12th Edition BeNeLux Power 2024

# IBM i & Power
# Recent Announcements

November 19, 2024

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IBM Technology, Belgium
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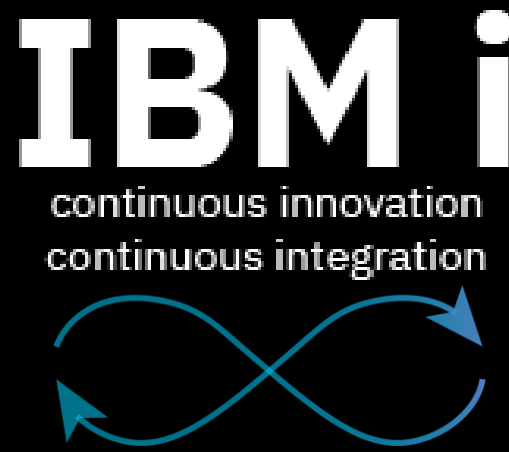
fabianmichel




IBM

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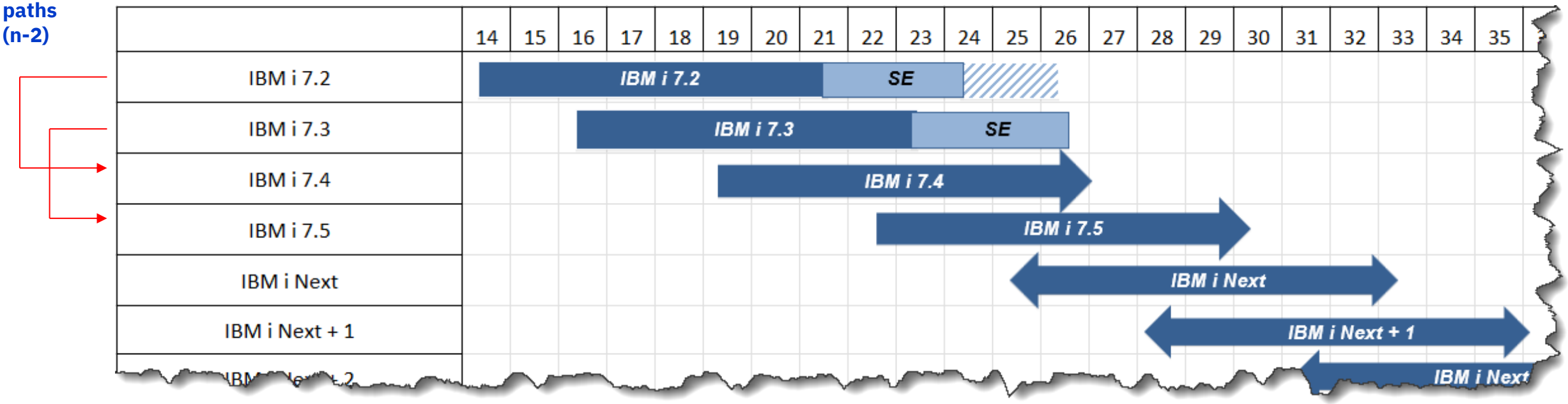
# IBM i Support Roadmap

IBM i
continuous innovation
continuous integration

**Supported Upgrade paths (n-2)**




IBM i 7.1/ 7.2 Service Extensions end 4/30/2024

** All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice and represent goals and objectives only.
** Arrows indicate “ongoing status” and do not imply any specific dates.

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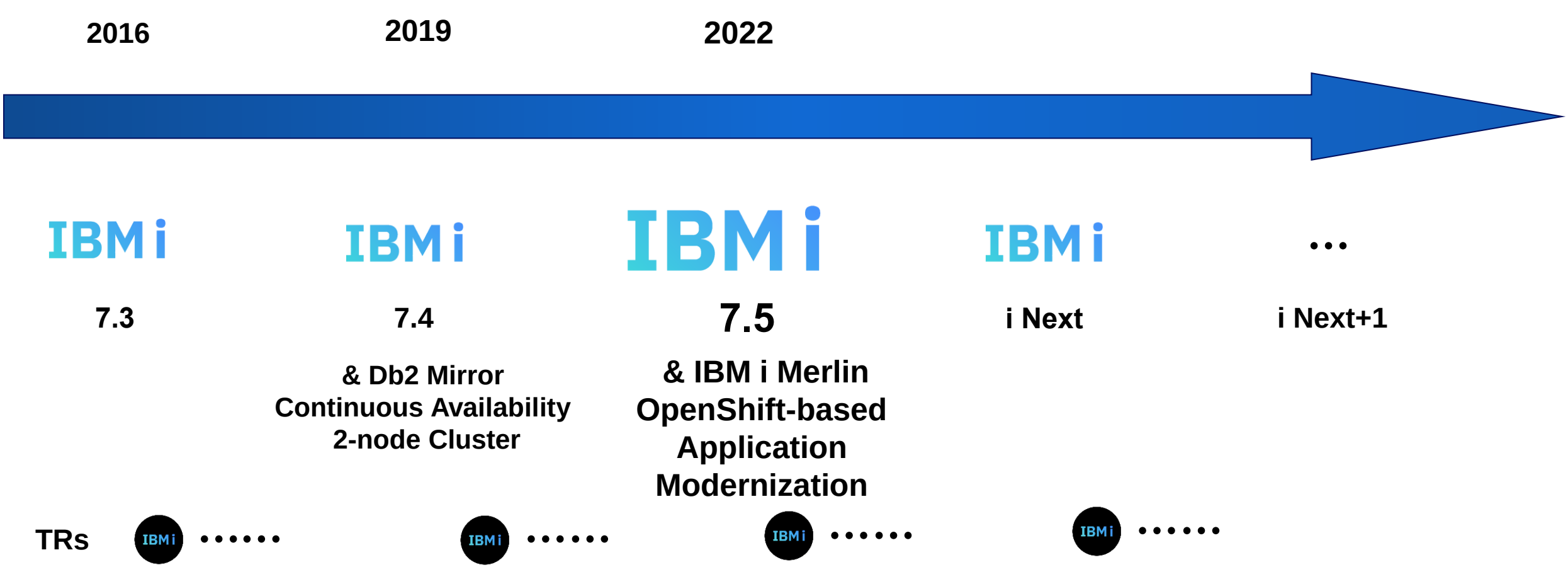
# IBM i Roadmap & Strategy Foundation

IBM i
continuous innovation
continuous integration




| Power Solutions | Options | Integration |
|---|---|---|

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** Arrows indicate “ongoing status” and do not imply any specific dates.

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# IBM i Release Roadmap – Announcement Dates

IBM i
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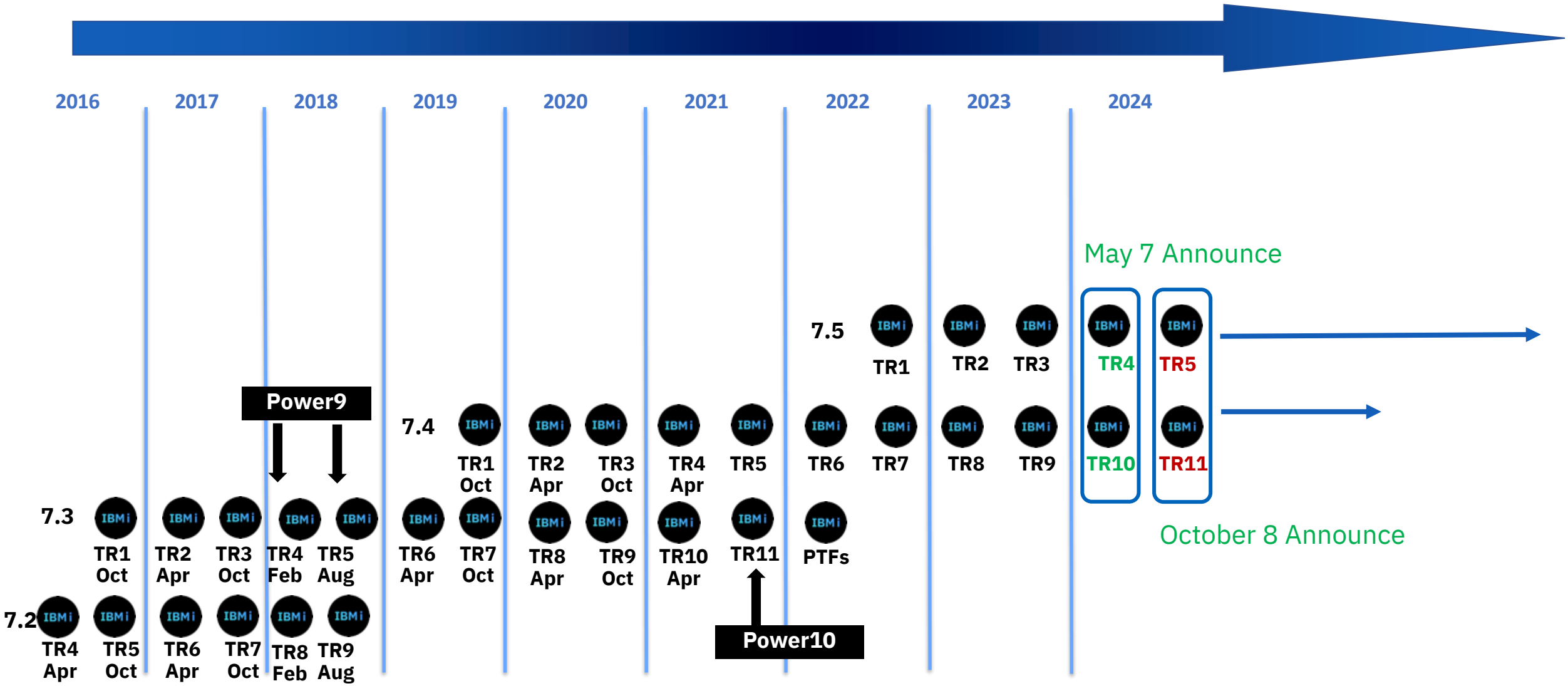
continuous integration




** All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice and represent goals and objectives only.
** Arrows indicate “ongoing status and do not imply any specific dates.

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# Statement of Direction

IBM i
continuous innovation
continuous integration

IBM intends to deliver a **code assistant for RPG -** a generative AI tool which helps developers of IBM i software **understand existing RPG code**, **create new RPG function** using natural language description, and automatically **generate test cases** for RPG code.

IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion. The information mentioned regarding potential future products or functionality is not a commitment, promise, or legal obligation to deliver any material, code or functionality, and 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.

https://www.ibm.com/support/pages/ibm-power-announcements

https://newsroom.ibm.com/blog-ibm-power-modernizes-infrastructure-and-accelerates-innovation-with-ai-in-the-year-ahead

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# Statement of Direction

IBM i
continuous innovation
continuous integration

IBM intends to incorporate the **IBM Spyre accelerator in future Power offerings** to provide **additional AI compute capabilities**. Working together, IBM Power processors and IBM Spyre accelerator will enable the next generation infrastructure **to scale demanding AI workloads** for businesses.

IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion. The information mentioned regarding potential future products or functionality is not a commitment, promise, or legal obligation to deliver any material, code or functionality, and 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.

https://www.ibm.com/support/pages/ibm-power-announcements

https://newsroom.ibm.com/blog-ibm-power-modernizes-infrastructure-and-accelerates-innovation-with-ai-in-the-year-ahead

https://community.ibm.com/community/user/power/blogs/val-besong/2024/11/12/ibm-power-modernizes-infrastructure-and-accelerate

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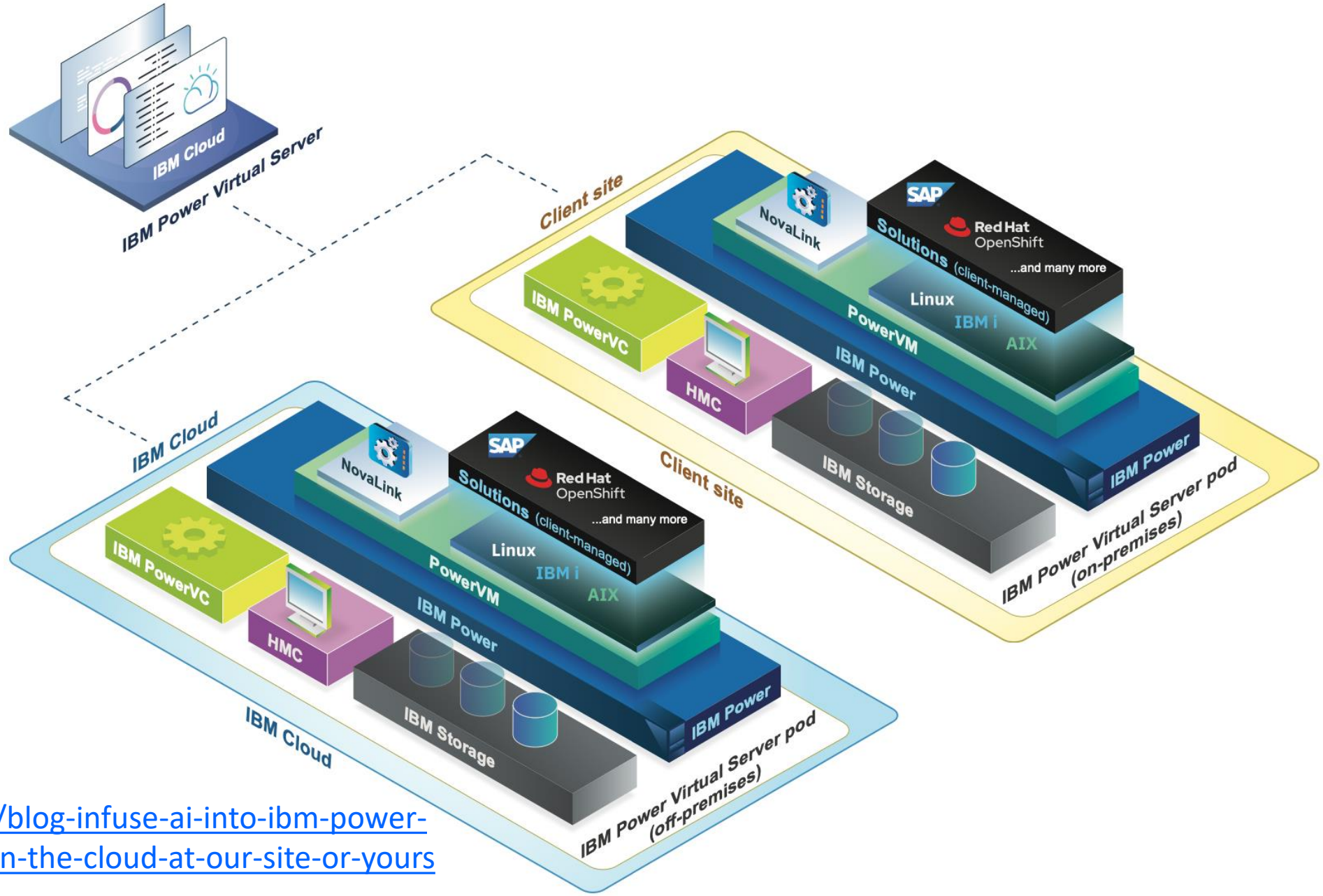
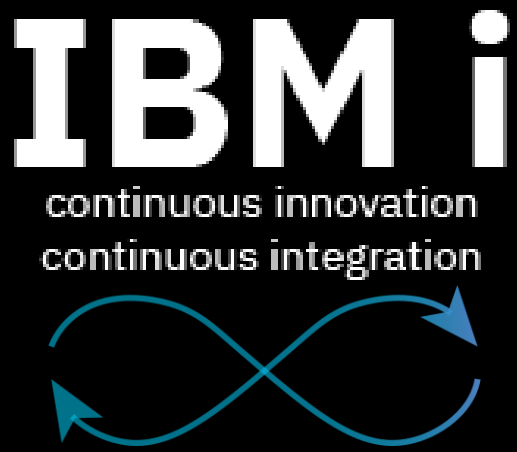
# IBM Power mission critical workloads on **the cloud at our site or yours**




https://newsroom.ibm.com/blog-infuse-ai-into-ibm-power-mission-critical-workloads-on-the-cloud-at-our-site-or-yours

# Introducing…
# IBM i Migrate While Active

https://www.ibm.com/docs/en/i/7.5?topic=availability-i-migrate-while-active

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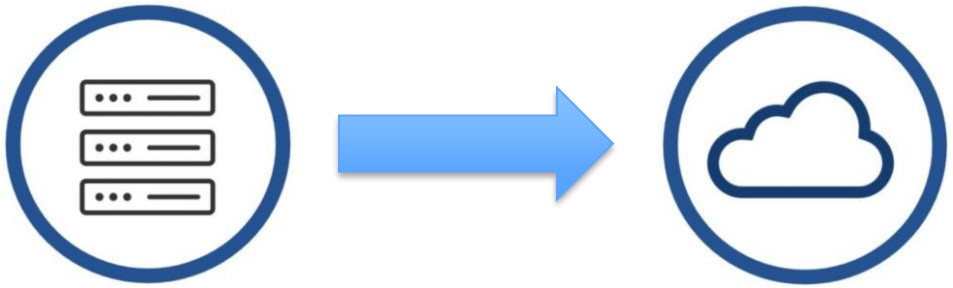
# IBM i Migrate While Active

IBM i
continuous innovation
continuous integration

Easily migrate from on premise to Power Virtual Server

- IBM i standardized tooling to **migrate while active** with minimal impact to production
- Production downtime reduced from days to minutes/hours
  - Dependent on total data size, change rate and network bandwidth
- Automation to reduce the time it takes to seed the base copy
  - Eliminates multiple tools and manual processes for multi-step SAVE/RESTORE
- Production on premise remains available while changes are synchronized in real-time to the target system
  - Eliminates third party replication tools or multiple point in time SAVE/RESTORE iterations



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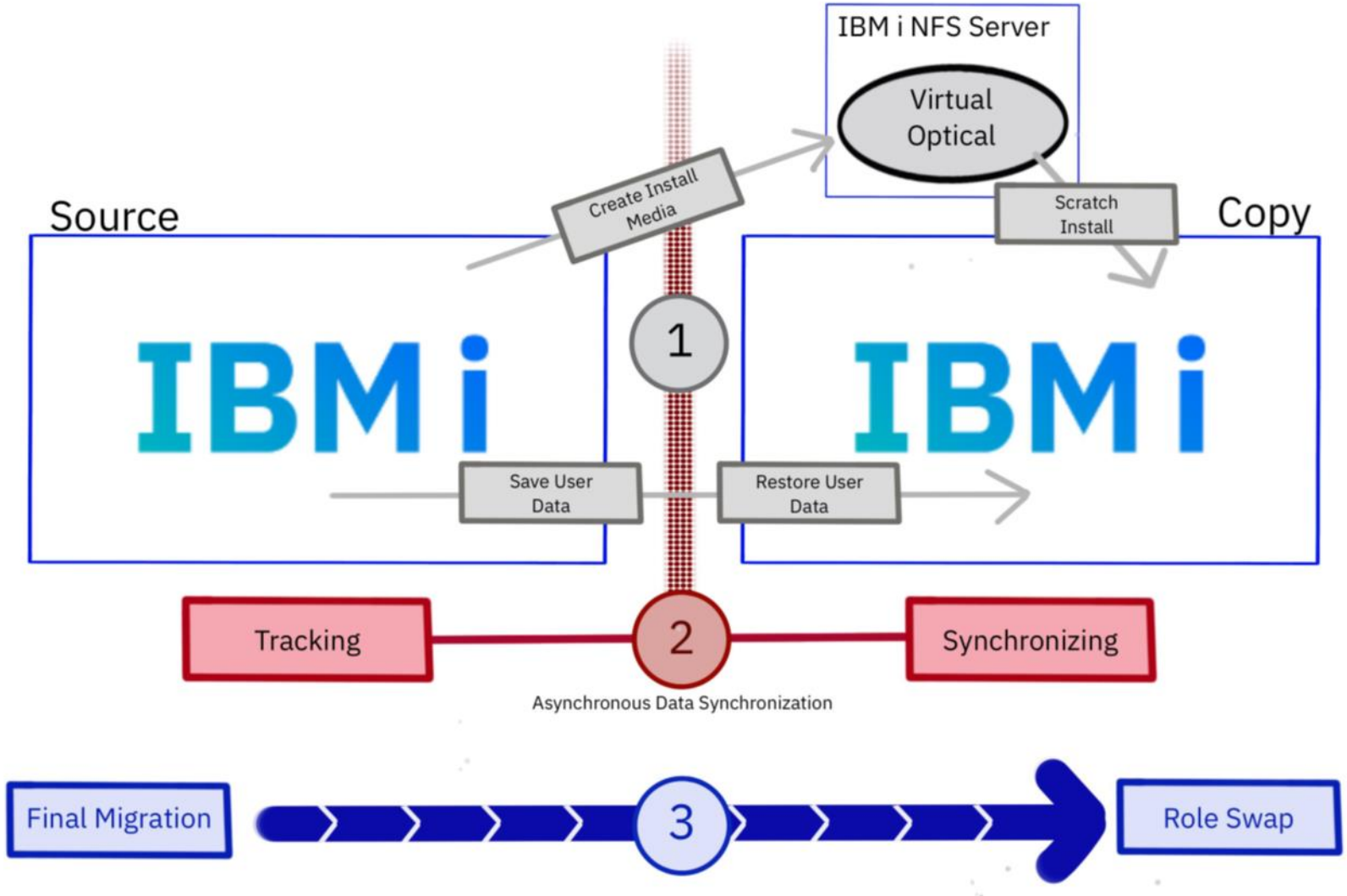
# IBM i Migrate While Active introduction

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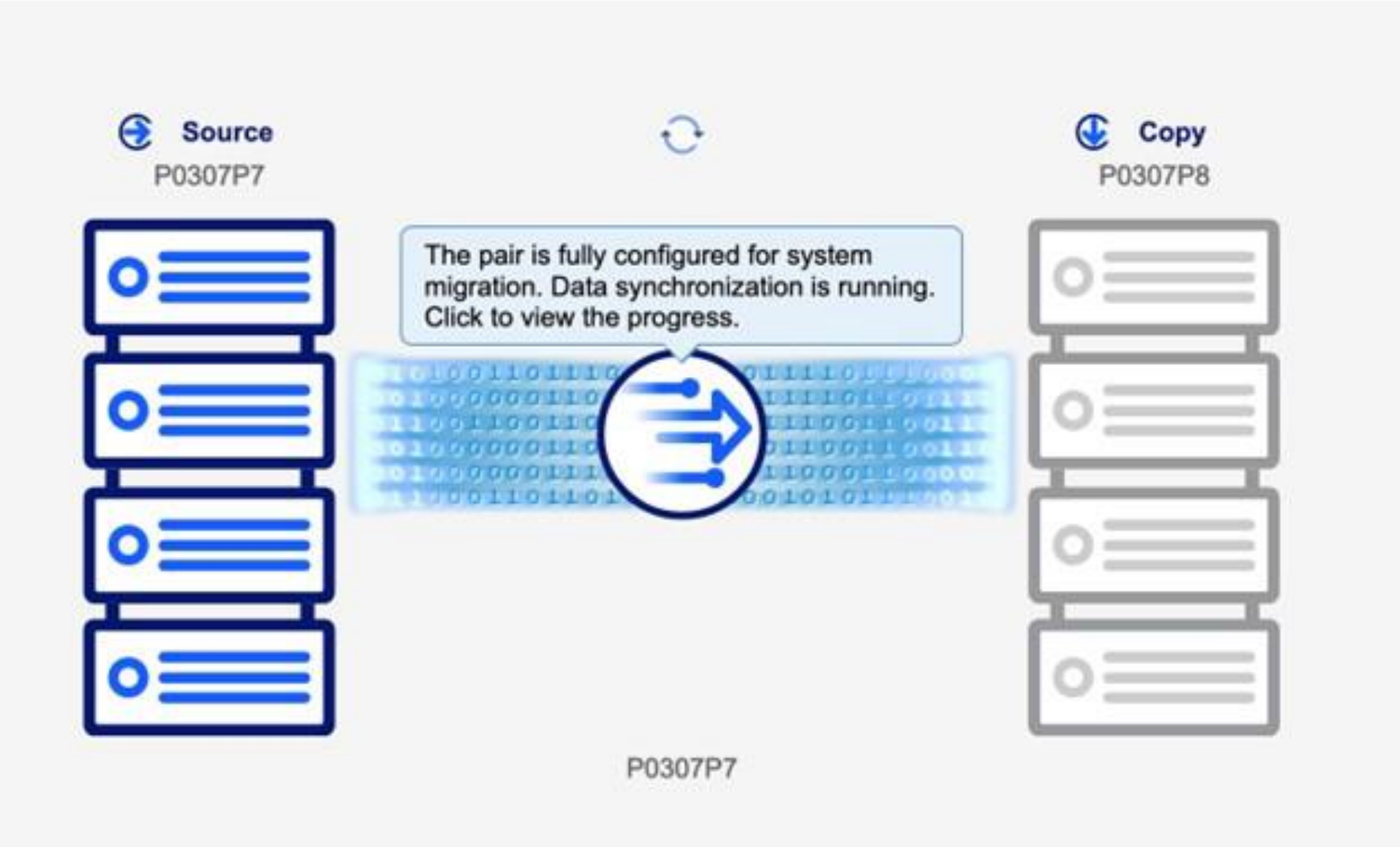
# IBM i Migrate While Active GUI (Db2 Mirror GUI)

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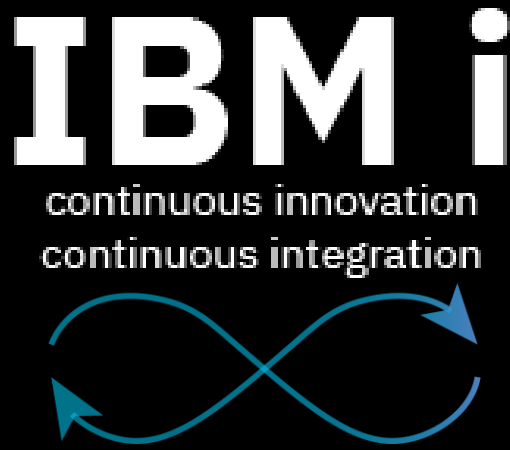
# IBM i 7.5 TR5
# &
# IBM i 7.5 TR11

https://www.ibm.com/support/pages/ibm-i-75-tr5-enhancements

https://www.ibm.com/support/pages/ibm-i-74-tr11-enhancements

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# IBM i 7.5 TR5, IBM i 7.4 TR11 – Announce 8/10/2024

IBM i
continuous innovation
continuous integration

## IBM i Operating System
- Integrated Web Services Server (IWS)
  - Enhancements to the Remote System Explorer (RSE) API

## Db2 for i
- Db2 for i enhancements
  - Enhanced built-in scalar functions
  - Performance improvements to User Defined Table Functions (UDTFs)
- IBM i Services
  - COMPARE_IFS tool expanded to compare additional IFS object attributes
  - Expanded IBM System Limits Alerting
- SYSTOOLS
  - Additional enhancements to the SEND_EMAIL scalar function
  - Updated SQL interfaces for IFS programmers via IFS_ACCESS

## IBM PowerHA SystemMirror for i
- Expanded integration with IBM Power Virtual Server
  - Global Replication Services
  - LUN-Level Switching capabilities
  - Flashcopy of independent ASPs

## IBM Backup Recovery and Media Services (BRMS)
- Web Interface provides a simplified view of backup & media health information
- Introduced new SQL services to provide detailed information about BRMS
- Updates to the RSTLIBBRM command

## Hardware Features for IBM i
- Support for IBM Power offerings
  - Support for new PCIe Gen5 2-port 200Gbe RoCE Adapters (#EC85, #EC86)
- Virtual Fibre Channel
  - Isolation of performance statistics to the subsystem level

## System Management
- Navigator for i
  - Dashboard and system home page provide clear subscription notifications
  - Monitoring of general IBM i subscription licenses with customizations
  - New ARE template support
  - Monitor jobs now utilize Java 11 or 17
  - Expanded Audit Journal support and Datamart features
  - New Performance Data Investigator (PFI) perspectives
  - Restorable MTU bookmarks
  - Full Advanced Job Scheduler (AJS) integration
- ACS
  - News and expanded enhancements to Run SQL Scripts
  - PROGRAM_NAME schema support for New Function & New Procedure
  - Screen history updates for 5250 display emulator
  - Enhanced password change panel

## Application Modernization & Open Source
- Code for IBM i
  - New Debug service management
  - Updates to Db2 for i Extension
  - New rpglint command-line interface
  - Multiple Source Orbit enhancements

- Rational Development Studio for i– RPG Specific
  - Compile-time two-digit year warning
  - New %HIVAL and %LOCAL built-in functions
  - %PROC built-in function enhancements

- Rational Developer for i
  - IFS performance improvements
  - Expanded delta compare options
  - Generate ILE Docs and @TAG support
  - JVM support enhancements

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Db2 for i
Navigator
ACS
RPG
VsCode
RDi

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# IBM i Technology Refreshes (TR)

IBM i

- Technology Refreshes for IBM i 7.4 and 7.5 available December 13th, 2024
  - IBM i 7.4: Database PTF Group SF99704 Level 29 (TR11)
  - IBM i 7.5: Database PTF Group SF99950 Level 8 (TR5)

- Contains a variety of database enhancements:

9 – IBM i Ideas delivered by Db2 for i

TR4/TR11 Landing Pages:

- IBM i 7.4 TR10: https://www.ibm.com/support/pages/ibm-i-74-tr11-enhancements
- IBM i 7.5 TR4: https://www.ibm.com/support/pages/ibm-i-75-tr5-enhancements

# SQL Built-in Functions

IBM i

- December 2024 - GENERATE_UUID & GENERATE_UUID_BINARY

- June 2024 – ANY_VALUE
- November 2023 – ENCRYPT_AES256, HTML_ENTITY_DECODE, and HTML_ENTITY_ENCODE
- May 2023 – QSYS2-based HTTP functions ADD_DAYS, ADD_HOURS, ADD_MINUTES, ADD_SECONDS, & ADD_YEARS
- November 2022 – FIRST_DAY, JSON_UPDATE, & TIMESTAMPDIFF_BIG
- May 2022 – TRY_CAST

# GENERATE_UUID

IBMi

- GENERATE_UUID built-in scalar function returns a CHAR(36), version 4 Universally Unique Identifier (UUID)
- GENERATE_UUID_BINARY returns a BINARY(16) encoded UUID

CAAC_Value-03-Medium

CEAC_Value-03-Medium

```
values GENERATE_UUID();
```

```
30718D3B-B3CD-4555-9AA3-36E9B1AD26E7
```

```
values GENERATE_UUID_BINARY();
```

```
34930452021453FA57E5F95E04A0655
```

# Audit Journal Data Mart

IBM i

- In June 2024 the support for Audit Journal Data Marts was added
- In December 2024, the data marts can be as granular as needed via new filtering capability!

