IBM i 7.1 Technology Refresh 9 offers performance, usability, and integration enhancements

At a glance

IBM® i 7.1 Technology Refresh 9 includes the following features and benefits:

- IBM i Integrated Web Services Server (IWS) delivers support for REST-based web services, widely used by the industry.
- IBM i Web Administration GUI for i streamlines configuration and management options and adds support for REST-based web services.
- Enhancements to the IBM HTTP Server enable HTTP server jobs to run in a customized subsystem, isolating impact of HTTP workload from other work on the system.
- 5770-DG1 now includes the open source node.js server side JavaScript runtime engine.
- IBM Navigator for i includes new performance and usability enhancements, using the latest in web technology to improve the user experience.
- IBM DB2® for i continues to focus on new and advanced SQL capabilities, productivity benefits for database engineers, and the ability to secure business-critical data in a production environment.
- IBM i supports the latest improvements to the following products, helping you to realize the business benefits delivered by each product:
  - IBM WebSphere® Commerce V7 Feature Pack 8 includes the latest updates for social integrated online business.
  - Rational® Developer for i V9.1.1 simplifies the setup and management of development teams.
  - IBM WebSphere Portal V8.5 delivers updated and relevant, social, and multichannel digital experiences.
  - IBM Connections V5.0 CR1 helps you collaborate with customers and business partners using enterprise social software on IBM i.
  - IBM MQ for Multiplatforms, V8.0 (MQ V8) adds new Advanced Message Security options for IBM i as well as new packaging and delivery options for File Transfer.
- Enhancements to Backup, Recovery and Media Services (BRMS) enable additional automation and ease of use.
- Support is added for new Enterprise Power Systems™ built with POWER8™ architecture and processors.
- Additional I/O options include a new PCI expansion drawer.
- Support for the new IBM TS1150 tape drive machine type 3592 Models E08 and EH8.
- Enhancements to RPG IV ALIAS include support for files and relaxed rules for data structures for I/O operations.

These announcements are documented in the iZone of IBM developerWorks®.

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

Overview

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

With the announcement of IBM i 7.1 Technology Refresh 9, IBM is again extending the base IBM i 7.1 operating system. This technology refresh offers support for the new POWER8 Enterprise Systems server models, enabling new options for clients who have computing requirements larger that the S814 and S824 models announced in April 2014. IBM i 7.1 TR9 supports these models.

IBM Integrated Web Services Server for i and IBM Web Administration GUI for i have been enhanced in IBM i 7.1 TR9, now supporting the industry accepted and widely used REST based services. Clients who want to use something other than SOAP protocols can choose the new REST-based services.

With the IBM HTTP server, you can isolate the HTTP workload from other work on the system. This means that heavy usage of the HTTP environment will have less impact on the performance of other jobs running on the system.

IBM Navigator for i delivers new features and functions as it continues to be considered the strategic direction for modern system management work. IBM Navigator for i uses the latest in web technology to improve the user experience.

Continuing the promise of delivering new DB2 for I functionality with every technology refresh, this refresh contains:

- Database programmers and database engineers can implement new features and functions.
- Database security personnel have access to enhanced additions to the IBM DB2 Guardium® product.

IBM i clients can take advantage of new features and new releases of many IBM Software Group products. IBM WebSphere Commerce, IBM Rational Developer for I, IBM WebSphere MQ, IBM Portal, and IBM Connections have added new features and introduced new releases of their products. Clients using these products should consider upgrading to the latest releases to get additional benefit to their businesses.

These announcements are documented in the iZone of IBM developerWorks at

   http://www.ibm.com/developerworks/

IBM i BRMS delivers periodic sets of enhancements via its PTF Group. The most recent new functions extend its automation and ease of use and integrate support for the newest generation of enterprise tape.

The RPG IV programming language is enhanced to include additional ALIAS support for files and relaxed rules for data structures, helping to increase productivity and modernizing the RPG language.

Key prerequisites

IBM i 7.1 TR9 is supported on IBM Power Systems servers; IBM PureFlex™ systems and blades with POWER7® or POWER7+™ processors; Power Systems servers and

blades with POWER5, POWER5+, POWER6®, or POWER6+™ processors; and IBM i servers with POWER6 processors.

