



IBM i 7.2 - An efficient, resilient platform for business

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At a glance

IBM® i 7.2 includes the following new enhancements:

- Enhanced security options in DB2® for i
- Many new functions for programmer productivity and expanded function in DB2 for i
- Improved ease of use with IBM Navigator for i
- Enhancements to iAccess Client Solutions
- Extension of security to more applications through new single sign-on (SSO) environments
- Liberty Core as the base for Integrated Application Server
- Support for Zend Server 6.0 on IBM i 7.2
- Performance improvements for the integrated file system
- Extensions to the printing environments
- Expanded Hub functions for Backup, Recovery, and Media Services (BRMS)
- PowerHA® SystemMirror® for i Express® Edition with new HyperSwap® capability
- Support for new Power Systems™ built with POWER8™ architecture and processor
- Additional I/O capabilities including support for WAN over LAN
- Rational® tools enhancements to support Free Format Report Program Generator (RPG)
- Support for the open source file serving solution Samba

For ordering, contact your IBM representative, an IBM Business Partner, or IBM Americas Call Centers at 800-IBM-CALL (Reference: AE001).

Overview

IBM i running on an IBM Power Systems server offers a highly scalable and virus-resistant architecture with a proven reputation for exceptional business resiliency. Running applications based on IBM i has helped companies over many years to focus on innovation and delivering new value to their business, not just on managing their data center operations.

IBM i integrates a trusted combination of relational database, security, web services, networking, and storage management capabilities. It provides a broad and highly stable database and middleware foundation for efficiently deploying business

processing applications, with support for over 5,000 solutions from over 2,500 independent software vendors (ISVs). IBM i solutions are offered through an extensive, highly skilled worldwide network of IBM Business Partners that is backed by IBM's trusted services and support infrastructure.

With the announcement of IBM i 7.2, IBM is extending the integration message of IBM i. This new release of IBM i provides significant new function in DB2 for i, systems management, and security as well as enhancing many other integrated components and licensed programs. IBM i 7.2 includes support for the latest Power Systems server family.

The Row and Column Access Control being added to IBM DB2 for i provides additional security considerations by changing the way in which clients may choose to lock down and enhance the security for their business data. By moving to a role-based security definition, businesses have the option to streamline security operations with regard to assigning usage rights to users. This enhancement not only increases the security options, but also helps improve the efficiency of executing database administrator-like functions.

IBM Navigator for i can increase the effectiveness of system management activities by adding the ability to manage and compare PTFs between systems, and to monitor, analyze, and predict workload impact on the system. Performance Data Investigator (PDI) allows further monitoring, detection, and adjustment of specific performance issues. Using the collection data as a base, PDI can model future workloads.

New functions in the integrated IBM i security enable SSO between a Kerberos-enabled FTP client and an IBM i FTP server and between a Kerberos-enabled Telnet client and an IBM i Telnet server. This opens the door for more applications to participate in a single sign-on environment.

IBM i 7.2 has the necessary licensed internal code to support the latest Power® servers, taking advantage of the improved resiliency, availability, and scalability characteristics. With additional throughput, these new servers will provide IBM i clients with significant benefits when moving to these new servers.

IBM Rational continues to provide new function in the Rational suite of development products, including Rational Development Studio and Rational Developer for i. This announcement includes the details regarding the latest features and functions.

The web-based middleware support integrated into the IBM i operating system has been updated and enhanced to leverage the latest version available from our open source providers and to now leverage the latest servers delivered by WebSphere®. These solutions are integrated into the operating system (OS), and ready to help you tackle modern applications.

There are many additional enhancements being added to many components of the integrated IBM i operating system and to its related licensed programs. These are documented in the new IBM Knowledge Center website

http://www.ibm.com/support/knowledgecenter/ssw_ibm_i_72/rzahg/ic-homepage.htm

Planned availability date

May 2, 2014

Description

IBM i integrates a trusted combination of relational database, security, web services, networking, and storage management capabilities. It provides a broad and highly stable database and middleware foundation for efficiently deploying business processing applications.

With the announcement of IBM i 7.2, IBM is extending the integration message of IBM i. This new version of IBM i provides significant new function in DB2 for i, systems management, and security as well as enhancing many other integrated components. IBM i 7.2 also includes support for the latest Power Systems build with POWER8 architecture and processor.

For a full picture of the updates in IBM i 7.2, visit the new IBM Knowledge Center website

http://www.ibm.com/support/knowledgecenter/ssw_ibm_i_72/rzahg/ic-homepage.htm

IBM i

IBM Navigator for i

The Navigator family has undergone a significant update in IBM i 7.2. The web-based Navigator, strategic for modern IBM i system management, has added many functions, improving navigation and incorporating the latest in web-based technology to improve usability and performance.

- Usability updates
 - A "fast search" capability has been added, providing the ability to find screens based on the familiar names.
 - The new favorites list allows users to save selected screens into a favorites list, creating a list of important screens for quick and easy repeatable access.
 - Users can "deep dive" directly to the IFS path of choice by entering the path name. This provides an alternative to using the navigator tree.
- PTF GUI
 - View all PTFs on the system using the new web-based interface.
 - Install and apply PTFs on the selected system.
 - Send PTFs to other systems in the network.
 - Use multisystem PTF compare to compare a primary system to any number of other systems in the network, optionally sending and installing missing PTFs automatically.
- System Monitor
 - Monitor many of the performance attributes collected by collection services.
 - Create monitors that combine multiple attributes.
 - When a threshold is hit, send a notification or run a command or program automatically.
- Message Monitor
 - Monitor for predefined messages in any message file.
 - Monitor for a user-defined message.
 - When a message is encountered, send a notification or run a command or program automatically.
- Performance Data Investigator
 - Left-hand navigation is improved.
 - Fast search for PDI enables users to easily search for specific performance attributes, charts, views, and metrics, allowing system administrative tasks to be executed quickly. Simply enter the attribute of interest and instantly get a list of all screens that apply.
 - The Batch Model has been added, providing the ability to change environment variables, modeling how those changes would impact the batch window.

There are many additional enhancements to the IBM Navigator for i product. For more details on the updates to the web Navigator, visit the new IBM Knowledge Center website

IBM i Access family

IBM i Access Client Solutions

Originally announced with IBM i 7.1 TR6 and available in June 2013, the IBM i Access Client Solutions family is enhanced with this release. IBM i Access Client Solutions enhancements for IBM i 7.2 continue to provide platform-independent features that will work with most operating systems that support Java™, such as Linux™, Apple Mac OS, and Microsoft™ Windows™. Highlights in the 7.2 release include:

- 5250 display and printer emulation based on IBM's Host-on-Demand
- 5250 Session Manager support modeled after IBM Personal Communications Session Manager
- Multiple language support for concurrent 5250 emulation sessions on the same client
- Data Transfer similar to IBM i Access for Windows Data Transfer plus support for Open Document spreadsheet (*.Odds), Excel Workbook (*.lax), and other file formats
- Data Transfer integration with Excel and OpenOffice
- Downloading and viewing of spool files
- IBM i Virtual Control Panel for LAN and HMC consoles
- 5250 emulation for LAN and HMC consoles
- Consolidation of hardware management interface configurations, including ASMI, IVM, and HMC

There are two option packages for IBM i Access Client Solutions, Windows Application Package and Linux Application package. These platform-specific packages provide features for connecting to IBM i resources using various options including connectivity to DB2 for i using ODBC, .Net, and OLE DB and the Programming Toolkit for accessing IBM i system objects.

IBM i Access for Web

IBM i Access for Web has added support for:

- IBM integrated web application server for i Version 8.5
- WebSphere Application Server Versions 8.0 and 8.5
- WebSphere Portal Versions 7.0 and 8.0
- RC4 and AES encryption types with SPNEGO environments
- Password expiration based on the QPWDEXPWRN system value

IBM i Access for Windows and IBM i Access for Linux

The newest members of the Access Client Solution family are able to provide the same (and improved) connectivity previously provided by IBM i Access for Windows and IBM i Access for Linux. Therefore, these products, while continuing to be shipped with Access Client solutions, are now considered to be stabilized. IBM i Access Client Solutions combined with the optional IBM i Access Client Solutions - Linux Application Package provides several additional features and enhancements previously not available in IBM i Access for Linux.

For additional information about IBM i Access Client Solutions, visit the product website at

<http://www-03.ibm.com/systems/power/software/i/access/solutions.html>

Upgrade options

Clients with IBM i 6.1 or IBM i 7.1 can acquire media for IBM i Access for Web 7.2 and IBM i Access Client Solutions 1.1.3 by ordering feature 6289 for 5761-SS1 or 5770-SS1. Feature 6289 replaces feature 6288 for both 5761-SS1 and 5770-SS1. The difference between features 6288 and 6289 is that feature 6289 delivers the IBM i Access for Web 7.2 rather than 7.1.