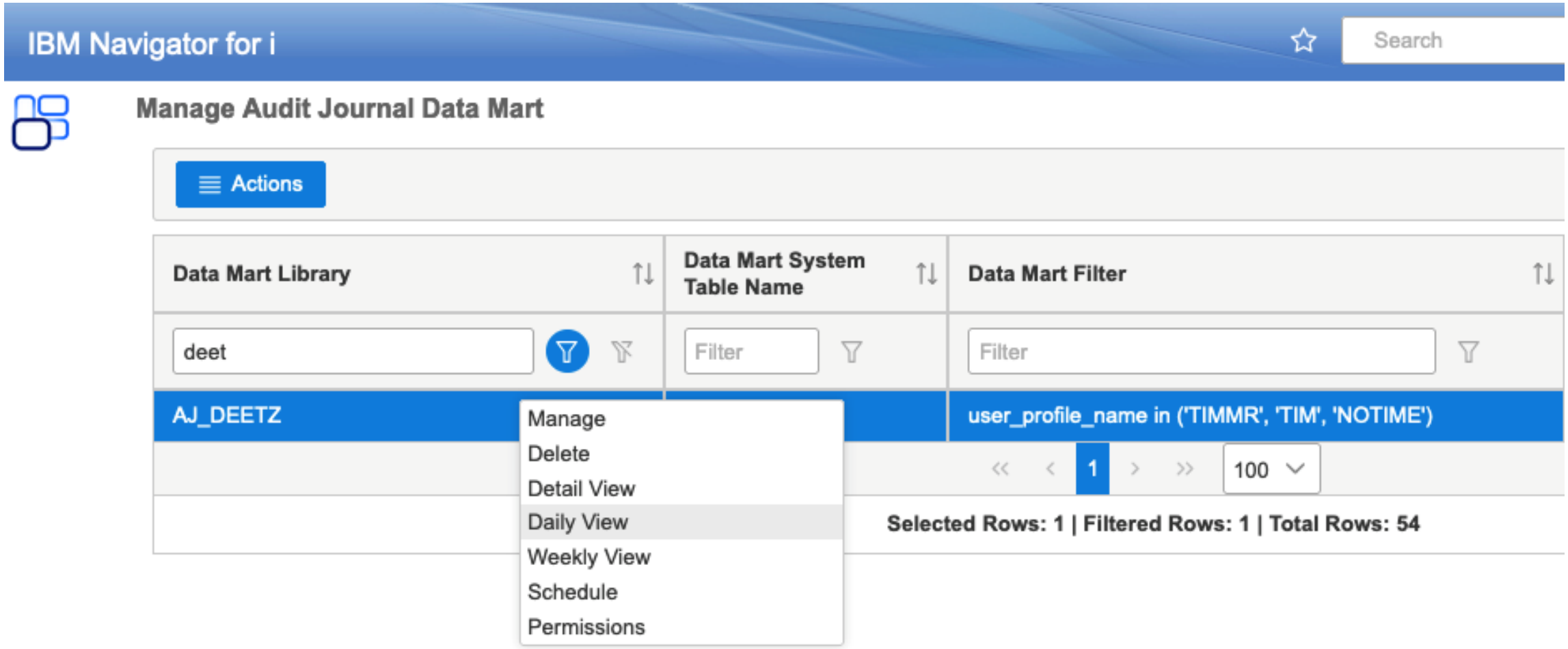
```
cl: crtlib aj_deetz;

--
-- Only capture authority failures for Tim's pseudonyms
--
CALL QSYS2.MANAGE_AUDIT_JOURNAL_DATA_MART(
  JOURNAL_ENTRY_TYPE => 'AF',
  DATA_MART_LIBRARY  => 'AJ_DEETZ',
  DATA_MART_FILTER   => ' user_profile_name in (''TIMMR'', ''TIM'', ''NOTIME'') ');
```

# Audit Journal Data Mart

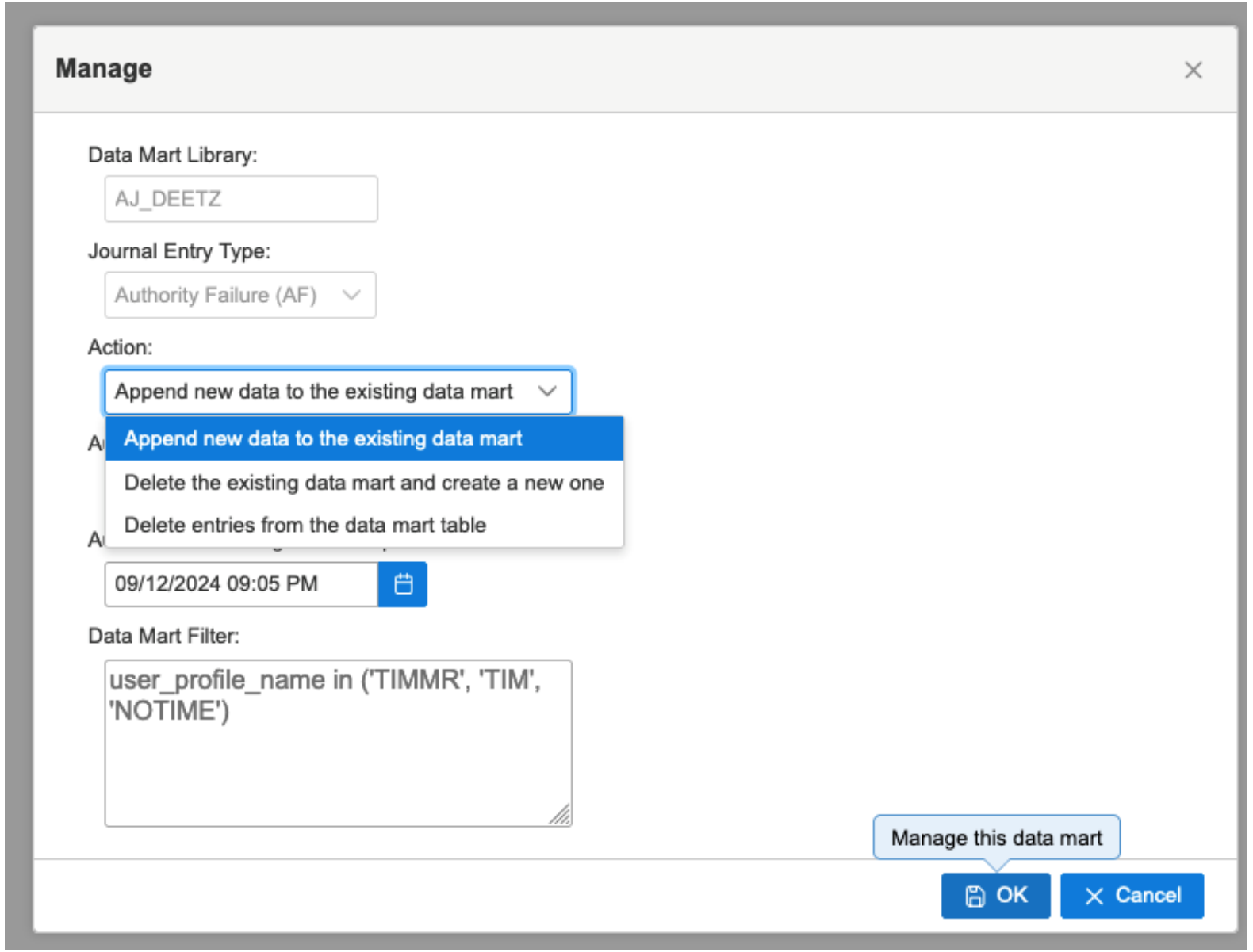
IBM i

- Administer the data mart from Navigator

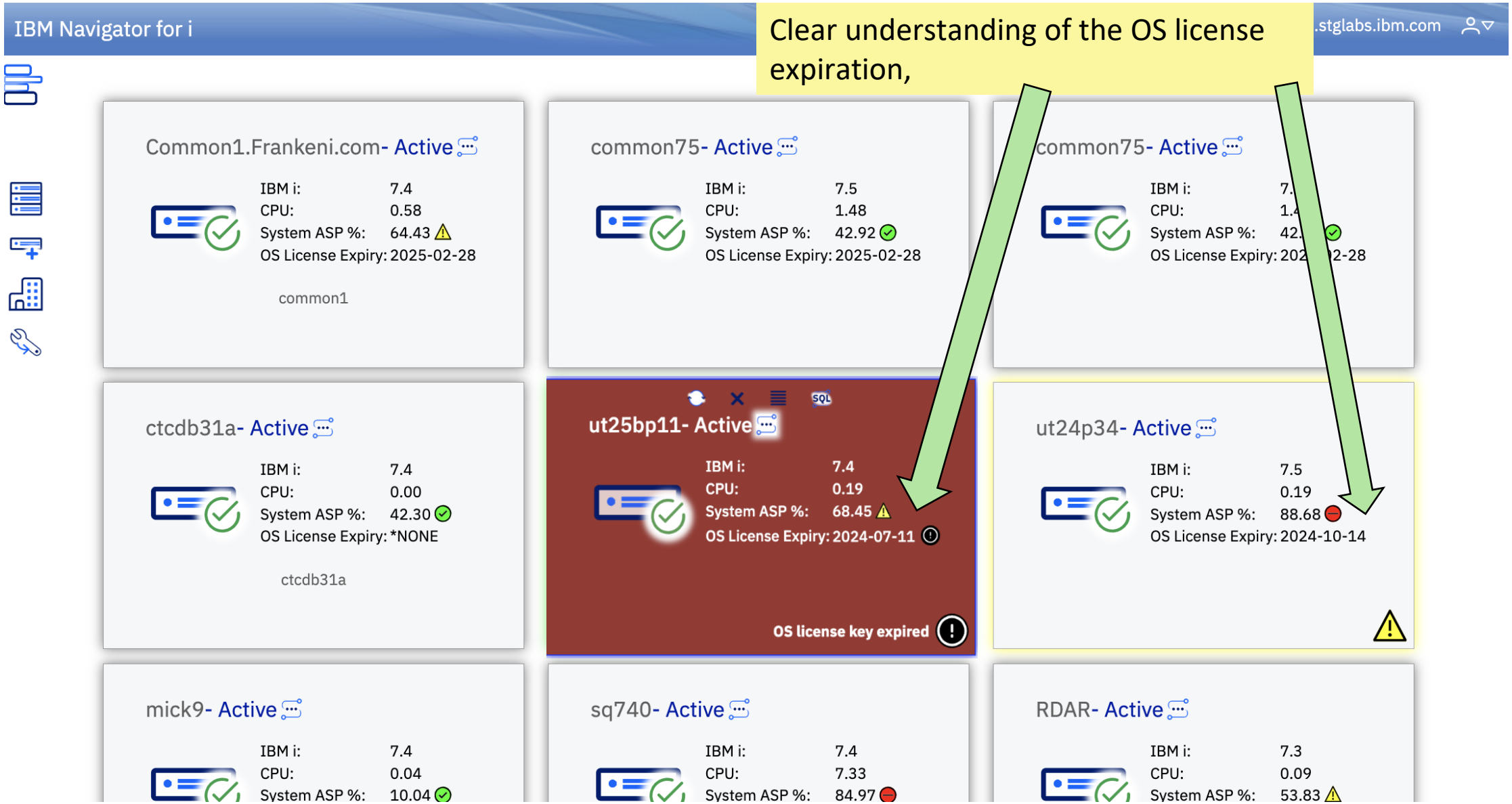


# Audit Journal Data Mart

IBM i



# Licensing Understanding



# SYSTOOLS enhancements

IBM i

New or enhanced:

- SEND_EMAIL
- IFS_ACCESS

Application Development

- ADD_VALIDATION_LIST_ENTRY
- CHANGE_VALIDATION_LIST_ENTRY
- REMOVE_VALIDATION_LIST_ENTRY
- AUDIT_JOURNAL_VP

Security

- FIRMWARE_CURRENCY
- POWER_SCHEDULE_INFO
- CONFIGURATION_STATUS

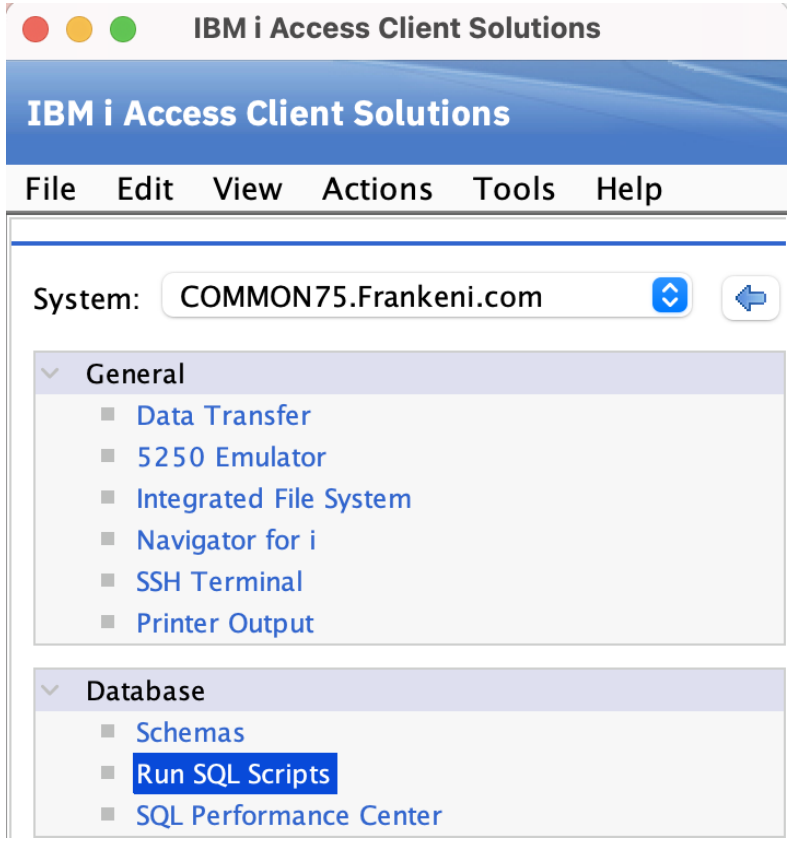
Systems Management

# IBM i Access Client Solutions

IBM i

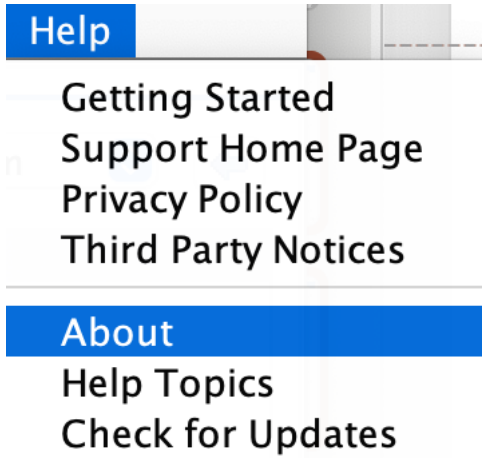
- The best IFS navigator
- The best Spooled file tool
- The best 5250 emulator
- The best Db2 for i tools
- The best IDE for SQL

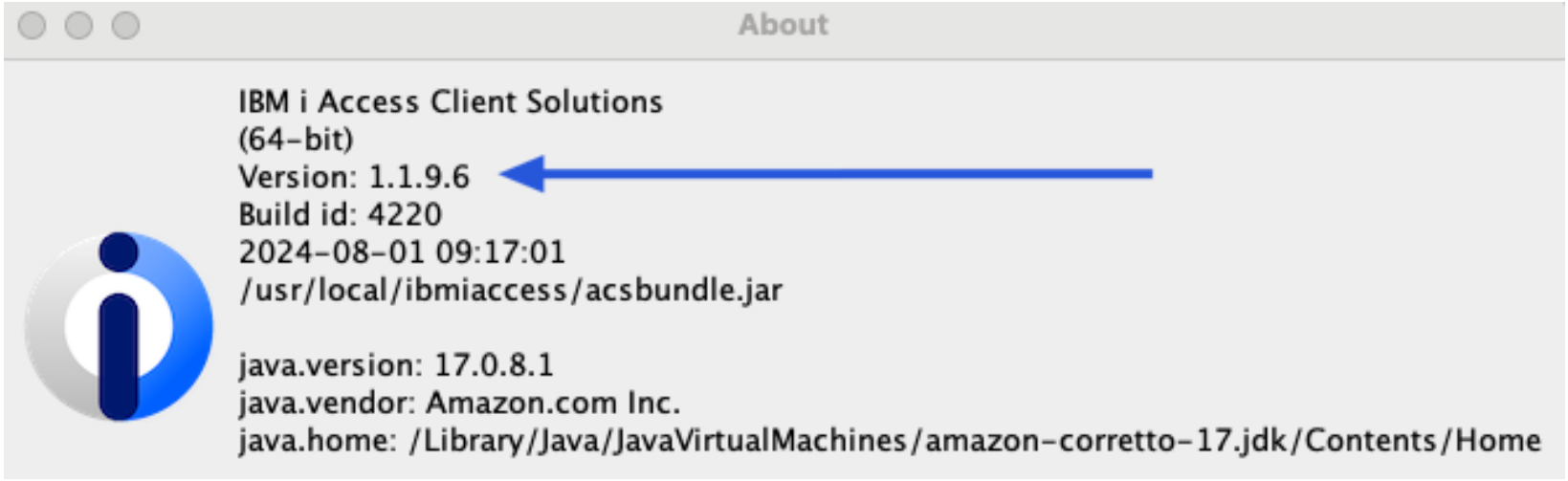
Best of breed tools for all IBM i users




**IBM i Access Client Solutions (1.1.9.6) download:**
https://ibm.biz/IBMi_ACS

# ACS – 1.1.9.6



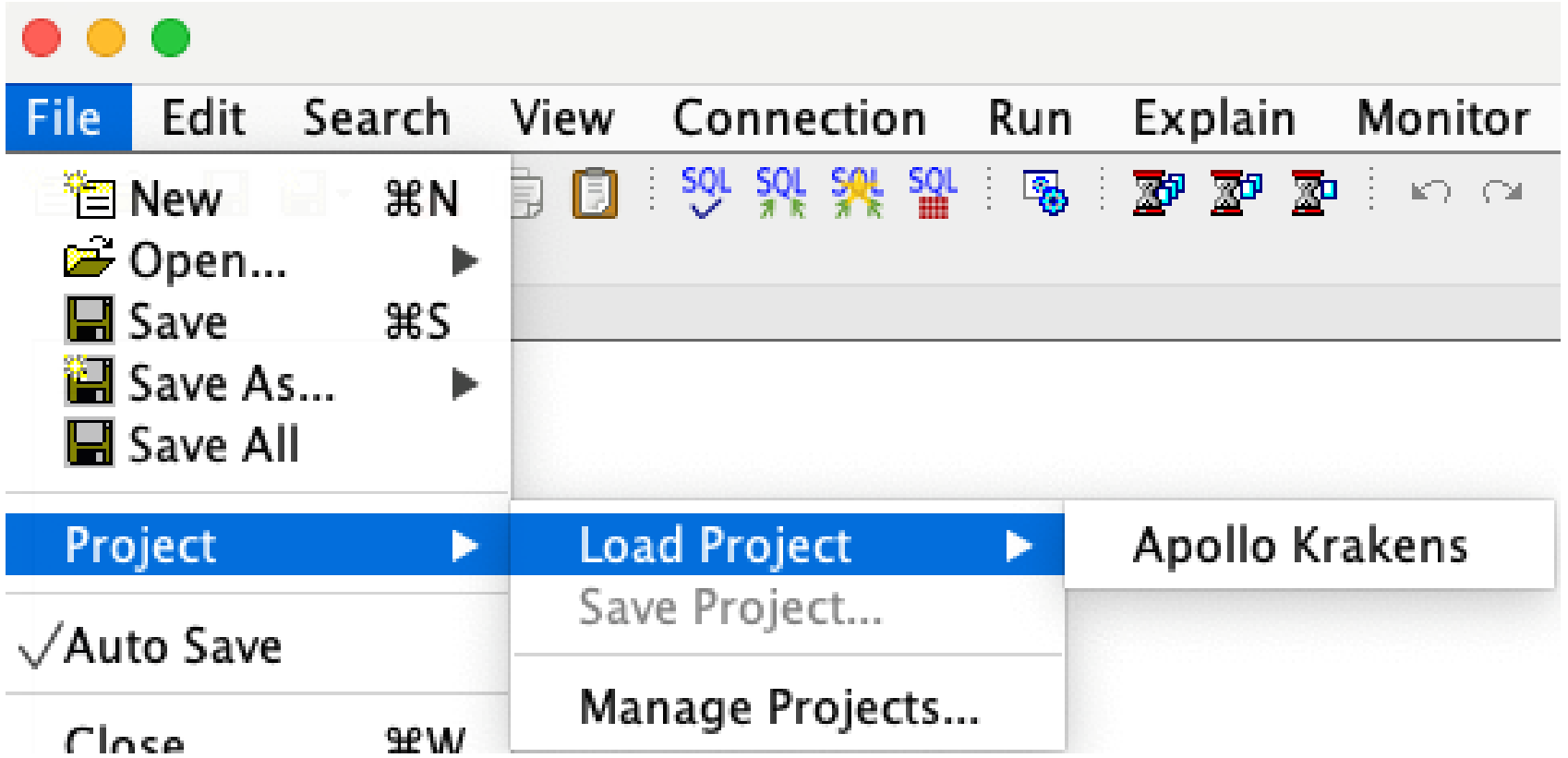




Summary of content (and previous updates):
https://www.ibm.com/support/pages/ibm-i-access-acs-updates

# ACS – Projects

IBM i

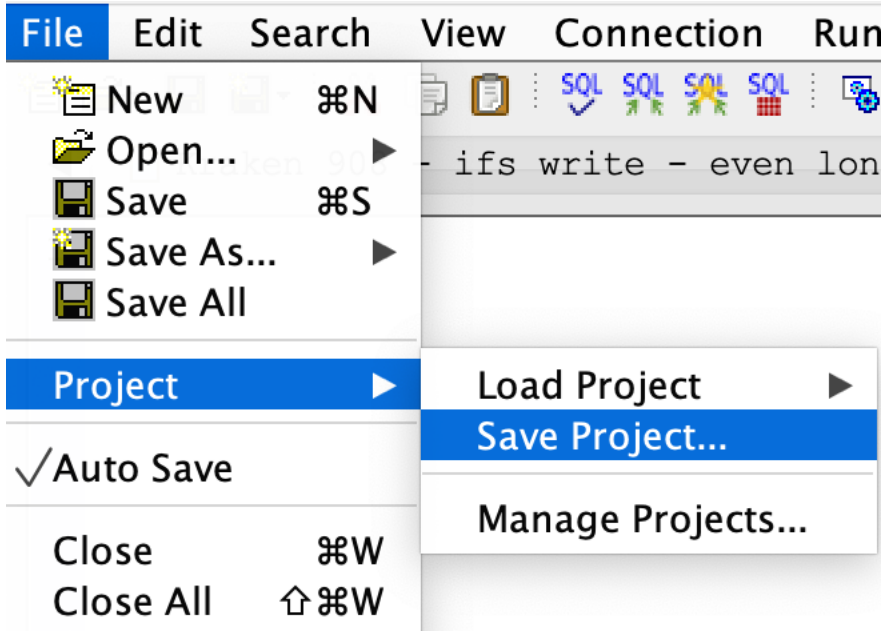
A project is a collection of Run SQL Scripts



# ACS – Projects

IBM i

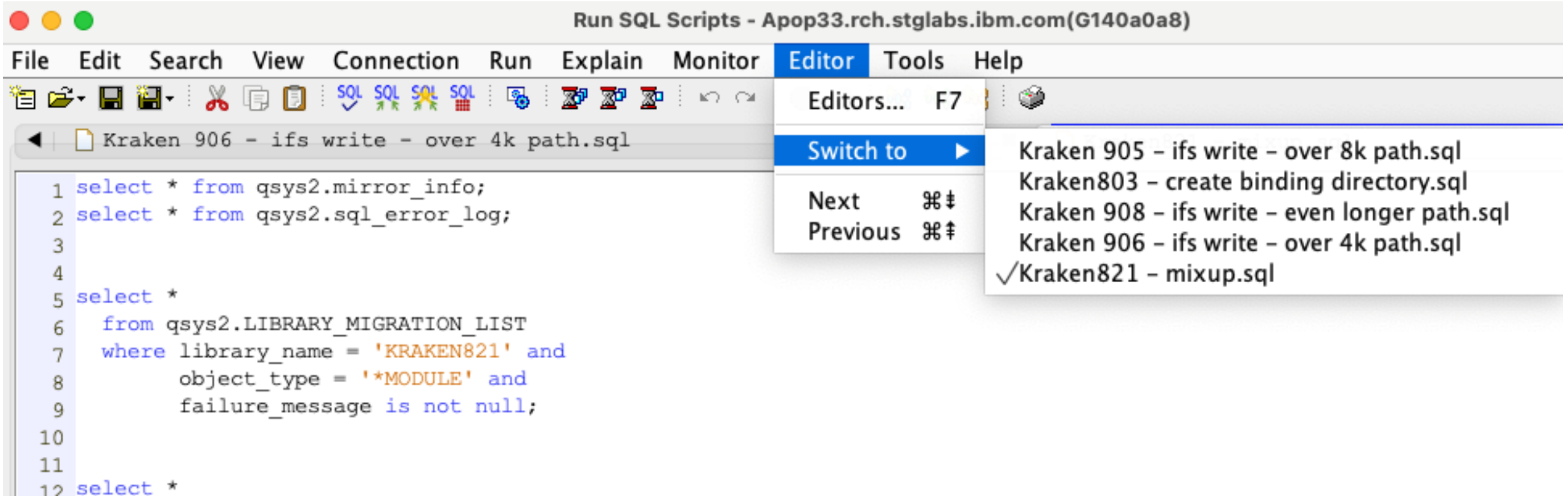
Projects can include files in the IFS, Source Physical files, or scripts on your laptop



# ACS – Projects

IBM i

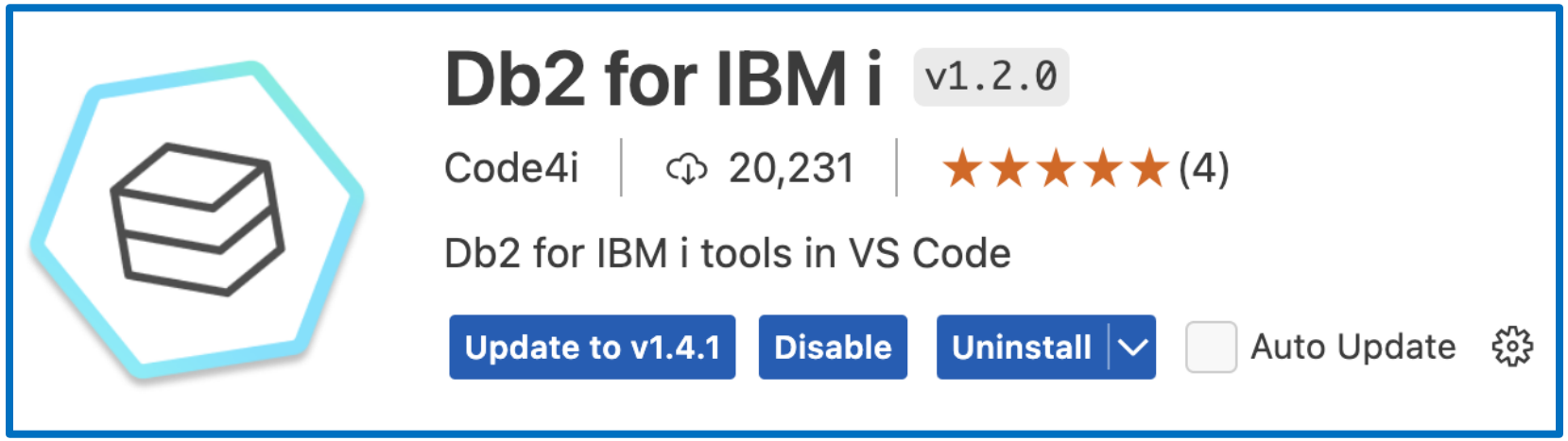
Use Editor→Switch to – for easy tab navigation



# VS Code for i – Database Extension

IBM i

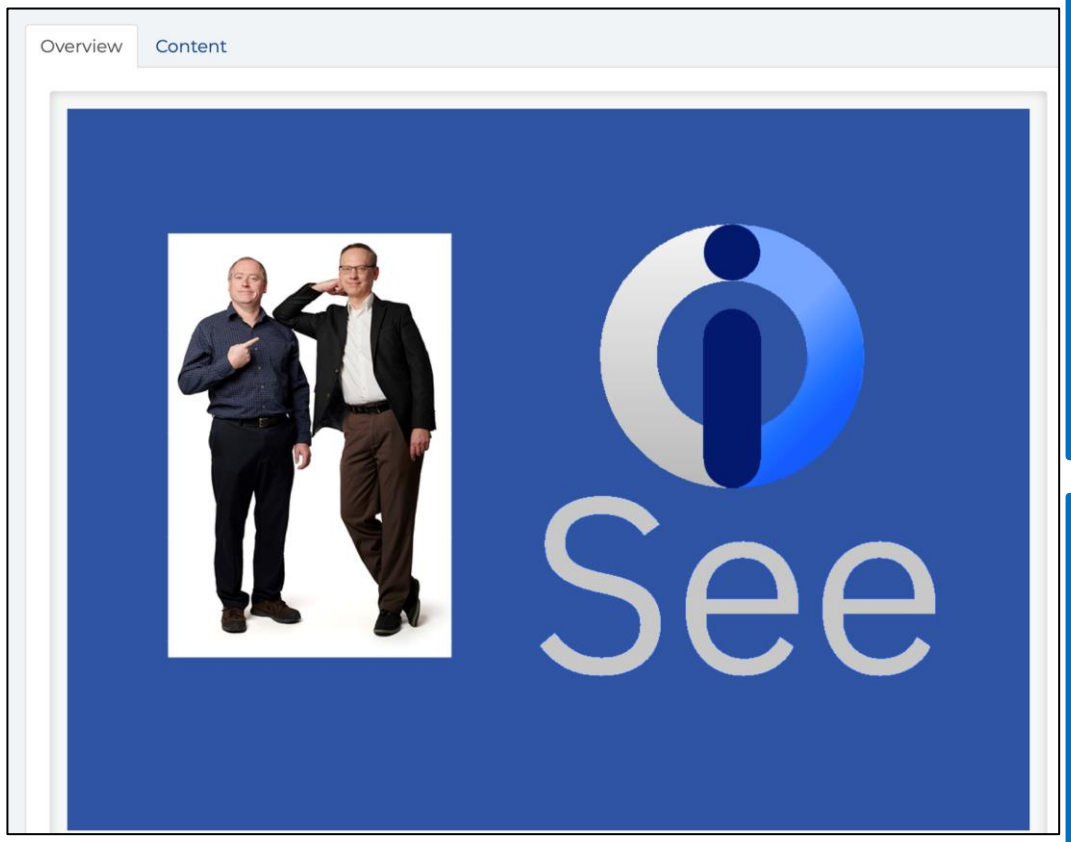
Which version are you using?



# How to get started with VS Code for i

IBM i

## iSee how to do this!




### iSee Using VsCode with Code for i

*Contains 1 Component(s)*

OVERVIEW SPEAKER(S)

Developing code on IBM i is key for many companies, Either business applications or even programs for helping with managing the system. The interface for developing those programs needs to be considered. I know too many that are still using the green screen SEU line editor as their primary interface. Its time to move on... forward...step out of 1984 (yea.. I know the hair styles were something back then...) and into 2024. VsCode is an amazing interface for building and creating programs for IBM i. Complete with the amazing Code for i plugins, everything you need for developing programs on IBM i is there. Learn how to install, and some basic how to use steps in this iSee.

MORE INFORMATION

### iSee VsCode Db2 for i Style

*Contains 1 Component(s)*

OVERVIEW SPEAKER(S)

In the previous iSee we learned the basics on how to use and install VsCode for your IBM i development needs. In this session we will venture down a path near and deer ( wonderful creature that likes to run out in front of your cars) to Scott, creating SQL for IBM i. This includes accessing databases, as well as getting the most out of your IBM i Services leveraging SQL. We will show you the power of this Db2 support that the Code for i team has been working on. Buckle up!

