












IBM i 7.4 TR1 and IBM i 7.3 TR7

COMMON Luxembourg
20 February, 2020

Fabian Michel
Client Technical Architect,
IBM Systems



What's on the menu?

<p>IBM i Latest & Greatest</p> <p>The Platform for Innovators by Innovators</p> <p>Alison Butterill</p>		<p>IBM i Hardware and I/O Update</p> <p>Simon Porstendorfer Principal Offering Manager Scale Out Systems</p>		<p>Security Enhancements</p> <p>Tim Mullenbach Business Architect, IBM i Security</p>		<p>IBM Db2 Mirror for i</p> <p>Kris Whitney Senior Architect for Db2 Mirror and Virtualization</p>	
<p>Two more Enhancements to the Base Operating Systems</p> <p>Kris Whitney Senior Architect, IBM i Development</p>		<p>PowerHA for i & BRMS Enhancements</p> <p>Steve Finnes FFINNES@us.ibm.com Power Systems HA/DR Offering Manager</p>		<p>Db2 Web Query Update</p> <p>Doug Mack mackd@us.ibm.com Db2 Web Query Team: QU2@us.ibm.com</p>		<p>Application Development</p> <p>Tim Rowe Business Architect, Application Development and Systems Management timr@us.ibm.com</p>	
<p>Open Source</p> <p>Jesse Gorzinski Business Architect, Open Source</p>		<p>Offering Updates</p> <p>Linda Hirsch lhirsch@us.ibm.com IBM i Product Manager</p>		<p>Miscellaneous Updates</p> <p>Alison Butterill akbutter@us.ibm.com</p>			

IBM i Latest & Greatest

The Platform for Innovators by
Innovators

Alison Butterill



IBM i Release Roadmap

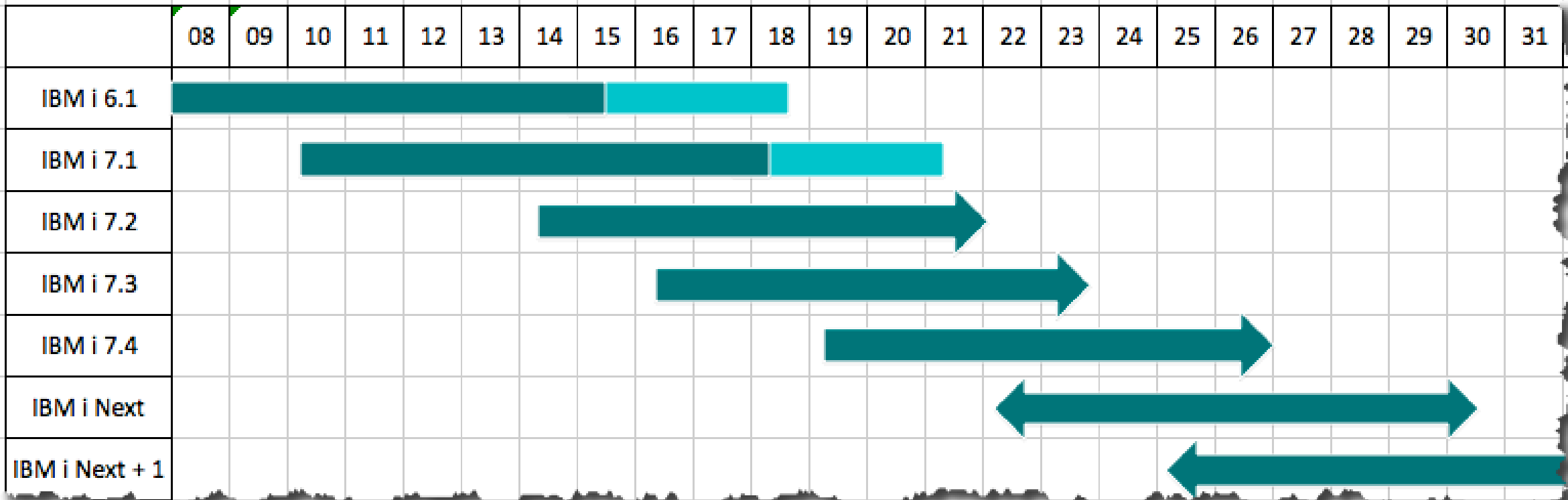


** All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.
** Arrows indicate "ongoing status and do not imply any specific dates."

IBM i 7.4 TR1 and IBM i 7.3 TR7 - Dates

- IBM i Portfolio
 - 7.4 TR1
 - Announcement October 8
 - Generally available November
 - 7.3 TR7
 - Announcement October 8
 - Generally available November

IBM i Support Roadmap



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

IBM i Strategic Directions

- **Power Solutions**

- Enable clients to exploit latest hardware technology (POWER9 and peripherals)
- Enable clients to transform their customer experience using mobile, Internet of Things, cognitive, Machine Learning and AI
- Enable ISV Solutions to implement the latest technologies
- Provide flexible solutions options for cloud and MSPs

- **Open Platform**

- Grow IBM i solutions options including open source languages and applications
- Extend IBM i solutions portfolio with Linux and AIX application choices

- **The *Integrated* Promise of IBM i**

- Deliver a simple, high value platform for business applications
- Provide exceptional security and resiliency for critical business data
- Leverage IBM systems, storage and software technologies