IBM i 7.2 clients who need installation media for IBM i Access for Windows 7.1 can order 5770-SS1 feature 6287. This feature delivers both the PC and server installation media.

Security enhancements for single sign-on

IBM i 7.2 is extending its reputation for industry-leading security, by adding new function and extending the existing application suite for IBM i single sign-on (SSO). Among other things that can be realized by this support, clients currently maintaining passwords across multiple partitions will be excited to know that they can now maintain passwords in a single partition and with the new FTP and Telnet support for authentication with Kerberos that information can percolate to the remaining partitions.

FTP client and server support enables SSO between a Kerberos-enabled client and an IBM i FTP server. Telnet client and server support enables SSO between a Kerberos-enabled client and an IBM i Telnet server. In both cases, the clients are enabled for Kerberos and support Kerberos authentication and Enterprise Identity Mapping functionality.

IBM i web middleware solutions

The web middleware solutions on IBM i consist of a wide range of leading-edge technologies for modern businesses. Whether the goal is to host simple websites or to run the most advanced sites, IBM i middleware provides the robust infrastructure required to run the business.

IBM HTTP Server (powered by Apache), 5770-DG1

The HTTP server on IBM i continues to leverage the industry-standard HTTP servers for web serving. The HTTP server has been updated to use the latest Apache 2.4 level of the server. This update helps ensure a firm foundation for web serving, both now and into the future. Some of the highlights of this support include:

- Server Name Indication (SNI) support - Allows a server to present multiple certificates on the same IP address and port. This means HTTPS websites can be served from the same IP address but use different certificates.
- Online Certificate Status Protocol (OCSP) support.
- Improved proxy capabilities.
- Advanced authentication settings.
- Many new enhanced Apache modules: mod_remoteIP, mod_request, and mod_watchdog, to name a few.
- The ability to run HTTP server jobs in a custom subsystem. Jobs are no longer tied to QHTTSPSVR. This ensures HTTP server jobs have their own dedicated memory pool as needed.
- The ability to allow fastCGI jobs to run with user profiles other than the default QTMHHTTP.

Note: With the Apache server level of 2.4, all user-created plug-ins will be required to be recompiled. For additional details see the HTTP Server for i product at

<http://www-03.ibm.com/systems/power/software/i/http/index.html>

IBM Developer Kit for Java, 5770-JV1

Java for IBM i has been refreshed for IBM i 7.2. The product ID has been updated to 5770-JV1. The default JVM for IBM i 7.2 has been updated to Technology for Java 7.1 32 bit (option 14). As a result several of the older versions of Java are no longer supported. The following options are no longer supported for IBM i 7.2:

- IBM Technology for Java (IT4J) 1.4.2 (option 13)
- IBM Technology for Java (IT4J) 5.0 (option 8 and 9)

Note: For additional details see the Java page on the IBM i zone for developerWorks®.

Integrated Web Application Server (IAS) V8.5

The Integrated Web Application Server has been updated to use a new runtime engine. The LWI-based server has been replaced with the WebSphere Liberty Core-based server run time. This is a significant update, providing increased ease of development for web developers, and removes previous development difficulties in the previous integrated server. As businesses needs grow and companies need to increase their web presence, web applications created in this new IAS will more easily migrate to the more robust industry-standard WebSphere Application Server as they share the same Liberty Core base.

The new IAS-based server continues to use the IBM Web Admin GUI for management of all web instances, to create, stop, start, and view the performance setting for a web application. This interface can be reached through <http://hostname:2001/HTTPAdmin>. V8.1 IAS servers will continue to run in IBM i 7.2; however, there will be no more enhancements to this older runtime engine.

Note: For additional details see the IAS product at

<http://www-03.ibm.com/systems/power/software/i/iwas/index.html>

Integrated Web Services Server V8.5

The Integrated Web Services Server has been enhanced to leverage a new application server based on the new WebSphere Liberty Application Server. In addition, the web services engine is based on the Liberty Java API for XML-Based Web Services (JAX-WS) runtime environment. There are several benefits to this new Liberty base:

- Faster startup and deployment
- Improved performance
- Greater stability

Web service deployers will see little change when deploying an ILE program or service program as a web service. For additional details, visit the Integrated Web Services for IBM i product page

<http://www.ibm.com/systems/power/software/i/iws/>

Zend Server, PHP runtime engine for IBM i

IBM continues to work closely with Zend to include the latest industry trends into Zend Server for i. With the IBM i 7.2 release, Zend Server Version 6 and higher will be supported.

Integrated file system

The integrated file system continues to be updated and enhanced to meet the demands of a modern application world.

- QFileSvr.400 - QFileSvr.400 will now allow multiple connections to a remote server. Users have the option of a single connection used by all jobs accessing the remote server or multiple connections where each job owns its own connection, which allows more parallel processing.
- Qp0IReaddir - A new API to return attributes with the entry name enables the user to get information from the read directory without having to call another API to retrieve additional attributes. This capability can offer significant performance improvements as compared to previous methods.
- Samba - Samba provides the de facto file server of choice for sharing files from a POSIX-compliant server. The addition of Samba to the IBM i platform gives users the flexibility to choose an open source alternative to the IBM i NetServer file server. Users can choose the file serving solution that is right for them. For additional details see the IBM i zone for developerWorks.

Additional enhancements

- New accounting method and tools for tracking use of temporary storage
- Install enhancements - A new API (QLPINSLP) that can be used to shorten the path a user must follow during the installation process
- CRTIMGCLG, which automatically adds all images within the catalog directory to the image catalog
- Enhancements to the journaling specific to the restore function
- Enhancements to the backing up of spooled files
- New PTF improvements for tracking of Security Audit Log
- More immediate Apply options for PTFs
- Enhanced networking capabilities to industry standards and some new environments
- Enhancements to the printing area, including more options for producing PDFs, support for all BCOCA bar codes, color printing on PCL 5C capable printers, and addition of color management support to PSF/i

DB2 for IBM i

In IBM i 7.2, as with previous releases, significant enhancements are delivered in DB2 for i. The enhancements include topics such as:

- New SQL-based, data-centric constructs to control access to data. These controls help you secure data comprehensively, relying upon IBM i integrated security. The thorough protection of business-critical data can be achieved with a sustainable infrastructure using auditable mechanisms.
- Improved SQL Query Engine (SQE) capabilities. The progression of expanding the interfaces supported by SQE continues with IBM i 7.2. By default, SQE will be used to implement Native DB queries, including those made via traditional interfaces Open Query File (OPNQRYF) and Query/400. Just by moving to IBM i 7.2, these Native DB queries will be easier to observe and manage through the extensive database tooling found in the IBM i Navigator OnDemand Performance Center . Heavy Native DB queries could reap a performance benefit from an implementation through a far more advanced query engine.
- New and enhanced SQL language capabilities for SQL application developers. Whether embracing database or application modernization, or simply meeting the ever-changing needs of business computing, users of DB2 for i on 7.2 will encounter new and useful capabilities.

These and many other DB2 for i enhancements await your use on IBM i 7.2.

Database security: Row and column access control (RCAC)

Data is an asset. Some data is referred to as business critical because the company has an absolute need for the data to exist for the business to operate. Critical business assets merit a robust protection strategy. From a database perspective, clients consider topics like object access or table privileges to control who has the ability to access tables with the intent to read or the intent to change the data within the table. Row and Column Access Control (RCAC) capabilities provide DB2 for i

clients additional constructs to limit the amount of data exposed to specific users. RCAC can be used once the 5770-SS1 Boss Option 47 - IBM Advanced Data Security for i is installed.

RCAC provides several advantages:

- Comprehensive control over access to rows and columns within a table. With RCAC, the database is given rules to apply when any interface or user accesses a table. No user or interface is inherently exempted. Once a user has passed the table privilege requirements, any RCAC row permissions are applied automatically and the working set of rows in the table is reduced as directed by the row permission rule. Finally, if any of the columns referenced has an RCAC column mask enabled, the rule within the mask will be automatically applied, potentially limiting the data seen by the user.
- By using a data-centric approach to solving an important problem, application layers are alleviated from the heavy burden of limiting access to data. Since any application-oriented enforcement of security is by definition not comprehensive, IBM i clients should strongly consider their overall strategy for data security using RCAC on IBM i 7.2.
- RCAC can be deployed with minimal application considerations. As with any changes to business-critical data and security, a well-formed, overall strategy is advised as a key component for successfully satisfying business requirements.