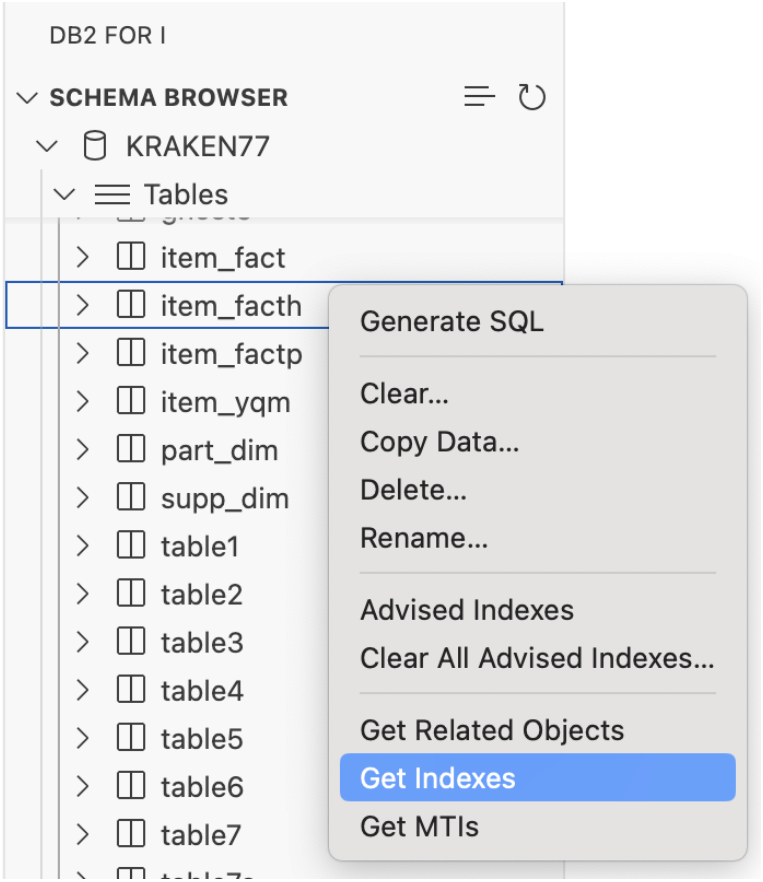
MORE INFORMATION

https://learn.common.org/products/ibm-isee#tab-product_tab_overview

# VS Code for i – Database Extension

IBM i

## Recent enhancement: **MTI Insight (existing indexes)**



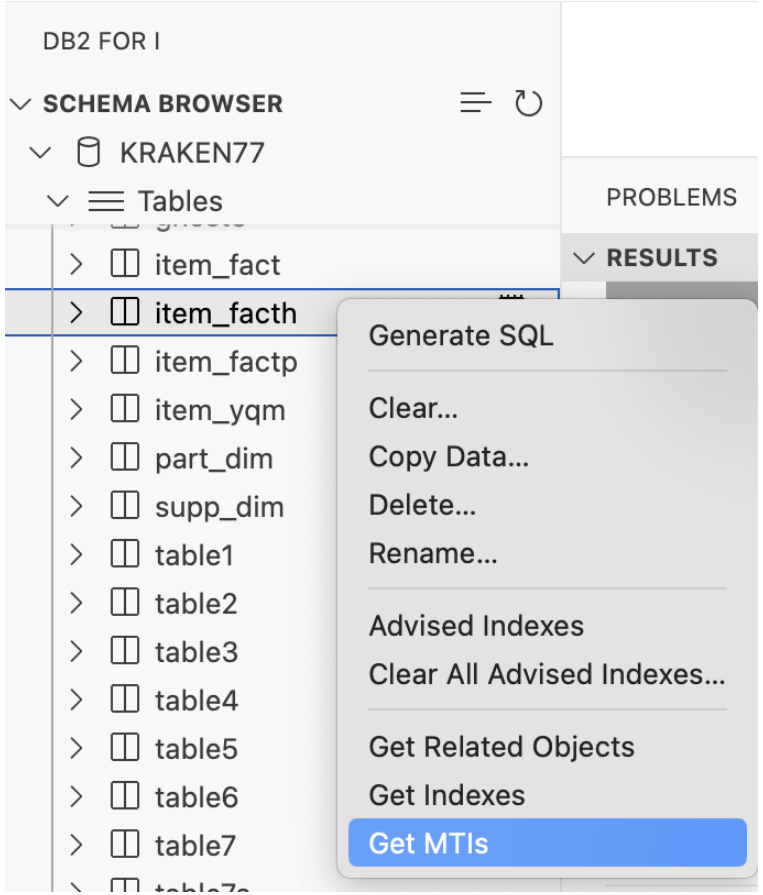

RESULTS

| Index Name | Type | Key Columns | Size | Valid | Owner | Date Created | Last Build |
|---|---|---|---|---|---|---|---|
| "MTI(106) (916993)" | Temporary Index | CUSTKEY DESC | 2,399,304,200 | Yes | SQL QUERY ENGINE | 08/19/2024 12:09:05 PM | 08/19/2024 12:14:59 PM |
| "MTI(129) (916993)" | Temporary Index | CUSTKEY DESC | 2,298,640,904 | Yes | SQL QUERY ENGINE | 08/19/2024 12:09:05 PM | 08/19/2024 12:16:43 PM |
| "MTI(37) (916993)" | Temporary Index | CUSTKEY DESC | 2,332,195,336 | Yes | SQL QUERY ENGINE | 08/19/2024 12:09:05 PM | 08/19/2024 12:09:05 PM |
| "MTI(60) (916993)" | Temporary Index | CUSTKEY DESC | 2,365,749,768 | Yes | SQL QUERY ENGINE | 08/19/2024 12:09:05 PM | 08/19/2024 12:11:05 PM |
| "MTI(83) (916993)" | Temporary Index | CUSTKEY DESC | 2,416,081,416 | Yes | SQL QUERY ENGINE | 08/19/2024 12:09:05 PM | 08/19/2024 12:13:08 PM |
| GS_EVI01H | Index | YEAR, QUARTER, MONTH | 603,209,728 | Yes | QDFTOWN | 04/20/2011 10:46:12 AM | 01/19/2023 07:58:14 PM |
| Loaded 6. End of data. | | 125506/QUSER/QZDASOINIT | | | | | |

# VS Code for i – Database Extension

IBM i

## Recent enhancement: **MTI Insight (Table – MTIs)**



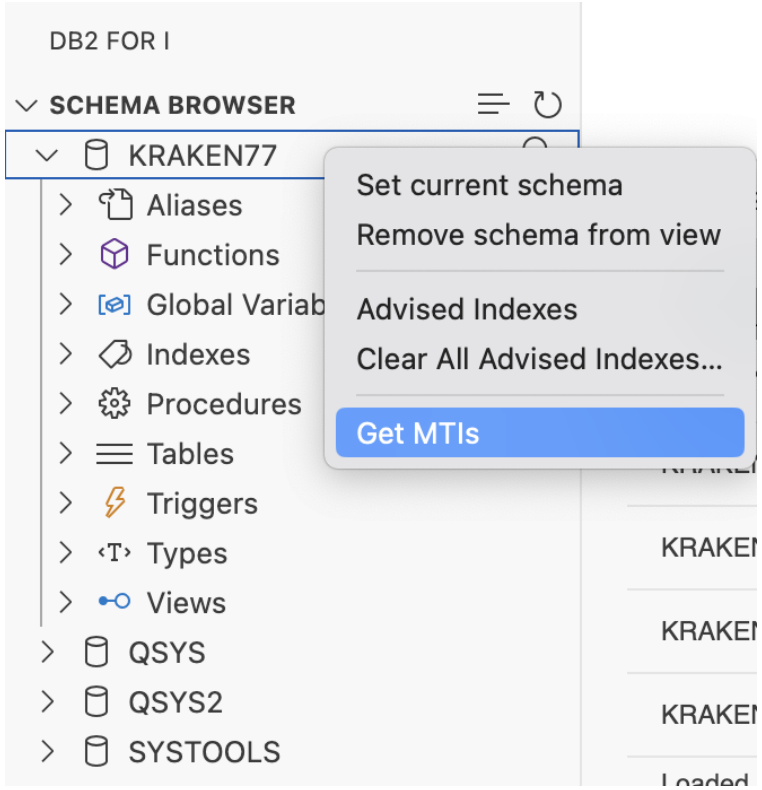

**RESULTS**

| TABLE_SCHEMA | TABLE_NAME | REFERENCE_COUNT | KEYS | KEY_DEFINITION | STATE | MTI_SIZE |
|---|---|---|---|---|---|---|
| KRAKEN77 | ITEM_FACTH | 3 | 1 | CUSTKEY DESC | VALID | 2298640904 |
| KRAKEN77 | ITEM_FACTH | 3 | 1 | CUSTKEY DESC | VALID | 2399304200 |
| KRAKEN77 | ITEM_FACTH | 3 | 1 | CUSTKEY DESC | VALID | 2416081416 |
| KRAKEN77 | ITEM_FACTH | 3 | 1 | CUSTKEY DESC | VALID | 2365749768 |
| KRAKEN77 | ITEM_FACTH | 3 | 1 | CUSTKEY DESC | VALID | 2332195336 |

# VS Code for i – Database Extension

IBM i

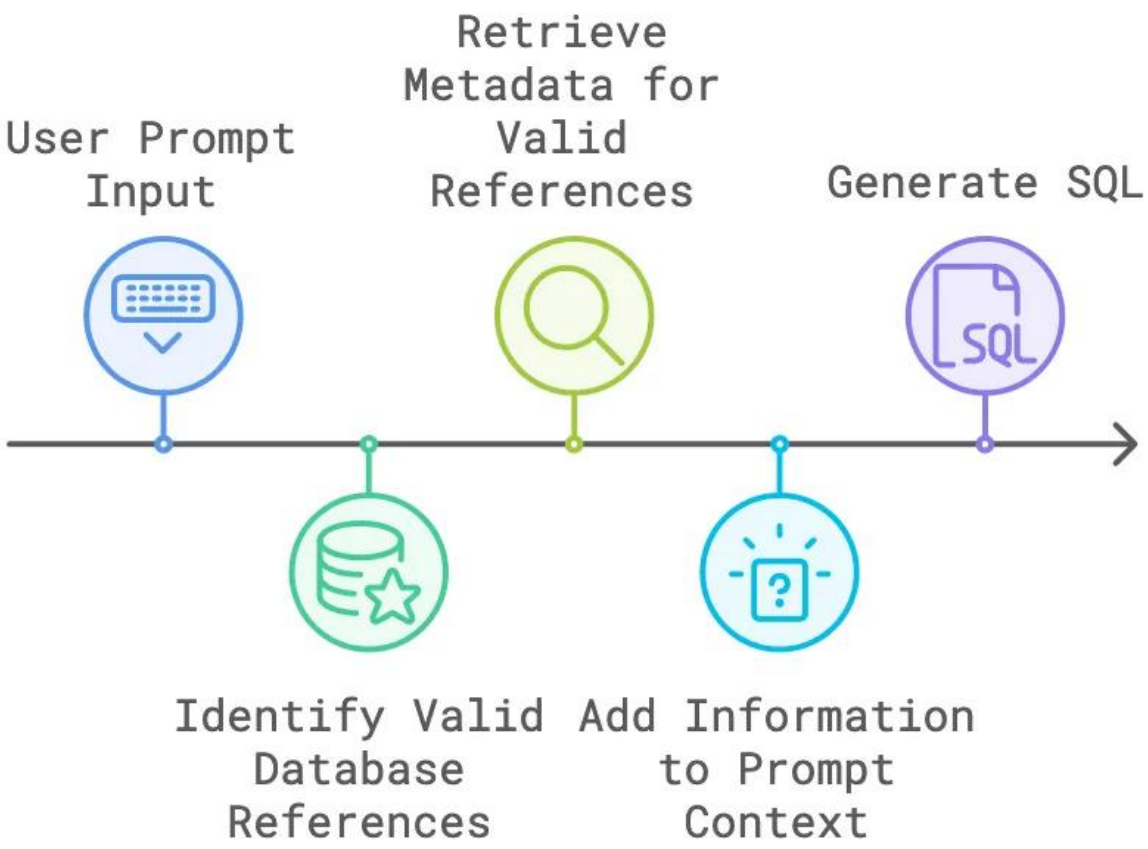
## Recent enhancement: **MTI Insight (Schema – MTIs)**




**RESULTS**

| TABLE_SCHEMA | TABLE_NAME | REFERENCE_COUNT | KEYS | KEY_DEFINITION | STATE | MTI_SIZE |
|---|---|---|---|---|---|---|
| KRAKEN77 | ITEM_FACTH | 3 | 1 | CUSTKEY DESC | VALID | 2298640904 |
| KRAKEN77 | ITEM_FACTH | 3 | 1 | CUSTKEY DESC | VALID | 2399304200 |
| KRAKEN77 | ITEM_FACTH | 3 | 1 | CUSTKEY DESC | VALID | 2416081416 |
| KRAKEN77 | ITEM_FACTH | 3 | 1 | CUSTKEY DESC | VALID | 2365749768 |
| KRAKEN77 | ITEM_FACTH | 3 | 1 | CUSTKEY DESC | VALID | 2332195336 |

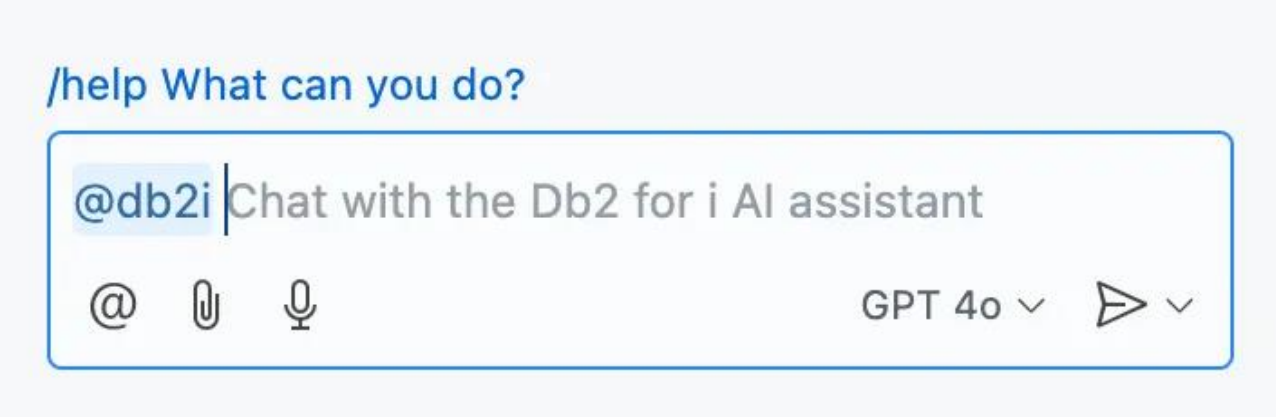
# Db2 for i SQL code assistant



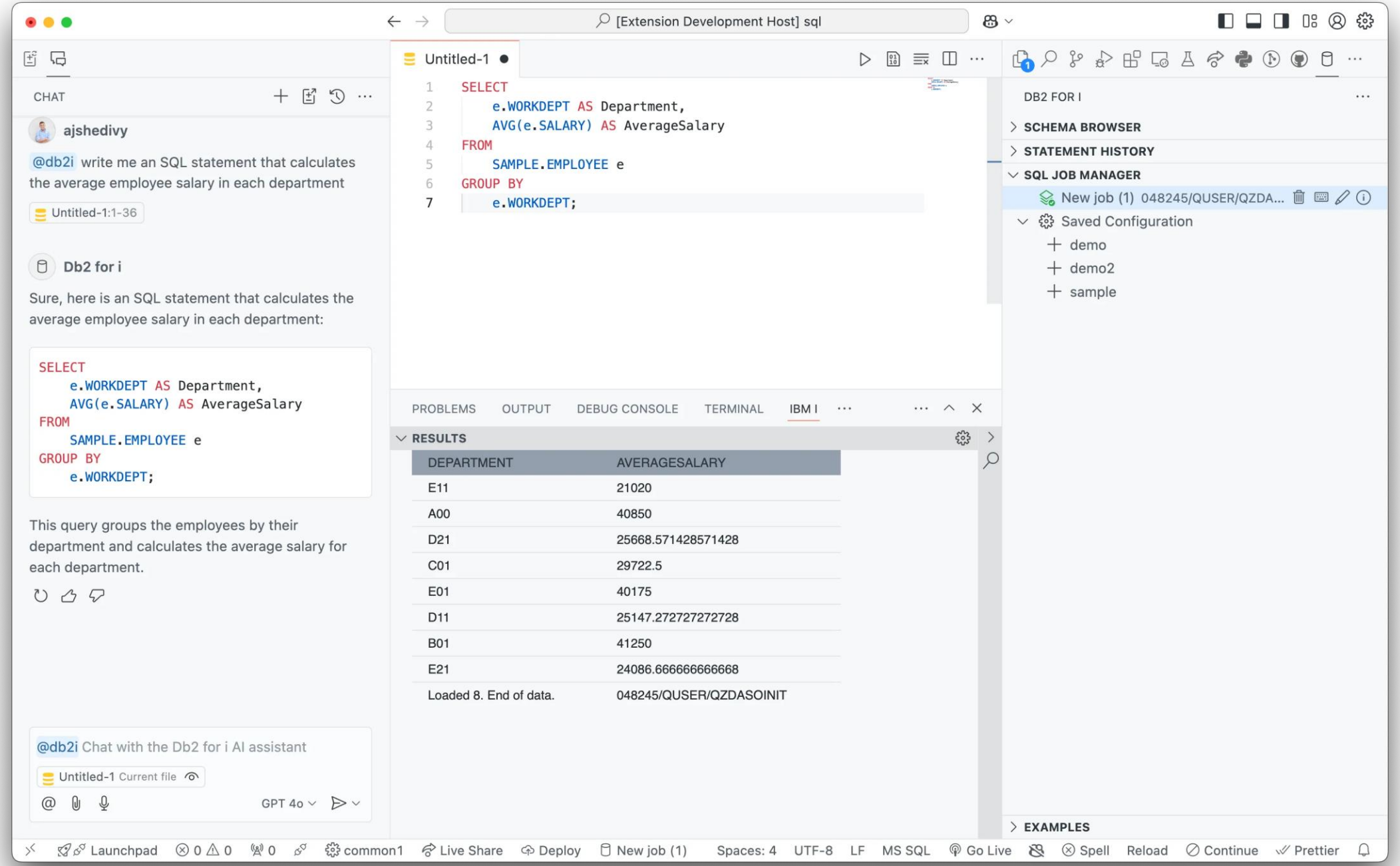

The **Db2 for i** SQL code assistant provides integrations **with AI code assistants** such as **GitHub Copilot Chat** and **Continue**. These integrations allow you to ask questions about your Db2 for IBM i database and get help with writing SQL queries. The best part is that you can do this **directly from your VS Code editor**.

Common Use cases of the SQL code assistant include:

- 📝 SQL query generation
- 💡 SQL query explanation
- 🛠️ SELF Error analysis
- 🚀 SQL query optimization



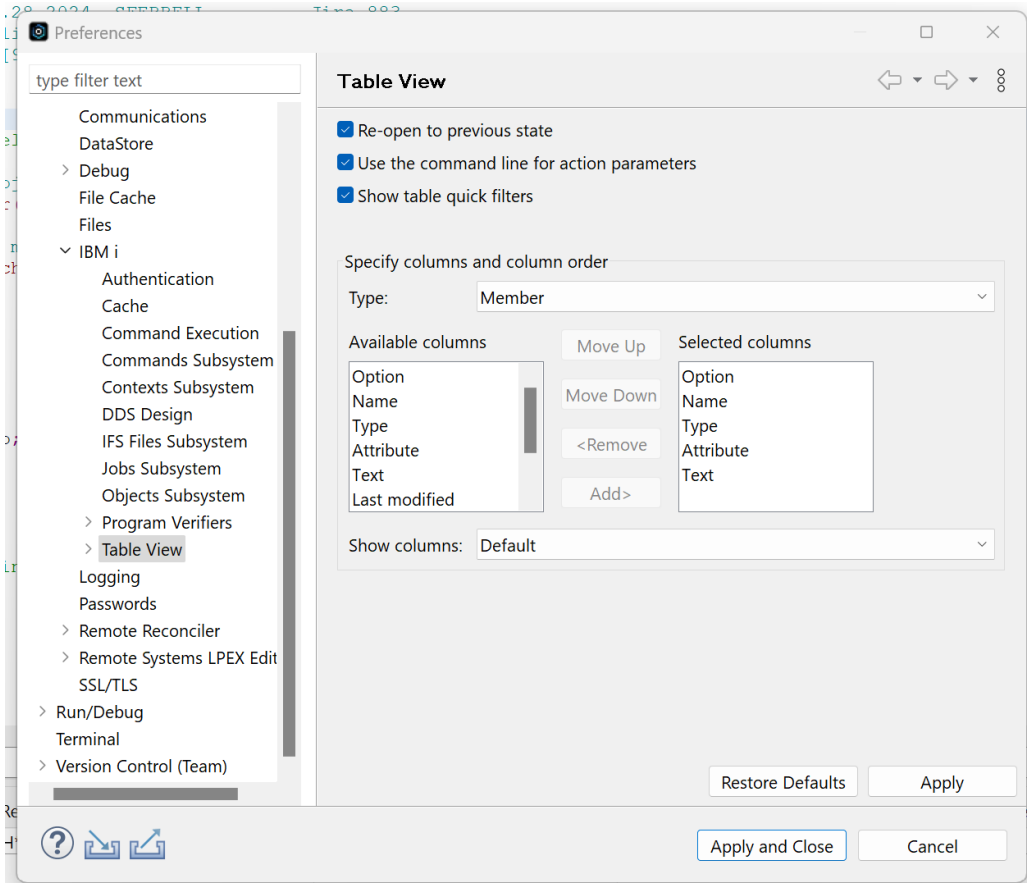

https://codefori.github.io/docs/extensions/db2i/ai/code-assistant/

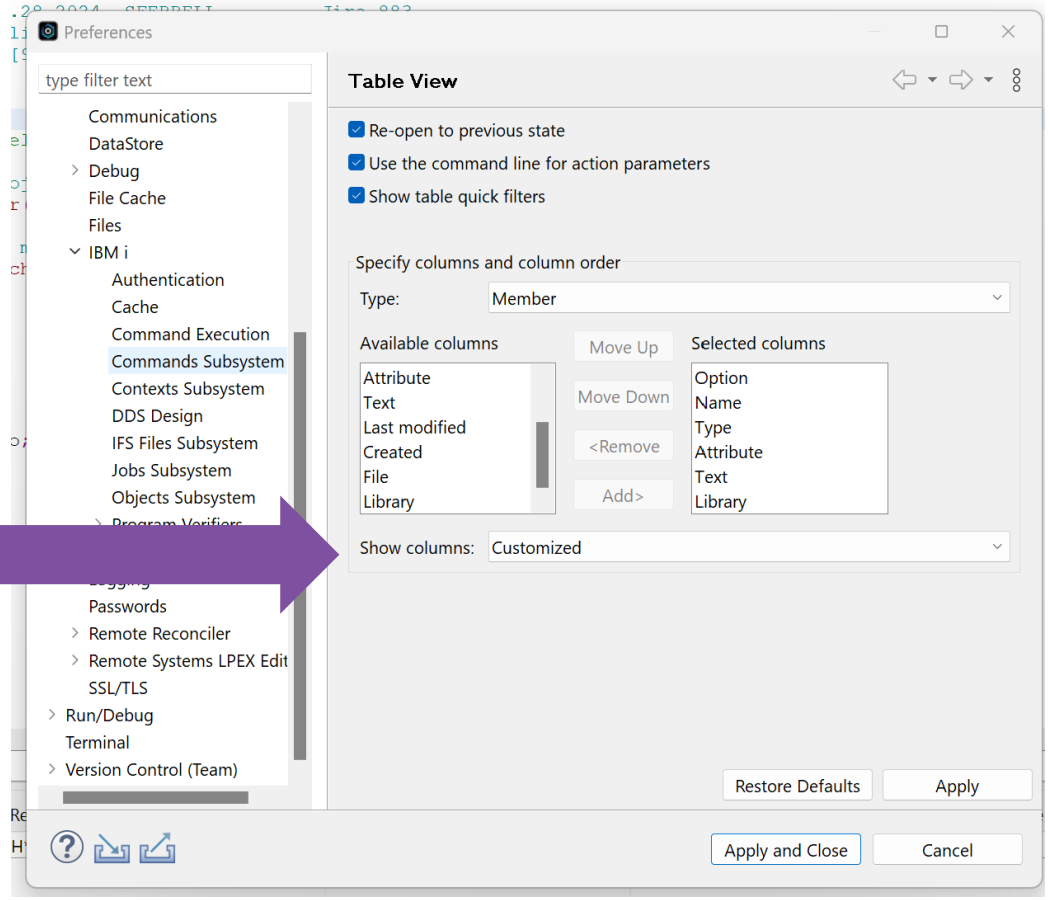

[Extension Development Host] sql
CHAT
ajshedivy
@db2i write me an SQL statement that calculates the average employee salary in each department
Untitled-1:1-36
Db2 for i
Sure, here is an SQL statement that calculates the average employee salary in each department:
SELECT
e.WORKDEPT AS Department,
AVG(e.SALARY) AS AverageSalary
FROM
SAMPLE.EMPLOYEE e
GROUP BY
e.WORKDEPT;
This query groups the employees by their department and calculates the average salary for each department.
@db2i Chat with the Db2 for i AI assistant
Untitled-1 Current file
GPT 4o
Untitled-1
SELECT
e.WORKDEPT AS Department,
AVG(e.SALARY) AS AverageSalary
FROM
SAMPLE.EMPLOYEE e
GROUP BY
e.WORKDEPT;
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
IBM I
RESULTS
DEPARTMENT AVERAGESALARY
E11 21020
A00 40850
D21 25668.571428571428
C01 29722.5
E01 40175
D11 25147.272727272728
B01 41250
E21 24086.666666666668
Loaded 8. End of data. 048245/QUSER/QZDASOINIT
DB2 FOR I
SCHEMA BROWSER
STATEMENT HISTORY
SQL JOB MANAGER
New job (1) 048245/QUSER/QZDA...
Saved Configuration
demo
demo2
sample
EXAMPLES
Launchpad
0 0
0
common1
Live Share
Deploy
New job (1)
Spaces: 4
UTF-8
LF
MS SQL
Go Live
Spell
Reload
Continue
Prettier

- A new option has been added to provide compile-time error or warning if the source uses a date with a 2-digit year.
- New built-in functions
  - %HIVAL - Returns the highest possible value of the field named in the parameter
  - %LOVAL - Returns the lowest possible value of the field named in the parameter
- The %PROC built-in function is now allowed in the ON-EXIT section of a procedure

The latest details can be found at the RPG Cafe.

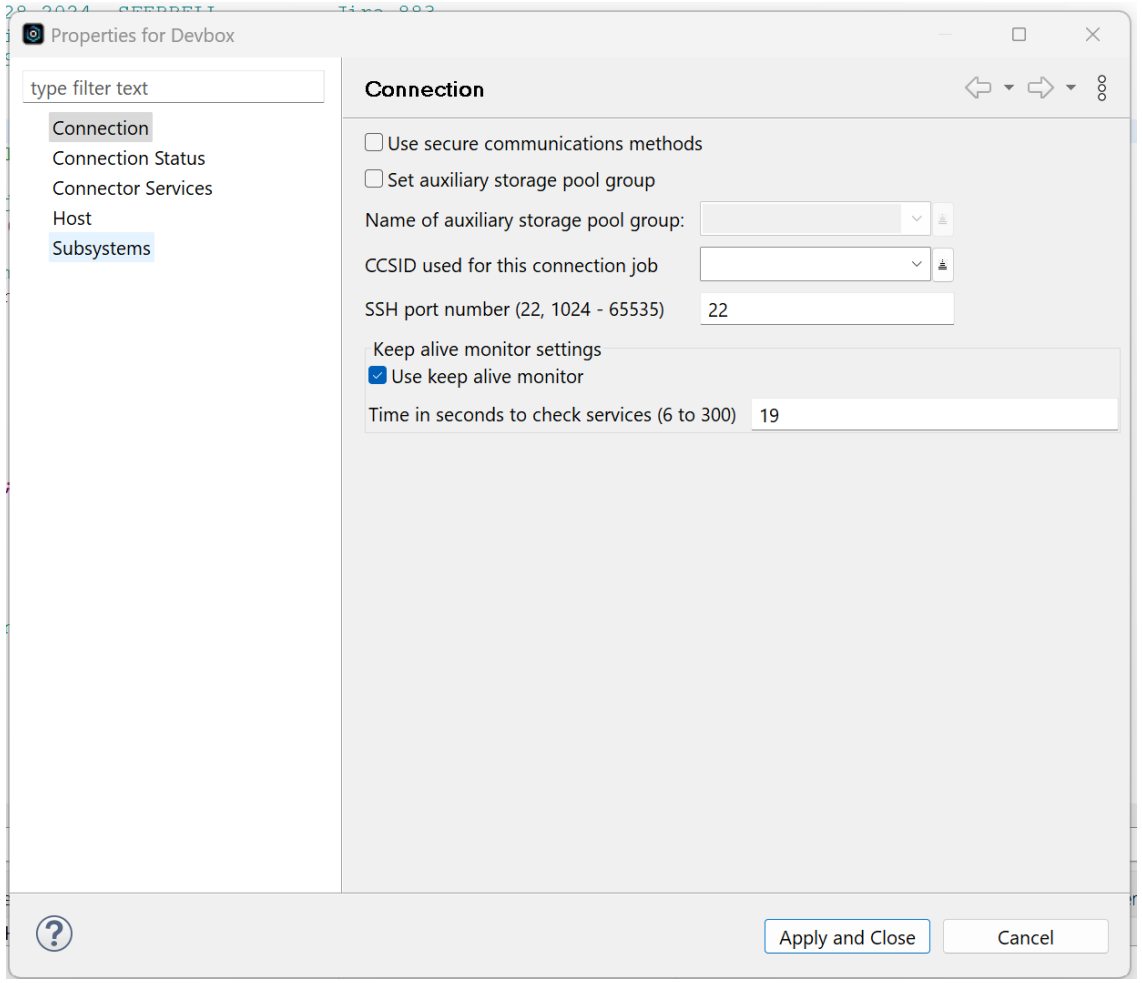
# We added a **Show columns drop-down** so you can quickly set customized columns in the Object Table view. We select Customized once you change the columns!



