

IBM i 7.4 TR4 offers enhanced performance, usability, and integration

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Overview

IBM^(R) 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.

IBM i 7.4 Technology Refresh 4 delivers the following new features and capabilities for small, midsize, and large companies:

- IBM Db2^(R) for i is enhanced to help enable new capabilities for database engineers to programmatically supervise the SQL Query Engine.
- IBM i Services, the SQL alternative to APIs and CL commands, provide enhanced productivity and insight to all IBM i users.
- Clustering is enhanced to allow the user to view or monitor the progress of a switchover of a Cluster Resource Group. Each step of the switchover is written to a cluster log file.
- Save/Restore is enhanced to save time by automatically bypassing ENDSBS command processing if the system is already in a restricted state.
- IBM i Common Cryptographic Architecture Cryptographic Service Provider (CCA CSP), delivered as IBM i Option 35, now includes support for Release 5.6.x for CCA for the IBM 4767 Cryptographic Coprocessor.
- IBM Rational^(R) Development Studio for i provides several new features for the RPG programming language.
- IBM Db2 Mirror for i adds security, Db2 for i performance improvements, and support for new objects.
- IBM Backup, Recovery, and Media Services for i (BRMS) adds new functionality based on user requests.
- IBM PowerHA^(R) SystemMirror^(R) for i brings a new set of enhancements centered around switchover, automation, and simplification.
- IBM i supports the hardware and I/O that are being announced on April 13, 2021, providing operational efficiency and increased configuration flexibility.

The [Description](#) section includes detailed information about these new functions and enhancements for this release.

For additional information on the IBM i 7.4 TR4 enhancements, see the following:

- [IBM i Technology Updates](#) wiki for technical details for IBM i 7.4 TR4
- [IBM i 7.4 TR4](#) wiki landing page to easily find IBM i 7.4 TR4-specific enhancements

Key requirements

IBM i 7.4 TR4 is supported on selected IBM Power^(R) Systems servers with IBM POWER9[™] and POWER8^(R) technology-based processors.

Clients using blades or IBM PureFlex^(R) systems, and those using servers with IBM POWER7, IBM POWER7+, or earlier processors, need to move to newer systems to take advantage of the features in IBM i 7.4 TR4.

For up-to-date information on all types of code levels needed for support of a particular feature, see the [IBM Prerequisite](#) website.

See the [Technical Information](#) section for specific hardware and software prerequisites.

Planned availability date

April 16, 2021

Description

Db2 for i

Db2 for i, the integrated database for IBM i, is known for containing the attributes valued by business computing solutions. Db2 for i is enhanced to include new capabilities for database engineers to programmatically supervise the SQL Query Engine.

To learn more about these and other Db2 for i enhancements, see the database section of the [IBM Db2 for i - Technology Updates](#) wiki page.

Db2 for i enhancements

With this update, Db2 for i now offers a Query Supervisor feature. The Query Supervisor gives clients the ability to establish automated controls for supervising the on-going consumption of system resources by SQL Query Engine (SQE) activity.

User-established threshold levels for CPU consumption and other criteria guide the Query Supervisor. When a threshold is met, a user-supplied exit program is called during query execution. The exit program can initiate immediate notification, log the detail, terminate the query, or otherwise take immediate action.

The Query Supervisor feature will be delivered with the Db2 for i PTF group (SF99704) on May 14, 2021. For more information, see the [Db2 for i 2021 PTF Group Schedule](#) support page.

Db2 for i Services

Db2 for i continues the tradition of providing advanced and easy-to-use tooling to the database engineer by providing new procedures, such as:

- **GENERATE_SQL** and **GENERATE_SQL_OBJECTS**: These procedures, used to generate the SQL statements for corresponding database objects, are enhanced to include an option to direct the output to an IFS stream file
- **CLEAR_PLAN_CACHE**: This procedure, which removes plans from the SQL Plan Cache, is enhanced to give the caller the ability to clear specific plans, providing a granular and programmatic tool for plan management
- **DUMP_PLAN_CACHE_TOPN**: This procedure, which captures deep detail about the most expensive SQL queries, is enhanced to include dump categories,

allowing the DBE to easily focus on the top consumers of CPU, storage, and other resource categories

These and other enhancements are delivered with the Db2 for i PTF group (SF99704) on May 14, 2021.

For complete details on these enhancements and other Db2 for i Services enhancements, see the [IBM i Technology Updates](#) wiki.

IBM i Services

IBM i Services are the strategic method for gaining access to IBM i objects, system information, and much more. Leveraging the power of SQL and the Db2 for i SQL Query Engine (SQE), application developers, database engineers, and system managers can now explore IBM i objects and data in ways that were not possible with previous technologies.