Other database enhancements

Not only has the DB2 for i team delivered the new support for RCAC, they have added many other significant new functions. Some of those new enhancements are listed here:

- DB2 for i supplied global variables (for example SYSIBM.ROUTINE_SPECIFIC_NAME) provide new SQL application insight into the application environment. Whether referenced within an RCAC rule, within an SQL trigger body, or elsewhere, database maintained built-in global variables provide a new and useful programming construct.
- Maintaining and extending the security model is easier on IBM i 7.2 with the addition of new SQL statements for security administration. SQL statements such as TRANSFER OWNERSHIP, GRANT to GROUP and USER, and the suite of RCAC SQL statements make it easier to leverage standardized SQL to administer security on i.
- SQL and external functions (both UDFs and UDTFs) have far more capability and are easier to extend with the addition of named and default parameters.
- Similar to procedures and functions, SQL trigger logic can be obfuscated on IBM i 7.2. Whether the trigger logic is being protected as an asset or simply kept in a state where the trigger logic can't be easily disrupted, obfuscation of SQL covers more resources and is easily applied to existing procedures, functions, or SQL triggers on IBM i 7.2.
- Timestamp columns are a crucial component to database tables. Since they provide a record of when something occurred, it's not hard to conclude that IBM i clients running fast-paced, time-critical transactional workloads on IBM Power Systems would have a need for moving beyond microsecond granularity. With DB2 for i on 7.2, timestamp columns are no longer limited to 6 digits of precision. Timestamp columns that do not require fine precision can be altered to utilize less precision and recoup storage footprint. Similarly, time-critical columns can be altered to have up to 12 digits of precision, avoiding situations where events appear to occur at exactly the same time.

These and many other capabilities await you on IBM i 7.2, and are documented in the DB2 for i books. Many of these books contain a section entitled, "What's new for IBM i 7.2". For more information about the database books and discover what's new on 7.2, visit

http://www.ibm.com/support/knowledgecenter/ssw_ibm_i_72/rzahg/ic-homepage.htm

Licensed programs

BRMS

As one of the highly used licensed programs for IBM i, BRMS continues to add function, increasing usability as well as technical features and functions. In IBM i 7.2 BRMS is extending the Hub functions originally introduced in IBM i 7.1 TR5. As well, there are additional functions such as:

- A dashboard view of all BRMS systems
- Graphical interface support *SYSCPY/BCKUPCY/*ARPCPY commands
- BRMS Object list support for Include and Exclude functions
- Enhancements to Media Services

More details can be found at the new IBM Knowledge Center website

http://www.ibm.com/support/knowledgecenter/ssw_ibm_i_72/rzahg/ic-homepage.htm

PowerHA System Mirror for i Express Edition

New with IBM i 7.2 is the IBM PowerHA SystemMirror for i Express Edition. The Express Edition is designed to be the foundation for a class of HA/DR offerings based on restarting the LPAR into another LPAR on a different server for HA operations. The Express Edition differs from the Standard Edition in that the database is not placed into an IASP separate from SYSBAS. Rather, a primary LPAR is restarted or IPLd to a target LPAR on another server. With PowerHA 7.2 for i, the first stage of the Express Edition offering enables single-node full-system HyperSwap with the DS8700 (and above), which provides you with continuously available storage through either planned or unplanned storage events. With HyperSwap technologies, the act of moving between storage servers is nearly seamless.

SWG updates

Rational support for IBM i

IBM Rational continues to enhance and extend the language compilers and developer tools required by IBM i clients and ISVs to create robust applications. Following the very successful launch of Free Format RPG with the announcement of IBM i 7.1 TR7, in October 2013, Rational has continued to build in extensions and new productivity features for their tools.

Rational Development Studio for i

IBM Rational Development Studio for i provides RPG, COBOL, C, and C++ compilers as well as textual host-based development tools for creating IBM i applications.

Rational Development Studio for i offers three separately orderable, chargeable capabilities, or "features":

- ILE Compilers - The latest generation of RPG, COBOL, C, and C++ compilers for IBM i. These feature modernized language capabilities and supporting key capabilities for integrating IBM i applications with other IT assets, for example cross-language/cross platform solution debugging, and Rational Open Access RPG Edition.
- RPG IV - As of October 2013, RPG has been updated to support a near free-format syntax. All specifications except I/O have been enabled for a new modern free-format expression. Details can be found at

https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/We13116a562db_46_7e_bcd4_882013aec57a/page/New%20with%20IBM%20i%207.1%20TR%207%20-%20Free-form%20H,%20F,%20D%20and%20P%20statements%20for%20RPG

- COBOL - Continues to support the advancements of the language and operating system. These include things like taking advantage of multithreading capabilities inherent in the IBM i operating system. While no specific COBOL commands are required, the underpinnings of the language run time exploit these new capabilities.
- Heritage Compilers - The prior generation of compilers. These older compilers include S/38 RPG, S/36 RPG II, and many other heritage environments. These compilers are considered stabilized and continue to be available to clients needing to maintain their older application code.
- Application Development ToolSet (ADTS) - The host-based, textual or "green screen" development tools for IBM i. These tools have been stabilized since IBM i 6.1, and continue to be provided as a feature of the RDS product.

Rational Developer for i V9.1

Rational Developer for i is the strategic desktop development tool for creating IBM i applications. The latest release, Version 9.1, has been enhanced to be completely RPG Free Form capable. In addition a new code coverage tooling has been added to Rational Developer for i.

IBM i support for Power hardware

Both IBM i 7.2 and IBM i 7.1 Technology Refresh 8 are supported on the new Power Systems servers with POWER8 technology. The operating system and most applications for IBM i are built on a Technology Independent Machine Interface (TIMI) that isolates programs from differences in processor architectures, and allows the system to automatically capitalize on many new POWER® architecture features without changes to existing programs. The new IBM i 7.2 release continues the tradition, providing a high degree of integration, security, and ease-of-use across multiple generations of IBM Power Systems and processors, including the new POWER8 processor. A selection of processor support features is highlighted below.

POWER8 Technology

Multicore and multithread

The maximum numbers of cores varies by system model. Also, the operating system support of multicore and multithread technology varies by operating system and release. The maximum number of processor cores and simultaneous multithreading (SMT) levels supported by a single IBM i logical partition by processor mode are as follows:

- For IBM i 7.2:
 - POWER8 : 24 Cores / SMT8
 - POWER7® : 32 Cores / SMT4
 - POWER6® : 32 Cores / SMT2

For IBM i 7.1 Technology Refresh 8:

- POWER8 : 24 Cores / SMT8
- POWER7 : 32 Cores / SMT4
- POWER6 : 32 Cores / SMT2
- POWER5: 32 Cores / SMT2

Clients who require additional capacity beyond the IBM i maximum can contact IBM to request support for additional processor cores. IBM Systems Lab Services works with clients to assess the requirements and to provide IBM i support for the client workload in a partition with a larger number of cores.

Automation and simple controls that offer flexibility to both the inexperienced and experienced system administrator are among the hallmarks of IBM i integration, even with the transition to a whole new generation of Power systems and through

the advances in complexity of processor technology. IBM i 7.2 and IBM i 7.1 Technology Refresh 8 offer enhanced controls designed to help maximize the flexibility afforded by the greater range of SMT levels available on newer generations of processors. IBM i is designed to automatically deliver maximum single-thread performance when the workload does not demand SMT concurrence. In systems where the workload can benefit from SMT, there are configuration settings that allow for dynamic configuration of the processor SMT context (for example, ST, SMT2, SMT4, SMT8) used by the logical partition. While previously an IPL was required to switch to or from single-thread context, with IBM i 7.2 and IBM i 7.1 TR8 the switching is dynamic. Additionally, IBM i 7.2 provides a new job attribute to influence how processor threads for the job are dispatched. With a simple adjustment of this configuration value, the system administrator can choose between optimizing a particular job for improved thread performance, or running multiple threads concurrently to maximize system efficiency.

Vector Scalar eXtension (VSX)

VSX in POWER provides support for Vector and Scalar Binary floating point operations conforming to the Institute of Electrical and Electronics Engineers Standard for Floating Point Arithmetic (IEEE-754). The introduction of VSX increases the parallelism by providing single-instruction, multiple-data (SIMD) execution functionality for floating point double-precision to improve the performance of some applications.

IBM i 7.2 automatically uses POWER8 vector instructions to help improve the performance of some cryptographic operations. In addition, PASE for i applications running on IBM i 7.2 on POWER7 or newer processors can now use VSX instructions.

More information

For more details about the new POWER8 systems, see the Hardware Announcement for the specific POWER8 model you are interested in.