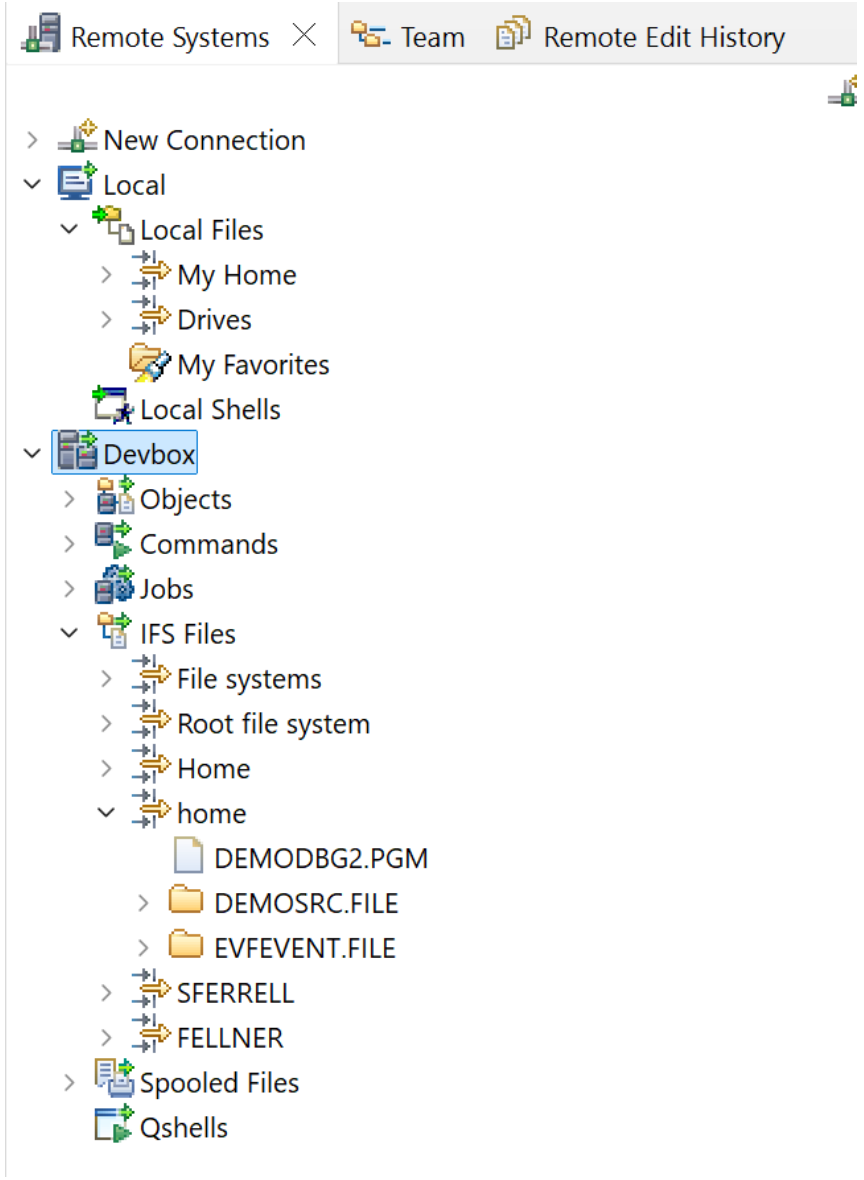



# Idea IBMI-I-619 - **Improve the Reconnect process for RDi**

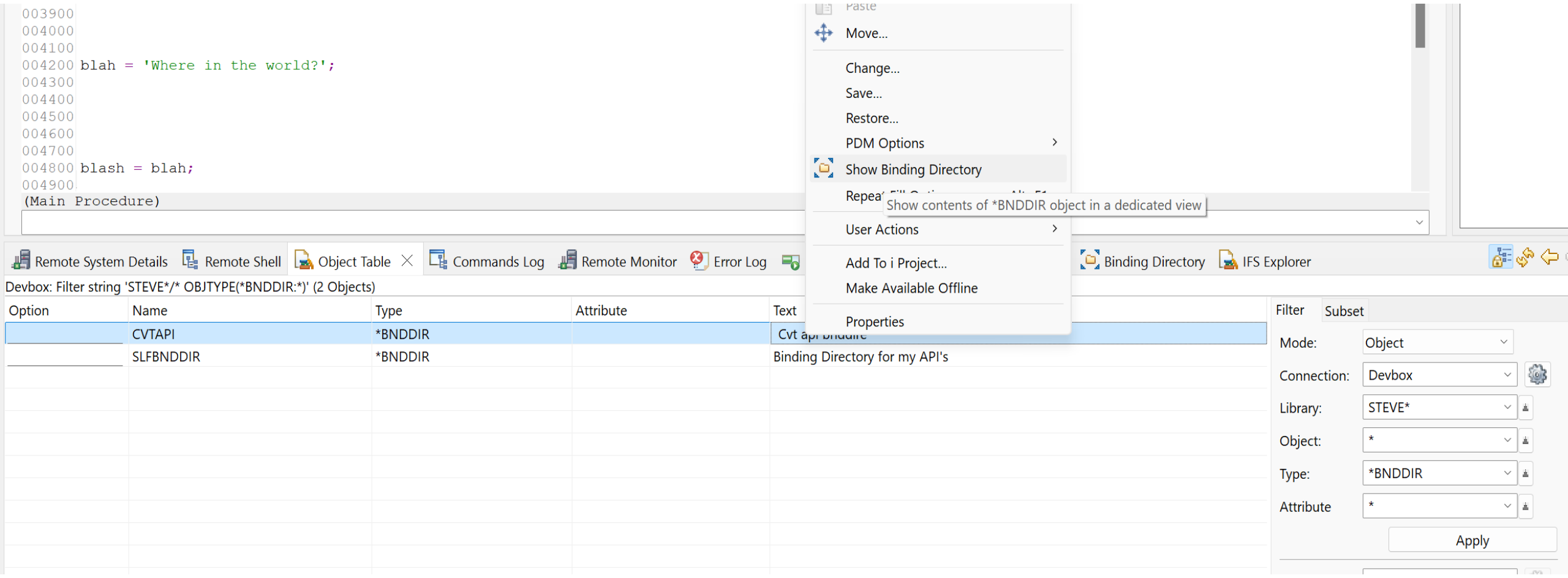
9.8.0.3 adds a keep alive monitor that allows you to choose how often to check the required services.



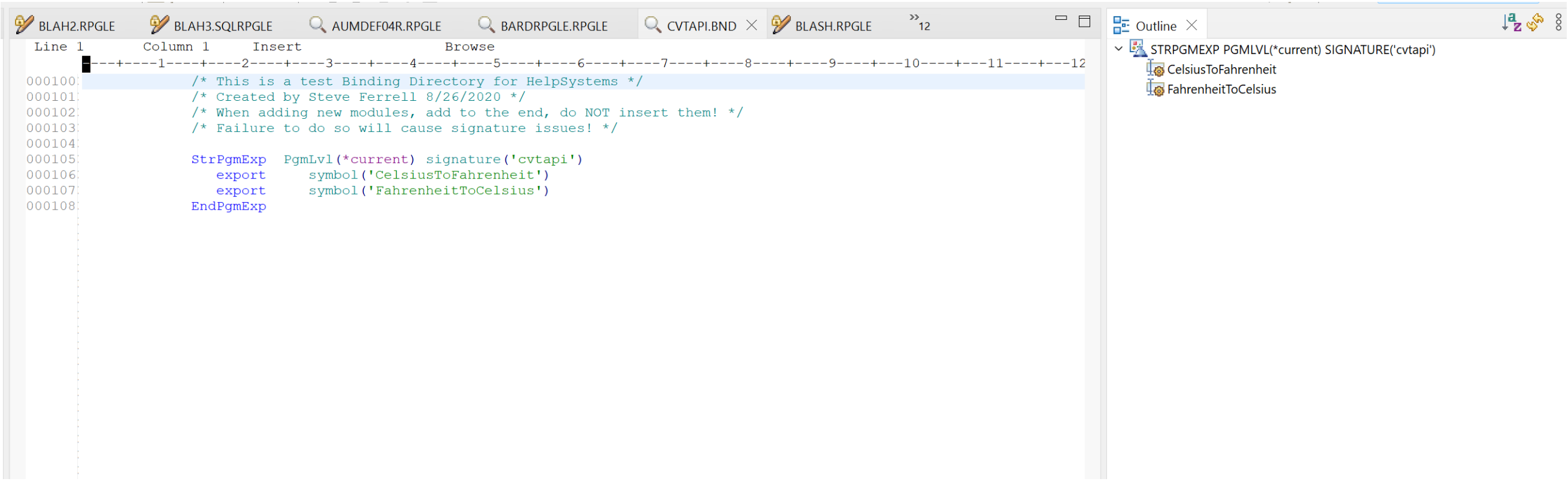
# In 9.8.0.3 we have decreased the **load speed of IFS** in the RSE view. Saving you time, making you more productive!



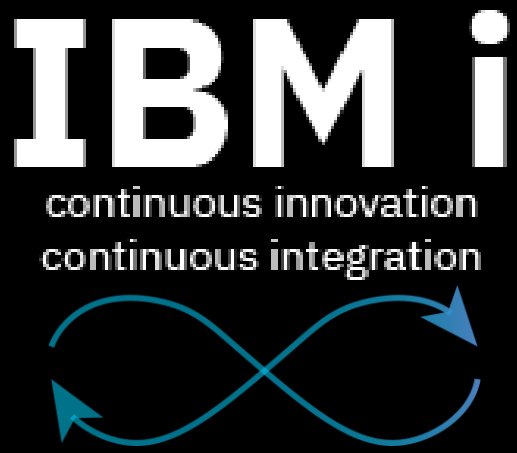
# Binding Directory - double-click on an *BNDDIR object.



# We also added an outline view, that allows you to sort!



# Backup, Recovery and Media Services for i (BRMS) Subscription Term (5770-BR2)

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# Why the change to BRMS licensing strategy?

- Change to IBM i Group SWMA strategy
  - Historical approach had a group of separately charged LPPs which were included in IBM i Group SWMA
  - Now the strategy and roadmap is to remove separately charged Licensed Program Products (LPPs) from IBM i Group SWMA
  - IBM i and the separately charged LPPs (BRMS, PowerHA SystemMirror, Db2 Mirror, Rational Development Studio)
    - Will be offered as subscription, license & support incorporated into the license

- BRMS Subscription Term (5770-BR2)…
  - includes the base, advanced, and network features that were formerly separately acquired with 5770_BR1
  - is provided at one price per core regardless of software tier
  - includes all 5770-BR1 function + future enhancements including the UI
  - can co-exist on the same serial number
  - can co-exist in the same network as 5770-BR1

- Customer benefit
  - The shift to subscription enables IBM to increase investment and time to market for BRMS enhancements
  - The list price of $400 (USD)/core/year is very reasonable when considering similar products & pricing

- Simplification
  - All function is in a single offering with no tiering
  - All new function is available only in 5770-BR2
  - 5770-BR2 replaces 5770-BR1:  the move requires removing 5770-BR1 from marketing:  withdrawal link
  - 5770-BR1 support shifts to usage and known-defect support, effective 1 October 2025

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# BRMS Subscription Additional Information

- Software License
  - BRMS (5770-BR2) 7.5 license terms
  - BRMS (5770-BR2) 7.4 license terms

- Migration from 5770-BR1 to 5770-BR2

- 5770-BR2 in Power Private Cloud with Dynamic Capacity (Enterprise Pools 2, EP 2.0)

  - 5770-BR2 is like the other Licensed Program Products (LPPs) for i other than PowerHA SystemMirror for i. For the LPPs other than PowerHA for i, the licensing is the same whether the machine is in an EP 2.0 configuration or not: the standard software license terms for each LPP applies, and the client acquires one of the following on each machine in the EP 2.0 where the LPP is used:
    - temporary keys for LPPs for a qualifying CBU for i machine
    - 5770-BR2 entitlement for peak capacity that you'll run on each machine in the EP 2.0

- Note: we plan to add 5770-BR2 notes for Capacity Backup (CBU) Machines and Designated Backup Machines

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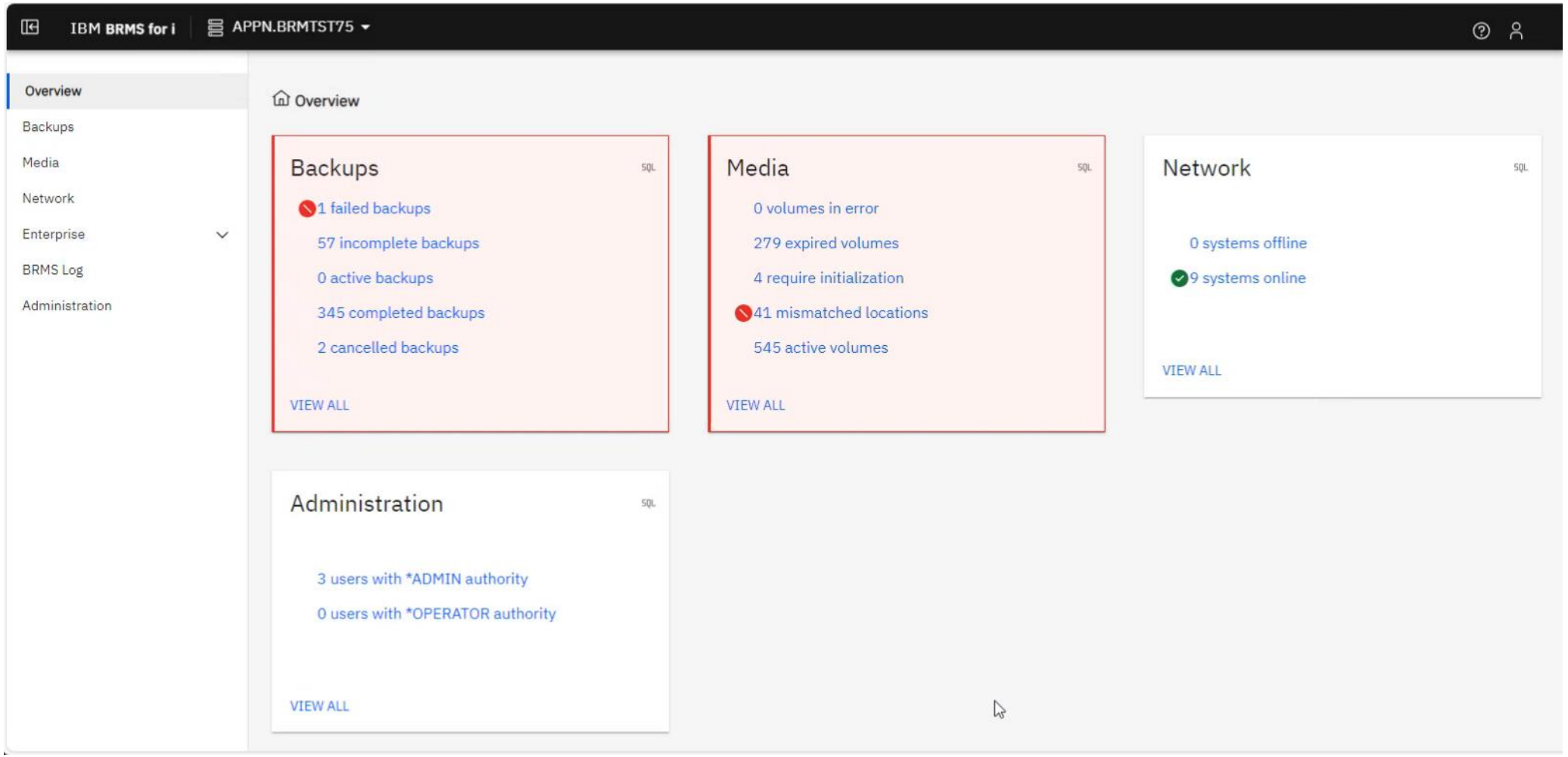
# Additional Resources

[BRMS wiki]

[Migration from 5770-BR1 to 5770-BR2]

[IBM announces withdrawal from marketing and change in service of BRMS (5770-BR1)]

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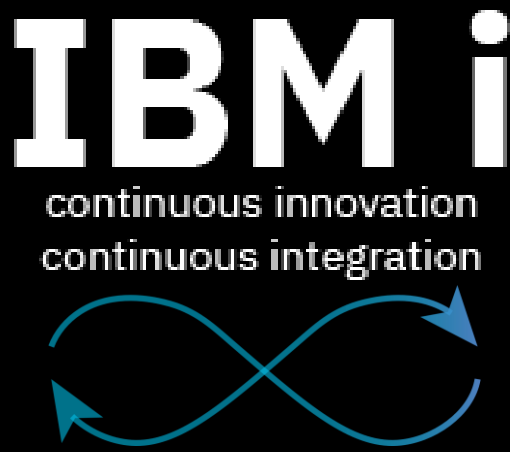
# Merlin as a Service

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# The Challenge

IBM i customers (often) don’t have

-OpenShift knowledge

-Spare infrastructure to run OpenShift cluster

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# The Solution

# Merlin

Hosted on IBM Power Virtual Server, delivered by the eco system,
as a service to the end customer

# Merlin as a Service

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# Merlin as a Service

- Environment build, controlled, and managed by partner
- IBM Power Virtual Server infrastructure host the Merlin environment
- Partner is the interface to the end user
- End user only have to focus on development

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# User experience

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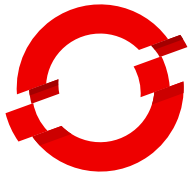
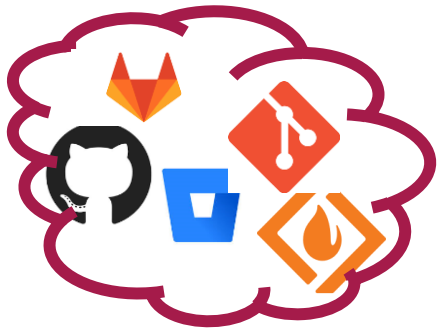
traditional

Setup Hardware

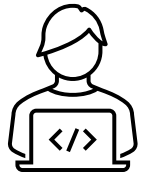


Install Openshift

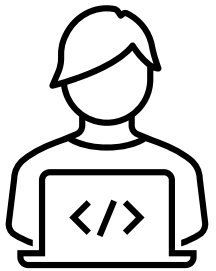
Install Merlin



Connect repository



Start using environment



Start using environment

Merlin as a Service

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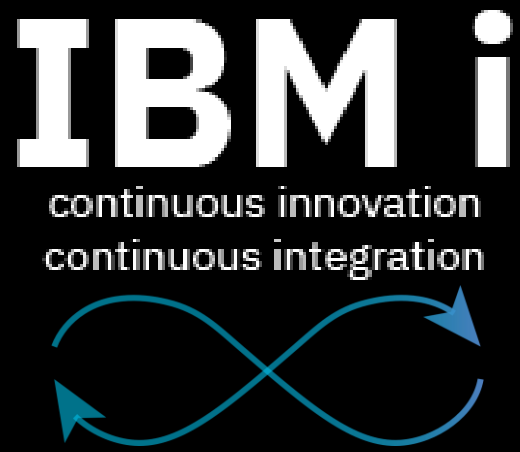
# IBM i 7.5 TR4
# &
# IBM i 7.5 TR10

https://www.ibm.com/support/pages/ibm-i-75-tr4-enhancements

https://www.ibm.com/support/pages/ibm-i-74-tr10-enhancements

https://www.ibm.com/products/power-s1012

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# IBM i 7.5 TR4, IBM i 7.4 TR10 – Announce 05/07/2024

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## IBM i Operating System
- Security
  - The IBM i CCA CSP updated to support CHIM release 3.3.8
- Cluster administrative domain
  - Support for adopted authority

## Db2 for i
- Db2 for i enhancements
  - The ANY_VALUE built-in aggregate function is added
  - CREATE ALIAS (SQL) statement includes support for the keyword *LAST
- IBM i Services
  - A variety of new table functions and procedures to access IBM i objects

## HA/DR
- PowerHA
  - IBM FlashSystem Asynchronous Policy-based Replication
  - Enhanced Administrative Domain Integration
  - PowerHA Modern Web Interface
  - PowerHA SQL Services
- BRMS
  - Support for 3592-70F tape drives and media
  - Support software data compression for tape and virtual tape

## Hardware Features for IBM i
- Support for IBM Power offerings
  - Support for new IBM Power S1012 server
  - Support for #EN2Y and #EN2Z: PCIe 4-port 1 GbE Adapter
- BMC-based ASMI adds IBM i functions to support multiple console function and new support for D-mode IPL tasks without an HMC

## Application Modernization & Open Source
- Code for IBM i
  - RPG Programmer
  - Database Extension
- IWS
  - New APIs for managing digital certificates on the system
  - APIs to retrieve TLS system information.
- Rational Development Studio for i– RPG Specific
  - The CONST keyword is now allowed for data structure & standalone fields
  - SND-MSG is enhanced to allow the specification of additional message types
- Rational Developer for i
  - ILE Docs and TAG support include
  - Introduction of a new @LINK{hyperlink} tag
  - Addition of F1 help for tag support
  - Quick filters and Object table view improvements

## System Management
- Navigator for i
  - Style changes for a simplified and modernized GUI appearance
  - Improved sign-on prompt for GUI node authorization
  - Networking improvements or multiple TCP/IP services
  - Monitor Jobs now leverage Java 11 or 17
  - Performance Data Investigator (PDI) Enhancements
  - Advanced Job Scheduler support for iASP
  - Console support for ARE is now included in Navigator
- ACS
  - Visual Explain enhancements to RUNSQL Scripts
  - Enhancements to the actions to generate SQL DML statements for tables and views

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# ACS – Visual Explain enhancements

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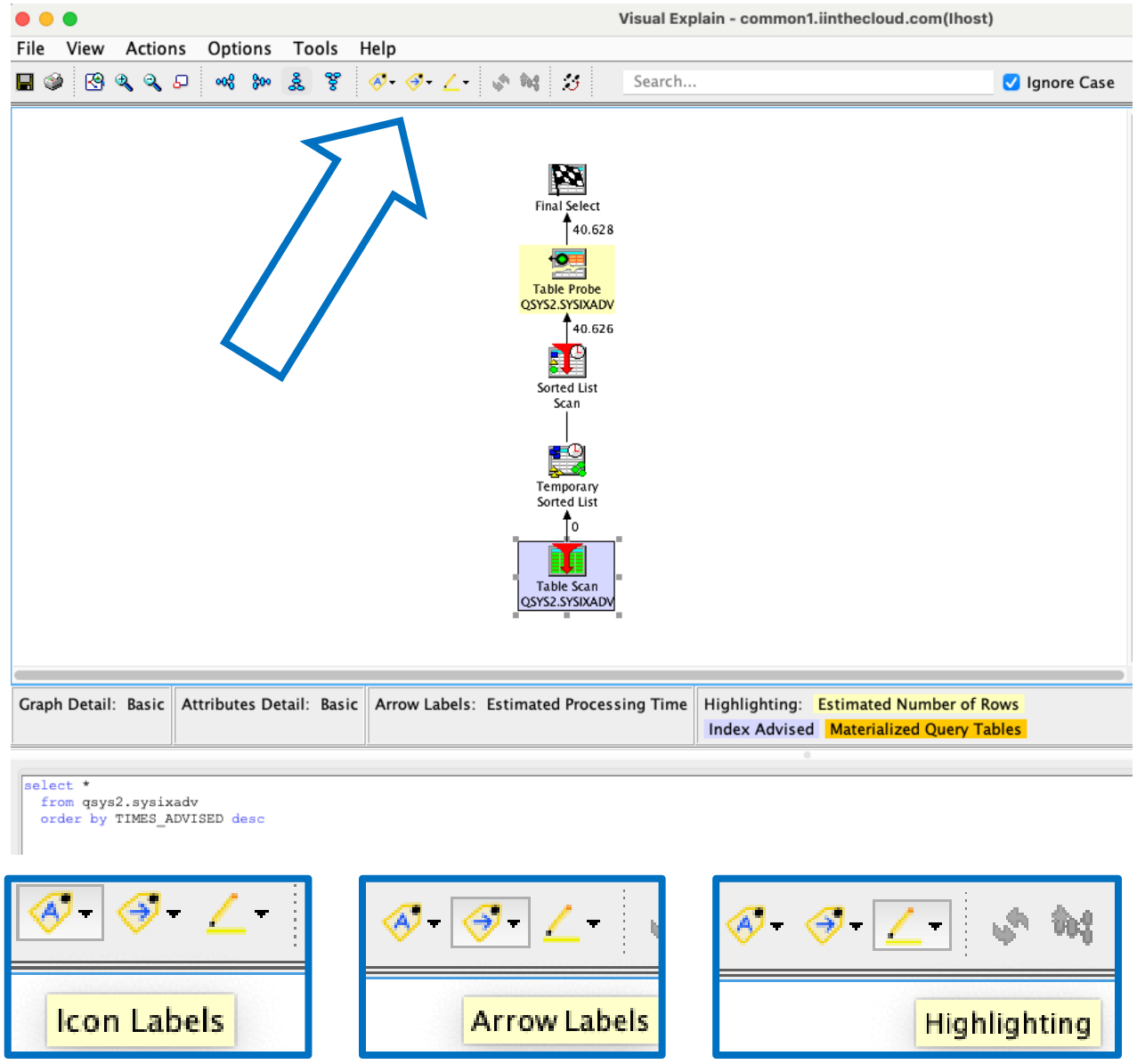











**Ideas:**

- Visual Explain Buttons for Actuals and Estimates

**IBM "Ideas":**

- Visual Explain provide ability to change settings via the diagram legend
- Visual Explain Actions menu - differentiate between graph and icon actions
- Visual Explain new arrow label option to show estimated and actual rows
- Visual Explain add tool tip hover text to graph links
- Visual Explain save icon spacing as a persistent setting
- Visual Explain – Improved zoom in and out
- And others…

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# Db2 for i – Database Engineering

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**SQE:**

- Active_Query_Info extended with another filter (Job User)
- Dump_Plan_Cache extended with another filter (IASP)

**Catalogs:**

- Addition of SYSMEMBERSTAT, which returns more data than SYSPARTITIONSTAT
- Addition of SYSTEM_OBJECT_TYPES, one row for every IBM i object type

**Multi-member files and source physical files:**

- CREATE ALIAS (SQL) support for *LAST

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# Create Alias with *LAST

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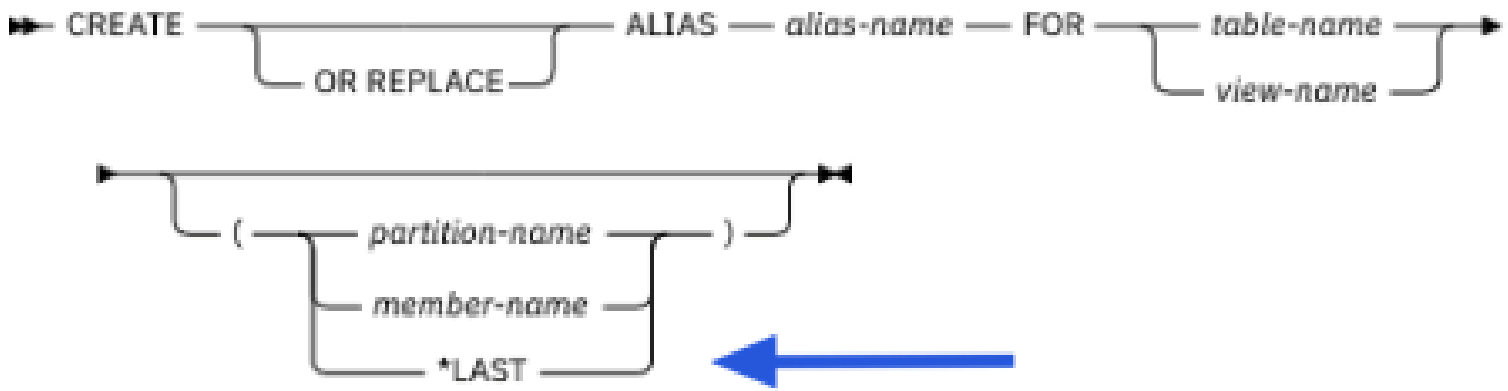
The CREATE ALIAS statement defines an alias on a table, partition of a table, view, or member of a database file at the current or remote server.




- ***LAST corresponds to the most recently created member**
- **The resolution of which member to use occurs at the time of use, not the time of alias creation**
- **Generate SQL on the ALIAS returns *LAST**
- **Save and Restore of the ALIAS retains the *LAST behavior**

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# Create Alias with *LAST

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```
--
-- Access TODAY's CS data for SQL PLAN CACHE PERFORMANCE
--
create or replace alias qtemp.TODAYS_SQLPC_DATA for QPFRDATA.QAPMSQLPC(*LAST);

Select * from qtemp.todays_sqlpc_data;
```

| Interval number<br>INTNUM | Interval date time<br>DATETIME | Elapsed interval seconds<br>INTSEC | Active queries<br>SQCURQRY | Plans in plan cache<br>SQCURPLN | Plan cache size (MB)<br>SQPCSIZE | Plan cache size limit (MB)<br>SQPCLIMIT | Plan cache size threshold (%)<br>SQPCTHRESH |
|---|---|---|---|---|---|---|---|
| 1 | 2024-05-01 00:15:00.000000 | 889 | 58 | 1943 | 252 | 512 | 94 |
| 2 | 2024-05-01 00:30:00.000000 | 900 | 58 | 1944 | 253 | 512 | 94 |
| 3 | 2024-05-01 00:45:00.000000 | 900 | 58 | 1945 | 253 | 512 | 94 |
| 4 | 2024-05-01 01:00:00.000000 | 900 | 58 | 1946 | 253 | 512 | 94 |
| 5 | 2024-05-01 01:15:00.000000 | 900 | 58 | 1947 | 253 | 512 | 94 |
| 6 | 2024-05-01 01:30:00.000000 | 900 | 58 | 1948 | 253 | 512 | 94 |
| 7 | 2024-05-01 01:45:00.000000 | 900 | 58 | 1949 | 253 | 512 | 94 |

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# SQL Built-in Functions

- June 2024 – **ANY_VALUE**
- November 2023 – **ENCRYPT_AES256,**
  **HTML_ENTITY_DECODE, and HTML_ENTITY_ENCODE**
- May 2023 – **More HTTP functions based in QSYS2**
  **ADD_DAYS, ADD_HOURS,**
  **ADD_MINUTES, ADD_SECONDS, & ADD_YEARS**
- November 2022 – **FIRST_DAY**, **JSON_UPDATE**, & **TIMESTAMPDIFF_BIG**
- May 2022 – **TRY_CAST**
- October 2021 – **New HTTP functions based in QSYS2**
- July 2020 – **INTERPRET built-in function** & **HASH_ROW built-in function**
- January 2020 – **HASH Built-in functions**

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# ANY_VALUE aggregate function

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ANY_VALUE(*expr)* aggregate function tells the optimizer that it can return any of the values defined by *expr* that exist within a given group. For certain grouping queries, this:

- Makes queries easier to write
- Enables better index usage

Assume PostalCode uniquely identifies a city and state (mostly true in the U.S.)
I want a count of the customers in each postal code.

```
SELECT COUNT(*), PostalCode FROM Customers GROUP BY PostalCode;
```

IBM Idea: Add an ANY_VALUE aggregate function

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# ANY_VALUE aggregate function

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ANY_VALUE(*expr)* aggregate function tells the optimizer that it can return any of the values defined by *expr* that exist within a given group. For certain grouping queries, this:

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I want a count of the customers in each postal code.

```
SELECT COUNT(*), PostalCode FROM Customers GROUP BY PostalCode;
```

If I want to my query to show the City and State for each PostalCode, I have to add it also to the GROUP BY list:

```
SELECT COUNT(*), City, State, PostalCode FROM Customers
  GROUP BY PostalCode, City, State;
```

To use index access, I need to have an index with three leading keys: **PostalCode, City, State**

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# ANY_VALUE aggregate function

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ANY_VALUE(*expr)* aggregate function tells the optimizer that it can return any of the values defined by *expr* that exist within a given group. For certain grouping queries, this:

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```
SELECT COUNT(*), City, State, PostalCode FROM Customers
  GROUP BY PostalCode, City, State;
```

To use index access, I need to have an index with three leading keys: **PostalCode, City, State**

With ANY_VALUE, I can add these columns without changing the grouping specification:

```
SELECT COUNT(*), ANY_VALUE(City), ANY_VALUE(State), PostalCode
  FROM Customers GROUP BY PostalCode;
```

This enables my query to use any index that has PostalCode as the leading key.
ANY_VALUE gives the optimizer more implementation choices.