IBM i Hardware and I/O Update

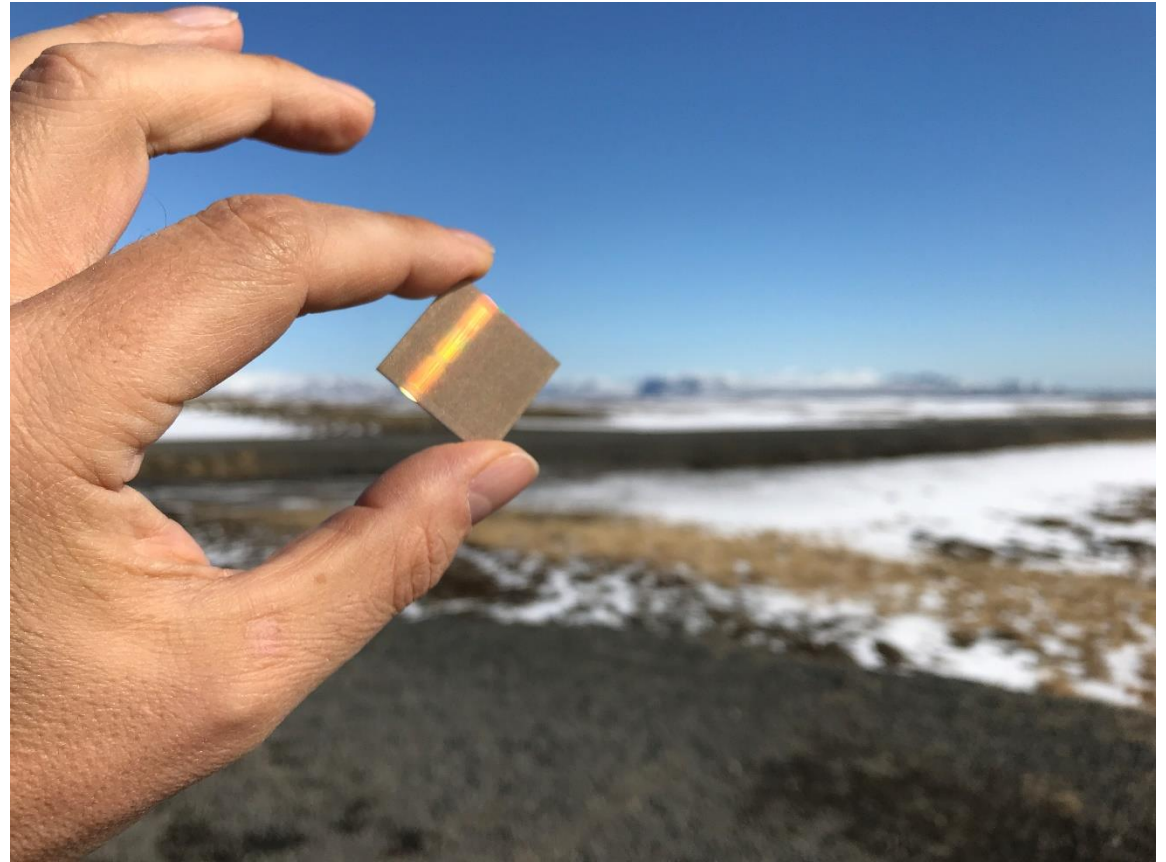
Simon Porstendorfer
Principal Offering Manager
Scale Out Systems



Fresh from the lab ...

New processor offering – **11 core starting** in October for S924 (like MR & HE)

- 11 core in S922 at a later point in time
- Announce: 10/08 GA:10/18
- Best price / performance
- Performance loss 6 - 7%



Smaller footprint for Bigfoot...

- **A new, 24-core processor feature is announced as a lower-priced entry point on the Power E980 server** for clients running IBM i, AIX or Linux.
- Each #EFP0 24-core processor feature provides 4 x 6c POWER9 processor modules running from (typical) 3.58GHz – 3.9GHz (max)
- The new processor feature may be used to configure 1-4 node Power E980 configurations, offering 24, 48, 72 or 96 physical cores per system, with a minimum of 8 cores active. Upgrades are available from POWER8.
- 1- to 2-node Power E980 systems with these new 24-core processor features, with from 8 to 48 cores active, can provide growth and substantial savings over 3-5 years for POWER7 IBM i clients who need to replace their POWER7 Power 770 (MMB/MMC) or 780 (MHB/MHC) systems.
- Similar to other E980 processor options, cores on systems with #EFP0 are P30 tier for IBM i Software licensing & SWMA



Each Power E980 system node with 1 x #EFP0 processor feature offers 4 x 6c POWER9 modules to deliver up to 24 active cores/node.

Announce : August 13th
GA : August 23rd

Performance overview...



40-core (4 x 10c)

Typical Frequency Range	# Nodes	# Cores	CPW
3.7 to 3.9 (max)	4	160	2,439,000
	3	120	1,827,000
	2	80	1,216,000
	1	40	611,300

24-core (4 x 6c)

Typical Frequency Range	# Nodes	# Cores	CPW
3.58 to 3.9 (max)	4	96	1,522,000
	3	72	1,140,000
	2	48	759,000
	1	24	381,000

48-core (4 x 12c)

Typical Frequency Range	# Nodes	# Cores	CPW
3.55 to 3.9 (max)	4	192	2,743,000
	3	144	2,055,600
	2	96	1,368,000
	1	48	687,500

44-core (4 x 11c)

Typical Frequency Range	# Nodes	# Cores	CPW
3.58 to 3.9 (max)	4	176	2,549,000
	3	132	1,910,000
	2	88	1,271,000
	1	44	639,000

32-core (4 x 8c)

Typical Frequency Range	# Nodes	# Cores	CPW
3.9 to 4.0 (max)	4	128	2,030,000
	3	96	1,521,000
	2	64	1,012,000
	1	32	508,900