IBM i support for "WAN over LAN" configurations

The new IBM i support for "WAN over LAN" expands advanced virtualization capabilities:

- Saves PCI slots for applications requiring a modem, thus reducing configuration cost
- Provides WAN connectivity for servers that do not have available PCIe slots
- Allows IBM i client partitions with virtual I/O to use FAX and other WAN applications
- Allows the same Ethernet adapter that provides TCP/IP connectivity for an IBM i partition to provide WAN connectivity

IBM i applications that have traditionally run on PCIe WAN adapters will now run seamlessly over an Ethernet connection to an Ethernet device server without application changes. For an existing IBM i configuration definition, the only change is that the Async or PPP line description must be modified to specify that it is for an Ethernet device server, and specify the Ethernet device server IP address and port. IBM i clients requiring a large number of serial ports or running on systems without PCIe adapter slots (such as PureSystems™ or BladeCenter® devices) now have the option to run IBM i Communication Applications on their systems.

IBM i on Power Systems has been providing WAN communications via system adapters. The #5289 - 2 Port Async EIA-232 PCIe / #5290 - PCIe LP 2-Port Async EIA-232 Adapter provides an RS-232 interface for two external devices, such as modems. The #2893 - PCIe 2-Line WAN w/Modem adapter / #2894 - PCIe 2-Line WAN w/Modem CIM adapter provides an integrated modem in addition to a single RS-232 interface. Now IBM i also supports Ethernet device servers, which provide multiple RS-232 serial ports. Ethernet device servers, which are also known as Ethernet serial servers or Ethernet terminal servers, are external non-IBM equipment that attaches to an Ethernet and contains one or more serial ports to which external modems can be attached. An Ethernet device server is accessed over

the network using a standard TCP/IP sockets connection. Thus, IBM i now has true virtual serial ports for applications, such as IBM Facsimile Support for i, 5798-FAX.

IBM i requires an Ethernet device server to support COM Port Control Protocol RFC 2217 for transport of serial data and RS-232 control signals. Ethernet device servers with RFC 2217 support are available from a variety of vendors, in models containing anywhere from 1 to 48 serial ports. IBM i 7.2 has been tested and found to work with the Digi PortServer TS 4 (firmware version 82000747_V2 01/29/2013) and Perle IOLAN SDS4 (firmware version 4.5) Ethernet device servers. Facsimile Support for IBM i has been tested with the MT9234ZBA modem attached to these Ethernet device servers.

IBM i support is limited to IBM's implementation of RFC 2217 and IBM software and hardware. The non-IBM vendor provides the support for its implementation of RFC 2217, its TCP/IP network connection, and any downstream modems or fax devices. In case a problem does occur at the client site, like other non-IBM products attached through IBM LAN adapters and standard protocols, IBM will participate with clients and other vendors in problem determination under standard IBM warranty and service agreements. If IBM determines the problem is associated with the IBM adapter or with the IBM protocol implementation, normal problem resolution procedures will follow.

Increase in maximum file size for IFS QOPT files

Prior to IBM i 7.2, the maximum file size supported by the /QOPT file system was about 4 GB, which worked well for accommodating the size of DVD media. With 7.2 the maximum size is increased to almost 10 TB. This will better accommodate the size of newer media types, such as the recently introduced RDX media that are over 1 TB in size. With this larger file size, it is possible for languages and utilities to access large files and perform operations, such as copying IBM i distribution images to RDX media to move them to another partition or system. For more specifics visit

http://www.ibm.com/support/knowledgecenter/ssw_ibm_i_72/rzau8/considerations.htm

Layer-2 bridging of VLAN-tagged frames

The Ethernet layer-2 bridge capability added in IBM i 7.1 Technology Refresh 3 now supports bridging of frames that contain an 802.1q Virtual LAN (VLAN) header. With this addition, a single IBM i Ethernet resource can transparently bridge multiple Power Hypervisor virtual Ethernet VLANs to the corresponding VLAN on the physical network, keeping the traffic for each VLAN isolated.

Control over resources used to initialize client disk

Addition of the resource allocation priority parameter (RSCALCPTY) to CRTNWSSTG/CHGNWSSTG commands allows the user to have more control over resources on an IBM i server partition. When initializing and formatting a virtual disk on an IBM i client partition, an IBM i server partition has used as much system resource as it can to try to complete the request as fast as possible. In some circumstances this has caused other jobs on the server partition to slow down. The new parameter gives the user the ability to specify how aggressively the server consumes system resources while performing initialization of the disk. A lower priority value can reduce server resource utilization but increases the amount of time it takes to complete disk initialization.

Visit IBM i Information Center documentation for the CRTNWSSTG command at

http://www.ibm.com/support/knowledgecenter/ssw_ibm_i_72/cl/crtnwsstg.htm

and the CHGNWSSTG command at

http://www-03preprod.ibm.com/support/knowledgecenter/ssw_ibm_i_72/cl/chgnwsstg.htm

Improved status display for aggregated Ethernet ports

Ethernet line descriptions now display more detailed status information for aggregated ports, making it easier to diagnose and correct any issues with performance or functionality.

Usability enhancements for vary on of tape and tape library devices

Vary on processing is now improved for tape and tape library devices so that it is no longer necessary to set the device description "Online at IPL" parameter to *NO and use a startup program to vary them on after the IPL. The device description "Online at IPL" parameter can now be set to *YES to allow the tape and tape library devices to be varied on and available after a system IPL.

The amount of time to wait for resources to be allocated during vary on processing for tape libraries has been changed to increase as the number of resources in the tape library is increased. This should reduce the number of "The request did not complete in the time allotted" failures when varying on or changing the resource allocations for tape libraries.

The amount of time to wait for a vary on with reset to complete has also been increased. This should reduce the number of vary on with reset failures that need to be recovered by another vary on attempt without the reset.

Highlights from IBM i 7.1 Technology Refreshes

In addition to the brand new IBM i 7.2 and POWER8 functions, there have been numerous functions and features delivered with Technology Refreshes for IBM i 7.1 over the past few years. Those are now all incorporated into the IBM i 7.2 release.

Some of the highlights for I/O include:

- Native SR-IOV support for Ethernet, allowing sharing of I/O without VIOS or an IBM i server partition
- New PCIe2 SAS adapters, both with and without cache, for higher performance and higher capacity with internal storage
- Native and direct attachment of SVC and Storwize® storage, allowing external storage to be a better fit for small and medium-sized businesses
- EXP30 Ultra SSD I/O drawer, which provides ultra-high levels of performance in a dense package
- Use of USB flash drives, which are very useful for copying files and installing PTFs
- LTO-6 tape drives
- RDX dock stations for Removable Disk cartridges
- Higher-capacity HDD and SSD disks
- EXP24S SFF Gen2-bay drawer
- PCIe cryptographic adapter
- VIOS support for a wide range of I/O adapters and devices

Among the VIOS virtualization highlights are these functions:

- NPIV attach of SVC and Storwize storage
- Large Receive Offload for Ethernet layer-2 bridging
- IBM i Live Partition Mobility
- IBM i Suspend/Resume
- Mirroring with NPIV-attached storage
- PowerVM® with Shared Storage Pools

Among the iVirtualization enhancements (configurations where an IBM i partition is acting as a server partition for one or more IBM i client partitions):

- Virtual Partition Manager (VPM) enhancement to allow creation of IBM i partitions
- Navigator for i GUI for VPM
- Ethernet layer-2 bridging
- Virtual tape support
- Support for embedded media changers

Enhancements within the IBM i operating system itself that are related to hardware functions include the following:

- Ethernet link aggregation
- Variable LUN sizes for the DS8870
- Performance improvements for the Licensed Internal Code PTF apply, record locks, and SSDs
- Support for the EB33 Dynamic Platform Optimizer
- Thin provisioning for DS8000® and VIOS Shared Storage Pools
- Collection of bus-level statistics for 12x loops
- More advanced multipath algorithms
- CEC node level mirroring
- Installation of new partitions via network

Accessibility by people with disabilities

A US Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be requested at

http://www.ibm.com/able/product_accessibility/index.html

Product positioning

IBM i 7.2 is the latest version of the IBM i operating environment. IBM i runs on IBM Power Systems servers or on IBM PureSystems servers and offers a highly scalable and virus-resistant architecture with a proven reputation for exceptional business resiliency. Companies that run applications on IBM i running on a Power server are able to focus on innovation and delivering new value to their business, not on managing their data center operations.

IBM i integrates a trusted combination of a DB2 relational database, industry-leading security, standards-based Internet technology, networking, and storage management capabilities. For example, IBM installs and integrates the SQL standards-based DB2 database for IBM i with advanced database management utilities, plus additional middleware components such as multiple file system options, directory capability, an HTTP web server powered by Apache, a web application server, and a web-services environment.

IBM develops, fully tests, and preloads these core middleware components of IBM i together. The preintegration and testing of IBM i is a key factor in enabling companies to realize lower operations costs by deploying applications faster and maintaining them with fewer staff.