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# Db2 for i – Programming

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**SQL services for ILE-style programming:**

- SYSTOOLS.PUTENV() scalar function
- SYSTOOLS.GETENV() scalar function
- SYSTOOLS.ERRNO_INFO() scalar function

**SQL services for the IFS:**

- SYSTOOLS.IFS_UNLINK scalar function
- QSYS2.COMPARE_IFS() table function

**Enhanced services:**

- SYSTOOLS.GENERATE_SPREADSHEET()
- SYSTOOLS.SEND_EMAIL()

- ✓ Support for more spreadsheet types
- ✓ Smarter spreadsheet column width for xlsx and xls spreadsheet types

- ✓ Support for CC
- ✓ Support for BCC
- ✓ Support for up to 20 email recipients
- ✓ Support for up to 10 attachments

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# Db2 for i – Security

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**SQL services for the audit journal:**

- SYSTOOLS.AUDIT_JOURNAL_NA (Attribute Change)
- SYSTOOLS.AUDIT_JOURNAL_PS (Profile Swap)
- Improved performance for some helper functions
- MANAGE_AUDIT_JOURNAL_DATA_MART

**SQL services special authority:**

- SYSTOOLS.SPECIAL_AUTHORITY_DATA_MART

**Improved Secure by default:**

- Add Physical File Trigger (ADDPFTRG) changed from *PUBLIC *USE to *PUBLIC *EXCLUDE
- Other changes, some noted in the Memorandum to Users (MTU)

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# Audit Journal Data Mart

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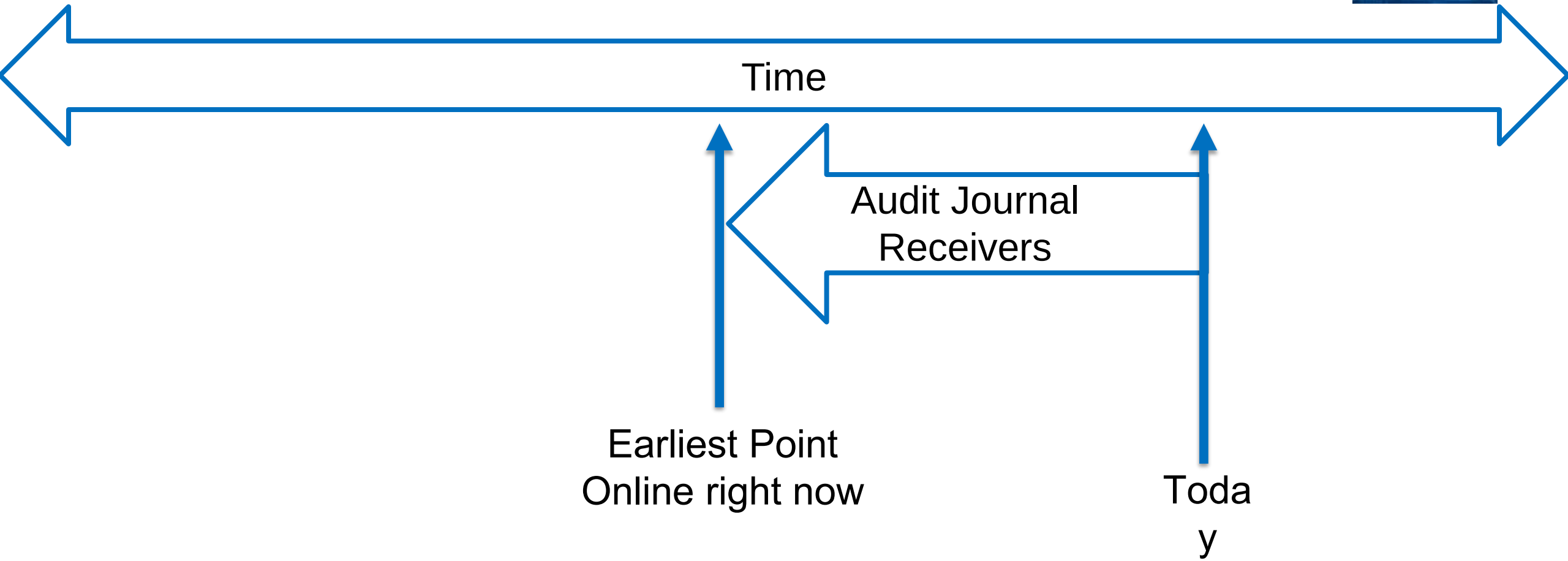


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# Audit Journal Data Mart

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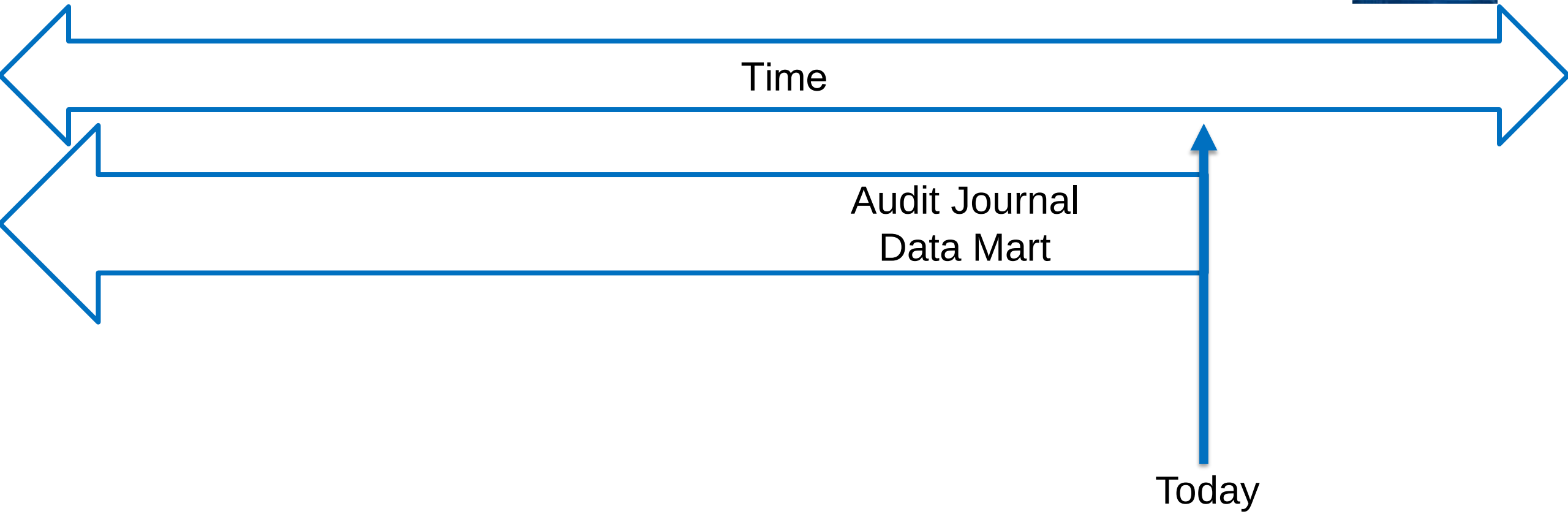
continuous integration

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# Audit Journal Data Mart

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## Establish a Data Mart for the AF (Authority Failure) audit journal entries

```
cl: crtlib AUD_DMART;
cl: RVKOBJAUT OBJ(AUD_DMART) OBJTYPE(*LIB) USER(*PUBLIC) AUT(*ALL);

CALL QSYS2.MANAGE_AUDIT_JOURNAL_DATA_MART(
   JOURNAL_ENTRY_TYPE => 'AF',
   DATA_MART_LIBRARY  => 'AUD_DMART',
   STARTING_TIMESTAMP => '*FIRST',
   ENDING_TIMESTAMP   => DEFAULT,
   DATA_MART_ACTION   => 'CREATE'
);
```

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# Audit Journal Data Mart

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**Add entries to the data mart, starting at the latest point of previous capture**

```
CALL QSYS2.MANAGE_AUDIT_JOURNAL_DATA_MART (
   JOURNAL_ENTRY_TYPE => 'AF',
   DATA_MART_LIBRARY  => 'AUD_DMART',
   STARTING_TIMESTAMP => '*CONTINUE',
   ENDING_TIMESTAMP   => NULL,
   DATA_MART_ACTION   => 'ADD'
);
```

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# Db2 for IBM i blog

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## Db2 for IBM i

News and advice related to Db2 for i

Tuesday, May 7, 2024

### Another Round of Db2 for i Enhancements

Today, IBM announced the content of its biannual delivery of new and enhanced IBM i capabilities via the upcoming TRs (Technology Refresh) for the 7.4 and 7.5 releases. As always, there are some nice additions to Db2 for i to make your life as an application developer and/or Database Engineer (DBE) easier!

The ANY_VALUE aggregate function simplifies the query writing and eliminates the performance overhead by telling Db2 that any old value in the specified column (or expression) will do as shown in this example query.

```
SELECT clientName, SUM(salesAmt) AS totSales,
       ANY_VALUE(clientEmail)
  FROM salesHistory
  GROUP BY clientName
  ORDER BY totSales DESC LIMIT 10
```

The usability of the ACTIVE_QUERY_INFO service was also greatly enhanced for those of you that are trying to monitor and track queries running in host server jobs like the QZDASOINIT jobs. The original version of the service had a job user parameter, JOB_USER, to track queries for a specific user. However, the JOB_USER filter was not applied to the current user of host server jobs. So essentially, there was no way to do user-level filtering for active queries running in host server jobs. That limitation is now gone with the addition of a new USER_NAME parameter that is applied to the current user of a host server job. The following example shows how you can easily target the active queries run by BADUSER in the QZDASOINIT server jobs.

```
SELECT * FROM
   TABLE(ACTIVE_QUERY_INFO(JOB_NAME=> 'QZDASOINIT',
                           USER_NAME=> 'BADUSER'))
```

These are my highlights of some of the Db2 for i advancements in the latest IBM i TR, so I'd encourage you to review the complete list on the IBM i Technology Updates wiki. Also, don't forget that the Memorandum to Users (MTU) gets updated with each IBM i TR as well – many users mistakenly believe that the MTU only gets updated at the GA of a new release. Here are the links to the MTU:

- IBM i 7.5 MTU
- IBM i 7.4 MTU
- IBM i 7.3 MTU

https://db2ibmi.blogspot.com/2024/05/another-round-of-db2-for-i-enhancements.html

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# Modernization Engine for Lifecycle Integration

# Merlin V2

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# Merlin V2 - GA planned for June 15

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## Cloud ready modern ecosystem for IBM i native development

- Built on the latest in DevSpaces
- Leveraging the latest Code for i technology
  - Improved developer experience
  - Db2 integration! Create and test your SQL from your Merlin IDE interface
  - Tools to help move from Source Physical Files into a GIT Repo
- Simplified OpenShift Requirements with Single Node OpenShift (SNO)

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# Merlin V2 - GA Jun 15

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Cloud ready modern ecosystem for IBM i native development

- Supports IBM i 7.3 or later
- Supports Power9 and Power10 platforms only
- Leverages DevSpaces vs old Eclipse based environment
- Full for Code for IBM i support built on VS Code
  - Latest Code for IBM i additions including Db2 for i plugin
  - Support optional 3rd party plugins for Merlin IDE
- Improved Debugger support
- Latest ARCAD product updates:
  - Transformer
  - Observer
  - Builder
- Supported for OpenShift v4.14 & Single Node (SNO)
- Subscription based pricing only
- Contains a full replacement for source control management solutions
- Improved usage metrics for better resource estimations

- Merlin v1 withdrawal
  - EOS notice will be 5 months vs standard 1yr
  - Easy transitions to Version 2

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# Visual Studio Code & Code for IBM i

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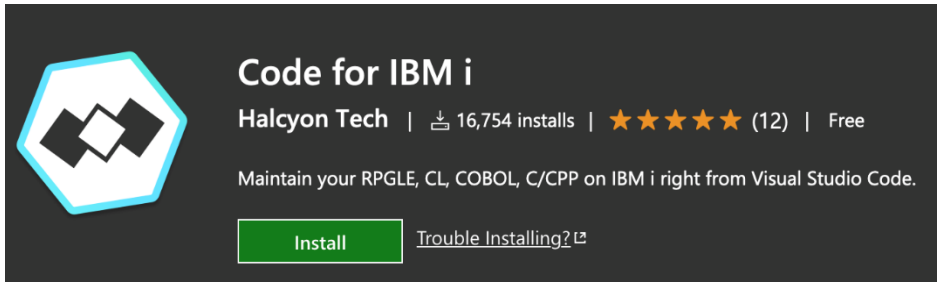
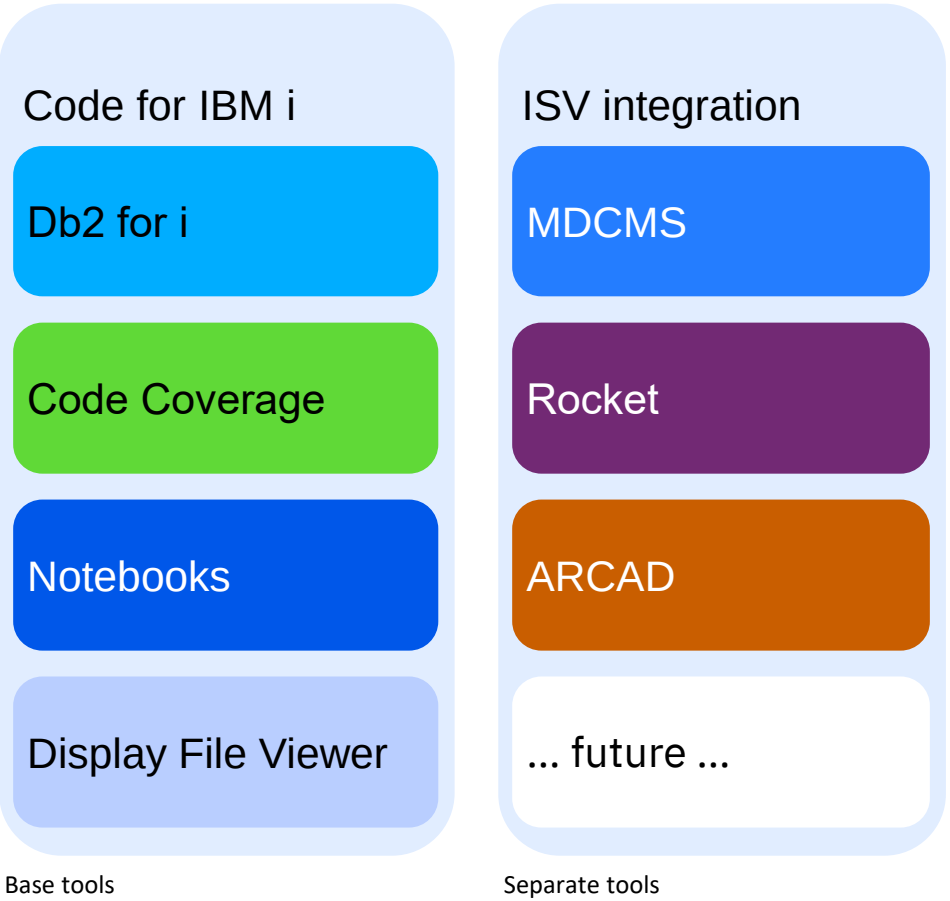
- Used by 74% of professional developers
- 27k+ installs
- 2000+ daily users
- Extended by Merlin and ISVs




Developer statistics from StackOverflow Survey 2023

Reference customers: FNZ Group, KS3 Solutions, CMA Technology Solutions, Amalgamated Banks of South Africa, Directa SIM, Vermont Information Processing, Polar Beverages, Wright Service Corp, CPB Software

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# Db2 Extension within Code for i

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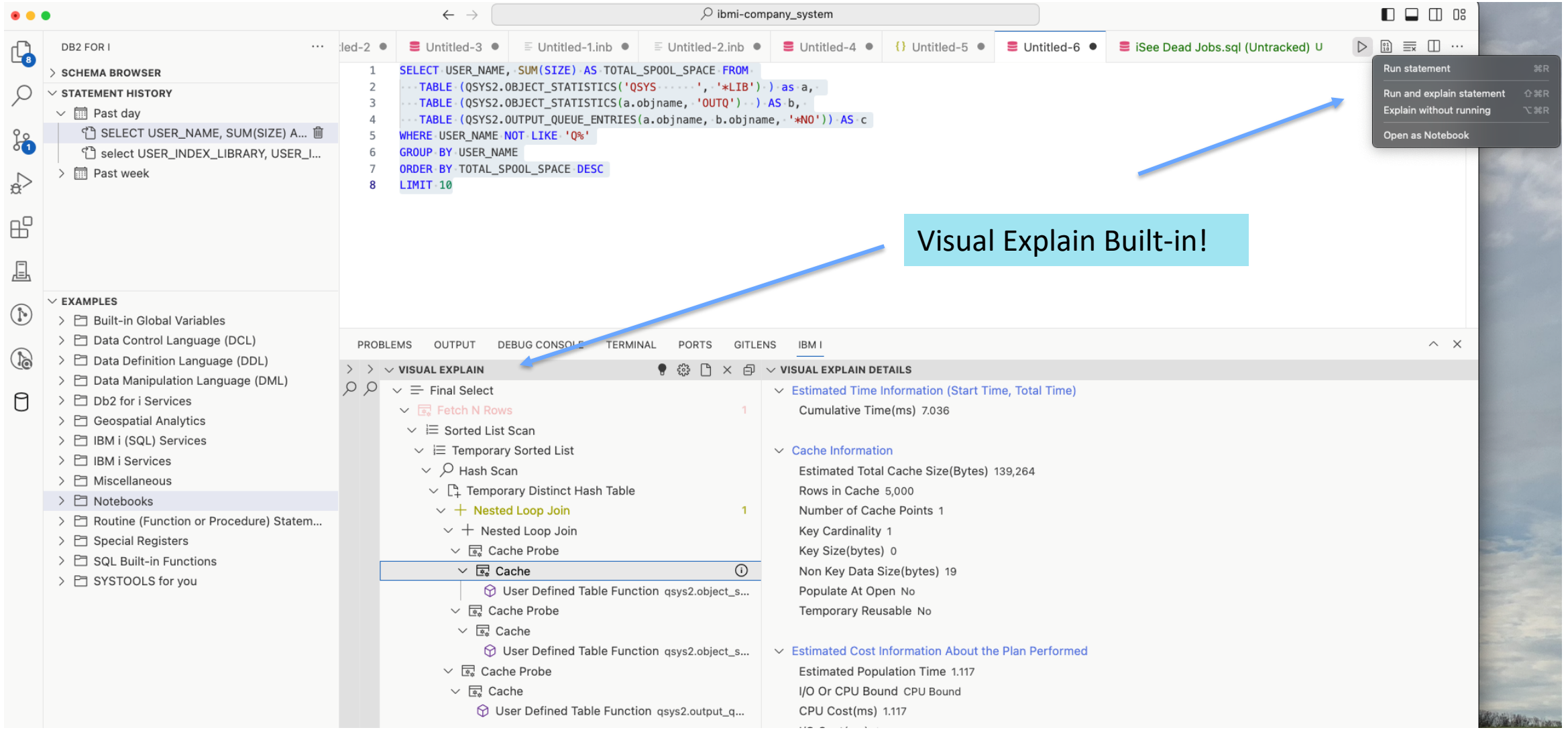


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# Support for the SQL Error Logging Facility (SELF)

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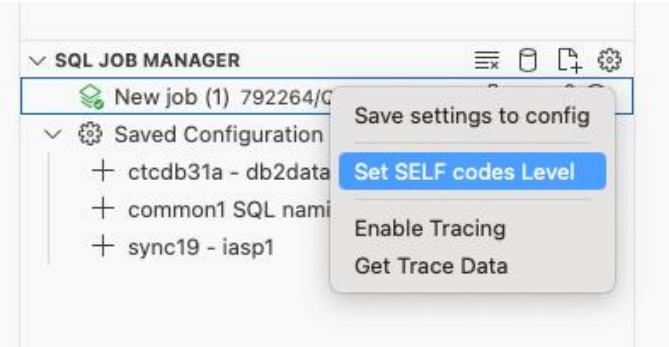
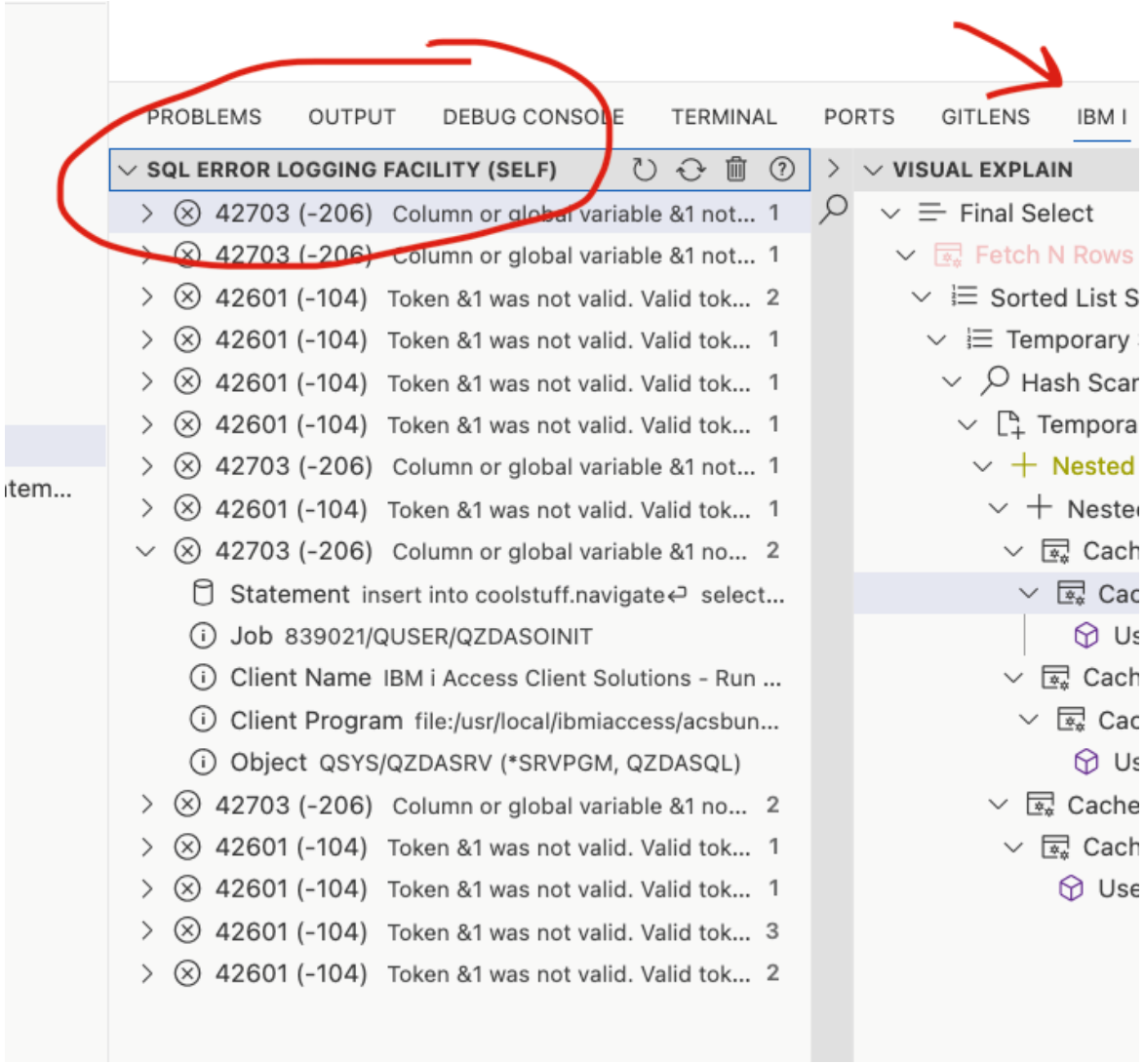
Challenge: Finding, understanding, and fixing SQL errors and warnings

SELF - Captures details about user specified SQL errors or warnings

VsCode Db2 for i extension provides a new easy to use interface for seeing the item captured by SELF




https://www.ibm.com/support/pages/node/6828091

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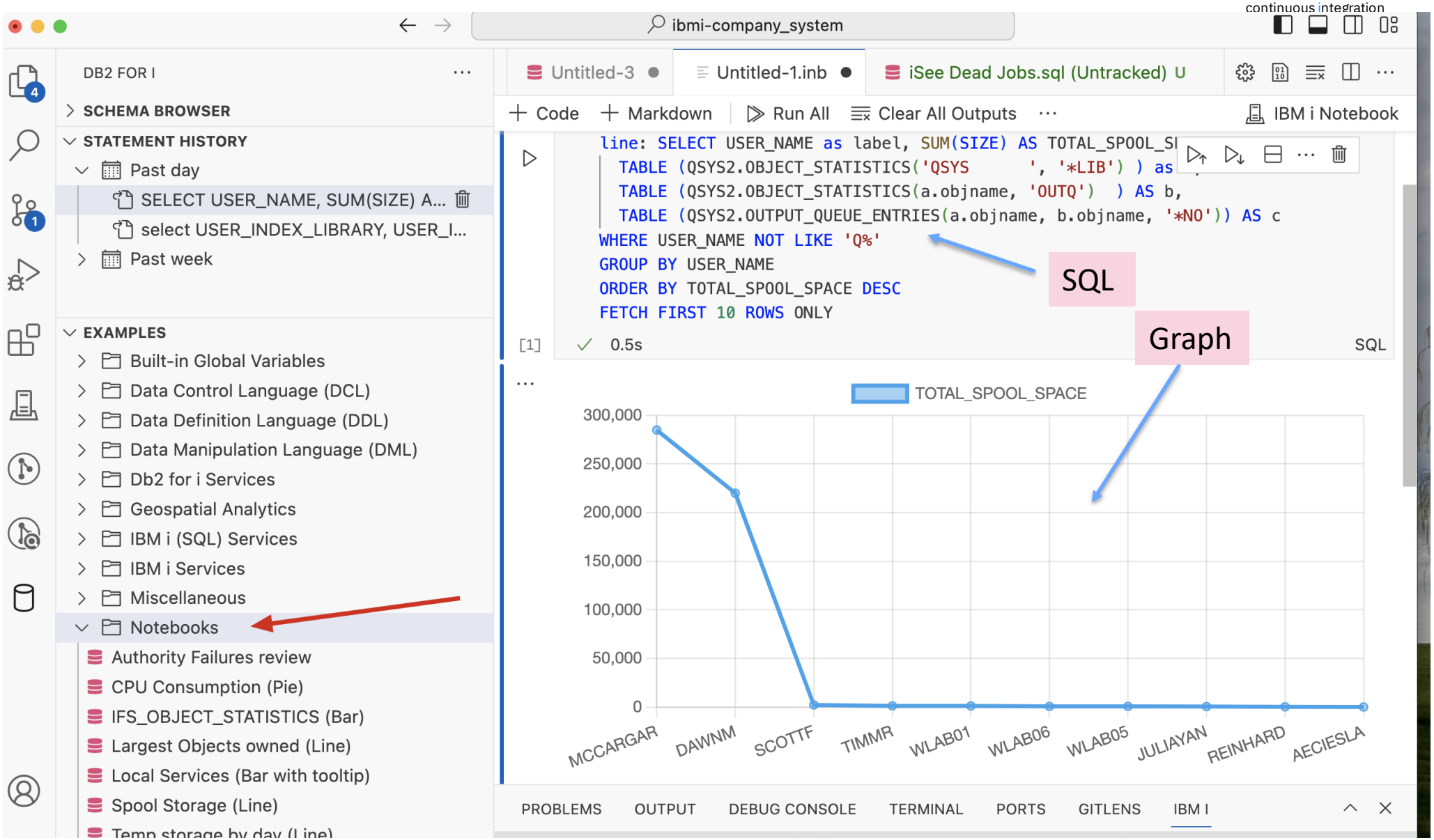
# Notebooks in VsCode

SQL in..... Generated data delivered in Graph form!!!

Publish as a doc!!!

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# Notebooks published as a Report!

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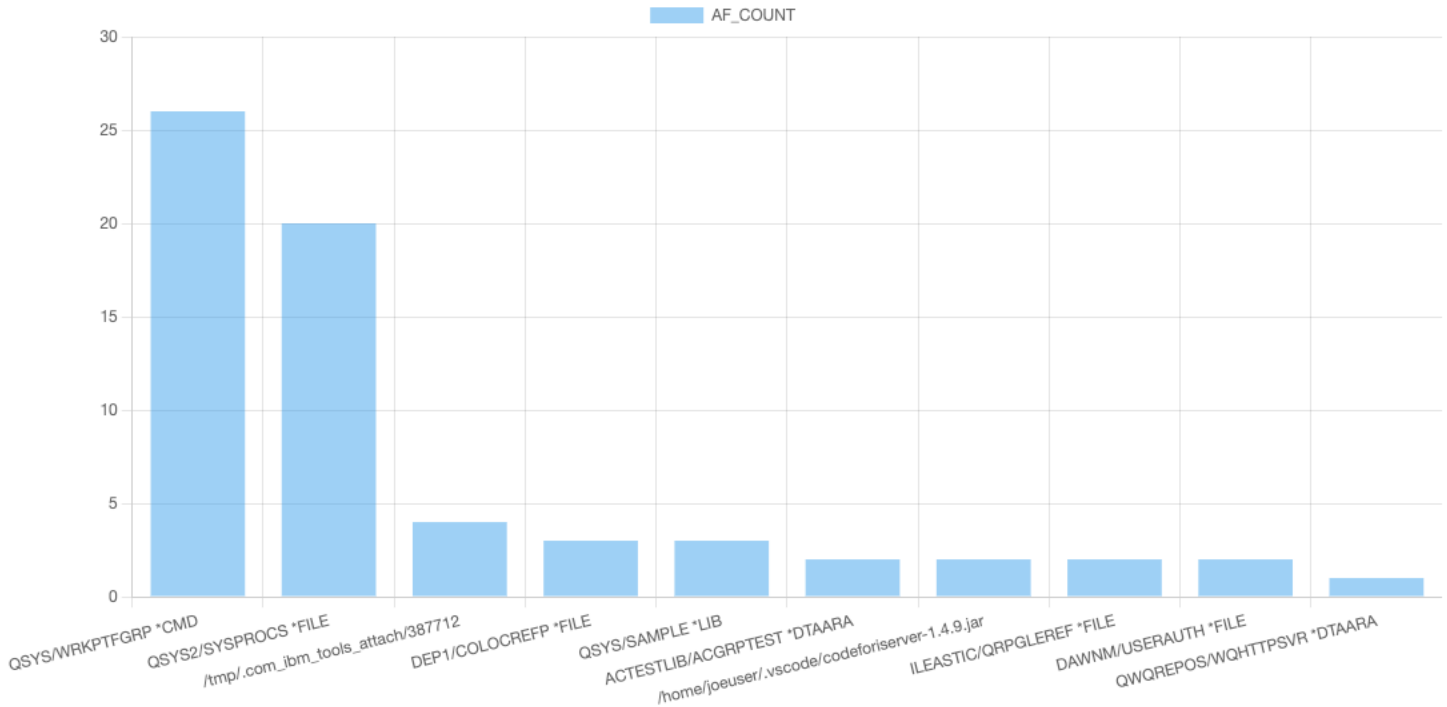
file:///Users/scottforstie/AF failures on common1 - april 30.html

Which objects are having the authorization failures?

```
select coalesce(
        path_name, object_library concat '/' concat object_name concat ' ' concat object_type) as label,
      count(*) as AF_count
 from table (
     SYSTOOLS.AUDIT_JOURNAL_AF(STARTING_TIMESTAMP => current timestamp - 1 month)
   )
 group by coalesce(
     path_name, object_library concat '/' concat object_name concat ' ' concat object_type)
 order by AF_count desc limit 10
```

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# iSee educational videos (hosted by COMMON)

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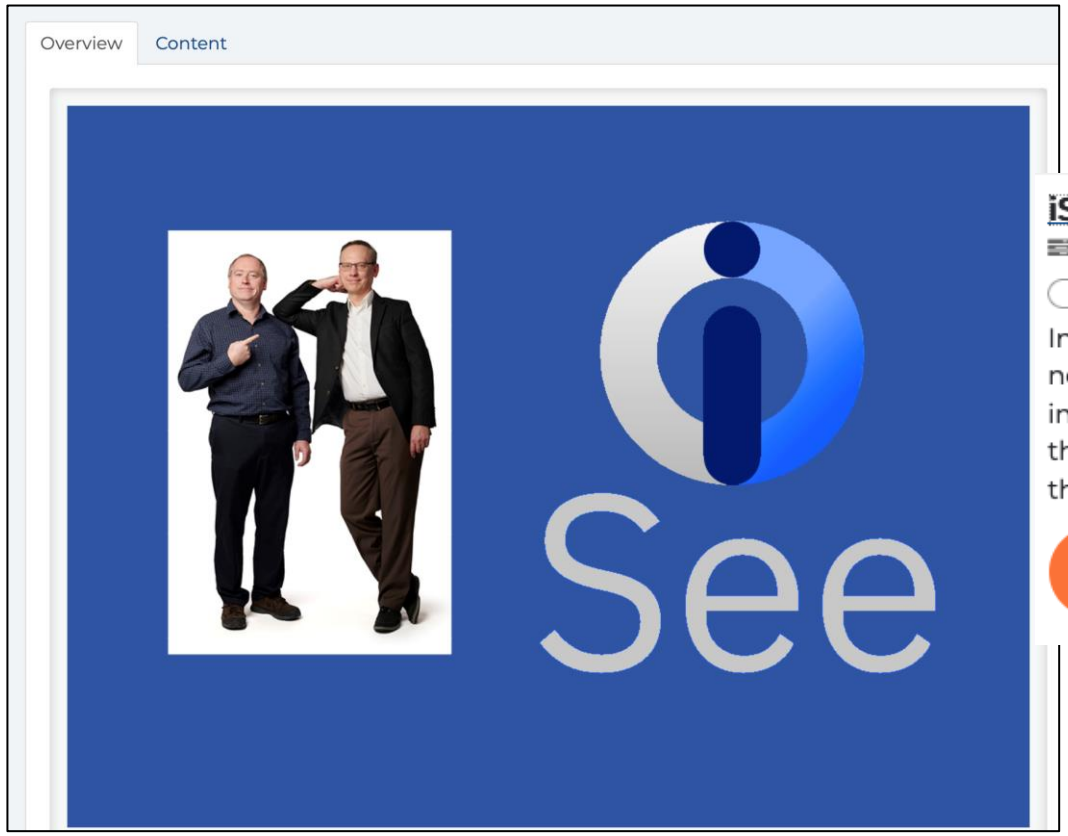
## Many “free” learning opportunities




**iSee VsCode Db2 for i Style**

*Contains 1 Component(s)*

OVERVIEW | SPEAKER(S)

In the previous iSee we learned the basics on how to use and install VsCode for your IBM i development needs. In this session we will venture down a path near and deer ( wonderful creature that likes to run out in front of your cars) to Scott, creating SQL for IBM i. This includes accessing databases, as well as getting the most out of your IBM i Services leveraging SQL. We will show you the power of this Db2 support that the Code for i team has been working on. Buckle up!