IBM i – Hardware and I/O Update

Douglas Gibbs

IBM Offering Manager – Power Systems I/O

douglasg@ca.ibm.com

@DouglasGibbsIBM

4Q19 HW Announcements Continued

- New Features
 - PowerVM v3.1.1, HMC & vHMC
 - Enhancements to SRIOV and VNIC
 - **LPM Performance Improvements**
 - **DRAM backed virtual persistent memory**
- Hardware Withdrawals
 - Various 8Gbps Fibre Channel adapters
 - 5273
 - 5729
 - 5735
 - EL2N
 - EL58
 - Older Racks, PDUs and associated cables



4Q19 HW Announcements

- New Features
 - IBM i Support for Direct Attached NVMe devices
 - **New Feature Codes for IBM i specific NVMe**
 - **1.6TB EC6U/EC6V**
 - **3.2TB EC6W/EC6X**
 - **6.4TB EC6Y/EC6Z**
 - New Feature Codes for Enterprise SSDs
 - 387GB ESB9/ESBB
 - 775GB ESBF/ESBH
 - 1.5TB ESBK/ESBM
 - Additional FCs for quantity of 150
 - New PDUs and associated power cords

See NVMe
deck!



Security Enhancements

Tim Mullenbach

Business Architect, IBM i Security



IBM i System Transport Layer Security 1.3

- Elliptic curve Diffie-Hellman key exchange using Curve25519(x25519) and Curve448(x448)
- Online Certificate Status Protocol (OCSP) stapling
- RSASSA-PSS certificate type
- Native IBM i JSSE provider support

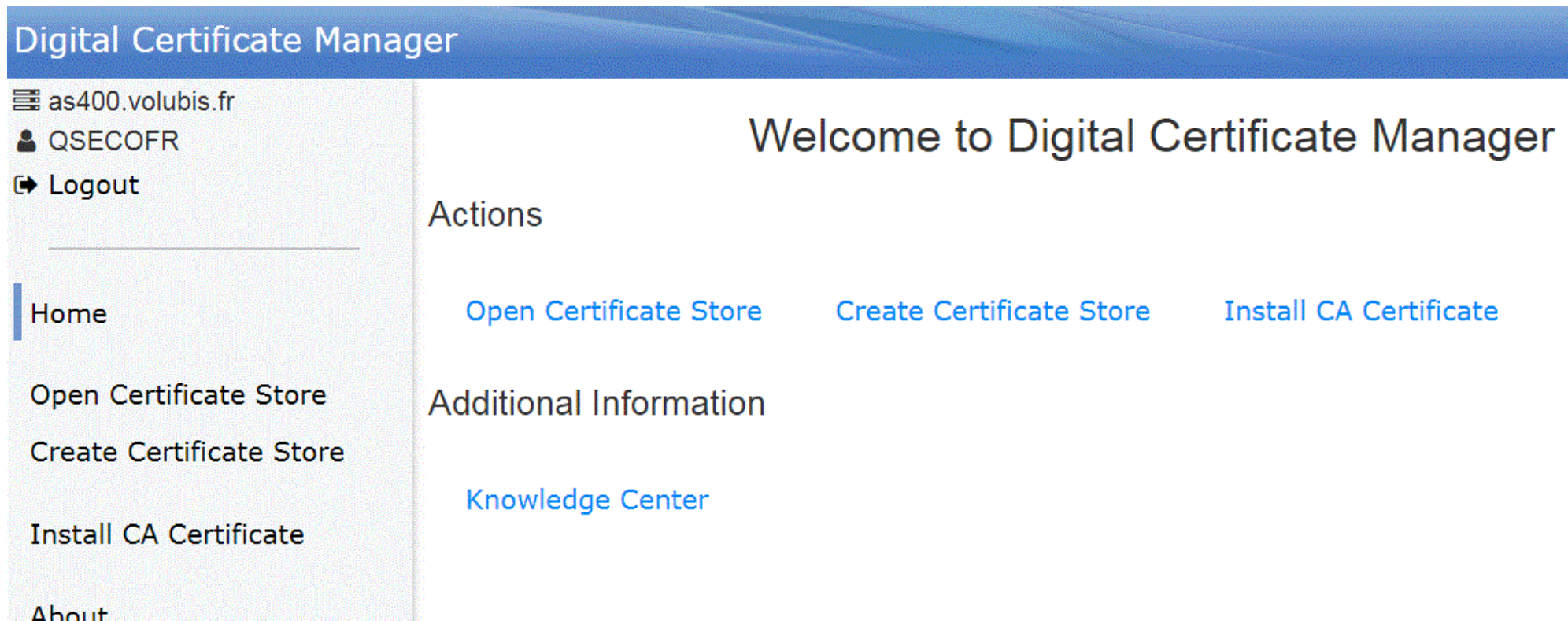


IBM i System Transport Layer Security 1.2

- ChaCha20 Poly1305 cipher suites
 - TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA256
 - TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256
- Elliptic curve Diffie-Hellman key exchange using Curve25519(x25519) and Curve448(x448)
- Online Certificate Status Protocol (OCSP) stapling

Modern Digital Certificate Manager Interface

- View all the certificates in the store, filter and sort them for quick identification
- Visually see certificates that are expiring or already expired
- Work with multiple certificate stores at the same time
- To access this **new GUI**, apply the required PTFs and enter **http://hostname:2001/DCM** from your web browser.
 - Original GUI interface still available



Db2 for i Enhancements

Scott Forstie

Architect, Db2 for i

Db2 PTF Groups
SF99703 and SF99704
November 15, 2019

What's new in Db2 for i?