Virtualization and workload management are also built into the IBM i operating environment to enable businesses to consolidate and run multiple applications and components together on the same system, driving up system utilization and delivering a better return on IT investments. This broad and highly stable database and middleware foundation is ideal for efficiently deploying business processing applications.

Architecture for simplicity, stability, and security

Another key differentiator for IBM i is the underlying architecture of the operating system, which provides for simplicity, stability, and security. These are not add-on features, but inherent aspects of the operating system. For detailed information regarding the advantages of IBM i running on Power servers, refer to the "IBM i Strategy and Whitepaper," which is available from your IBM representative. This section describes a few examples.

Simplicity

As mentioned above, the relational database in IBM i is an integrated component, and it is built on integrated storage management capabilities unique to IBM i and its predecessors. This storage management is based on the "single-level storage" architecture that treats all of the storage managed by IBM i as if it were one long stream of memory that encompasses the system memory as well as the storage on disks. This architecture makes it critical that the operating system decide where to store any given piece of data, and that in turn removes the necessity of the user to manage data placement. This makes management of storage, and the database objects contained in that storage, significantly simpler.

Stability

IBM i also architecturally separates the address spaces of user applications and the operating system, so it is difficult for poorly written, or malicious, software to intrude upon the underlying operating system support. This is one of several attributes that can help keep IBM i running for days, weeks, or months without unexpected restarting of the operating system.

Several architectural attributes of IBM i contribute to the stability of the system over the years. First, applications compiled on IBM i are compiled to a set of intermediate code instructions defined as the Technology Independent Machine Interface (TIMI). This allows IBM i to fundamentally change the implementation of underlying hardware, firmware, and virtualization features, without requiring rewriting, changing, or even recompiling the applications written by users. This sort of forward compatibility is a tremendous business advantage, and has allowed the movement of software developed and compiled several years to even decades previously to run on later generations of IBM i.

Security

IBM i and its predecessors have an "object based" architecture. Each entity on the system is an object, which has a set of prescribed operations that can be performed on it, and connections from the object to those other objects that are allowed to perform various operations. An object that does not have a legal "edit" operation cannot be edited. It cannot be renamed to another kind of object. If the object does have an "edit" operation (known as "change" for most objects), only a defined set of attributes can be edited, and then only by users who have authority to do that editing.

Objects can easily be "hidden" from other users by use of the library list objects, secured by the object-based security associated with all objects. And users who all have a similar role on the system can be grouped together for role-based security, again as part of the base architecture of the system.

In conclusion, while the IBM i operating system supports open programming methods such as Java, PHP, web services, and so on, the underlying architecture provides a level of integration, stability, simplicity, and security that is a significant differentiator, and these aspects provide excellent business value to its users.

Statement of direction

A mobile solution for accessing IBM i is now available as a technology preview. Powered by IBM i Access for Web (5770-XH2), it enables you to access IBM i resources from any mobile device that supports a browser.

Features include the ability to:

- View and manage jobs, messages, output queues, files, and printers
- View, add, insert, and update database records
- Build, run, and save SQL statements with an SQL wizard
- Start one or more 5250 emulation sessions with the ability to reconnect even after a device power down
- Extract data from a variety of IBM i resources into a table using optional column selection
- Distribute and manage files to other users from a common download location

This capability is provided as part of 7.2 IBM i Access for Web (5770-XH2), which can be installed on IBM i 7.2, 7.1, and 6.1. An IBM i Access Family license (5770-XW1) is required to connect.

For additional information visit

<http://www.ibm.com/systems/power/software/i/access/index.html>

IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion. Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision. The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. Information about potential future products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for our products remain at our sole discretion.

Program number

Program number	Version	Program name
5733-B45	3.1	IBM AFP Font Collection for workstations and OS/400
5648-E77	1.1	IBM Infoprint Fonts for Multiplatforms
5722-WE2	5.3 SS	IBM Web Enablement for i5/OS
5722-IP1	5.3 SS	IBM Infoprint Server for iSeries
5733-ARE	1.1	IBM Application Runtime Expert for i
5733-CY3	7.2	IBM Cryptographic Device Manager for i
5733-ID1	5.1 SS	IBM Infoprint Designer for iSeries
5733-ITL	1.1 SS	IBM Temporary Software License for i
5733-NKY	5.2 SS	Remove Keys/ePOEs for Transferred Software
5733-OMF	1.3	OmniFind® Text Search Server for DB2 for i
5733-RDW	9.1	IBM Rational Developer for i
5733-WQX	2.1 SS	IBM DB2 Web Query for i
5733-WQE	2.1 SS	IBM DB2 Web Query for i Express Edition
5733-WQS	2.1 SS	IBM DB2 web Query for i Standard Edition
5733-XT2	1.2 SS	IBM XML Toolkit for i
5761-AP1	6.1 SS	IBM Advanced DBCS Printer Support for iSeries
5761-CM1	6.1 SS	IBM Communications Utilities for System i
5761-DB1	6.1 SS	IBM System/38 Utilities for System i
5761-DP4	6.1 SS	IBM DB2 DataPropagator for iSeries®, v8.1
5761-DS2	6.1 SS	IBM Business Graphics Utility for System i
5769-FN1	4.4 SS	IBM Advanced Function Printing DBCS Fonts for AS/400
5769-FNT	4.4 SS	IBM Advanced Function Printing Fonts for AS/400
5770-AF1	7.2	IBM Advanced Function Printing Utilities

5770-AMT	7.2	IBM Rational Application Management Tool Set for i
5770-BR1	7.2	IBM Backup, Recovery and Media Services for i
5770-DFH	7.2	IBM CICS® Transaction Server for i
5770-HAS	7.2	IBM PowerHA SystemMirror for i
5770-JS1	7.2	IBM Advanced Job Scheduler for i
5770-MG1	7.2	IBM Managed System Services for i
5770-NLV	7.2	IBM National Languages for i
5770-PT1	7.2	IBM Performance Tools for i
5770-QU1	7.2	IBM Query for i
5770-SM1	7.2	IBM System Manager for i
5770-SS1	7.2	IBM i
5770-ST1	7.2	IBM DB2 Query Manager and SQL Development Kit for i
5770-WDS	7.2	IBM Rational Development Studio for i
5770-XW1	7.2	IBM i Access Family
5798-FAX	5.8	IBM i Facsimile for i

Business Partner information

If you are a Direct Reseller - System Reseller acquiring products from IBM, you may link directly to Business Partner information for this announcement. A PartnerWorld® ID and password are required (use IBM ID).

<https://www.ibm.com/partnerworld/mem/sla.jsp?num=214-154>

Additional products

The following products are also shipped with the IBM i operating system:

- IBM HTTP Server for i, 5770-DG1
- IBM Developer Kit for Java, 5770-JV1
- IBM Network Authentication Enablement for i, 5770-NAE
- IBM Portable Utilities for i, 5733-SC1
- IBM TCP/IP Connectivity Utilities for i, 5770-TC1
- IBM Transform Services for i, 5770-TS1
- IBM Universal Manageability Enablement for i, 5770-UME
- IBM i Access Client Solutions, 5733-XJ1
- IBM i Access for Web, 5770-XH2
- IBM i Access for Windows, 5770-XE1
- Zend Server Community Edition for i, 5639-ZC1

Software progression

The following table is used to show the updates for various products.

Program upgrades

V4R5	V5R1	V5R2	V5R3	V5R4	i 6.1	i 7.1	i 7.2
5769-SS1	5722-SS1	5722-SS1	5722-SS1	5722-SS1	5761-SS1	5770-SS1	5770-SS1
*	*	*	*	*	5733-ARE	*	*
5733-A38	*	*	PN	PN	NA	NA	NA
*	*	*	*	*	5761-AMT	5761-AMT	5770-AMT
*	5722-AC2	NA	NA	NA	NA	NA	NA
*	5722-AC3	5722-AC3	5722-AC3	NA	NA	NA	NA
*	5722-AF1	5722-AF1	*	*	5761-AF1	5770-AF1	5770-AF1
5769-AP1	5722-AP1	5722-AP1	5722-AP1	*	5761-AP1	*	*
5769-AP1	5722-AP1	5722-AP1	5722-AP1	*	5761-AP1	*	*
*	5722-BR1	5722-BR1	5722-BR1	5722-BR1	5761-BR1	5770-BR1	5770-BR1
5769-WDS	5722-WDS	5722-WDS	5722-WDS	5722-WDS	5761-WDS	5770-WDS	5770-WDS
*	NA						
*	5722-CE2	NA	NA	NA	NA	NA	NA