MORE INFORMATION

https://learn.common.org/products/ibm-isee#tab-product_tab_overview

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# IBM i Remote System Explorer API

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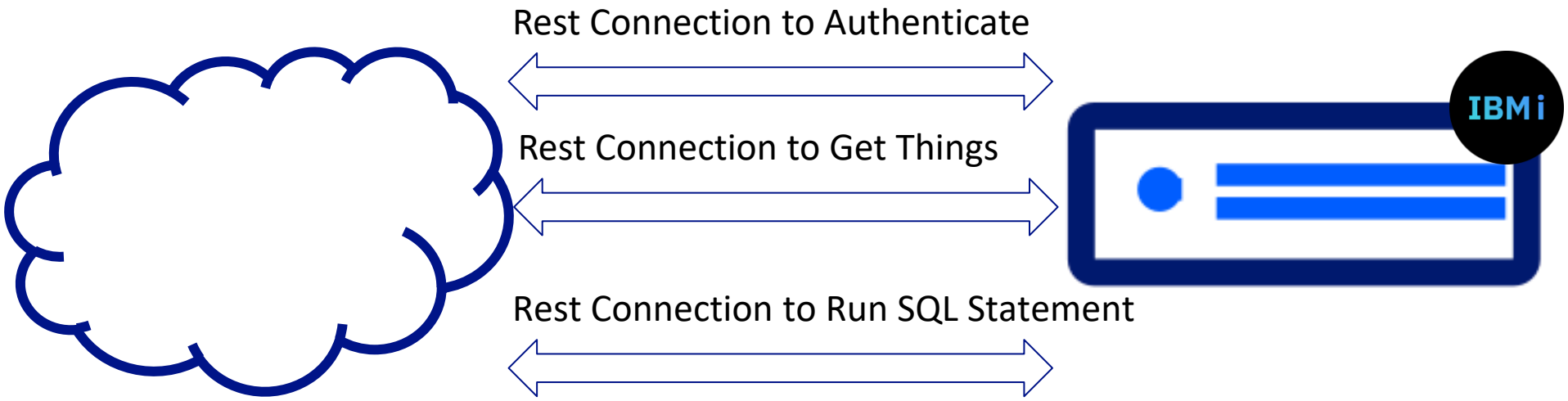
## Authenticate to an IBM i and Access Data / Change things with REST




https://www.ibm.com/support/pages/node/6982701.

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# RSE API – New DCM Management Services

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**POST** `/api/v1/security/dcm/cert/list` Retrieve a list of certificates in a certificate store.

Example request:

```
{
  "certStoreType": "CMS",
  "certStorePath": "*SYSTEM",
  "certStorePassword": "passw0rd",
  "filters": {
    "alias": "q*",
    "certTypes": [
      "SERVER_CLIENT",
      "CERTIFICATE_AUTHORITY",
      "CERTIFICATE_SIGNING_REQUEST"
    ],
    "daysUntilExpiration": 5000,
    "excludeExpired": false
  }
}
```

List Certificates

**POST** `/api/v1/security/dcm/cert/import` Import a digital certificate.

Sample request:

```
{
  "certStoreType": "CMS",
  "certStorePath": "*SYSTEM",
  "certStorePassword": "myPassw0rd",
  "certType": "SERVER_CLIENT",
  "certAlias": "mylabel",
  "certData": "BASE64-BLOB",
  "certDataPassword": "myPassw0rd"
}
```

Import Certificates

**POST** `/api/v1/security/dcm/appdef/associate` Assign digital certificate(s) to an existing application definition.

Example request:

```
{
  "id": "myappdef",
  "type": "SERVER",
  "certAlias": [
    "mylabel1",
    "mylabel2"
  ]
}
```

Associate Certificates

And More….

Everything you need to Automate the regular management of certificates in DCM

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# IBM i Remote System Explorer API

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PTFs are available that contain the new DCM REST APIs. The PTFs are:

| | |
|---|---|
| SI85817 | V7R5M0 (RSE APIs) |
| SI86098 | V7R5M0 (DCM) |
| | |
| SI85818 | V7R4M0 (RSE APIs) |
| SI86097 | V7R4M0 (DCM) |
| | |
| SI85819 | V7R3M0 (RSE APIs) |
| SI86095 | V7R3M0 (DCM) |

https://www.ibm.com/support/pages/node/7144245

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# Navigator

https://www.ibm.com/support/pages/navigator-i

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# Navigator – Audit Journals Like Never Before!

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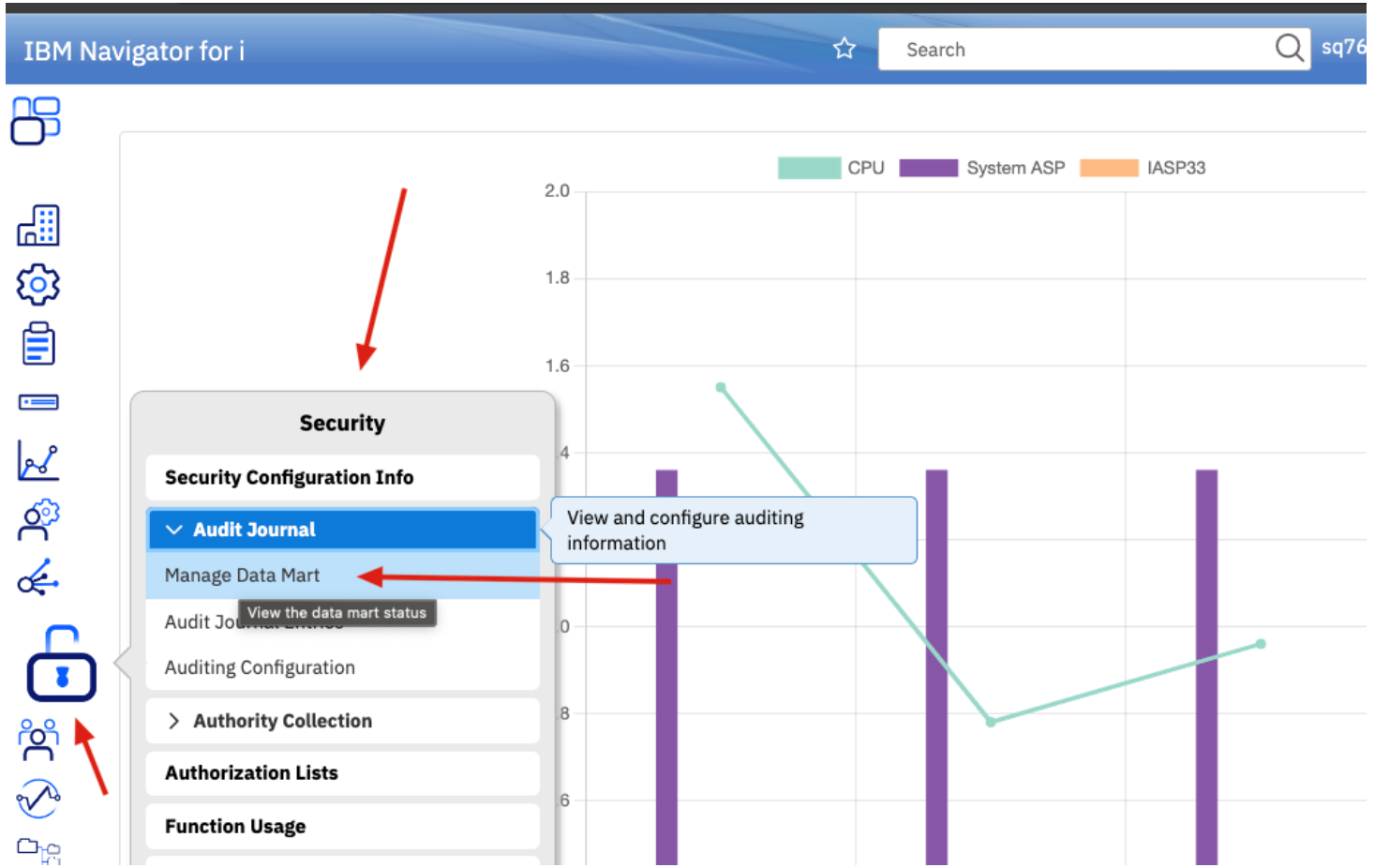
## New Datamart!

- Consolidate Audit entries across many days to enable fast graphing and inspection
- Pay attention to Audit info to spot trends and security concerns

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# Navigator – Audit Journals Like Never Before!

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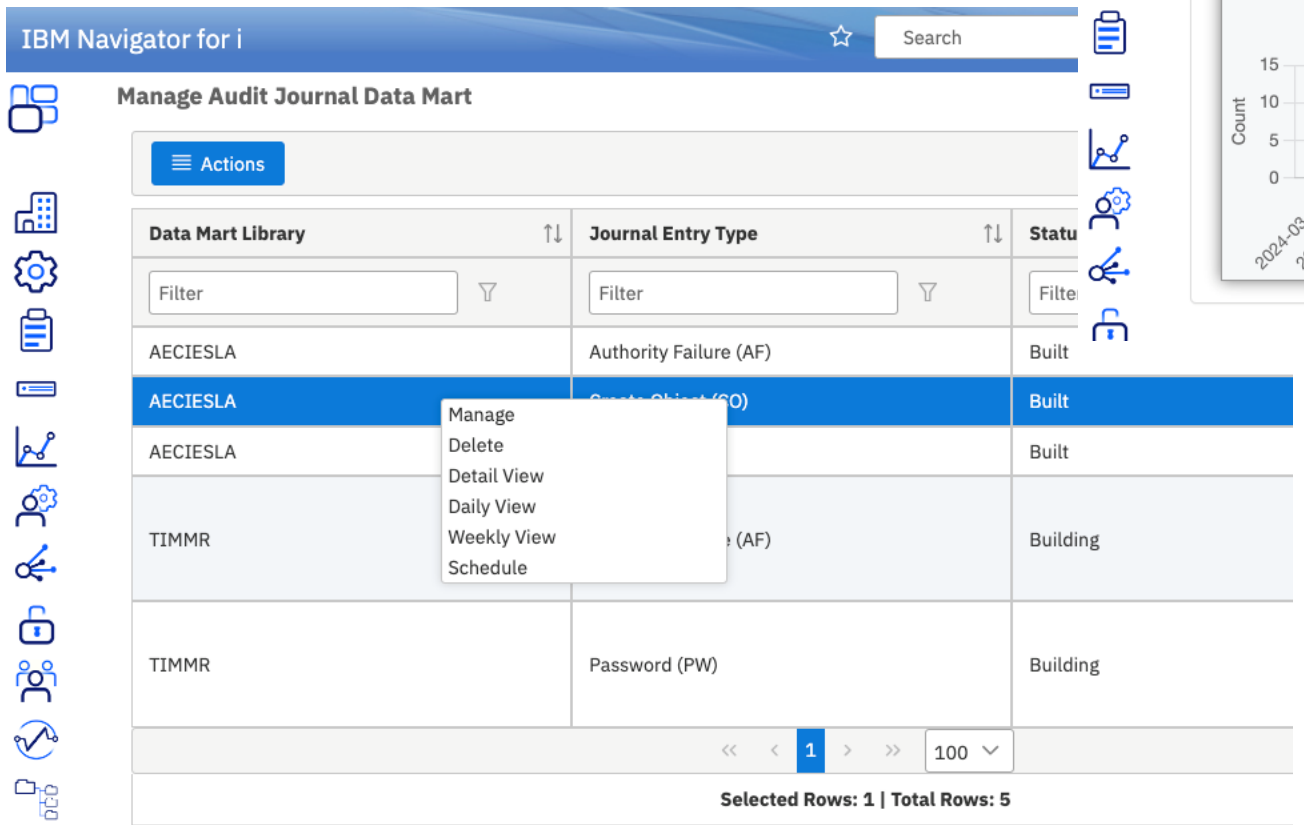
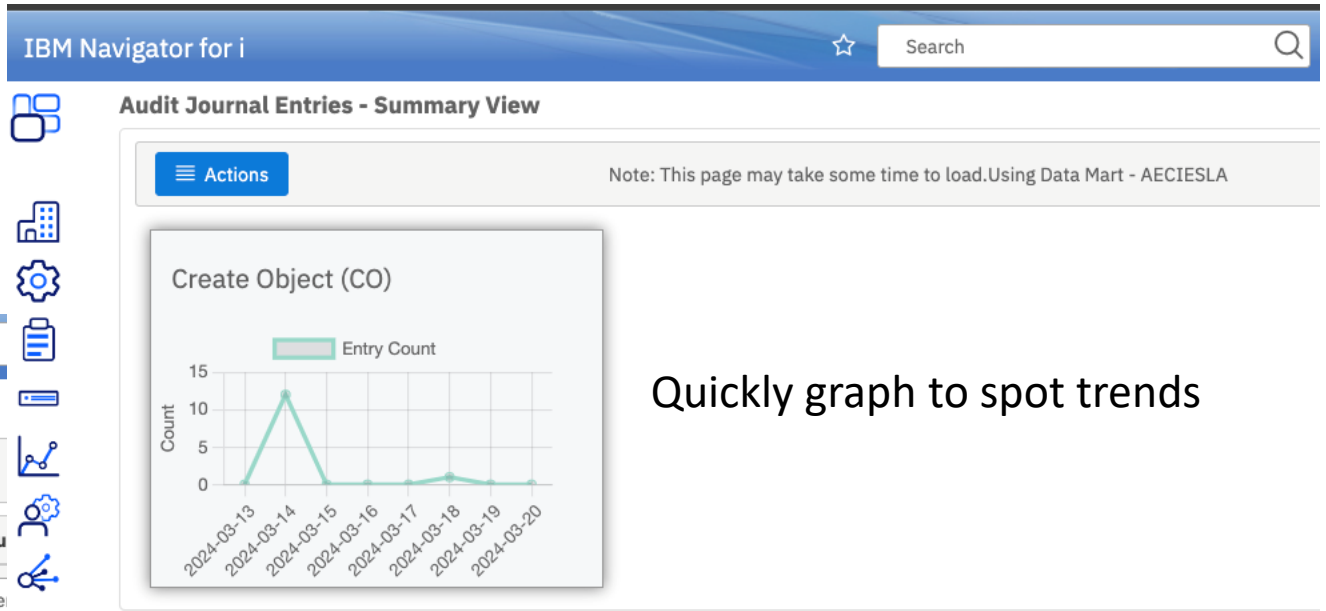
Create a data mart for each audit type of interest




Quickly graph to spot trends

View details to see what is causing the trends

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# HTTP, IAS and IWS Server Management

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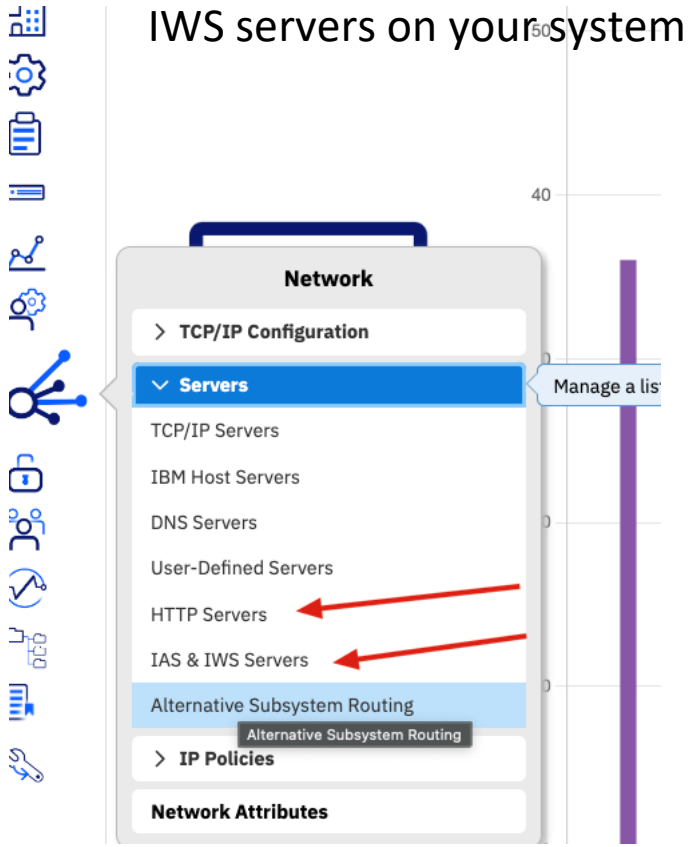
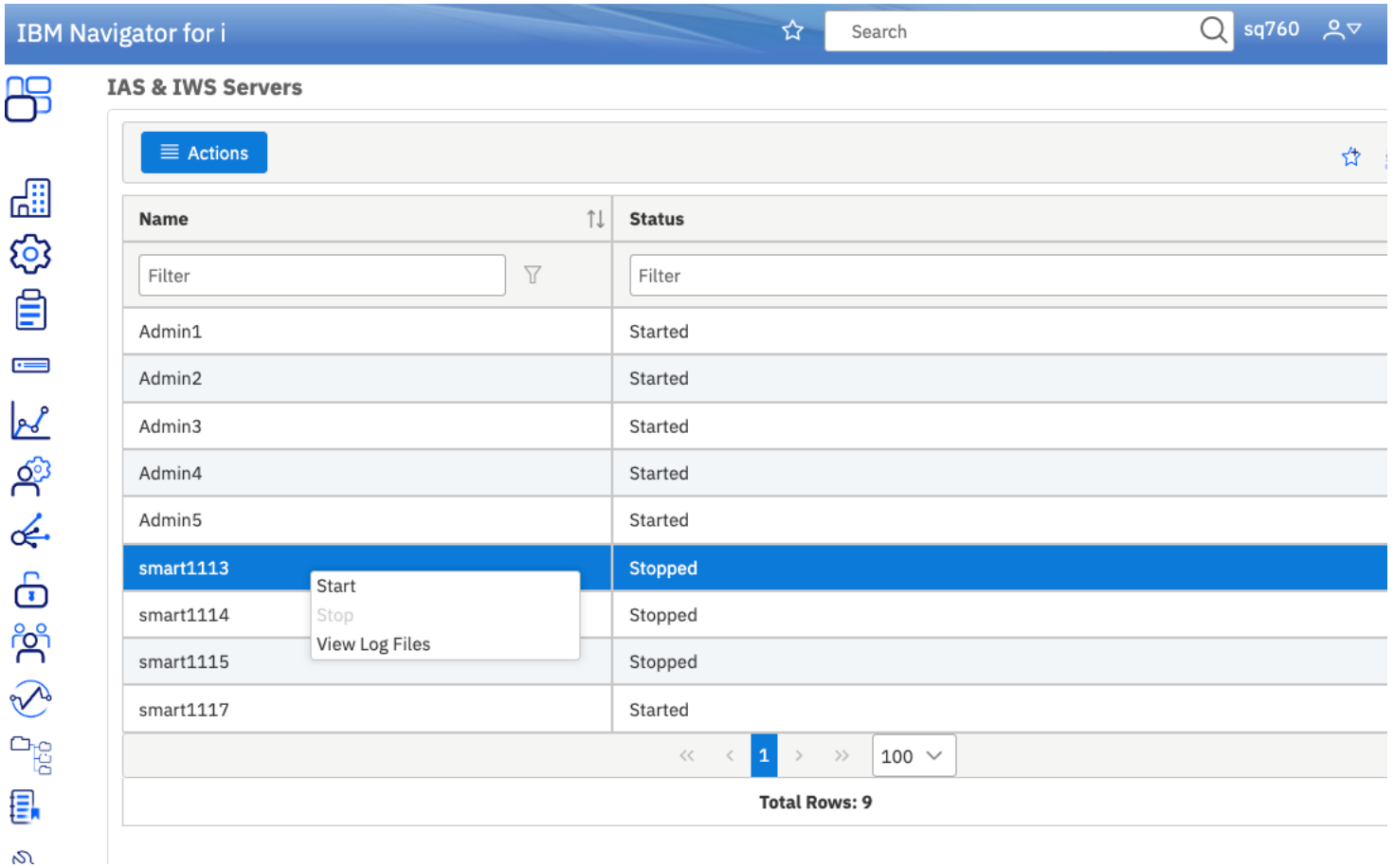
See all the HTTP, IAS, and IWS servers on your system




Manage the servers all from Navigator

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# Updated Angular Infrastructure – Cleaner Look

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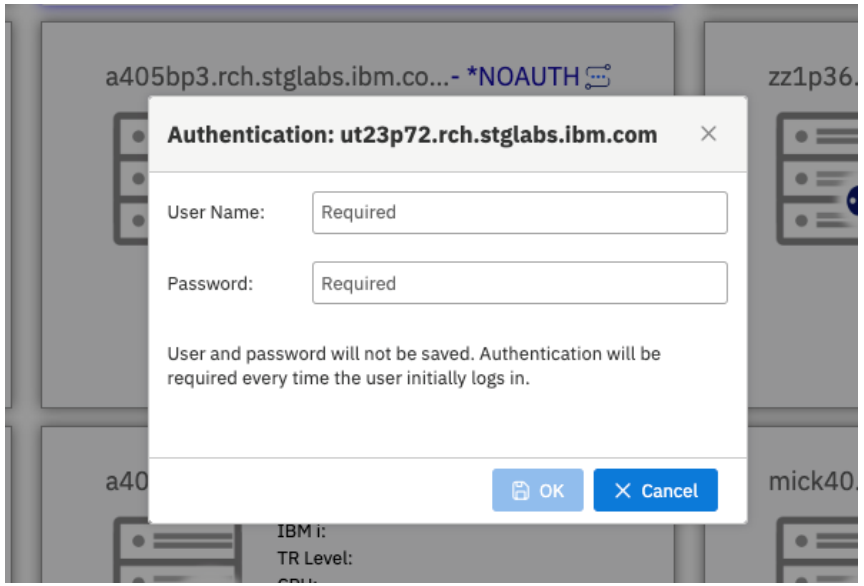
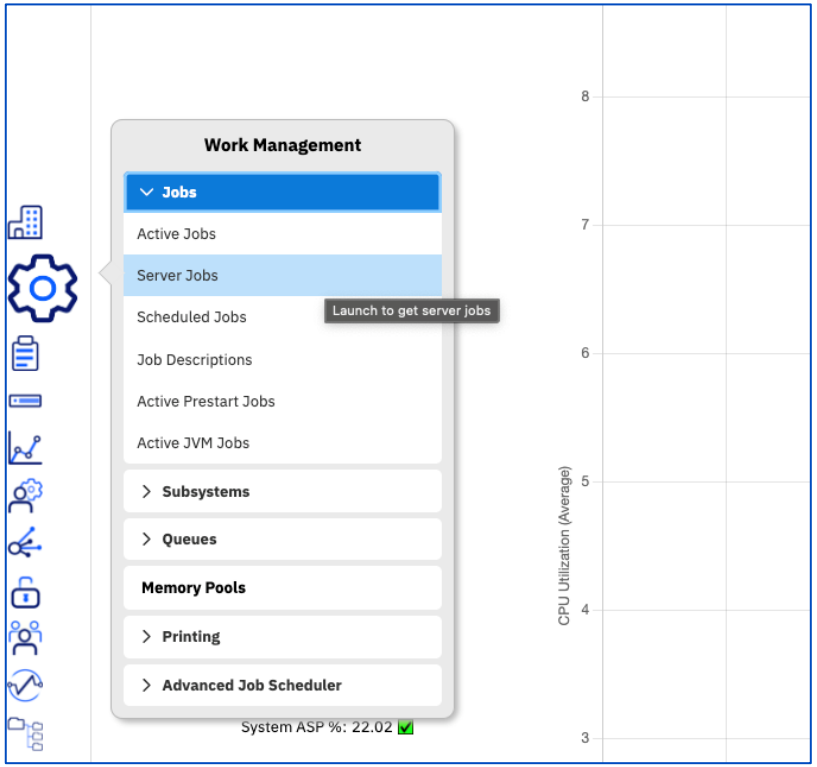



Cleaner prompt for authenticating to an IBM i node




Cleaned up left nav menu

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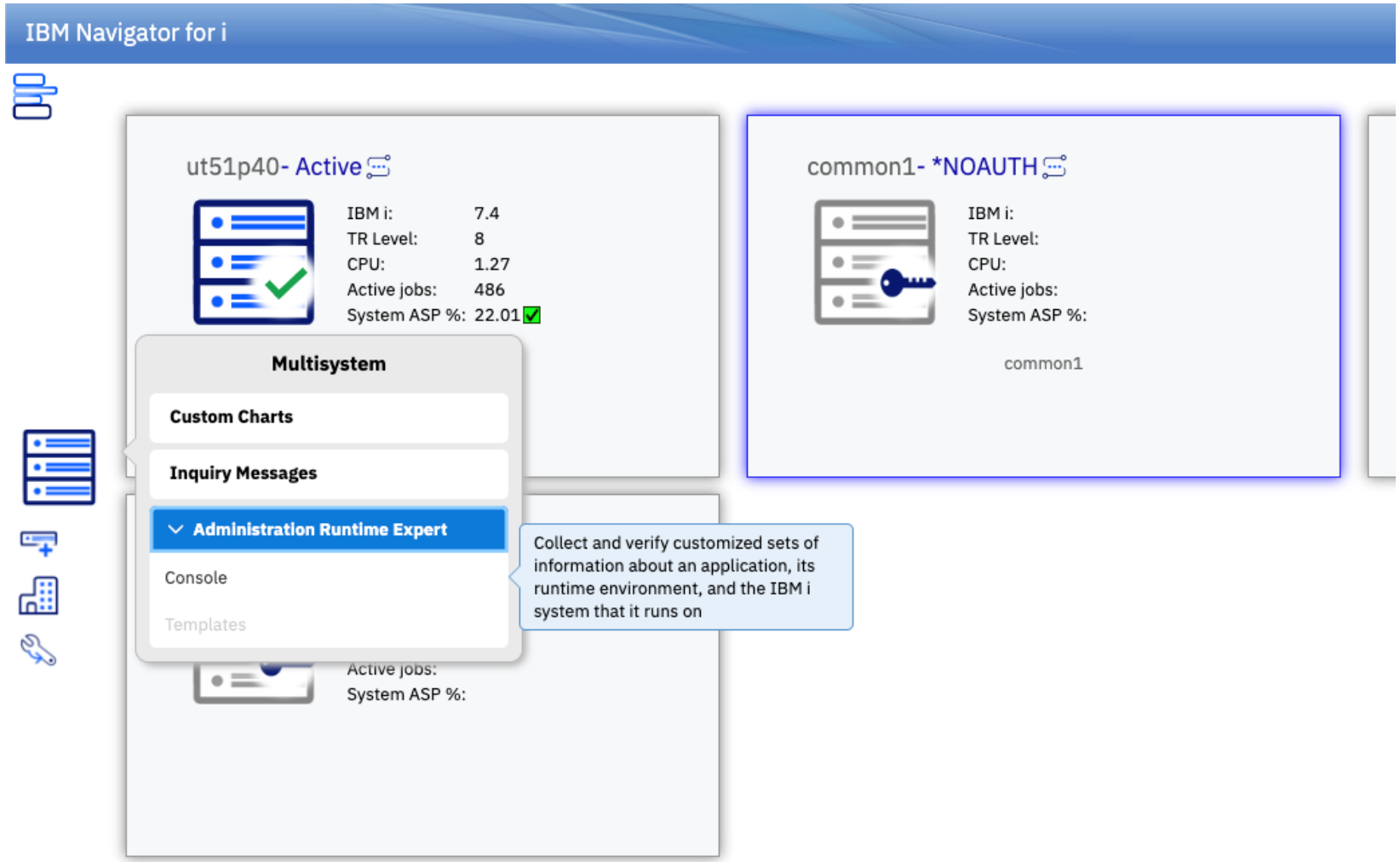
# ARE – Console support built into Navigator

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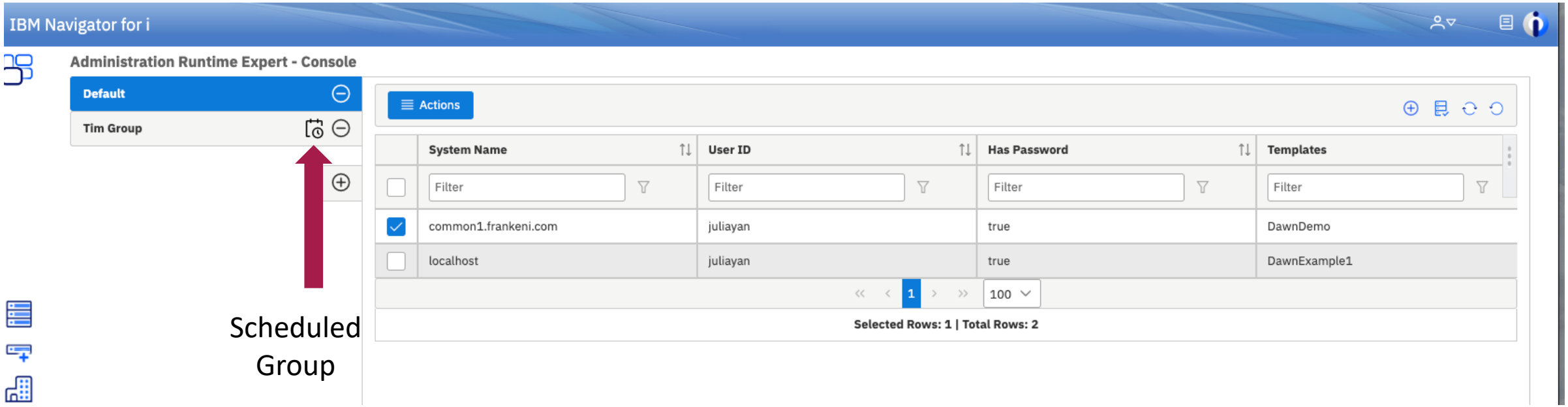
# ARE – Run Template