Refer to the Technical information section for specific hardware and software prerequisites.

Planned availability date

November 11, 2014

Description

IBM i

IBM i Integrated Web Services Server - REST support

The Integrated Web Services (IWS) server support has been enhanced to enable users to deploy programs or service programs as REST services. REST services are supported only on IWS servers that are based on the Integrated Application Server powered by Liberty (V2.6, or later). This gives you a quick and easy way to expose ILE RPG and ILE COBOL programs as REST-based web services.

In addition to REST support, the IWS scripting support is updated in the following ways:

- The restoreWebServices.sh script is enhanced to enable the migration of web services that are located on an IWS server V1.5 to an IWS server that is based on Liberty. Users do not have to go through the process of reinstalling the web services manually to a new IWS server.

  Note: When you move from IWS V1.5 to the newest version of IWS, Web Services Description Language (WSDL) includes the following changes:
  – The schema namespace is different.
  – Only one SOAP version can be specified.
  – The URL endpoint will be different.
- New QShell scripts, saveWebServicesServer.sh and restoreWebServicesServer.sh enable users to save IWS servers and restore the servers on another Power® system running IBM i. This includes the deployed web services. It ensures that the corresponding back-end ILE programs are on the new system.

For additional details, visit the Integrated Web Services for IBM i product page

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

IBM Web Administration GUI for i

The IBM Web Administration GUI for i interface is a single integrated location for IBM i users to create, start, stop, and manage all web-related servers. This includes IBM HTTP Server, IBM WebSphere Application Server, IBM i Integrated Application Server, IBM i Integrated Web Services Server, and IBM WebSphere Portal. You can obtain the following updates by installing the latest HTTP PTF Group level. These and many other enhancements are delivered with the HTTP PTF Group SF99368.

Visit the IBM i Technology Updates wiki on developerWorks to learn more about these and other IBM i Web technology enhancements.

   http://www.ibm.com/developerworks/ibmi/techupdates/web

- IBM Web Administration GUI for i offers an interface for easily enabling SSL for the IBM HTTP server. Today, there are many interfaces that are required in order to configure an IBM HTTP Server to use SSL. The new SSL wizard consolidates the panels from the IBM i Web Administration GUI and Digital Certificate Manager

GUI into a single, easy-to-use wizard. This wizard simplifies the steps required and handles both the HTTP server and the configuration within the DCM server.

- IBM Web Administration GUI for i enables an integrated interface for managing IBM WebSphere Portal V8.5 servers. It is easy to see all the created servers and start/stop these servers from this integrated interface. Additionally, the web performance advisor is updated to support Portal 8.5 to enable a guide for configuring a Portal server on IBM i to its optimum values. To create an IBM WebSphere Portal 8.5 server, you need to follow the normal WebSphere Portal instructions.

For more details on IBM WebSphere Portal V8.5, refer to Software Announcement 214-166, dated May 6, 2014.

- IBM Web Administration GUI for i offers a full-function, integrated interface for creating and managing traditional SOAP and the new REST-based web services. It is quick and easy to create both SOAP-based and REST-based web services running on the latest Liberty-based Integrated Application Server and the JAX-WS Web Services runtime engine.

More details can be found at

  http://www-03.ibm.com/systems/power/software/i/iws/

IBM HTTP Server for i

The IBM HTTP Server is built on the industry-standard Apache HTTP Server. This server delivers the necessary HTTP Sever requirements in an integrated and secure environment. The HTTP Server for i is included as part of the 5770-DG1 product. You can obtain the following updates by installing the latest HTTP PTF Group level.

For additional details on these enhancements, refer to

  http://www-03.ibm.com/systems/power/software/i/http/

- IBM HTTP Server for i is enhanced to enable the HTTP server jobs to run in a user-defined customized subsystem. Currently, all the HTTP server jobs run in the system-defined subsystem QHTTPSVR. With this new support, users can better manage the memory and system impact of their HTTP server workloads. Now all of the HTTP Server-related jobs can optionally run in a user-defined subsystem.
- IBM HTTP Server for i is enhanced to support the module mod_reqtimeout. This enables various timeouts to be set for receiving the request headers and the request body from the client. If the client fails to send headers or body within the configured time, a 408 REQUEST TIME OUT error is sent.