In this technology refresh, these IBM i Services are added and enhanced, providing useful SQL-based alternatives to IBM i commands and APIs, such as:

- **NVME_INFO**: Provides essential fuel gauge and related details on NVMe devices, providing a simple-to-consume solution for device management.
- **SYSDISKSTAT**: The service that provides statistical insight into spinning disk and solid-state drives (SSD) is enhanced to include fuel gauge detail for SSD devices.
- **OBJECT_STATISTICS**: This popular and powerful table function is used to find objects and is enhanced for improved performance through support for generic object names.
- **SECURITY_INFO**: Using SQL to manage security takes a step forward with this new view that provides one place to look for the current IBM i security configuration.
- **USER_SPACE_INFO** and **USER_INDEX_INFO**: New views that provide details and attributes about user spaces and user indexes.
- **USER_SPACE** and **USER_INDEX_ENTRIES**: New table functions that can be used to query the contents of user spaces and user indexes.
- **MESSAGE_QUEUE_INFO**: The table function is documented and enhanced to include a message type filter, providing a performance-advantaged approach to finding specific messages.
- **QCMDEXC**: The scalar function is added, providing an essential building block for clients to modernize SQL-based systems management solutions.
- **System Limits**: New controls are provided that enable IBM i clients to control the system limits alerting capability. The alerting support is expanded to include more system limits.
- **ACTIVE_JOB_INFO**: The SQL alternative to WRKACTJOB is enhanced by adding return columns for the job name, job user, and job number, which makes it much easier to search and subset active job detail.

SYSTOOLS

Db2 for i provides working examples and tools in the SYSTOOLS schema. Like previous technology refreshes, SYSTOOLS is enhanced with tools to help clients move forward with extreme automation using SQL:

- **GENERATE_PDF**: The table function is pointed to a spooled file and a PDF file is produced into a user-specified location within the IFS.
- **CHANGE_USER_PROFILE**: The table function can be used to evaluate or deploy changes to one or more user profiles, greatly easing the complexity in managing user-based security.
- **Audit journal functions**: Table functions unique to specific audit journal entry types are added to SYSTOOLS. The table functions return the basic audit journal detail, but also extract the entry-specific detail into easily consumed return columns.

Additional information

For complete details on these enhancements and other IBM i Services enhancements, see the [IBM i Technology Updates](#) wiki.

Base operating system

Clustering enhancement - Switch-over progress monitoring

Previously, when a system administrator requested switch-over of a Cluster Resource Group, the only notification would be the one to indicate the switch-over had completed, along with error messages if the request had failed. Any switch-over may take some time to complete and involves many steps. A new feature is added to Cluster Resource Groups by writing an entry to a cluster log file for each step of the switch-over so that the user can monitor the progress of the switch-over and determine how long each step takes. This new function will be available in a PTF by June 30, 2021.

See [General IBM i Operating System](#) in the IBM i Technology Updates wiki for more details.

Save/Restore enhancement - Improvement to Restricted State Processing for GO SAVE and GO RESTORE

A recent PTF enhancement improves restricted state processing when performing the GO SAVE and GO RESTORE menu options 21, 22, 23, and GO LICPGM menu option 40.

The ENDSBS command is processed as part of the GO SAVE or GO RESTORE menu options 21, 22, 23, and GO LICPGM option 40. Traditionally, while in an unattended mode, the ENDSBS command was issued even if the system was already in a restricted state. The ability to manually bypass the ENDSBS command was offered only while in an attended mode, and only for user data menu option 23 of the GO SAVE and GO RESTORE menus.

With the application of the new PTF, a pre-check will be performed to automatically bypass the ENDSBS command processing if the system is already in a restricted state. This applies to both attended and unattended modes. The advantage is avoiding the unneeded ENDSBS processing, thereby saving time. An additional benefit is that it can avoid ending limited mode TCP/IP services that can operate while the system is in a restricted state.

See [Improvement to Restricted State Processing for GO SAVE and GO RESTORE](#) in the IBM i Technology Updates wiki for more details.

IBM i CCA CSP enhancements

IBM i CCA CSP, delivered as IBM i Option 35, is updated to support Release 5.6.x for CCA from 5.3.x for the IBM 4767 Cryptographic Coprocessor.

This support is provided with IBM i PTFs, which will be available by June 30, 2021. For the latest information, including PTF numbers, see [IBM i Security](#) in the IBM i Technology Updates wiki.