*	5722-CE3	5722-CE3	5722-CE3	NA	NA	NA	NA
5769-WDS	5722-WDS	5722-WDS	5722-WDS	5722-WDS	5761-WDS	5770-WDS	5770-WDS
*	NA						
*	5722-CM1	5722-CM1	5722-CM1	5722-CM1	5761-CM1	*	*
*	5722-CR1	5722-CR1	*	*	NA	NA	NA
NA	NA	5733-CO2	*	NA	NA	NA	NA
5769-WDS	5722-WDS	5722-WDS	5722-WDS	5722-WDS	5761-WDS	NA	NA
5769-WDS	5722-WDS	5722-WDS	5722-WDS	5722-WDS	5761-WDS	5770-WDS	5770-WDS
NA	NA	NA	5733-CY1	5733-CY1	NA	NA	NA
NA	NA	NA	NA	NA	5733-CY2	5733-CY3	5733-CY3
*	5722-DB1	5722-DB1	5722-DB1	5722-DB1	5761-DB1	*	*
NA	NA	NA	5733-DIR	5733-DIR	NA	NA	NA
NA	NA	NA	5733-DR1	5733-DR1	NA	NA	NA
NA	5722-DE1	5722-DE1	5722-DE1	5722-DE1	5761-DE1	5770-DE1	NA
*	5722-DFH	5722-DFH	5722-DFH	5722-DFH	5761-DFH	5770-DFH	5770-DFH
5769-DL1	*	*	NA	NA	NA	NA	NA
5769-DP3	*	5722-DP4	*	*	5761-DP4	*	*
*	5722-DS1	5722-DS1	5722-DS1	5722-DS1	5761-DS2	*	*
NA	NA	NA	5648-E77	5648-E77	5648-E77	*	*
NA	NA	NA	5733-EWA	5733-EWA	NA	NA	NA
NA	NA	NA	5733-EWM	5733-EWM	NA	NA	NA
*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*
NA	5733-FXD	*	*	*	*	5733-FXD	NA
NA	5733-ID1	*	*	*	*	*	*
NA	5722-IP1	5722-IP1	5722-IP1	*	*	*	*
NA	NA	NA	NA	NA	5761-HAS	5770-HAS	5770-HAS
5733-ITL							
5769-JS1	5722-JS1	5722-JS1	5722-JS1	5722-JS1	5761-JS1	5770-JS1	5770-JS1
*	*	PN	PN	NA	NA	NA	NA
*	*	PN	PN	NA	NA	NA	NA
*	5722-MG1	5722-MG1	5722-MG1	5722-MG1	5761-MG1	5770-MG1	5770-MG1
NA	NA	NA	NA	5722-NLV	5761-NLV	5770-NLV	5770-NLV
NA	NA	NA	NA	NA	5733-OMF	5733-OMF	5733-OMF
*	5722-PD1	*	*	NA	NA	NA	NA
NA	NA	NA	NA	5733-PS1	5733-PS1	NA	NA
5769-PT1	5722-PT1	5722-PT1	5722-PT1	5722-PT1	5761-PT1	5770-PT1	5770-PT1
5769-QU1	5722-QU1	5722-QU1	5722-QU1	5722-QU1	5761-QU1	5770-QU1	5770-QU1
5769-WDS	5722-WDS	5722-WDS	5722-WDS	5722-WDS	5761-WDS	5770-WDS	5770-WDS
NA	NA	NA	NA	5733-QU2	5733-WQX	*	*
NA	NA	NA	NA	5733-QU3	5733-WQX	*	*
NA	NA	NA	NA	5733-QU4	5733-WQX	*	*
5769-RD1	5722-RD1	5722-RD1	PN	PN	PN	PN	PN
5769-WDS	5722-WDS	5722-WDS	5722-WDS	5722-WDS	5761-WDS	5770-WDS	5770-WDS
NA	NA	NA	NA	NA	5733-RDI	5733-RDP	NA
NA	NA	NA	NA	NA	5733-RDP	5733-RDG	NA
NA	NA	NA	NA	NA	5733-RDW	5733-RDX	NA
NA	NA	NA	5733-SC1	#	#	#	#
5769-SM1	5722-SM1	5722-SM1	5722-SM1	5722-SM1	5761-SM1	5770-SM1	5770-SM1
5769-ST1	5722-ST1	5722-ST1	5722-ST1	5722-ST1	5761-ST1	5770-ST1	5770-ST1
NA							
*	*	*	*	*	NA	NA	NA
5769-VG1	*	*	*	NA	NA	NA	NA
5769-VI1	5722-VI1	5722-VI1	PN	PN	PN	PN	NA
5769-WDS	5722-WDS	5722-WDS	5722-WDS	5722-WDS	5761-WDS	5770-WDS	5770-WDS
NA	NA	NA	5722-WE1	NA	NA	NA	NA
NA	NA	NA	5722-WE2	*	*	*	*
5769-XW1	5722-XW1	5722-XW1	5722-XW1	5722-XW1	5761-XW1	5770-XW1	5770-XW1
*	5798-FAX	5798-FAX	*	*	*	*	5798-FAX
NA	NA	5733-XT1	5733-XT1	5733-XT1	NA	NA	NA
NA	NA	NA	NA	5733-XT2	5733-XT2	5733-XT2	*
*	*	*	NA	NA	NA	NA	NA

Legend:

Restating the product number indicates new code has been added for that release.

* Indicates the product is included in the release, but no new code has been added.

Indicates not orderable, but ships with 5722-SS1. NA Indicates no longer available.

PN Indicates available as part number product only via Passport Advantage®.

Offering Information

Product information is available via the Offering Information website

<http://www.ibm.com/common/ssi>

Publications

No publications are shipped with this program.

With the IBM Systems Information Center, users can use a single information center to access product documentation for IBM Systems hardware, operating systems, and server software. Through a consistent framework, users can efficiently find information and personalize their access to that information. The IBM Systems Information Center is at

<http://www.ibm.com/systems/i/infocenter/>

Technical information

Specified operating environment

Hardware requirements

IBM i 7.2 is supported on IBM Power Systems with POWER8 architecture and technology, IBM Power Systems servers, IBM PureFlex™ systems and blades with POWER7 or POWER7+™ processors, IBM Power Systems servers with POWER6 or POWER6+™ processors, IBM Blades with POWER6 or POWER6+ processors, and IBM i servers with POWER6 processors. Clients using any previous servers need to upgrade or install new systems to take advantage of the new features in IBM i 7.2.

Software requirements

For specific software requirements, see the *Memo to Users* at

http://www.ibm.com/support/knowledgecenter/ssw_ibm_i_72/rzahg/rzahgmtu.htm

The program's specifications and specified operating environment information may be found in documentation accompanying the program, if available, such as a readme file, or other information published by IBM, such as an announcement letter. Documentation and other program content may be supplied only in the English language.

Limitations

For additional information, refer to [Usage restriction](#) in the "Terms and conditions" section of this announcement, or to the license information document that is available on the IBM Software License Agreement website

<http://www.ibm.com/software/sla/sladb.nsf>

IBM Electronic Support

The IBM Support Portal is your gateway to technical support. This includes IBM Electronic Support tools and resources, for software and hardware, to help save time and simplify support. The Electronic Support tools can help you find answers to questions, download fixes, troubleshoot, automate data collection, submit and track problems through the Service Request online tool, and build skills. All these tools are made available through your IBM support agreement, at no additional charge. Read about the Electronic Support portfolio of tools

<http://ibm.com/electronicssupport>

Access the IBM Support Portal

<http://ibm.com/support>

Access the online Service Request tool

<http://ibm.com/support/servicerequest>

Planning information

Planning statements provide insight into IBM's current plans, directions, and intent, and are subject to change or withdrawal without notice. Any reliance on these planning statements is at the relying party's sole risk and will not create liability or obligation for IBM.

IBM plans to withdraw the AT&T dial accounts for connecting to IBM for electronic customer support requests. These AT&T dial accounts will no longer be available for use with the release following IBM i 7.2. If you were creating your service configuration with a local dial or remote dial connection type and using the IBM-supplied AT&T telephone numbers, you will be affected by this change. It is recommended that you connect to IBM with a direct Internet connection for electronic customer support requests. If you must continue to use a dial account, you will need to use your own Internet Service Provider (ISP) beginning with the release after i 7.2. You can make this change now with the current IBM i release you are running on your system.

IBM plans for i 7.2 to be the final release to support the Communications Trace Analyzer plug-in to IBM i Navigator. An enhancement in the i 6.1 release (PTF SI33685) allows a communications trace to be dumped into the Packet Capture (PCAP) format used by other trace analysis tools. It is recommended that you use a tool that can analyze the communications trace data in PCAP format rather than the communications trace analyzer. In the i 6.1 release, you need to create a data area named QCMNTRCPCP in library QGPL prior to issuing the Dump Communications Trace (DMPCMNTRC) CL command. The existence of this data area will result in the data being dumped in the PCAP format. In the i 7.2 release, the DMPCMNTRC command has a new Stream file format keyword, FORMAT, where *PCAP can be specified.