Managing Change

- Add tables with referential integrity... without an exclusion lock
- Grant and revoke authority to a database file... without an exclusion lock

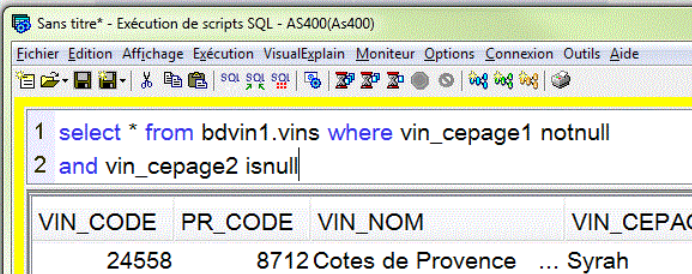
SQL Programming

- New synonyms
- Program name control for SQL routines
- Improved management of External routines
- SQL Precompilers support CCSID 1208 source

Synonyms are added for improved Db2 Family compatibility

Existing Built-in	New Synonym
RAND	RANDOM
RIGHT	STRRIGHT
LEFT	STRLEFT
POWER	POW
CLOB	TO_CLOB
POSSTR	STRPOS
COALESCE	NVL

Existing Predicate	New Synonym
IS NULL	ISNULL
IS NOT NULL	NOTNULL



Sans titre* - Exécution de scripts SQL - AS400(As400)

Fichier Edition Affichage Exécution Visual Explain Moniteur Options Connexion Outils Aide

```
1 select * from bdvin1.vins where vin_cepage1 notnull
2 and vin_cepage2 isnull
```

VIN_CODE	PR_CODE	VIN_NOM	VIN_CEPAC
24558	8712	Cotes de Provence	... Syrah

What's new in Db2 for i?

IBM i Services

- IFS
- Data Queues
- Security
- Objects
- Work Management
- Communications
- Systems Management
- Programs and Service Programs
- And more...

RISK OF *Awesome*
TODAY



IBM Access Client Solutions (ACS)

Scott Forstie

Version 1.1.8.3
November, 2019

Get the Details – WebCasts coming soon

Db2 for i & ACS

When:

Stay Tuned – Coming Soon

What:

Scott Forstie will cover Db2 for i and ACS enhancements, with working examples

www.ibm.com/developerworks/ibmi/techupdates/i73-TR7

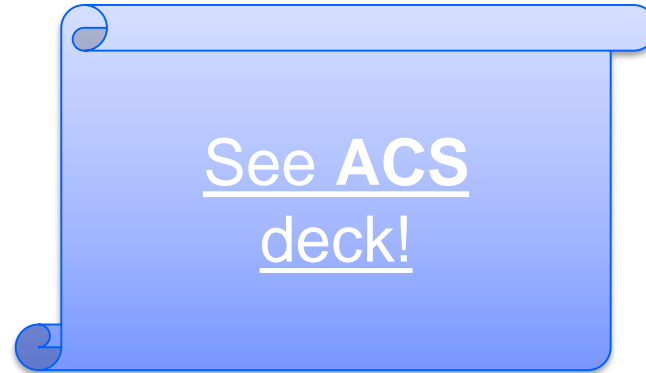
www.ibm.com/developerworks/ibmi/techupdates/i74-TR1



What's new in IBM i Access Client Solutions

Run SQL Scripts

- Smart Prompting
- New Insert from Examples
- Insert from Examples Manager
- More...



IBM Db2 Mirror for i

Kris Whitney

Senior Architect for Db2 Mirror and
Virtualization



S922 Support for Db2 Mirror for i

With IBM i 7.4 TR1 and FW940 you can **assign logical SR-IOV ports to a restricted I/O LPAR**. The S922 requires the restricted I/O attribute



LPM Support for LPM

With IBM i 7.4 TR1 and FW940 you can assign logical SR-IOV ports to a restricted I/O LPAR.

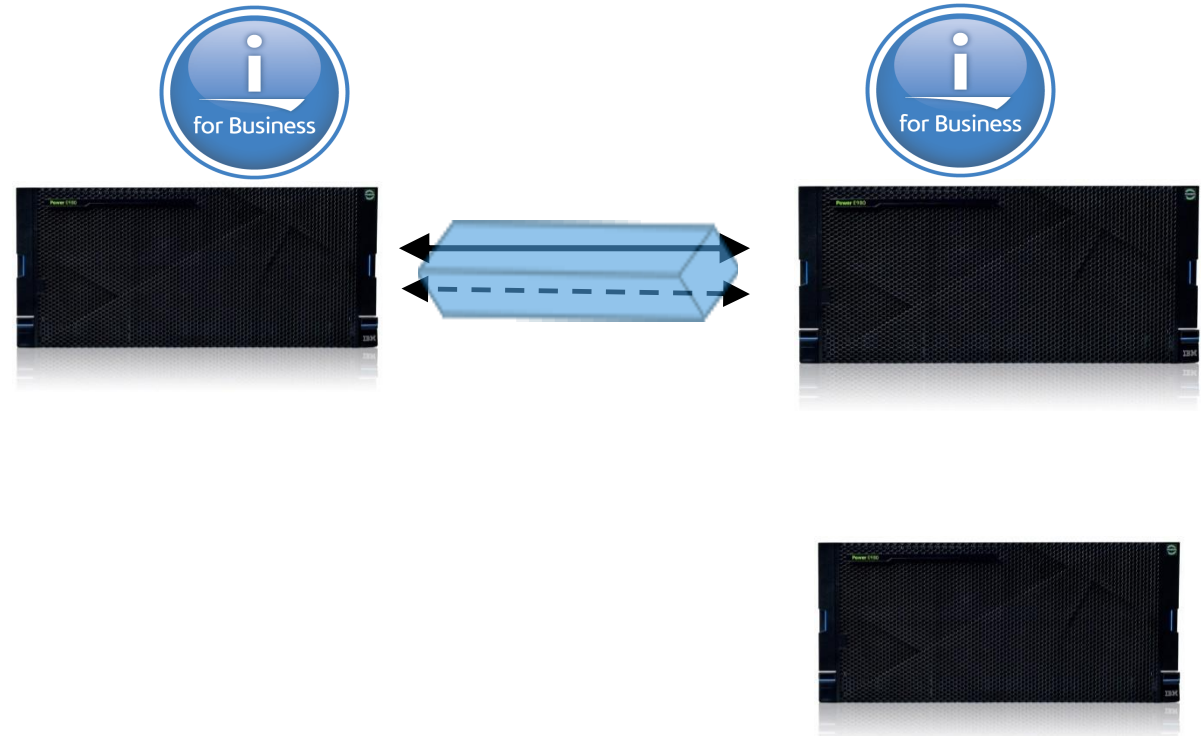
LPM requires the restricted I/O attribute