LPPs

Rational Development Studio (5770-WDS)

IBM is delivering key new features requested by RPG developers. The following features are included in this update:

- %LOWER and %UPPER built-in functions convert contents of a char variable from lowercase to uppercase or vice versa
- %SPLIT built-in function splits a string into an array
- %MAXARR and %MINARR return the index of the maximum or minimum element of an array

For more information about details and updates, see the [RPG Cafe](#) website.

Db2 Mirror for i enhancements (5770-DBM)

The Db2 Mirror product provides continuous availability for IBM i clients. The Db2 Mirror feature in IBM i 7.4 TR4 provides additional security, Db2 performance improvements, and support for new objects.

Security

The Analyze Profile Activity (ANZPRFACT) command has been updated to consider Db2 Mirror environments. Prior to this enhancement, ANZPRFACT would consider activity only on the node where the command executed. This could cause active profiles on the other node to become disabled. This enhancement will now be multi-node aware and disable profiles only if there is no activity on either Db2 Mirror node.

Db2 for i performance improvements

Db2 for i has been enhanced to increase performance in a Db2 Mirror environment. Performance improvements vary based on application and database architectures. See [IBM Db2 Mirror for i: Performance Considerations](#) for additional information.

New objects supported

Data Queue entries are now supported in addition to the data queue itself. This is selected by the data queue and managed by the Replication Criteria List.

User Index and User Space objects can now also be replicated with Db2 Mirror. For more information on these new objects that can be replicated, see the [Db2 Mirror](#) topic.

BRMS for i (5770-BR1)

BRMS for i 7.2 and later has several enhancements:

- New SQL services that provide similar views of BRMS log information as those provided by the DSPLOGBRM command.
- BRMS network sync job improves performance by reducing the number of journal entries processed.
- Improved cloud support for Network Installations using Network File Systems.
- Integrated support for full system backups using IBM i iSCSI supported devices.

For BRMS 7.4, these enhancements are available with PTF SI74479.

PowerHA SystemMirror for i (5770-HAS)

PowerHA SystemMirror for i 7.4 TR4 brings a new set of enhancements centered around switchover, automation, and simplification.

Streamlined switchovers

PowerHA continues to provide simple and easy switchovers. The latest enhancements provide simplified node selection with automated recovery domain management with the ability to monitor detailed switchover and failover progress from a single node.

FlashCopy^(R) automation

FlashSystem FlashCopy technologies are enhanced with integrated automation to simplify FlashCopy operations. Previously, Flashcopy automation required externally developed tools and scripts that performed multi-node operations.

Additional enhancements

PowerHA SystemMirror for i 7.4 TR4 offers additional enhancements, including:

- Continued simplified management of PowerHA with interactive prompting
- Additional simplified commands that provide contextual F4 prompt options that are optimized for a specific environment and configuration

For more information on these enhancements and to get started, see the [IBM PowerHA SystemMirror for i](#) wiki page.

The PowerHA enhancements will be available on June 25, 2021.

Hardware and I/O topics

With IBM i 7.4 TR4, IBM i supports new hardware and I/O offerings for Power Systems:

- 12-core POWER9 processor option for Scale Out 2U servers
- IBM i as a client of Virtual I/O Server (VIOS) for configurations with new 2-port, 32 GB and 4-port, 16 GB Fibre Channel adapters
- Enterprise PCIe4 NVMe disk in U.2 form factor with a new lower capacity of 800 GB
- New mainstream SAS SSDs
- New enterprise SAS SSDs

See the [Hardware and Firmware](#) support page in the IBM i Technology Updates wiki for more details.

Reference information

For information about IBM i 7.3 TR10, see Software Announcement [221-074](#), dated April 13, 2021.

For additional information about hardware and I/O, see:

- Hardware Announcement [121-013](#), dated April 13, 2021, IBM Power Systems enhancements
- Hardware Announcement [121-001](#), dated April 13, 2021, Hardware Management Console (7063-CR2) based on POWER[®] technology

Program number

Program number	VRM	Program name
5770-SS1	7.4	IBM i 7.4 TR4

Offering Information

Product information is available on the [IBM Offering Information](#) website.

Publications

None

Services

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Technical information

Specified operating environment

Hardware requirements

IBM i 7.4 TR4 is supported on select Power Systems servers with POWER9 or POWER8 processors. Clients using blades or IBM PureFlex systems, and those using servers with POWER7, POWER7+, or earlier processors, need to move to newer systems to take advantage of the features in IBM i 7.4 TR4.

For up-to-date information about all types of code levels needed for support of a particular feature, see the [IBM Prerequisite](#) website.

For additional information, see the [System to IBM i maps](#) website.

Software requirements

To find the supporting technical details and software requirements for IBM i 7.4, see the [TR4 enhancements](#) website.

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Variable charges apply

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