Node.js for i

Node.js is a platform built on Google Chrome JavaScript™ run time for server-side and networking applications. It is enabled on IBM i and shipped as part of the licensed program 5770-DG1. Besides the core functions of node.js, IBM i node.js also offers extensions to operate DB2 for i and gain access to native IBM i objects such as programs, commands, data queues, data areas, spool files, user spaces, jobs, system values, environment values, and more.

Additional information on Node.JS on IBM i can be found on the IBM i zone for developerWorks at

  http://www.ibm.com/developerworks/ibmi/techupdates/web

IBM Navigator for i

Significant updates have been made to the entire Navigator family in IBM i 7.1 TR9. The web-based version of Navigator is the strategic direction for modern system management for IBM i. The interface for the web-based version has undergone a significant transformation by adding new function, improving navigation, and incorporating the latest in web-based technology. All of this provides improvement to both usability and performance.

The usability updates include the following new and enhanced functions:

- A fast search capability helps you to find screens based on the names commonly used. Enter a CL command name and the corresponding Navigator screen is displayed.
- A new favorites list enables you to select specific screens to which fast access is required and save that into a favorites list. Users can create their own customized list of important screens for quick and easy repeatable access.
- You can now deep dive directly to the IFS path of choice by entering the path name. You can use either the navigator tree to find the required path or the new path name entry screen.
- Many database features within Navigator for i updated for improved ease of use and improved performance of database tasks via Web Navigator. While the iAccess for Windows™ Navigator continues to be the tool of choice for database users, Navigator for i contains impressive support for database users who want to take advantage of a browser-based solution.

DB2 for i

With IBM i 7.1 TR9, DB2 for i continues to focus on new and advanced SQL capabilities, database engineer productivity, and the ability to secure business-critical data in a production environment. By moving up to the suggested DB2 PTF Group, you will have a database that offers significant new capabilities for a wide range of users.

New capabilities for database application developers

Database application developers have the following new capabilities for constructing advanced SQL solutions:

- Database programmers have a new SQL alternative to External User Defined Table Functions (UDTFs) in the form of pipelined functions. Pipelined functions give programmers complete flexibility within the UDTF while shielding them from the burden of traditional application deployment tasks.
- Queries can use new built-in functions for regular expressions to find data that is not perfectly encoded. This ability to have a data-centric solution that accommodates for human error lightens the load for the application developer.
- Queries can leverage new built-in functions for manipulating data with left and right padding. By pushing the formatting of the data into the SQL query, application programmers have fewer tasks in front of them.
- Other SQL enhancements as described in developerWorks.

  http://www.ibm.com/developerworks/

Improved capabilities for database engineers

Database engineers have improved capabilities for designing, reviewing, redesigning, and customizing database objects:

- Many database features within Navigator for i are updated for improved ease of use and improved performance of database tasks via Web Navigator. While the iAccess for Windows Navigator continues to be the tool of choice for database users, Navigator for i contains impressive support for database users who want to take advantage of a browser-based solution.
- New DB2 for i procedures make it possible to automate the collection, import, and removal of SQL Plan Cache Snapshots and SQL Plan Cache Event monitors, enabling an easy approach for automating the management of database operational data. By automating these steps, database engineers and performance analysts will be better positioned to study operational details.

Improved governance of business-critical data

Governance of business-critical data has been improved in the following ways:

- Guardium Database Activity Monitor (DAM) i S-TAP® is enhanced to produce reduced CPU overhead when collecting information about SQL activity. This enhancement extends the unique value of Guardium DAM with DB2 for i for clients who need to monitor database activity in a production environment.
- Guardium DAM and SQL Performance Monitor users can filter collection of SQL activity by up to 10 unique user or group profile names, making it easier to narrow the scope of data collection to match database compliance objectives.
- SQL Performance Monitor users have a new security control that directs the monitor to be collected without host variable values. This combination achieves a balance between protecting sensitive data while enabling application development and database performance analysts to continue to use a critical tool.