You must DLPAR away the SR-IOV RoCE port prior to LPM causing one side to track and the other to block

Perform the LPM action

DLPAR the SR-IOV logical port back

Resume Db2 Mirroring



LPM Support for LPM

With IBM i 7.4 TR1 and FW940 you can assign logical SR-IOV ports to a restricted I/O LPAR.

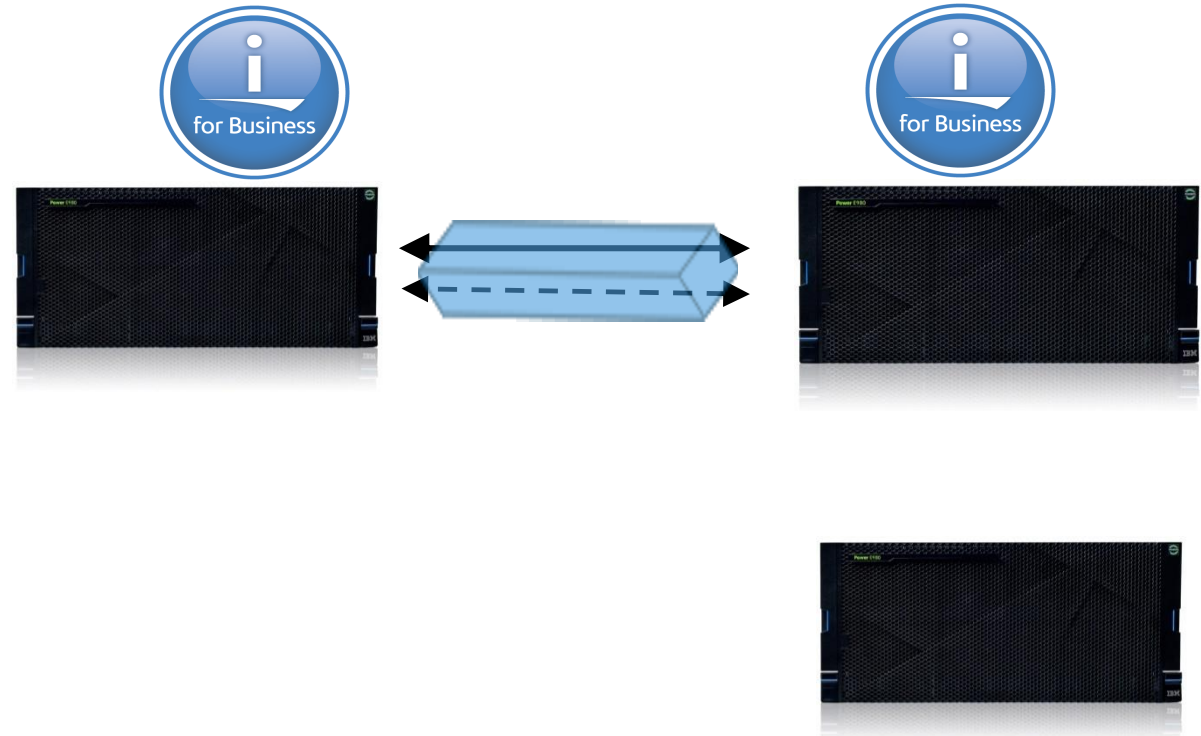
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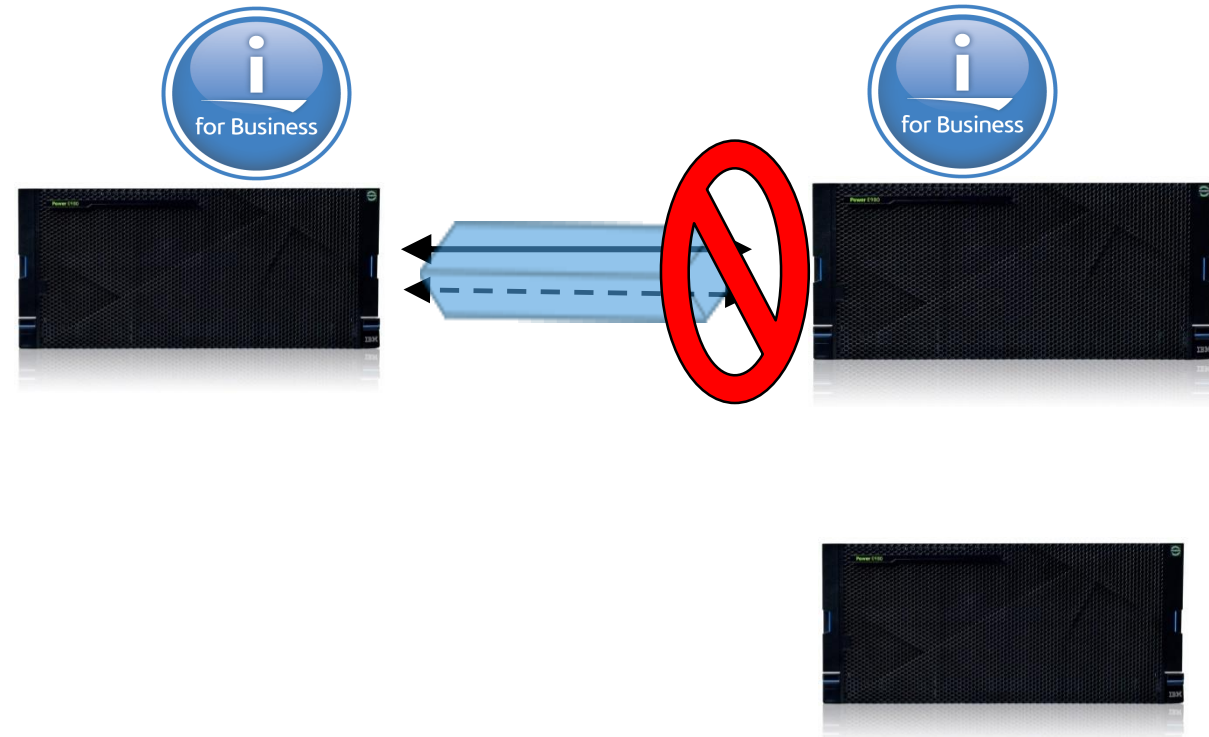
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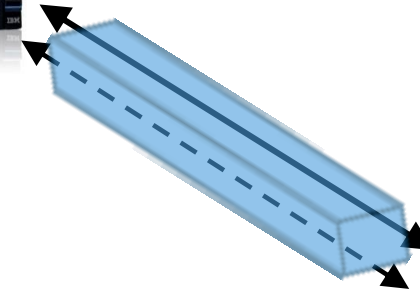
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Perform the LPM action

