Server

IBM Security Directory Server is no longer available on the AIX expansion pack media.

IBM Security Directory Server Version 6.4 is available on the AIX 7 with 7200-04 base media. To upgrade to Security Directory Server Version 6.4, you must upgrade from Security Directory Server Version 6.3. For instructions about upgrading to Security Directory Server Version 6.4, see the Upgrade an instance of IBM Security Directory Server topic.

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

- 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 1.6.0.4 for AIX

IBM Network Authentication Service Version 1.6.0.4 for the AIX environment is a network-authentication protocol based on the IETF RFC 1510 standards protocol for the Kerberos V5 IBM Network Authentication Service. The IBM Network Authentication Service 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 Network Authentication Service (NAS) fileset is updated with AIX VRMF 16.0.4. The fileset also includes the SPNEGO feature.

- All of the impacted vulnerabilities reported until MIT Kerberos version 1.15.1 is back ported to this fileset.
- Additional packaging-related changes have been done in this fileset to remove redundant dependency on bos.net.tcp.client.

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

Network Authentication Service Documentation

Read the README.*lang* file for IBM Network Authentication Service, 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 Administrator's 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`

New packages

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 called Nest accelerators (NX) on IBM POWER9™ processor-based servers. zlibNX is based on zlib 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 2.1. The SMB server is a server that 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. By using the SMB client file system, you can access the 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 2.1. 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 AIX Expansion Pack.

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 smbc.rte package on the AIX LPAR. For more information, see the SMB client file system topic.

Java Technology Edition

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

Table 1. 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 7200-04 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

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

Notices

This information was developed for products and services offered in the US.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive, MD-NC119
Armonk, NY 10504-1785
US

For license inquiries regarding double-byte character set (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

Intellectual Property Licensing
Legal and Intellectual Property Law
IBM Japan Ltd.
19-21, Nihonbashi-Hakozakicho, Chuo-ku
Tokyo 103-8510, Japan

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM websites are provided for convenience only and do not in any manner serve as an endorsement of those websites. The materials at those websites are not part of the materials for this IBM product and use of those websites is at your own risk.

IBM may use or distribute any of the information you provide in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Director of Licensing
IBM Corporation
North Castle Drive, MD-NC119
Armonk, NY 10504-1785
US

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement or any equivalent agreement between us.

The performance data and client examples cited are presented for illustrative purposes only. Actual performance results may vary depending on specific configurations and operating conditions.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Statements regarding IBM's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

All IBM prices shown are IBM's suggested retail prices, are current and are subject to change without notice. Dealer prices may vary.

This information is for planning purposes only. The information herein is subject to change before the products described become available.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to actual people or business enterprises is entirely coincidental.

COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs. The sample programs are provided "AS IS", without warranty of any kind. IBM shall not be liable for any damages arising out of your use of the sample programs.

Each copy or any portion of these sample programs or any derivative work must include a copyright notice as follows:

© (your company name) (year).

Portions of this code are derived from IBM Corp. Sample Programs.

© Copyright IBM Corp. _enter the year or years_.

Privacy policy considerations

IBM Software products, including software as a service solutions, ("Software Offerings") may use cookies or other technologies to collect product usage information, to help improve the end user experience, to tailor interactions with the end user or for other purposes. In many cases no personally identifiable information is collected by the Software Offerings. Some of our Software Offerings can help enable you to collect personally identifiable information. If this Software Offering uses cookies to collect personally identifiable information, specific information about this offering's use of cookies is set forth below.

This Software Offering does not use cookies or other technologies to collect personally identifiable information.

If the configurations deployed for this Software Offering provide you as the customer the ability to collect personally identifiable information from end users via cookies and other technologies, you should seek your own legal advice about any laws applicable to such data collection, including any requirements for notice and consent.

For more information about the use of various technologies, including cookies, for these purposes, see IBM's Privacy Policy at http://www.ibm.com/privacy and IBM's Online Privacy Statement at http://www.ibm.com/privacy/details the section entitled "Cookies, Web Beacons and Other Technologies" and the "IBM Software Products and Software-as-a-Service Privacy Statement" at http://www.ibm.com/software/info/product-privacy.

Trademarks

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the web at Copyright and trademark information at www.ibm.com/legal/copytrade.shtml.

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.

Windows is a trademark of Microsoft Corporation in the United States, other countries, or both.