IBM DB2 for i Services is extended

In the tradition of recent database enhancements, new IBM i Services deliver the following important alternatives to IBM i commands and APIs:

- The JOURNAL_INFO catalog offers deep details and insight into the state and statistics of local and remote journals. Use this service to recognize inefficiencies, gauge throughput, and easily answer questions using an SQL query.
- The REPLY_LIST_INFO catalog enables easy access to the reply list information. Use this ability to easily determine unused reply list entries, to confirm that configurations are identical between production and backup partitions and many other applications.
- Other new IBM i services as described in developerWorks.

These and many other enhancements are delivered with the DB2 PTF Group SF99701. Visit the IBM i Technology Updates wiki on developerWorks to learn more about these and other DB2 for IBM i enhancements

  http://www.ibm.com/developerworks/ibmi/techupdates/db2

To view the DB2 for IBM i PTF Group details, visit

  http://www.ibm.com/developerworks/ibmi/techupdates/db2/groupptf

BRMS

IBM i Backup, Recovery and Media Services (BRMS) is an IBM licensed program that is geared to implement your business's choices for your backup, recovery, and media management. Similar to DB2, BRMS delivers enhancements periodically via PTF Groups. The most recent enhancements to IBM i 6.1, and later, include the following:

- STRBKUBRM will automatically remount file systems after a backup is run for a control group during backup of integrated file system objects.
- The Print Report using BRM (PRTRPTBRM) command has been enhanced to support multiple values on the From system (FROMSYS) parameter. The PRTRPTBRM command has also been enhanced to support the Use save files (USESAVF) and TSM (USEADSM) parameters.
- BRMS support is added for new tape device type 3592 models.
- Control group entries *ALLCHGRCV and *ALLDTCRCV have been enhanced to process journals in libraries that start with 'Q' when they are specified in object lists QCHGJRNRCV and QDTCJRNRCV.

For more information about these and other BRMS enhancements visit

  http://www.ibm.com/developerworks/ibmi/techupdates/brms

RPG IV

IBM Rational has announced enhancements to the RPG IV language delivered in 5770-WDS. In the continuing effort to increase the power of RPG as a modern

business language, RPG IV will support extended ALIAS support for files and relaxed rules for data structures for I/O operations. These new enhancements will be delivered through PTF SI54502 and can be applied to RPG IV V7.1. These new enhancements will also be available with a Technology Refresh for 7.2. Full documentation for the enhancements will be found starting from the What's New section of the ILE RPG Reference in the 7.2 Info Center. The ILE RPG Reference in the 7.1 Info Center will not be updated. Information will also be available in the RPG Cafe at

https://www.ibm.com/developerworks/ibmi/rpg/welcome

IBM Software Group enhancements

IBM WebSphere Commerce V7 Feature Pack 8

IBM WebSphere Commerce V7.0 delivers a powerful customer interaction platform for cross-channel and online commerce. E-commerce is no longer simply about selling things online. It is about delivering a seamless, integrated experience across all touch points. WebSphere Commerce V7 Feature Pack 8 delivers enhanced e-commerce capabilities for business-to-business (B2B) and helps accelerate time to market by enhancing the WebSphere Commerce Aurora store to deliver a single starter store for both business-to-customer (B2C) and B2B.

In addition, WebSphere Commerce V7.0 Feature Pack 8.0 delivers productivity benefits with dynamic sales categories, flexibility through an expanded range of B2B and B2C representational state transfer (REST) API services, enhanced integration for IBM Sterling Configurator, and further enhancements for the benefit of B2B and B2C businesses.

WebSphere Commerce V7.0 Feature Pack 8.0 replaces Feature Pack 7.0 and includes all of the features previously released with Feature Pack 7.0. For additional details refer to the WebSphere Commerce knowledge center at

https://www-01.ibm.com/support/knowledgecenter/

Rational Developer for i V9.1.1

Rational Developer for i V9.1.1 includes a number of enhancements to help IBM i developers create and maintain their code on IBM i. These enhancements include the "push to client" capability for standardizing preference and connection settings across a team, based on templates maintained on the server. This means that preferences, connections, filters, and actions can be exported and imported when connecting to a central server. These updates can be forced to all team members or can generate a prompt so that imports are done by choice. In addition, other updates include enhancements to the code coverage support that was new in V9.1.