DLPAR the SR-IOV logical port back

Resume Db2 Mirroring



Application Evaluation

IBM Db2 Mirror for i

Primary: SYNC3Secondary: RESYNC3timmrIBM

GUI Build Time: 2019-09-13 09:14:43

Application Evaluation

Primary - SYNC3

Secondary - RESYNC3

Both Nodes

*SYSBAS

ITST1

ITST2

ITST3

IASP33P

Default Inclusion State: Exclude

Library Name	Replication State	Object Count
QPDA	Exclude	393
QSYS2	Exclude	371
MDDSUPP	Exclude	365
PERFTOOL	Exclude	355
KTJRN	Exclude	337
MJATST	Exclude	336
MECHTEST	Exclude	326
HOBBYFARM	Exclude	320
NQEBATS	Exclude	301
CPYCRT	Exclude	297
QTCP	Exclude	295
QWQREPOS	Exclude	286
SCOTTLIBS	Exclude	275
QPFR	Exclude	267
QDLTFLIB	Exclude	261
NQE520	Exclude	257
QSPTLIB	Exclude	251
QSPL	Exclude	247

Showing 300 of 997

PERFTOOL

All ObjectsGrouped By State

All

Object Type	Replication State	Object Count
*CMD	Ineligible	109
*QMFORM	Ineligible	1
*PGM	Exclude	152
*PNLGRP	Ineligible	13
*MSGF	Ineligible	3
*MSGQ	Ineligible	3
*MODULE	Ineligible	6
*QRYDFN	Ineligible	9
*QMQR	Ineligible	11
*FILE	Exclude	48

1100

Statement of Direction - Save / Restore based Setup

Setup Db2 Mirror

GUI Build Time: 2019-08-05 13



Source and Copy Node Configuration ?

HMC Information

Node Information

Cloning Method

Cluster Information

Time Server

The Db2 Mirror pair is created by making a clone of the source node.

Specify the method for creating the copy node clone:

☐ **Flash Copy**

Utilizes the flash copy technology within a single storage server to rapidly create a copy of the source node. This is the fastest method for creating the copy node.

☐ **Remote Copy**

Remote copy is required when the storage for the source node and copy node are on different storage servers. Copy services within the storage servers are used to create a replica of the source node to be used for the copy node.

☒ **Manual Copy**

The Manual process collects the required data for the clone process and will set up the actual mirror configuration details, But, it's the users responsibility to use one of the manual copy options below for creating the second node for the mirror pair.

☐ **Storage Server Copy Tools**

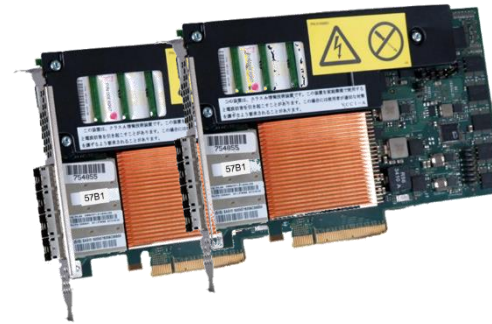
Manual copy allows you to use IBM storage or give you the ability to create the *SYSBAS and any additional IASP clones manually leveraging the tools provided by the storage servers. The Wizard will help you collect the needed information into the setup file. The wizard will also walk you through the process allowing you to manually create the cloned copy and then the wizard will regain control to update the copy node with the correct system information.

☐ **IBM i Save / Restore Copy Process**

Use the IBM i Save and Restore tools to create a second node that will be used as the mirrored pair. This option can be used for either external or internal storage.

Ability to use Save and Restore to Configure Db2 Mirror for i

- Can configure Db2 Mirror for i regardless if the storage has copy service functionality.
- Can reconfigure without have to flash copy of the Ipar or IASP
- Enables **support for storage such as NVMe or SAS**



Two more Enhancements to the Base Operating Systems

Kris Whitney

Senior Architect, IBM i Development



DS8900 LUN expansion for IBM i

- IBM i will now support the changing of the size of a LUN that comes from a DS8900 Storage Controller.
- Must use the **variable lun size** model of 050 or 099
- Only **takes effect after an IPL**
- The loadsource lun is supported



Enhance Unmap support for Spectrum Virtualize

- The IBM i support for the SCSI umap command has be enhanced to move the processing to the background. This can **improve the management of Data Reduction Pools** and thin provisioned LUN while **not impacting the runtime performance**.
- The rate of the background task can be changed with an advanced analysis macro.