Refer to the following website for additional planning information for IBM i 7.2

<http://www.ibm.com/systems/support/i/planning/upgrade/index.html>

Customer responsibilities

None

Direct customer support

For technical support or assistance, contact your IBM representative or visit

<http://www.ibm.com/support>

Packaging

This offering is delivered through the Internet. There is no physical media. This program, when downloaded from a website, contains the applicable IBM license agreement and License Information, if appropriate, which will be presented for acceptance at the time of installation of the program. For future reference, the license and License Information will be stored in a directory such as LICENSE.TXT.

Security, auditability, and control

IBM i uses the security and auditability features of IBM i. The customer is responsible for evaluation, selection, and implementation of security features,

administrative procedures, and appropriate controls in application systems and communication facilities.

Software Services

IBM Software Services has the breadth, depth, and reach to manage your services needs. You can leverage the deep technical skills of our lab-based Software Services team and the business consulting, project management, and infrastructure expertise of our IBM Global Services team. Also, we extend our IBM Software Services reach through IBM Business Partners to provide an extensive portfolio of capabilities. Together, we provide the global reach, intellectual capital, industry insight, and technology leadership to support a wide range of critical business needs.

To learn more about IBM Software Services or to contact a Software Services sales specialist, visit

<http://www.ibm.com/software/sw-services/>

Ordering information

No-charge features

IBM i (5770-SS1)

IBM i 7.2 (5770-SS1)

Supply features	Feature number
-----------------	----------------

i 7.2 Machine Code	5872
i 7.2 Lang Grp 1 Supply	5827
i 7.2 Lang Grp 2 Supply	5828
i 7.2 Lang Grp 3 Supply	5829

Media and Storage Extensions (5770-SS1 - Option 18)

Supply features	Feature number
-----------------	----------------

i 7.2 M&S Extensions Supply	5921
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PSF for IBM i 1-55 IPM Printer Support (5770-SS1 - Option 36)

Supply features	Feature number
-----------------	----------------

i 7.2 PSF/400 1-55 IPM Supply	5926
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PSF for IBM i 1-100 IPM Prtr Supp (5770-SS1 - Option 37)

Supply features	Feature number
-----------------	----------------

i 7.2 PSF 1-100 IPM Prtr Supp	5927
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PSF for IBM i AnySpeed Printer Support (5770-SS1 - Option 38)

Supply features	Feature number
-----------------	----------------

i 7.2 PSF Any Speed Supply	5938
----------------------------	------

HA Switchable Resources
(5770-SS1 - Option 41)

Supply features	Feature number
-----------------	-------------------

i 7.2 HA Switch Res Supply | 5939

HA Journal Performance
(5770-SS1 - Option 42)

Supply features	Feature number
-----------------	-------------------

i 7.2 HA Journal Perf Supply | 5940

OptiConnect
(5770-SS1 - Option 23)

Supply features	Feature number
-----------------	-------------------

i 7.2 OptiConnect Supply | 5922

DB2 Symmetric Multiprocessing
(5770-SS1 - Option 26)

Supply features	Feature number
-----------------	-------------------

i 7.2 DB2 Symm Multi Supply | 5923

DB2 Multisystem
(5770-SS1 - Option 27)

Supply features	Feature number
-----------------	-------------------

i 7.2 DB2 Multisystem Supply | 5934

Encrypted Backup Enablement
(5770-SS1 - Option 44)

Supply features	Feature number
-----------------	-------------------

i 7.2 Encry Bckup Enab Supply | 5925

Encrypted ASP Enablement
(5770-SS1 - Option 45)

Supply features	Feature number
-----------------	-------------------

i 7.2 Encry ASP Enable Supply | 5930

Advanced Function Printing Utilities (5770-AF1)

Supply features	Feature number
-----------------	-------------------

Language Group 1	5827
Language Group 2	5828
Language Group 3	5829

Rational Application Management Tool Set for i (5770-AMT)

Supply features	Feature number
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Rational Application Management Tool Set for i (5770-AMT)	5819
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Backup Recovery and Media Services for i (5770-BR1)

Supply features	Feature number
-----------------	-------------------

Language Group 1	5827
Language Group 2	5828
Language Group 3	5829

- Network Feature	
Language Group 1	5947
Language Group 2	5948
Language Group 3	5949

- Advanced Feature	
Language Group 1	5967
Language Group 2	5968
Language Group 3	5969

Cryptographic Device Manager for i (5733-CY3)

Supply features	Feature number
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Cryptographic Device Manager for i	5819
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CICS Transaction Server for i (5770-DFH)

Supply features	Feature number
-----------------	-------------------

CICS Transaction Server for i	5819
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Facsimile Support for i V5R8M0 (5798-FAX)

Supply features	Feature number
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Facsimile Support for i V5R8M0	5839
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PowerHA SystemMirror for i (5770-HAS)

Supply features	Feature number
-----------------	-------------------

- PowerHA for Standard Edition	
Language Group 1	5827

Language Group 2	5828
Language Group 3	5829
- PowerHA for i Enterprise Edition	
Language Group 1	5947
Language Group 2	5948
Language Group 3	5949
- PowerHA for i Express Edition	
Language Group 1	5727
Language Group 2	5728
Language Group 3	5729

Advanced Job Scheduler for i (5770-JS1)

Supply features	Feature number

Language Group 1	5827
Language Group 2	5828
Language Group 3	5829

Managed System Services for i (5770-MG1)

Supply features	Feature number

Managed System Services for i	5819

IBM National Languages for I (5770-NLV)

IBM National Languages for i (5770-NLV)	Feature number

LANGUAGE FEATURES	
Estonian Secondary Language	5602
Lithuanian Secondary Language	5603
Latvian Secondary Language	5604
Vietnamese Secondary Language	5605
Lao Secondary Language	5606
Belgian English Secondary	5609
Slovenian Secondary Language	5611
Croatian Secondary Language	5612
Macedonian Secondary Language	5613
Serbian Secondary Language	5614
Portuguese Secondary Language	5622
Dutch Secondary Language	5623
English U/L SBCS Secondary	5624
Finnish Secondary Language	5625
Danish Secondary Language	5626
French Secondary Language	5628
German Secondary Language	5629
Japanese Universal Secondary	5630
Spanish Secondary Language	5631
Italian Secondary Language	5632
Norwegian Secondary Language	5633
Swedish Secondary Language	5637
English U/C DBCS Secondary	5638
German MNCS Secondary Language	5639
French MNCS Secondary Language	5640
Italian MNCS Secondary Language	5642
Arabic Secondary Language	5654

Turkish Secondary Language	5656
Greek Secondary Language	5657
Icelandic Secondary Language	5658
Hebrew Secondary Language	5661
Japanese DBCS Secondary	5662
Belgian Dutch Secondary Lang	5663
Belgian French Secondary Lang	5666
Thai DBCS Secondary Language	5672
Bulgarian Secondary Language	5674
Czech Secondary Language	5675
Hungarian Secondary Language	5676
Polish Secondary Language	5678
Russian Secondary Language	5679
Braz Portuguese Secondary Lang	5680
Canadian French Secondary Lang	5681
English U/L DBCS Secondary	5684
Korean DBCS Secondary Language	5686
Trad Chinese DBCS Secondary	5687
Simp Chinese DBCS Secondary	5689
Romanian Secondary Language	5692
Slovakian Secondary Language	5694
Albanian Secondary Language	5695
Portuguese MNCS Secondary	5696
Farsi Secondary Language	5698

SUPPLY FEATURES

i 7.2 Lang Grp 1 Supply	5827
i 7.2 Lang Grp 2 Supply	5828
i 7.2 Lang Grp 3 Supply	5829
i 7.2 Licensed Machine Code	5872

OmniFind Text Search Server for DB2 for i (5733-OMF)

Supply features	Feature number
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OmniFind Text Search Server for DB2 for i	5839
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Performance Tools for i (5770-PT1)

Supply features	Feature number
-----------------	--------------------

Language Group 1	5827
Language Group 2	5828
Language Group 3	5829

- Manager Feature

Language Group 1	5947
Language Group 2	5948
Language Group 3	5949

- Agent Feature

Language Group 1	5967
Language Group 2	5968
Language Group 3	5969

- Job watcher Feature

Language Group 1	5988
Language Group 2	5998
Language Group 3	5999

Query for i (5770-QU1)

Supply features	Feature number
Language Group 1	5827
Language Group 2	5828
Language Group 3	5829

System Manager for i (5770-SM1)