For additional details visit

http://www-01.ibm.com/support/docview.wss?uid=swg27038481

IBM WebSphere Portal V8.5

The WebSphere Portal family of servers continues to be supported on IBM i allowing the delivery of a highly relevant, social, and multichannel digital experiences to users.

Additional details can be found at

http://www-01.ibm.com/common/ssi/cgi-bin/
ssialias?subtype=ca&infotype=an&appname=iSourc
e&supplier=897&letternum=ENUS214-166#

IBM Connections V5.0 CR1

Connections V5.0 adds new capabilities that make it easier for a company's employees to collaborate with customers and business partners on projects and share relevant information. With Connections V5.0, external users, such

as customers and business partners, can be invited to a shared file and an IBM Connections community. Communities that have been opened to external users are identified as such to the members of the community. The CR1 service release includes support for Connections to run natively on IBM i and Connections Content Manager (CCM) support for IBM i. CCM support uses a Filenet server, which is currently supported only for existing platforms.

For additional details on Connections 5.0 refer to Software Announcement 214-190, dated June 17, 2014.

IBM MQ for Multiplatforms, V8.0

MQ for Multiplatforms, V8.0 (MQ V8) offers a universal messaging solution. It delivers the messaging you need, where you need it, from enterprise messaging for secure core business applications to mobile messaging to extend the business to the Internet of things and mobile devices. MQ V8 gives you access to key business data in files from across the business, and simplifies messaging access for application developers.

The key features of MQ V8 can be grouped mainly into themes of improved scalability, enhanced security, and updates to standards and currency.

It includes the following enhancements:

- Verification of user ID and password, making use of either operating system definitions or a Lightweight Directory Access Protocol (LDAP) repository.
- Use of Domain Name System (DNS) host names in Channel Authentication Records (CHLAUTH).
- Channel-level certificates, enabling multiple certificates to be used in a queue manager.
- Routed publish-subscribe in clusters.
- Enhanced status reporting for publish-subscribe.
- Performance enhancements including queue manager scaling and multiplexed client performance.
- Support for updated standards (JMS 2.0).
- Support for multiple transmission queues defined for use in a clustered queue manager on all.
- Availability on all platforms for both Advanced Message Security and Managed File Transfer. Both of these additional products are integrated into the core MQ installation and are additional chargeable options.

Additional details can be found at

http://www-01.ibm.com/common/ssi/ShowDoc.wss?docURL=/common/ssi/ rep_ca/7/897/ENUS214-17 7/index.html&lang=en&request_locale=en

Hardware enhancements

POWER8 technology

IBM i 7.1 Technology Refresh 9 is supported on the new Enterprise 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 enables the system to automatically capitalize on many new POWER® architecture features without changes to existing programs. A selection of processor support features is highlighted below.

Multicore and multithread

The maximum number 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 with POWER8 processor

technology in an IBM Power System E870 or E880 running IBM i 7.1 Technology Refresh 9 is 32 cores per SMT8. 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 offer 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 7.1 Technology Refresh 9 offers 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, or SMT8) used by the logical partition. Recent updates in technology now enable this switching to be dynamic.

Live Partition Mobility

Live Partition Mobility (LPM) was introduced with IBM i 7.1 Technology Refresh 4 on POWER7 systems. With LPM you can move a running IBM i partition from one system to another, so that planned maintenance can be done on the source system with essentially no downtime. You can also balance workloads among multiple systems.

LPM is supported on both POWER8 and POWER7 systems. Now with the newer generation of Power systems with POWER8 processors, an active IBM i partition can move between a POWER7 system and a new POWER8 system with essentially no downtime. This function can even be used to permanently migrate a partition from a POWER7 system to a POWER8 system, provided appropriate licenses and activations are set up on the POWER8 system.

New I/O options

An expansion drawer with additional Gen3 PCIe slots is available to expand the number of adapters that can be used on the new Enterprise System models with POWER8 technology. There are several new options for disk, both SSD and HDD with 10,000 and 15,000 rpm speeds. A new configuration of IBM i with VIOS takes advantage of EasyTier technology to allow a read intensive SSD drive to be used. IBM TS1150 tape driver machine type 3592 models E08 and EH8, which are the newest generation of enterprise tape technology, are now supported. In addition, increased storage capacity for RDX is now available with a 2.0 TB removable disk drive.