PowerHA for i & BRMS Enhancements



Steve Finnes

FINNES@us.ibm.com

Power Systems HA/DR Offering Manager



PowerHA for i 7.4 Solutions

Internal Storage	DS8000	SVC/Storewize	IBM Copy Services Manager (DS8000) 
Sync. Geographic Mirroring	LUN Level Switching	LUN Level Switching	Metro Mirror and Global Mirror
Async. Geographic Mirroring	Metro Mirror and Global Mirror	Metro Mirror and Global Mirror	HyperSwap with Global Mirror
	FlashCopy	FlashCopy	
	HyperSwap 	HyperSwap	

What's new for PowerHA for i 1H 2019 for IBM i 7.3 TR6 & IBM i 7.4

PowerHA for i V7.3 TR6 Enterprise Edition

- **Integration of PowerHA IASP-based replication with IBM Copy Services Manager for DS8000**
 - Enables DS8000 HyperSwap + Global Mirror link

PowerHA for i V7.4

- Automate Admin Domain monitored resource entries
 - For object creation, deletion and restore
 - 2H 2019, populate admin domain
- New construct: **CRG containers**
 - **Enables you to group CRGs and switch them together as a group (particularly required for Db2 Mirror)**
- New IASP failover process control options
 - **Select which state post failover: Online or Offline**
 - Using a new command *Current, the state of the IASP post failover is either vary on if the IASP was properly varied off, or do not vary on automatically if the IASP was not properly varied off.

PowerHA for i V7.4 continued

- New: Admin Domain master node for synchronization
 - Enables one to define which node will be the source for synchronizing the other nodes in the cluster
- New: PowerHA policies
 - Going forward you will be able to define various PowerHA behaviors giving you more flexibility and control
 - In this release, the policy structure enables you to define the various admin domain management and IASP failover options previously mentioned

[IBM Knowledge Center](#)

PowerHA for i 7.4 in 2H 2019 (IBM i 7.4 TR1)

- IBM PowerHA SystemMirror for i brings several enhancements to the PowerHA portfolio, including:
 - Improvements to the administrative domain, such as support for **replicating user-profile passwords** that have been set with the QSYSUPWD API.
 - Increased capacity of the administrative domain with support for **synchronizing up to 200,000 monitored resources**.
 - Faster and easier management of the administrative domain so **users can easily sort and filter monitored resources** with the WRKCADMRE command.
 - **Simplified setup** and implementation of the administrative domain with a streamlined way to easily find and add many resources using a single command.
 - Integrated and streamlined recovery from a data-center outage in a HyperSwap with a LUN-level switching environment that enables **HyperSwap protection to be restored with a single command**.

PowerHA for i 7.2 in 2H 2019 (IBM i 7.3 TR7)

- IBM PowerHA SystemMirror for i brings several enhancements to the PowerHA portfolio, including:
 - Improvements to the administrative domain, such as support for replicating user-profile passwords that have been set with the QSYSUPWD API.
 - Integrated and streamlined recovery from a data-center outage in a HyperSwap with a LUN-level switching environment that enables HyperSwap protection to be restored with a single command.

Backup, Recovery and Media Services for i (BRMS)

- Backup, Recovery, and Media Services for i (BRMS) has added new enhancements:
- **Improved virtual tape image catalog management** for backups using a virtual device.
- The select-user space support **now includes cumulative incremental** *ALLUSR backups.
- Added the Change Control Group Attributes (Q1ACHGCGA) API.
- **Enhanced volume selection** for concurrent backup-tape reservations.
- **Improved the backup omit processing** to combine GUI web omits and green screen backup policy omits for libraries.
- **Enhanced the backup control group exit program** with the ability to run at the end of a control group.

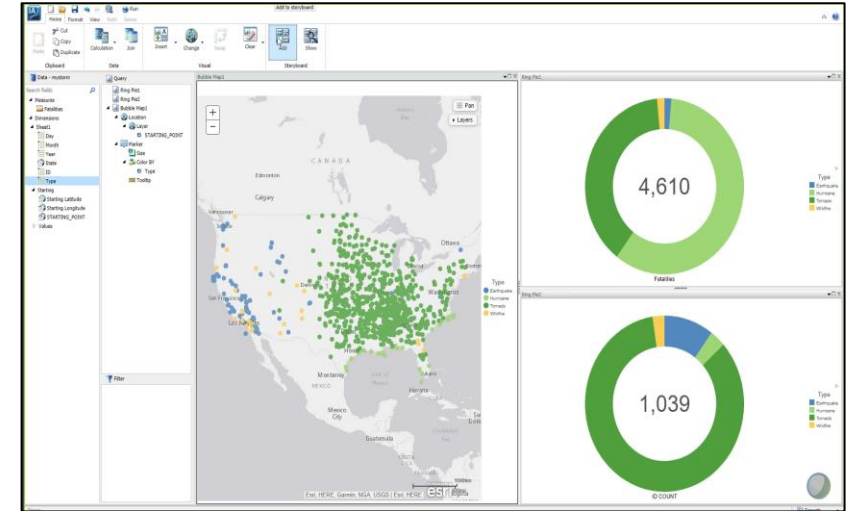
Db2 Web Query Update

Doug Mack mackd@us.ibm.com

Db2 Web Query Team: QU2@us.ibm.com

Db2 Web Query Version 2.2.1

- Steps beyond traditional Business Intelligence into **Powerful Data Visualization**
 - New data driven **Visualizations** empowers end users and analysts
- **Auto drill down** and **linked reports** simplifies navigation
- **Dynamic Parameters** allow dynamic field selection
- Enhanced geographical location data analysis
- Consolidate, Prepare, and Transform Data with **DataMigrator ETL**
 - IBM i Data Replication and Extract/Transform/Load
- Install or upgrade in 15 minutes with the “EZ-Install” Package
 - Includes 100+ sample reports, for the business and I/T
 - Leverage included Query/400 tool to modernize