Supply features	Feature number
System Manager for i	5819

DB2 Query Mgr & SQL Dev Kit for i (5770-ST1)

Supply features	Feature number
Language Group 1	5827
Language Group 2	5828
Language Group 3	5829

Rational Development Studio (5770-WDS)

Supply features	Feature number
Language Group 1	5827
Language Group 2	5828
Language Group 3	5829
- ILE Compilers	
Language Group 1	5947
Language Group 2	5948
Language Group 3	5949
- Heritage Compilers	
Language Group 1	5967
Language Group 2	5968
Language Group 3	5969
- Application Development ToolSet	
Language Group 1	5988
Language Group 2	5998
Language Group 3	5999

IBM i Access Family (5770-XW1)

Supply features	Feature number
- Processor Based	
Language Group 1	5827
Language Group 2	5828
Language Group 3	5829

- User Based	
Language Group 1	5727
Language Group 2	5728
Language Group 3	5729

System i® Temp SW License (5733-ITL)

Supply features	Feature number
-----	-----
IBM i 7.2	5072
High Avail Sol Mgr Std	5990
High Avail Sol Mgr Exp	5991

National Language for I5/OS (5761-NLV)

Supply features	Feature number
-----	-----
ePoE NLV Reg OTC	6001
ePoE NLV Reg OTC	6101

CICS Transaction Server for i (5761-DFH)

Supply features	Feature number
-----	-----
ePoE DFH Reg OTC	6345
ePoE DFH Reg OTC	6346

National Language for I5/OS (5770-NLV)

Supply features	Feature number
-----	-----
ePoE NLV Reg OTC	6001
ePoE NLV Reg OTC	6101

IBM i5/OS™ (5761-SS1)

Supply features	Feature number
-----	-----
IBM i Access Client Sol	6289

IBM i (5770-SS1)

Supply features	Feature number
-----	-----
IBM i Access Client Sol	6289
IBM i Access Win 7.1.	6287

Registration feature (5722-WE2)

Supply features	Feature number
Dev Demo Sys Sw Reg	6485

Registration feature (5722-IP1)

Supply features	Feature number
Dev Demo Sys Sw Reg	6485

Electronic Software Update orders

Entitled Software Update (ESU) is a way for customers to self order their Power software release upgrades via the Entitled Software Support (ESS) website without the need to go to their seller to place the upgrade order. Entitled Software Update (ESU) orders for Electronic Software Delivery (ESD) will now be available in all countries. ESU orders for Power software including i 5.4, i 6.1, i 7.1, AIX® 5.3, AIX 6.1, PowerVM, and IBM Systems Director Editions will be placed on the ESS website

<https://www-05.ibm.com/servers/eserver/ess/ProtectedServlet.wss>

Customers should generally select electronic delivery when ordering via ESU, but do have the ability to select physical delivery. Programs ordered for ESD will have the same download images provided as on the CD / DVD media shipped for physical orders. Countries requiring physical delivery of License Information Documentation will have these document(s) shipped separately. This physical shipment will not delay the immediate availability of the ESD images for customer download.

ESU Customers placing ESD software orders will be able to immediately proceed to the "Downloads" website support for program access, instead of waiting for delivery of a physical package shipped from IBM. For ESD orders, an email with software order information will be sent to the email address on file with the ESS website.

Customers choosing physical delivery will also have the electronic images available for ESD download.

ESD help (instructions on how to use)

http://www.ibm.com/systems/support/software/delivery/en_US/downloadinfo.html

ESD sign-in (must have customer number and Power software entitlements to get in)

<https://www.ibm.com/servers/eserver/ess/OpenServlet.wss>

List of Power software products that are available for electronic download

http://www.ibm.com/systems/support/software/delivery/en_US/supportedproducts.html

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Customers may use the Try and Buy support to download earlier versions of a currently entitled software program. Software key(s) created for previously entitled software programs may be requested from the Key Center

<http://www-304.ibm.com/servers/eserver/ess/OpenServlet.wss>

Media charge

A media charge will be billed to Power software customers ordering physical delivery of media and/or publications. The billing charge will apply to both initial and upgrade software orders. No media charge will be billed to customers choosing Electronic Software Delivery (ESD).

The physical media charge for Power software will appear under the following programs:

5761-SS1 IBM i V6 Operating System
5770-SS1 IBM i V7 Operating System

5761-NLV IBM i V6 National Languages for i
5770-NLV IBM i V7 National Languages for i

5692-A6P AIX V6 System Program Order
5692-LOP Linux on Power System Program Order

Charge metric

Program name	Part number or PID number	Charge metric
IBM i	5770-SS1	Per Processor and Per Server
Additional IBM i Processors	5770-SSA	Per Processor
IBM i Application Server	5770-SSB	Per Processor
IBM i Users	5770-SSC	Per User

Concurrent User

Concurrent User is a unit of measure by which the program can be licensed. A Concurrent User is a person who is accessing the program at any particular point in time. Regardless of whether the person is simultaneously accessing the program multiple times, the person counts only as a single Concurrent User. The program may be installed on any number of computers or servers, but licensee must obtain entitlements for the maximum number of Concurrent Users simultaneously accessing the program. Licensee must obtain an entitlement for each simultaneous Concurrent User accessing the program in any manner directly or indirectly (for example, via a multiplexing program, device, or application server) through any means.

Note: Some programs may be licensed where devices are considered users. In that case, the following applies. Any computing device that requests the execution of

or receives for execution a set of commands, procedures, or applications from the program or that is otherwise managed by the program is considered a separate user of the program and requires an entitlement as if that device were a person.

Processor Value Unit (PVU)

PVU is a unit of measure by which the program can be licensed. The number of PVU entitlements required is based on the processor technology (defined within the PVU table by processor value, brand, type, and model number at the website below) and the number of processors made available to the program. IBM continues to define a processor, for the purpose of PVU-based licensing, to be each processor core on a chip. A dual-core processor chip, for example, has two processor cores. The PVU table can be found at

http://www.ibm.com/software/lotus/passportadvantage/pvu_licensing_for_customers.html

Licensee can deploy the program using either full capacity licensing or virtualization capacity (sub-capacity) licensing according to the Passport Advantage Sub-Capacity Licensing Terms (refer to the web page below). If using full capacity licensing, licensee must obtain PVU entitlements sufficient to cover all activated processor cores* in the physical hardware environment made available to or managed by the program, except for those servers from which the program has been permanently removed. If using virtualization capacity licensing, licensee must obtain entitlements sufficient to cover all activated processor cores made available to or managed by the program, as defined according to the Virtualization Capacity License Counting Rules at

http://www.ibm.com/software/lotus/passportadvantage/Counting_Software_licenses_using_sp_ecific_virtualization_technologies.html

* An activated processor core is a processor core that is available for use in a physical or virtual server, regardless of whether the capacity of the processor core can be or is limited through virtualization technologies, operating system commands, BIOS settings, or similar restrictions.

Notes :

- Some programs may require licenses for the program **and** what is being managed. In that case, the following applies. In addition to the entitlements required for the program directly, licensee must obtain PVU entitlements for this program sufficient to cover the processor cores managed by the program.
- Some programs may be licensed on a managed basis only. In that case, the following applies. Instead of the entitlements required for the program directly, licensee must obtain PVU entitlements for this program sufficient to cover the processor cores managed by the program.
- A few programs on an exception basis may be licensed on a referenced basis. In that case, the following applies. Rather than obtaining entitlements for the activated processor cores available to the program, licensee must obtain PVU entitlements for this program sufficient to cover the environment made available to the referenced program as if the program itself were executing everywhere the referenced program was executing, independent of the basis on which the referenced program is licensed.

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http://www-947.ibm.com/systems/support/machine_warranties/machine_code.html

Elliptical Curve Cryptography (ECC) technology is included with 7.2 IBM i (5770-SS1). This ECC technology is delivered through the machine code, and requires license terms in addition to the standard IBM License Agreement for Machine Code (LMC) referenced above. These additional terms are delivered through the LMC's Addendum for Elliptical Curve Cryptography. This ECC Addendum is available for review at the following website or by contacting your IBM representative

http://www-947.ibm.com/systems/support/machine_warranties/machine_code_cryptadd.html

License Information number

Z125-3301

The program's License Information will be available for review on the IBM Software License Agreement website

<http://www.ibm.com/software/sla/sladb.nsf>

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Yes

Limited warranty

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For clarification, note that for programs acquired under any of IBM's On/Off Capacity on Demand (On/Off CoD) software offerings, this term does not apply since these offerings apply to programs already acquired and in use by you.

Volume orders (IVO)

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Passport Advantage applies

No

Usage restriction

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Corrections

(Corrected on June 10, 2014)

"Try and Buy" information was revised.