For more details on these hardware and I/O enhancements, including more information about planned availability and hardware requirements, Refer to 114-160, dated October 6, 2014

Refer to 114-158, dated October 6, 2014

Refer to 114-170, dated October 6, 2014

For an IBM i specific description of these hardware enhancements, refer to

https://www.ibm.com/developerworks/ibmi/techupdates/hw

Product positioning

IBM i 7.1 is the latest version of the IBM i operating environment. IBM i runs on an IBM Power Systems server 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 delivers a fully integrated and trusted combination of relational database, security, web services, networking, and storage management capabilities required to run business applications. 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 usage 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 important advantage for IBM i is the underlying architecture of the operating system, which enables simplicity, stability, and security. These are not add-on features, but inherent aspects of the operating system. Here are a few examples:

Simplicity

The relational database in IBM i is an integrated component that is built on a set of integrated storage management 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 one long stream of memory that encompasses the system memory as well as the storage on disks. This architecture makes it critical for the operating system to decide where to store any given piece of data, which removes the user from having 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, and 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 enables 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 the IBM i operating system.

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 which 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, it only has a defined set of attributes that 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.

While the IBM i operating system supports open programming methods such as Java™, PHP, web services, and so on, the underlying architecture offers a level of integration, stability, simplicity, and security that makes it significantly different from comparable operating systems. These aspects deliver excellent business value to its users.

Statement of direction

DB2 for i Query Performance:

IBM intends to enhance its DB2 for i database to provide an enhanced in-memory oriented access capability to its database EVI (Encoded Vector Index) technology to facilitate enhanced aggregate query performance.

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 remains at our sole discretion.

Program number

```
Program                   Program
number        VRM         name

5770-SS1      V7.1        IBM i V7.1
```

Product identification number

```
                    Maintenance        Maintenance
Program PID number  1 year PID number  3 year PID number

5770-SS1            N/A                N/A
```

Offering Information

Product information is available via the Offering Information website

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

Publications

No publications are shipped with these programs.

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=214-399

Technical information

Specified operating environment

Hardware requirements

A supported Power server with POWER8, POWER7+, POWER7, POWER6+, POWER6, POWER5+, or POWER5 processor is required to run IBM i 7.1 TR9.

For up-to-date information on all types of code levels needed for support of a particular feature, refer to the IBM Prerequisite website at

https://www-912.ibm.com/e_dir/eServerPrereq.nsf

Software requirements

For specific software requirements, refer to the IBM i Technology Updates wiki on developerWorks at

http://www.ibm.com/developerworks/ibmi/techupdates/

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.

Companion products

The MSP Utility Pricing Offer is a program that leverages channel-led discounting for Managed Service providers who purchase a Cloud Hosting Infrastructure built with IBM hardware and software.

User group requirements

A strong and passionate worldwide user community focuses on all aspects of IBM i running on Power servers. The community includes online groups and face-to-face community gatherings. The COMMON organization has branches around the world, including COMMON North America, iSUC in Japan, COMMON Europe, and Interaction in Australia/New Zealand.

IBM continues to recognize key community leaders through the IBM champion program. The 14 current IBM i Champions have been recognized for their work in the betterment of user groups, social media, and the Academic Initiative. To learn about the IBM Champions program, visit

https://www.ibm.com/developerworks/community/profiles/html/advancedSearch.do?profileTag s=power_systems&profileType=champion&lang=en

Security, auditability, and control

These programs use the security and auditability features of the host hardware or software. 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/

Terms and conditions

The information provided in this announcement letter is for reference and convenience purposes only. The terms and conditions that govern any transaction with IBM are contained in the applicable contract documents such as the IBM International Program License Agreement, IBM International Passport Advantage® Agreement, and the IBM Agreement for Acquisition of Software Maintenance.

Licensing

IBM International Program License Agreement including the License Information document and Proof of Entitlement (PoE) govern your use of the program. PoEs are required for all authorized use.

This software license includes Software Subscription and Support (also referred to as Software Maintenance).

Agreement for Acquisition of Software Maintenance

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Yes

Limited warranty

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