Add Group of Systems and Templates to Verify

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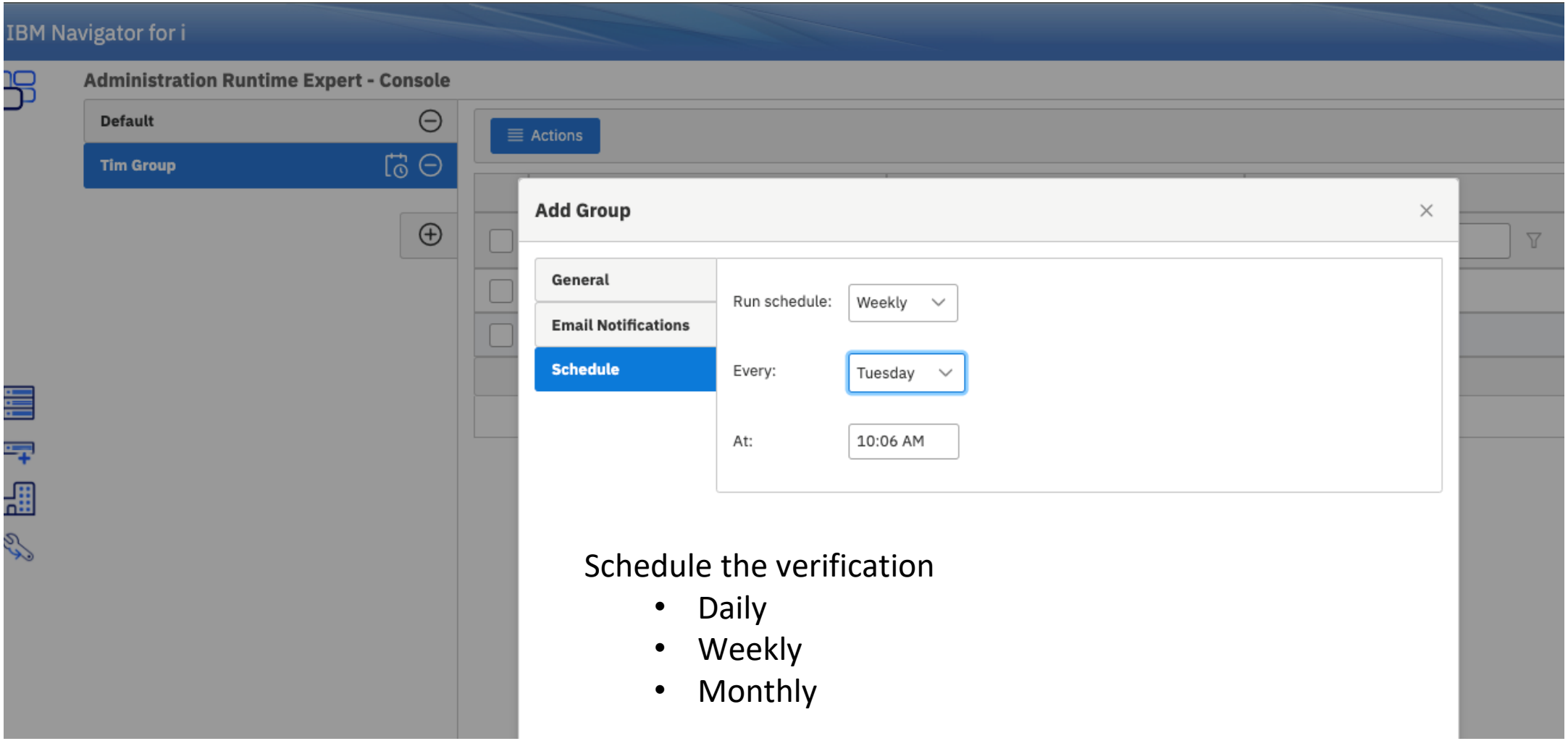
# ARE – Schedule a Verification




Schedule the verification

- Daily
- Weekly
- Monthly

Schedule now tied to Admin1. Restart Admin1 and Scheduled Verifications are resumed

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# ARE – Details and Fix Actions

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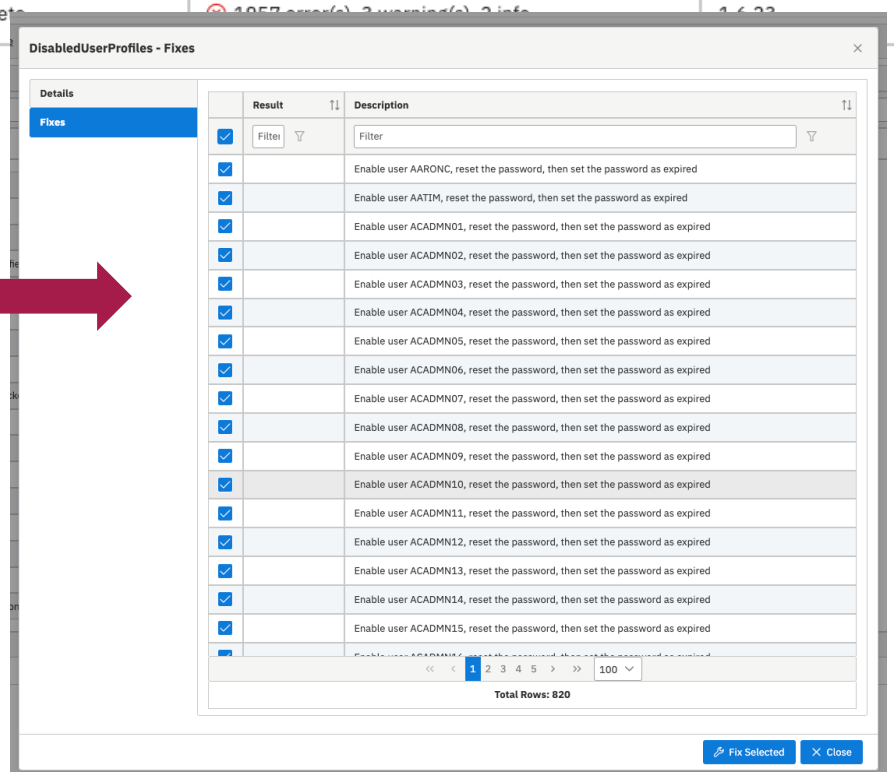
IBM Navigator for i

**Administration Runtime Expert - Verify Systems**

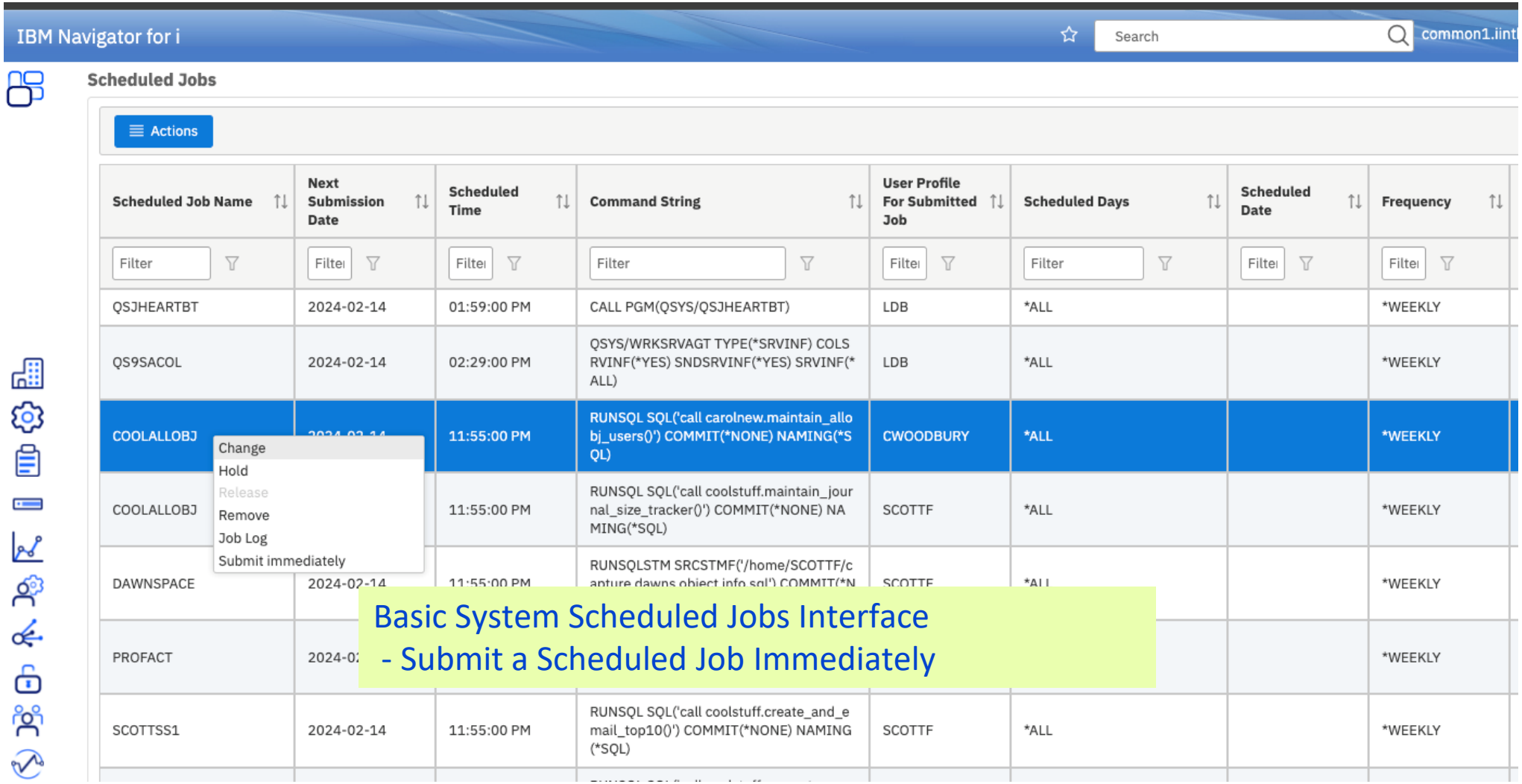
Actions | Console > Verify Systems

| System Name | User ID | Templates | Status | Result | Core Version |
|---|---|---|---|---|---|
| common1.frankeni.com | JULIAYAN | DawnDemo | Complete | 1957 error(s), 3 warning(s), 3 info | 1.6.23 |

| Plugin Name | Attributes Verified | Errors | Warnings | Info | Action |
|---|---|---|---|---|---|
| Authority Verifier | 2466 | 76 | 0 | 0 | Fixes |
| Command Verifier | 16 | 1 | 0 | 0 | Details |
| Configuration Attribute Verifier | 31 | 4 | 0 | 0 | Details |
| DisabledUserProfiles | 0 | 1640 | 0 | 0 | Fixes |
| File Attribute Verifier | 1495 | 207 | 0 | 0 | Details |
| FirmwareStatus | 0 | 0 | 0 | 0 | |
| NetServerFileShares | 0 | 1 | 0 | 0 | Details |
| Network Configuration Checker | 0 | 0 | 0 | 0 | |
| Network Verifier | 0 | 0 | 0 | 0 | |
| PTF Verifier | 43 | 11 | 0 | 0 | Fixes |
| Port Verifier | 4 | 0 | 0 | 0 | |
| Product Verifier | 11 | 3 | 0 | 0 | Details |
| SQL Query Verifier | 20 | 5 | 2 | 0 | Details |
| System Value Verifier | 22 | 6 | 1 | 1 | Details |
| User Profile Verifier | 120 | 2 | 0 | 0 | Fixes |
| Verify Collection Services Configuration | 0 | 1 | 0 | 1 | Details |



# Scheduled Jobs – Submit Immediately




Basic System Scheduled Jobs Interface
- Submit a Scheduled Job Immediately

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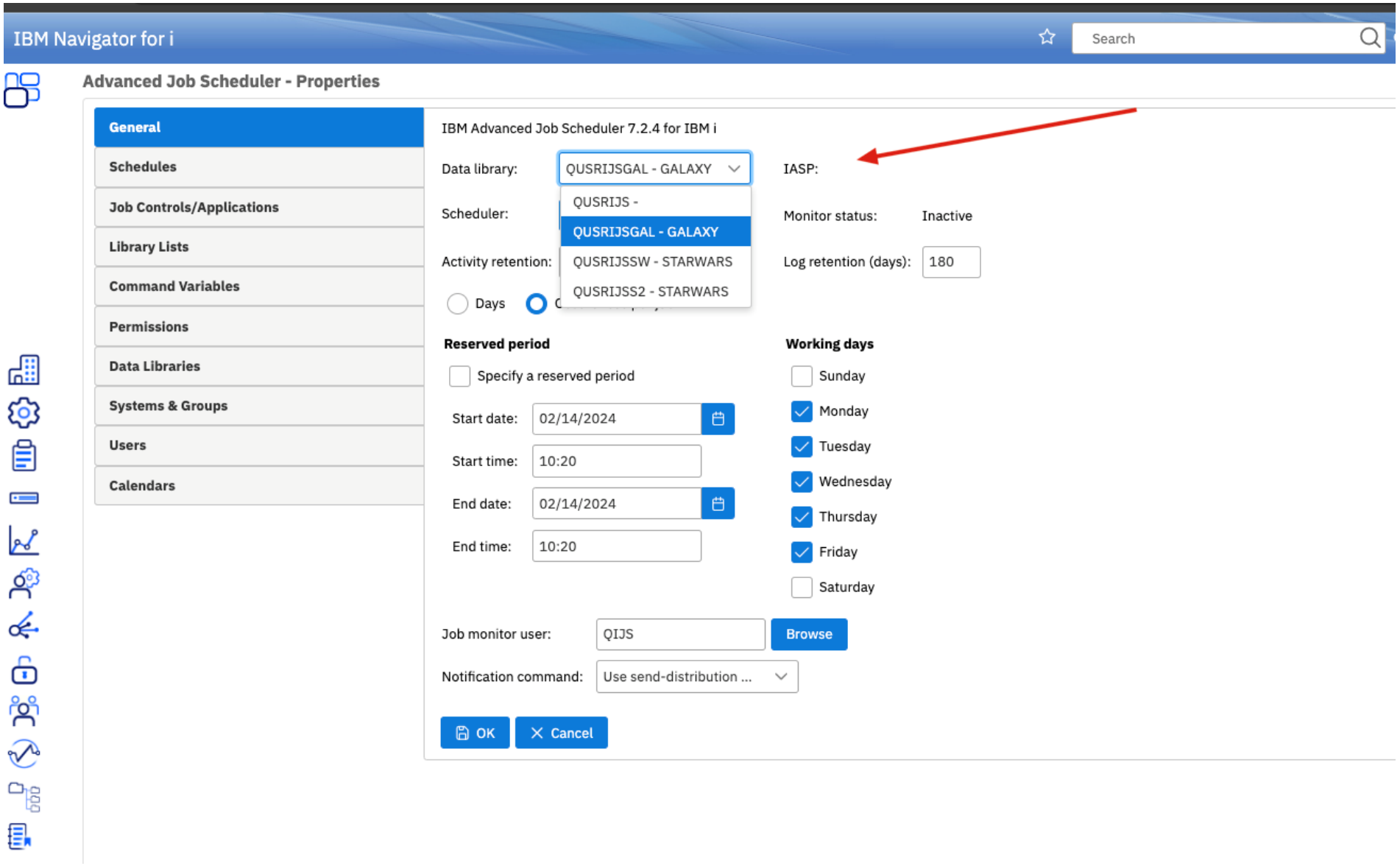
# Advanced Job Scheduler – IASP Support

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# What's New for RPG in Spring 2024

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# New options for SND-MSG

PTFs for 7.4 and 7.5
- Spring 2024

New message types for SND-MSG

- *COMP - New
- *DIAG - New
- *ESCAPE
- *INFO
- *NOTIFY - New
- *STATUS - New

```
snd-msg *comp 'Order processed successfully';
```

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# New options for SND-MSG

PTFs for 7.4 and 7.5
- Spring 2024

New targets for SND-MSG

- *CALLER
- *CTLBDY - New, send to the activation group boundary
- *EXT - New, send to the external message queue
- *SELF
- *PGMBDY - New, send to the program boundary

Send a message to the caller of the current program:

```
snd-msg *escape order_num + ' not found'
        %target(*pgmbdy : 1);
```

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# New options for SND-MSG

PTFs for 7.4 and 7.5
- Spring 2024

A *STATUS message sent to *EXT displays at the bottom of the interactive screen.

```
for i = 1 to num;
   ...
   if %rem(i : 10) = 0; // Show a message after every 10
      snd-msg *status %char(i) + ' of ' + %char(num) + ' complete'
              %target(*ext);
   endif;
endfor;
```

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# Constant standalone fields and data structures

PTFs for 7.4 and 7.5
- Spring 2024

The CONST keyword is supported for variables

A constant field cannot be modified by the program after it is initialized

For data structures, it is only supported for the entire data structure

- An individual subfield cannot be defined as constant

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# Constant standalone fields and data structures

PTFs for 7.4 and 7.5
- Spring 2024

The "usrprf" subfield of the "defaults" data structure is initialized to the current user profile
It cannot be changed any further by any RPG statements

```
DCL-DS defaults QUALIFIED CONST;
   usrprf CHAR(10) INZ(*USER);
   branch VARCHAR(50) INZ('Main');
END-DS;
```

The "startTimestamp" field is initialized to the current timestamp when the procedure starts.
It cannot be changed any further by any RPG statements

```
DCL-S startTimestamp TIMESTAMP INZ(*SYS) CONST;
```

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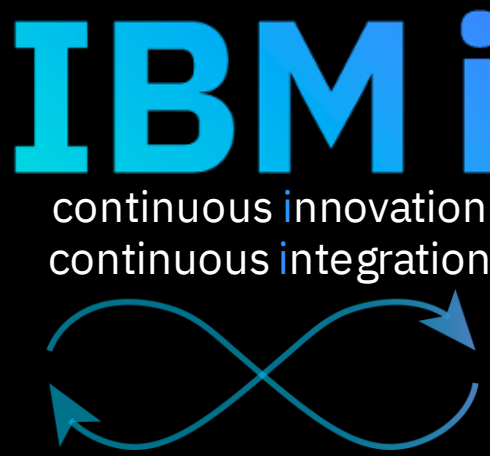
# PowerHA enhancements

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# PowerHA SystemMirror IBM i announced 04/11/23

| Client Value | Capability being delivered. | Unique value |
|---|---|---|
| Non disruptive hardware upgrades and off-line backups when using multi-target Geographic Mirroring | Multi-target Geographic Mirroring on prem, hybrid, or cloud to cloud, up to 6 nodes for **PowerHA 7.5** | Example; customer can migrate to new pods in PowerVS non-disruptively, customer can detach a copy for off-line backup operations |
| Continuous availability of production data during resynchronization of a failed node | While one node is being synchronized the other nodes remain active in the HA/DR replication process | Maintain HA/DR cluster after a hard crash of one of the nodes in a multi-target Geographic Mirroring cluster |
| Non disruptive geographic mirroring configuration changes | Capability to change from synchronous mode to asynchronous mode without impacting the production workload | Continuous operations during a change in replication mode |
| Enable access to data on secondary nodes for diagnostics or for save operations | Enable detach of secondary volumes when network replication is suspended | Customer can access data on a secondary node whether network is down planned or unplanned |
| Simplified access to cluster health status detail via the new Graphical UI | UI will present diagnostic information without the user having to perform multiple steps | Integrated, simple health monitoring and information presentation via a modern graphical user interface |

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# PowerHA SystemMirror IBM i 4.12.2 & 5.6.2 announce 05/07/24

| Client Value | Capability being delivered. | Unique value |
|---|---|---|
| PowerHA automatically detects asynchronous policy-based enabling the use of the same configuration and management commands. | PowerHA IBM i support for IBM FlashSystem asynchronous policy-based Replication | Automation |
| Ease of use enhancement requested by customers | Synchronization of resources when changes occur with adopted authority | Automation |
| Expands admin domain eliminating manual synchronization processes | Admin Domain synchronization of SNMPv3 attributes on printer device descriptions, including the SNMP username (SNMPUSR) and SNMP context name (SNMPCNTX) attributes | Automation |
| Eliminates a previously manual operations | Add multiple user profiles based on selection criteria, simplifies the ability to omit IBM profiles | Automation |
| Expanded cluster  health monitoring | Additional SQL for retrieving PowerHA information programmatically including the ability to retrieve HyperSwap status | Ease of monitoring |

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# PowerHA SystemMirror IBM i 4.12.2 UI announce 05/07/24 continued

| Client Value | Capability being delivered. | Unique value |
|---|---|---|
| Up and coming IT administrators will likely be using the UI verse CL | Cluster management via PowerHA GUI | Single pane of glass for PowerHA cluster monitoring and management |
| | Start and end cluster nodes | |
| | Administrative domain management, including:<br>• Start and end administrative domains<br>• Add and remove monitored resources | |
| | Manage switchable environments<br>• Start and end cluster resource groups<br>• Perform administrative switchovers and failovers<br>• Manage replication sessions with the ability to suspend, resume, detach, and reattach replication | |

IBM PowerHA SystemMirror for i

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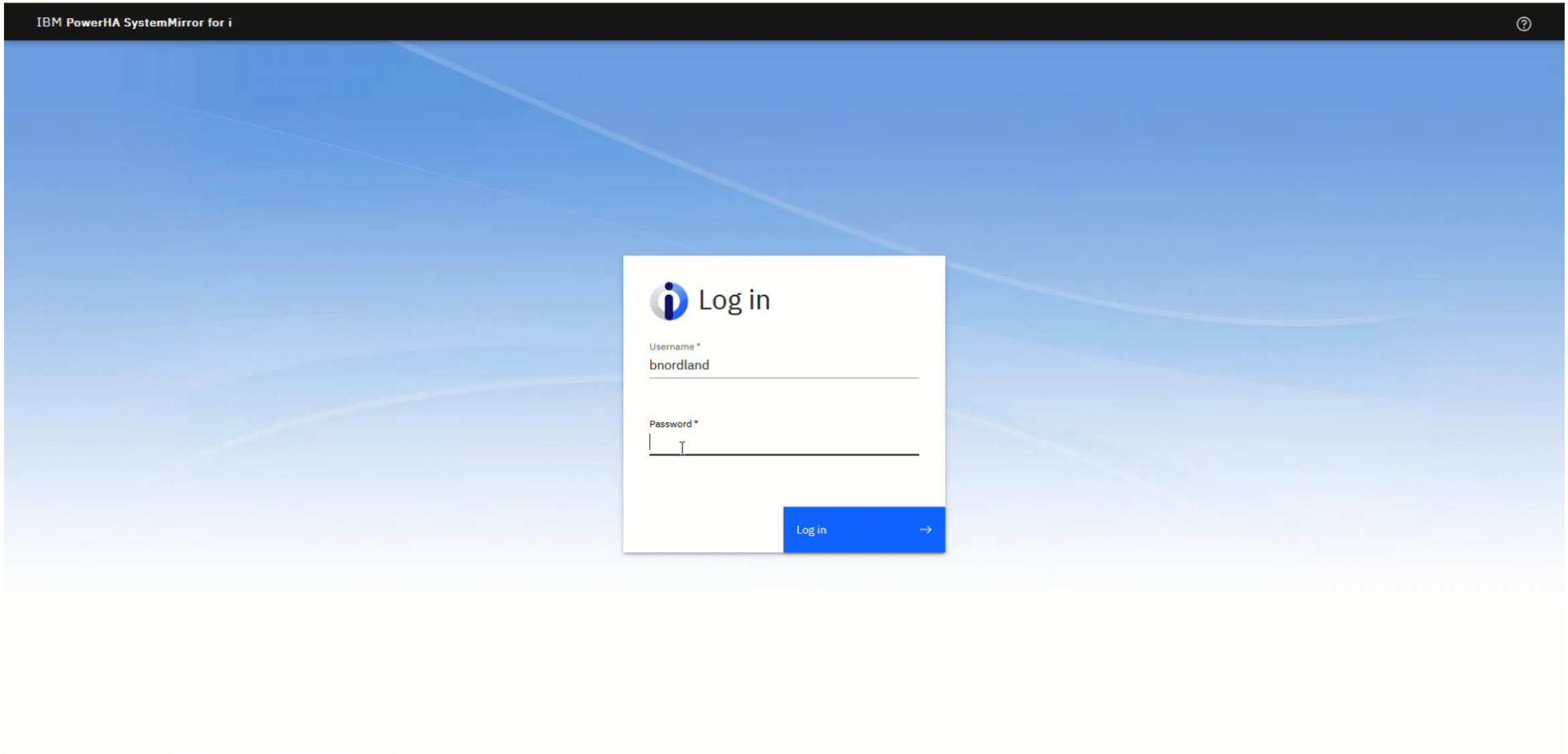
# A quick look at the PowerHA for IBM i  UI




https://www.youtube.com/watch?v=liH1LEXCIfs

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# PowerHA Modern Web Interface

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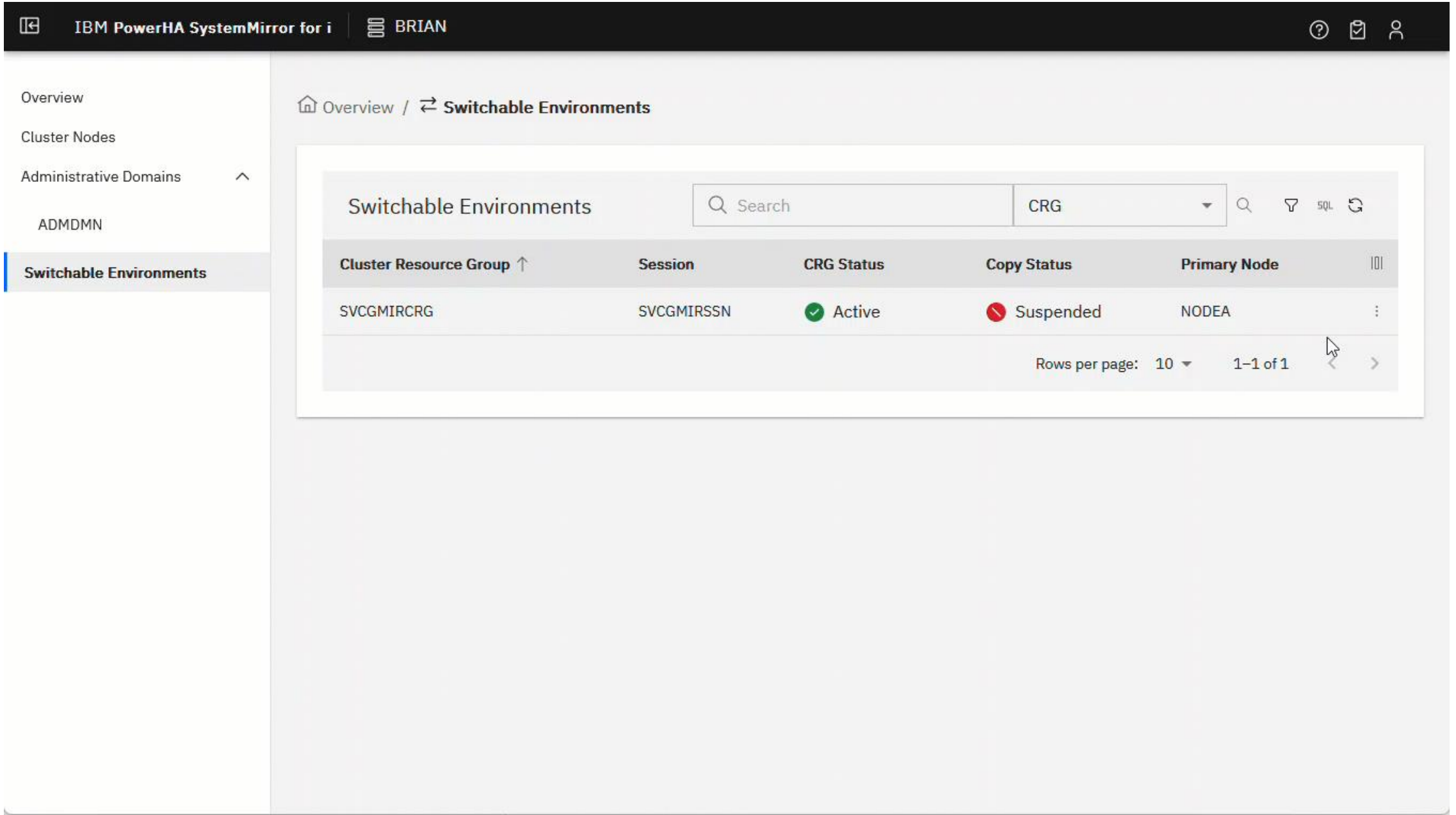
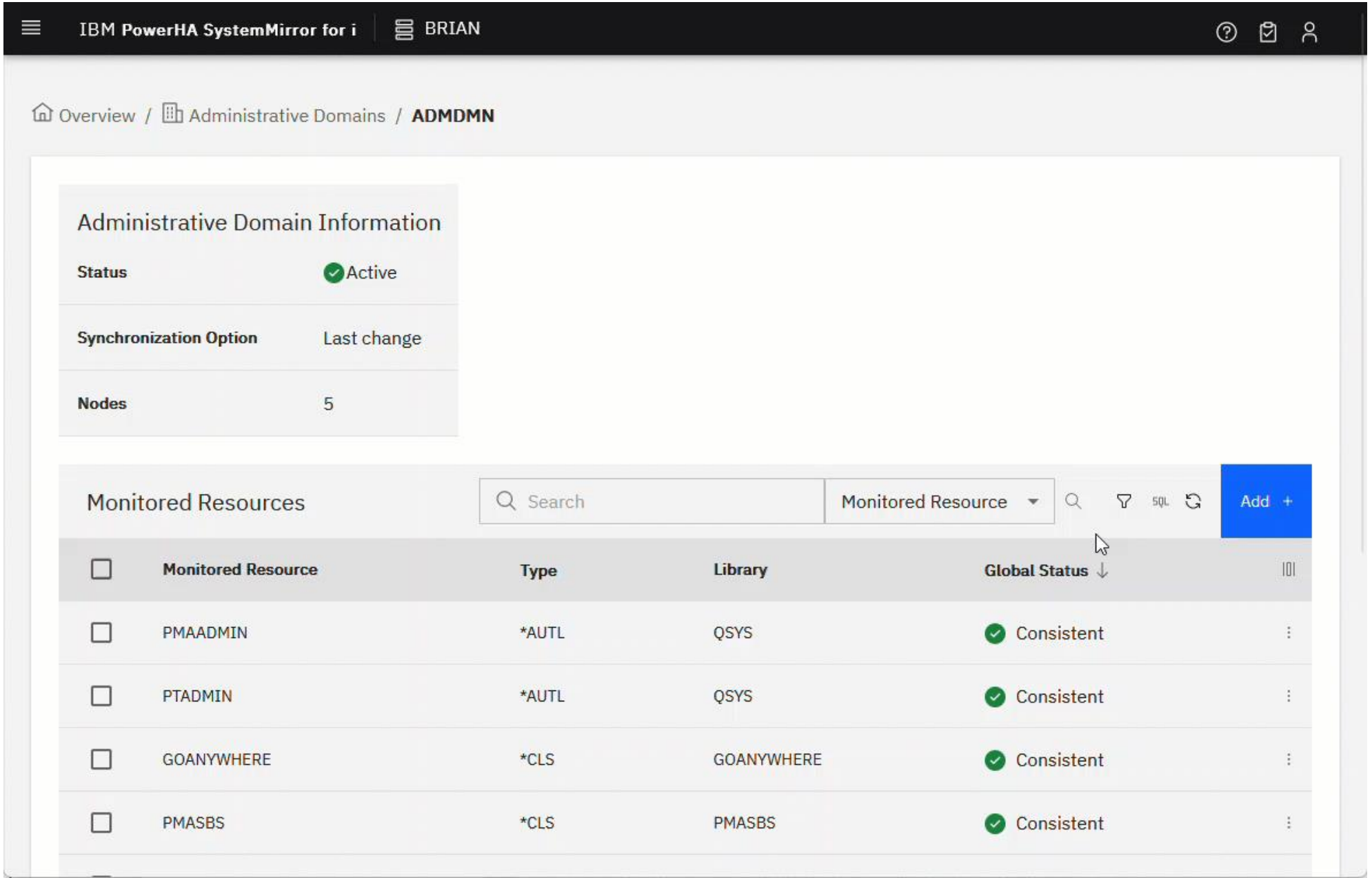
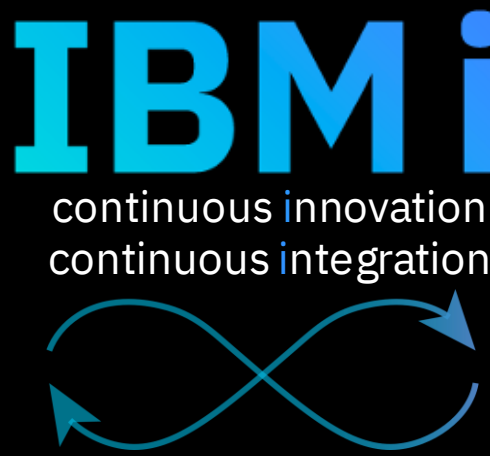


# PowerHA SQL Services





# BRMS enhancements

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BRMS Subscription Term [Announcement 1/09/2024](#) ; GA 1/26/2024

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| | Non-expiring | Subscription Term |
|---|---|---|
| Backup, Recovery and Media Services (BRMS) | 5770-BR1<br>BRMS SWMA is covered under IBM i group SWMA<br><br>Per server, price based on tier<br><br>Base feature required; Advanced & Network features optional<br><br>**Price:**<br>0812 P05 OTC base - $1,060<br>0813 P10 OTC base - $2,120<br>0815 P20 OTC base - $6,360<br>0818 P30 OTC base - $12,720<br><br>0861 P05 Advanced - $382<br>0862 P10 Advanced - $763<br>0863 P20 Advanced - $2,290<br>0864 P30 Advanced - $4,579<br><br>0898 Network feature - $954/system | 5770-BR2<br>License & SWMA combined<br><br>Per core: One price regardless of tier<br><br>90 day or 1/2/3/4/5-year terms<br><br>Consolidate Base & Advanced & Network features – all are provided on one order<br><br>**Price:**<br>Price/core: $400/core/year<br>(in addition, buying one-year term has 15% premium)<br><br>IBM i 7.4 or 7.5 |

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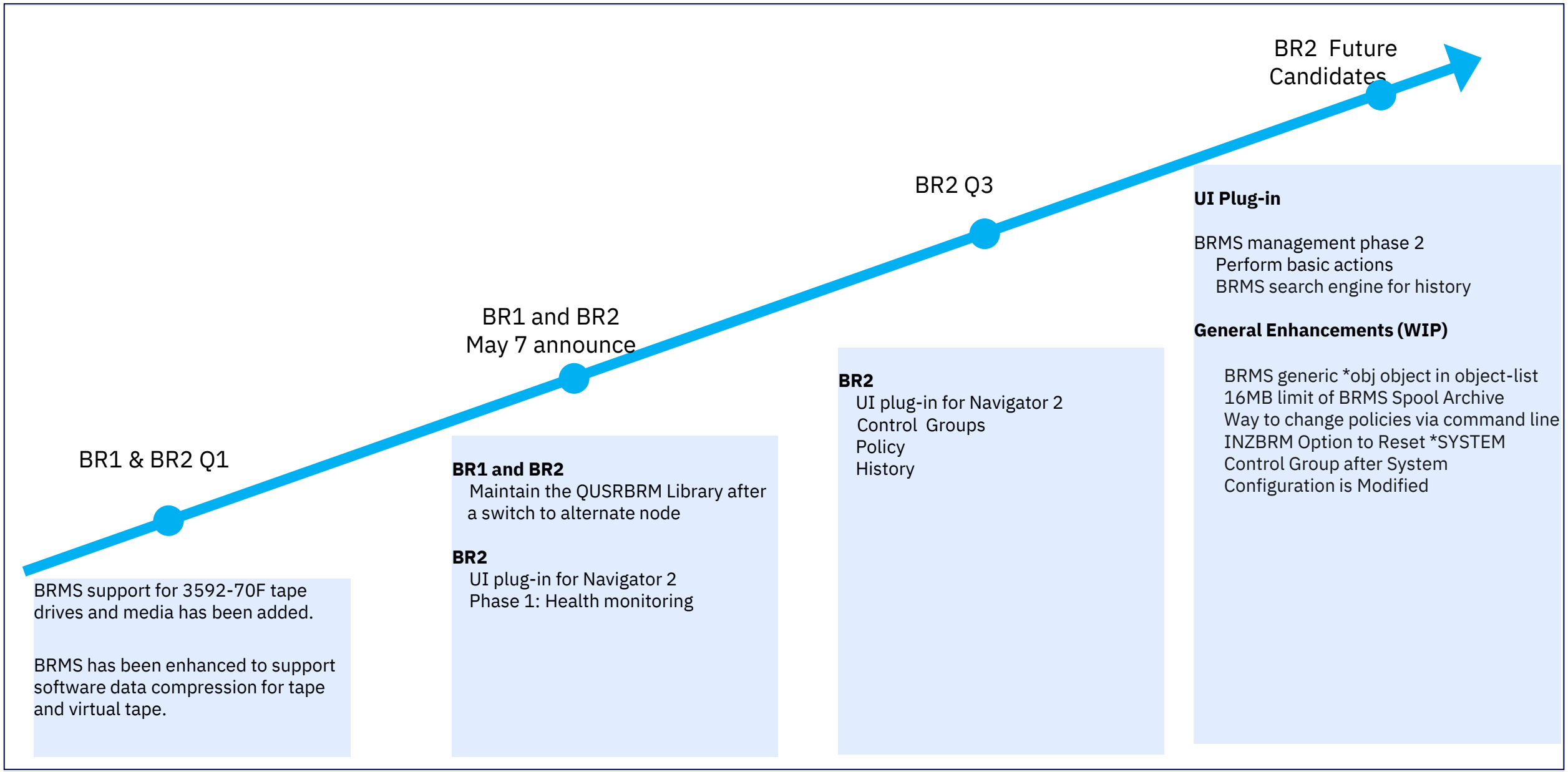
# BRMS Roadmap

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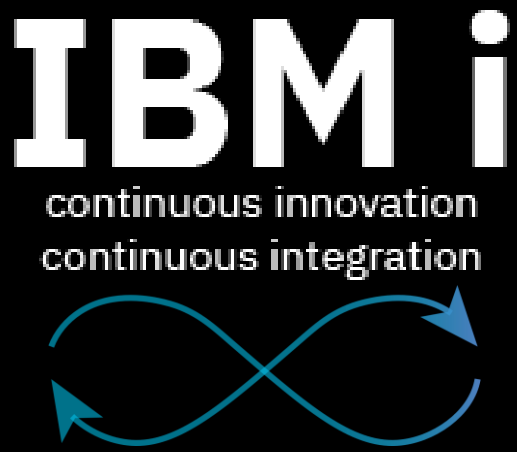
# IBM Power S1012 (9028-21B)
# &
# New eBMC ASMI Functions

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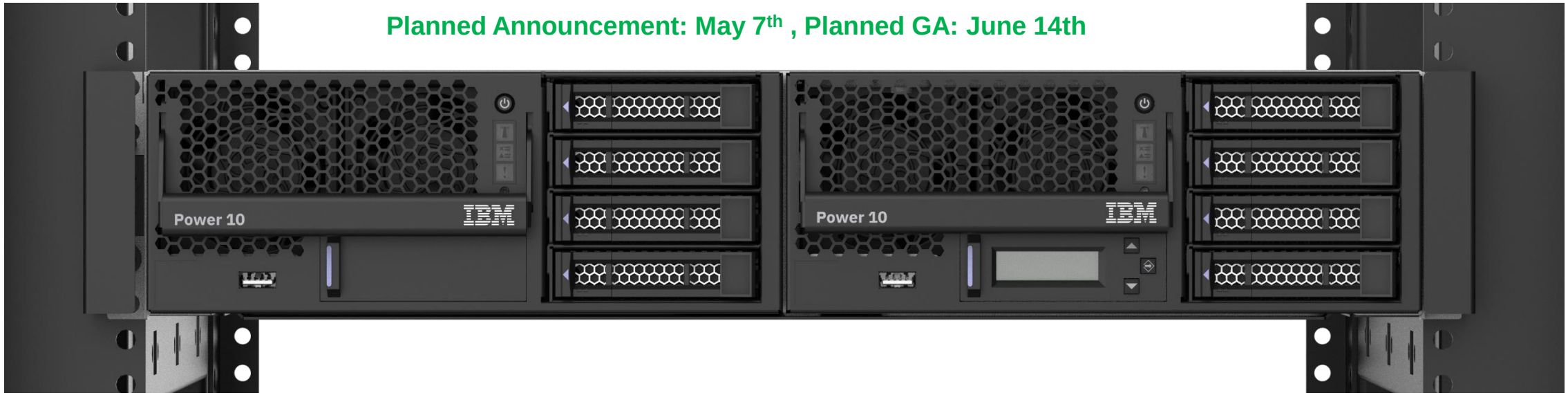
# New IBM Power S1012 System

- New base system design to explore an alternate approach toward both existing and new use cases.
- It is a one-socket, 2U height, half-rack width, equipped with a 1, 4, or 8-core eSCM module, up to 256GB of memory, up to 6.4TB internal storage, 4 PCIe slots, and optional RDX.
- It is offered in two form factors:
  - A rack-mounted option utilizing a bare-metal sliding drawer.
  - A deskside-mounted option that is 54% smaller than S1014.
- 3-year warranty systems with available value-added support services through Power Expert Care offerings.
- Dual system density enables advanced remote management and/or HA capabilities

**Planned Announcement: May 7th , Planned GA: June 14th**

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# Delivering Cloud-to-Edge Excellence on Scale-Out Systems

## Edge Computing

- Up to 8 cores and 256 GB memory footprints
- Reduced IT footprint
- Fully active, static servers

## Mainstream Computing

- Up to 16 cores and 2TB memory footprints
- Up to 32% perf/price increase vs. P9
- Fully active, static servers
- Lower technical requirements and competitive deals

## Core Computing

- Up to 48 cores and 8TB memory footprints
- Up to 1.4x system performance vs. P9
- Dynamic Capacity consumption with CUoD and PEP2.0
- Value-driven solutions and higher technical standards

## Cloud Computing

- Unlimited cores and memory
- Dynamic Capacity
- Computing aaS

### S1012

9028-21B

- 1-socket, 2U, half-wide
- Up to 8 cores per system
- 1, 4, 8 SMT8 cores/socket
- 4 ISDIMM slots
- 256 GB memory
- 4 PCIe HHHL slots (All Gen5)
- 4 NVMe U.2 bays
- Max of 6.4 TB of internal storage
- Optional Internal RDX Media Bay
- Rack and Tower form factors

### S1014

9105-41B

- 1-socket, 4U
- Up to 24 cores per system
- 4, 8, 24 SMT8 cores/socket
- 8 DDIMM slots
- 1 TB memory
- 5 PCIe FHHL slots (4 Gen5)
- 16 NVMe U.2 bays
- Max of 102.4 TB of internal storage
- Optional Internal RDX Media Bay
- Rack and Tower form factors

### S1022s

9105-22B

- 1,2-socket, 2U
- Up to 16 cores per system
- 4, 8 SMT8 cores/socket
- 16 DDIMM slots
- 2 TB memory
- 10 PCIe HHHL slots (8 Gen5)
- 8 NVMe U.2 bays
- Max of 51.2 TB of internal storage

### S1022 & L1022

9105-22A / 9786-22H

- 1,2-socket, 2U
- Up to 40 cores per system
- 12, 16, 20 SMT8 cores/socket
- 32 DDIMM slots
- 4 TB memory
- 10 PCIe HHHL slots (8 Gen5)
- 8 NVMe U.2 bays
- Max of 51.2 TB of internal storage
- L1022: max 25% of cores with other OS

### S1024 & L1024

9105-42A / 9786-42H

- 1,2-socket, 4U
- Up to 48 cores per system
- 12, 16, 24 SMT8 cores/socket
- 32 DDIMM slots
- 8 TB memory
- 10 PCIe FHHL slots (8 Gen5)
- 16 U.2 NVMe bays
- Max of 102.4 TB of internal storage
- Optional Internal RDX Media Bay
- L1024: max 25% of cores with other OS

### PowerVS

- Delivered aaS off-premise
- Unlimited cores
- Unlimited memory
- Unlimited storage and I/O
- Add-on backup services including VTL

AIX IBM i Linux Red Hat OpenShift

All PowerVM based servers

# IBM Power S1012 1-Pager

- **P10 eSCM Feature**
  - 1x 8 BC (Rack only)
  - 1x 4 BC
  - 1x 1 BC (IBM i only)
  - Max socket power 240W
- **OMI Memory with DDR4 ISDIMMs**
  - 4 OCMB+ 4 ISDIMMs
  - 16GB, 32GB, 64GB, 102 GB/s peak
  - Max 256 GB capacity
- **Internal Storage**
  - 4x NVMe Slots
    - 0.8 TB, 1.6 TB NVMe 15mm U.2
  - Max 18W
  - 6.4 TB capacity max
  - Optional RDX
- **PCIe HHHL Slots**
  - 2 PCIe G5 x8 / G4 x16 direct
  - 2 PCIe G5 x8 direct
- **Form factor**
  - Half-wide 2U rack
  - 26” system depth
  - Includes desk-side
- **Rack Shippable option**

**MTM 9028-21B**
**GA June 2024**

**Rack and Desk-Side**

**No Disk Drawer**
**No support for IO Drawer**

**AIX and VIOS**
- AIX73D+: AIX Version 7.3 with the 7300-01 Technology Level and Service Pack 2 (P10 mode)
- AIX72Z: AIX Version 7.2 with the 7200-05 Technology Level and Service Pack 8 (P9-compat mode)
- VIOS 4.1.0.20
- VIOS 3.1.4.40 (P9 mode)

**IBM i**
- IBM i 7.4 TR10
- IBM i 7.5 TR4

**Linux**
- RHEL 9.2

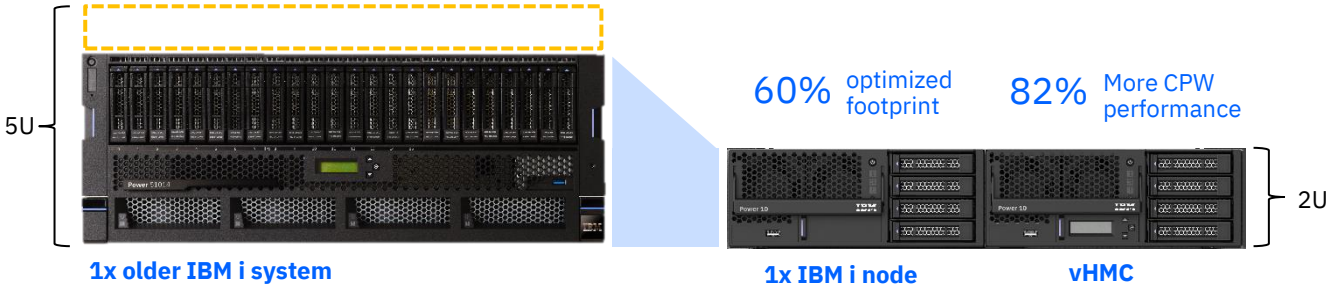
- **OS**
  - IBM i
    - 1 core is native only
    - 4 & 8 core are native or virtual client
  - AIX
  - Linux
- **Hypervisor**
  - PowerVM
- **RAS**
  - Concurrent maintenance on NVMe
  - No concurrent maintenance on PCIe adapters
  - Redundant cooling, concurrent maintenance supported
  - Redundant power, concurrent maintenance supported
    - (1+1) 800W CRPS PS, 110 or 220 VAC
  - Customer setup, install & repair
- **Energy Efficiency**
  - 80+ Titanium Power Supply Compliant
  - EPA Energy Star Compliant
  - Built-in Advanced Thermal & Power Management
- **Enterprise BMC**
  - Op-panel (Base), LCD op-panel (Featured)
  - 1 1GbE, 1 USB/UPS 2.0 (all rear)
- **Host I/O**
  - 2 USB 3.0 (front, internal for RDX)
- **System Management (optional)**
  - HMC/vHMC (not redundant), Novalink, PowerVC (rack only)
- **Certifications**
  - FCC: Class A
  - Acoustics: General Business Category 2E for Desk Side and Data Center Category 1B for Rack
  - Environment: ASHRAE A3
    - 5-40C, 8-85% RH, 3050m max

# Power Footprint Expansion

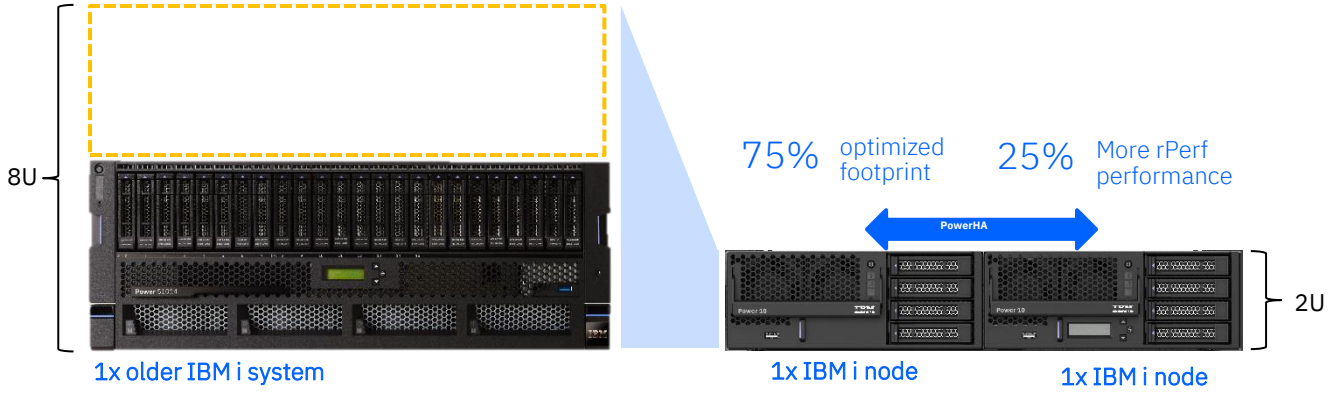
- Tech refresh focused on an architecture best practices approach vs. system unit replacement and maintenance cost
    - The Goal is 1-to-2 Tech Refresh
- Remote Management, HA/Recovery, Single-Node Openshift, WatsonX, and upcoming use cases.
- Cloud-Core-Edge conversation for a comprehensive infrastructure approach.

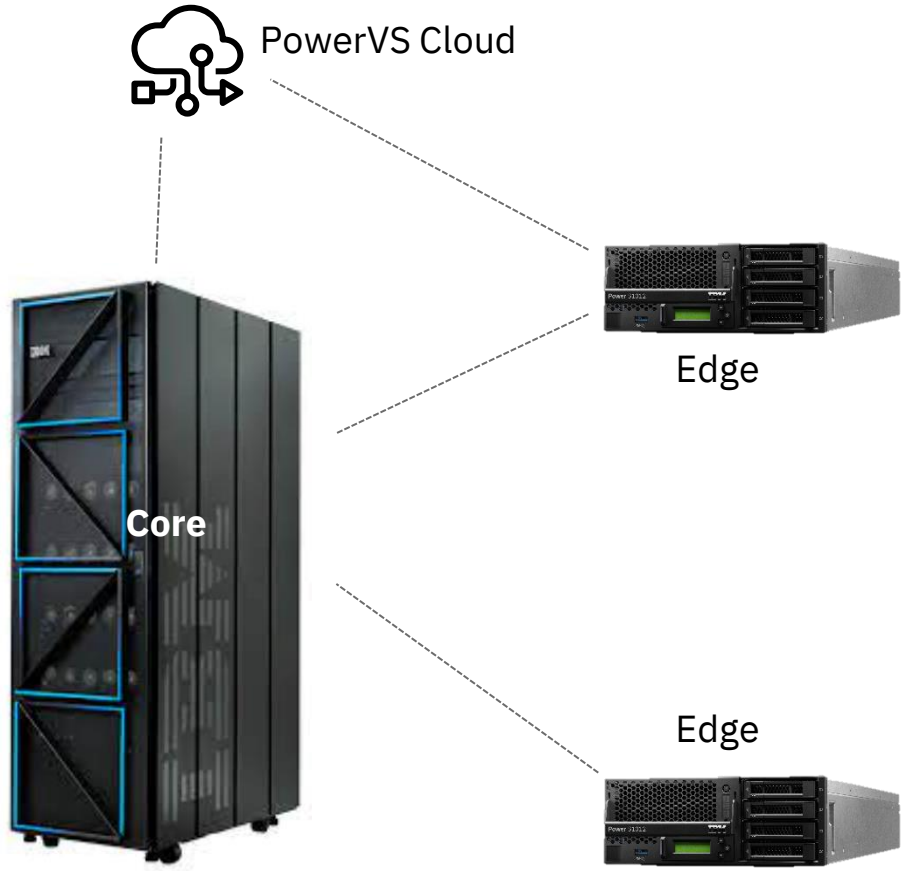
Improve IT management capabilities by attaching vHMC:

- HMC attach rate to 1S4U systems is very single-digit/low 2-digit %




Improved, advanced high availability attaching PowerHA:



# New eBMC ASMI Functions

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1. **Easier set-up**
   - No need to access and use a physical control panel to perform the most common configuration operations
   - Select Alternate restart device
   - Select Load source device
   - Select Console adapter slot
   - No need to access and use a physical control panel to access a Dedicated Service Tools (DST) screen

2. **More “install” and IPL use cases are supported without requiring HMC**
   - FC tape D-mode IPL and install – just tag the adapter
   - Install from a network image
   - Install from iSCSI

3. **Improved remote management for IBM i partitions without HMC**
   - Access DST without pressing buttons on the control panel
   - Initiate a Mainstore Dump
   - Display debug SRCs for error situations

4. **All IBM i supported releases for S1012 can use the new eBMC ASMI functions**
   - No IBM i PTFs are needed for these new functions – just FW1060

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# Contrast – Why Would Customer Still Want HMC?

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**HMC provides same values that are new in eBMC ASMI:**

- Easy configuration
- The additional install and IPL use cases
- Improved remote management

**BUT… HMC also provides:**

- Ability to configure and run multiple partitions, with or without VIOS
- Remote power on of the system
- Shared remote console
- Guidance through concurrent maintenance operations
- Performance metrics
- And more…

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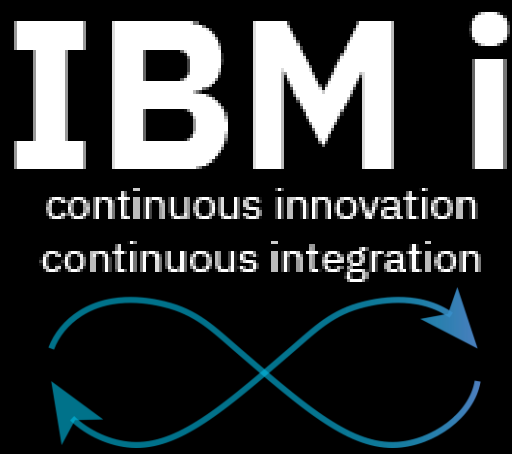
# IBM i Resources

IBM i Team

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# For more information

# IBM Sites:

| | |
|---|---|
| IBM i Home Page | https://www.ibm.com/it-infrastructure/power/os/ibm-i |
| IBM Strategy Whitepaper | https://www.ibm.com/it-infrastructure/us-en/resources/power/i-strategy-roadmap/ |
| IBM Client Success | https://www.ibm.com/it-infrastructure/us-en/resources/power/ibm-i-customer-stories/ |
| Support Life Cycle | https://www.ibm.com/support/lifecycle/ |
| License Topics | https://www-01.ibm.com/support/docview.wss?uid=nas8N1022087 |
| IBM i Release Life Cycle | https://www.ibm.com/support/pages/release-life-cycle |
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# For more information

## Events:

| | |
|---|---|
| IBM i Guided Tours registration | https://ibm.webex.com/webappng/sites/ibm/webinar/webinarSeries/register/b5896475d7f74f5fbbb1f270b42916b9 |
| IBM i Guided Tours 2023 box | https://ibm.box.com/v/IBM-i-Guided-Tours-2023-REPLAY |
| IBM TechXchange Conference | https://www.ibm.com/community/ibm-techxchange-conference/ |
| COMMON North America PowerUP 2024 | https://www.common.org/powerup2024/home |
| COMMON Europe Congress (CEC) 2024 | https://comeur.org/common-europe-congress-2024-2/ |

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# For more information

# Marketplace:

| | |
|---|---|
| Forrester TEI Study | https://www.ibm.com/downloads/cas/1ZLRK39P |
| Steve Will's blog | https://techchannel.com/SMB/you-and-i-blog |
| Forta 2024 Marketplace Survey | https://www.fortra.com/resources/guides/ibm-i-marketplace-survey-results |
| IBM iSee Video Blog | https://learn.common.org/products/ibm-isee-video-blog |

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# For more information:

## Blogs to follow

- TechChannel You and i (Steve Will)
- TechChanneli-Can (Dawn May)
- TechChannel: iTalk with Tuohy
- TechChannel: OpenYour i with Jesse Gorzinski
- IBM Db2 for i (Kent Milligian)
- IBM i Analyitics Blog (Jon Westcott Jr)
- iSee with Scott and Tim

## More to follow

@IBMservers
@COMMONug
@IBMChampions
@IBMSystemsISVs
@LinuxIBMMag
@OpenPOWERorg
@ITJungleNews
@SAPonIBMi
@SiDforIBMi
@IBMAIXeSupp
@IBMAIXdoc

## Hashtags to Use

#IBMPower
#IBMi
#IBMAIX
#Power10
#LinuxonPower
#HANAonPower
#ITinfrastructure
#OpenSource
#HybridCloud

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# IBM i License Topics

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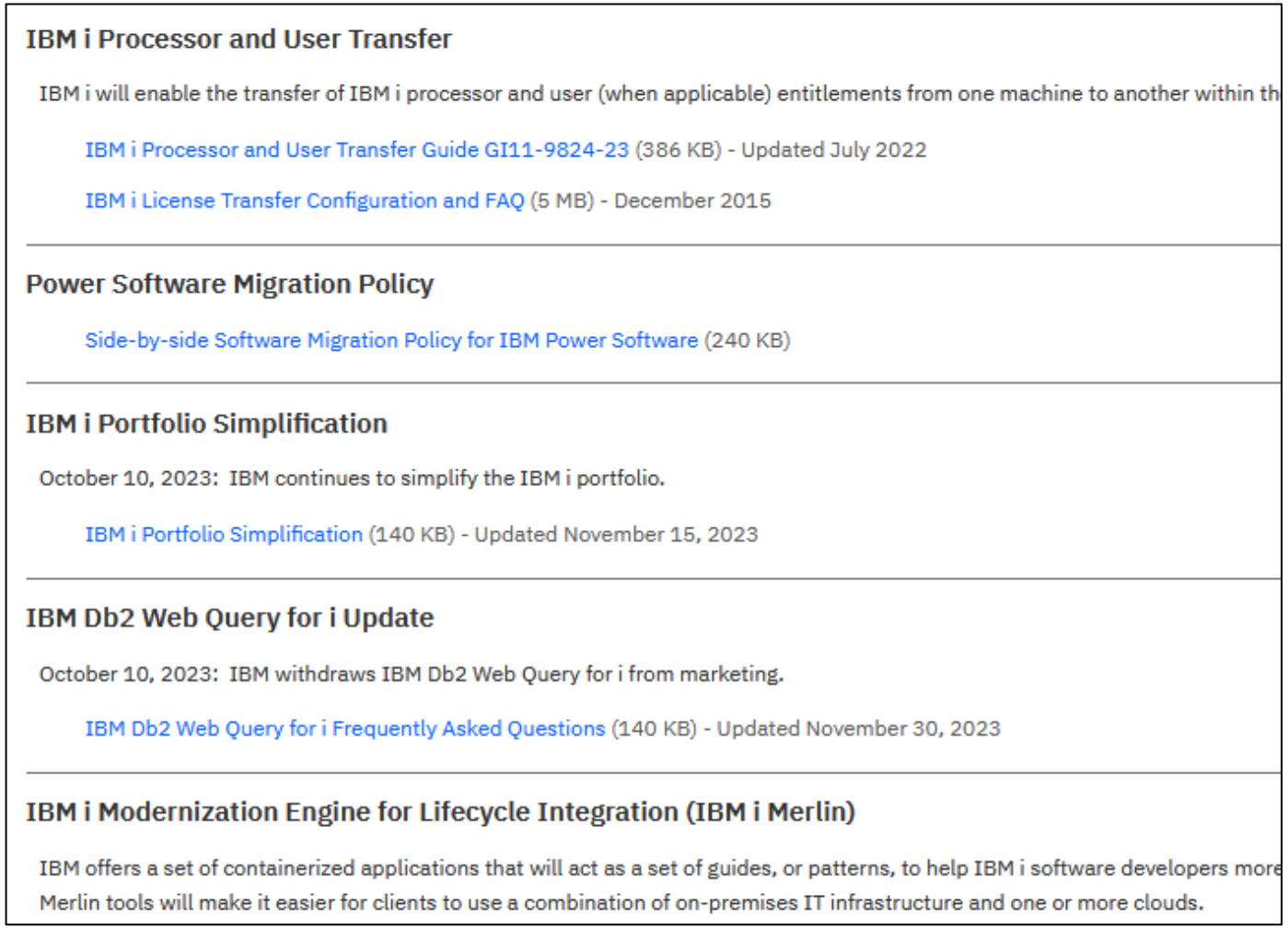
***Check IBM i License Topics first*** for IBM i offering and licensing questions:
https://www.ibm.com/support/pages/ibm-i-license-topics



### IBM i Processor and User Transfer

IBM i will enable the transfer of IBM i processor and user (when applicable) entitlements from one machine to another within th

IBM i Processor and User Transfer Guide GI11-9824-23 (386 KB) - Updated July 2022

IBM i License Transfer Configuration and FAQ (5 MB) - December 2015

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### Power Software Migration Policy

Side-by-side Software Migration Policy for IBM Power Software (240 KB)

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### IBM i Portfolio Simplification

October 10, 2023: IBM continues to simplify the IBM i portfolio.

IBM i Portfolio Simplification (140 KB) - Updated November 15, 2023

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### IBM Db2 Web Query for i Update

October 10, 2023: IBM withdraws IBM Db2 Web Query for i from marketing.

IBM Db2 Web Query for i Frequently Asked Questions (140 KB) - Updated November 30, 2023

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### IBM i Modernization Engine for Lifecycle Integration (IBM i Merlin)

IBM offers a set of containerized applications that will act as a set of guides, or patterns, to help IBM i software developers more
Merlin tools will make it easier for clients to use a combination of on-premises IT infrastructure and one or more clouds.

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