GA 12/08/2017

No Charge Upgrade from previous versions**

** Assumes currency on SW Maintenance

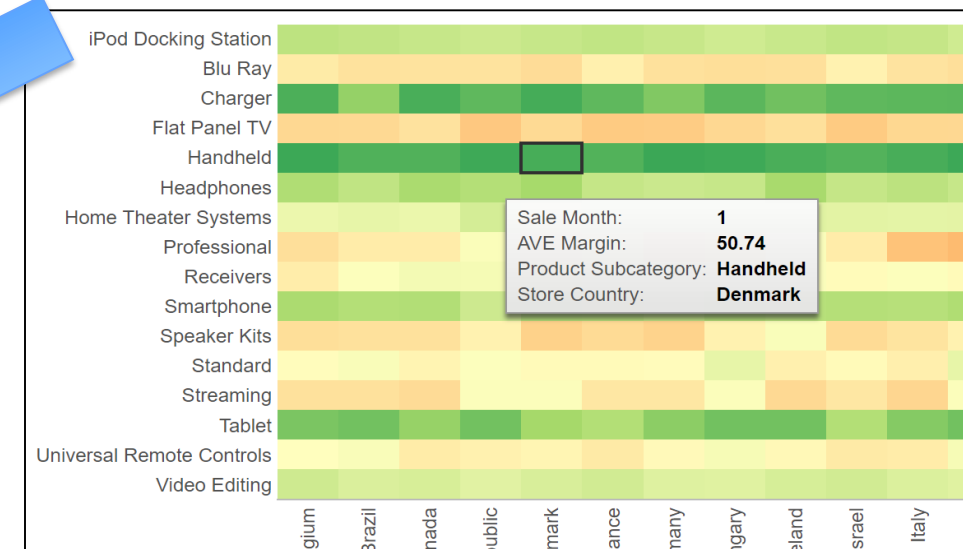
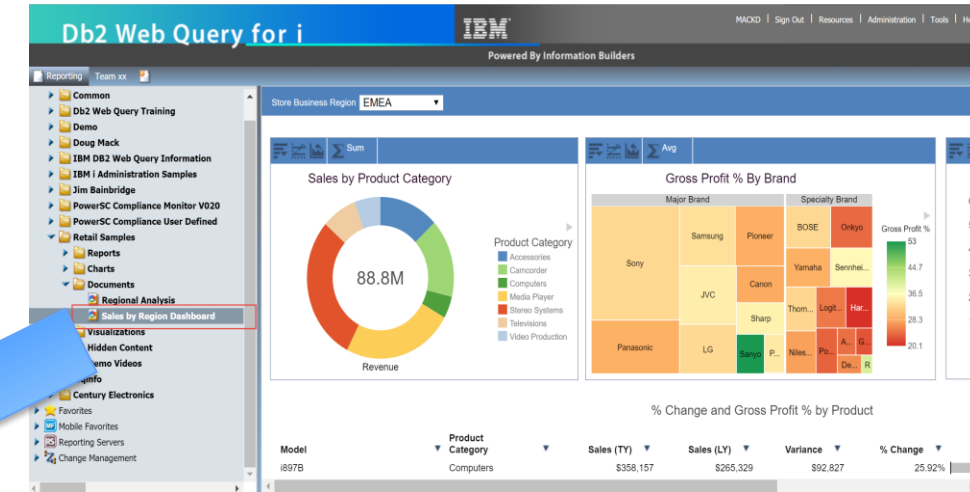
Video Demos at <http://ibm.biz/db2wq-221-videos>

EOS for Version 2.1.x of Db2 Web Query

- End of Service for Version 2.1.x Effective Sept 30, 2019
 - https://www-01.ibm.com/common/ssi/ShowDoc.wss?docURL=/common/ssi/rep_ca/7/897/ENUS918-147/index.html&lang=en&request_locale=en
- DB2 Web Query Version 2.2.1 is the ONLY version to work with IBM i 7.4
- “There’s Never Been A Better Time to Upgrade to Version 2.2.1” Blog Post:
 - <http://db2webqueryi.blogspot.com/2019/07/theres-never-been-better-time-to.html>
- TO UPGRADE (or to install for the first time):
 - **PLEASE PLEASE USE OUR EZ-INSTALL PACKAGE (and not the ESS DVD IMAGE)**
 - You won’t Regret it
- Despite what some might say, Db2 Web Query is NOT going away (we are working on the next version), nor is it being replaced by COGNOS

NEW Db2 Web Query EZ-Install Package

- Simplified Installation of 70 day Trial Code (ALL Products)
 - 100+ SAMPLE reports and dashboards
- For new installations OR upgrades from previous releases.
 - NOT for upgrades within same Version/Release/Mod
- Jump Start the Learning Process
 - **Test Drive** what you now have
 - **Learn** how to build reports/dashboards
 - Run **Query/400 Discovery Tool**
 - Learn about **System Admin Reports**
 - Learn about **Developer Workbench**
 - Learn about **DataMigrator ETL**
 - Learn about **Date Dimension Table**



Request by sending email to QU2@us.ibm.com w/
Serial Number and OS level, we'll get you going!

Sample Reports/Dashboards for the Systems Administrator

Monitor Systems Information

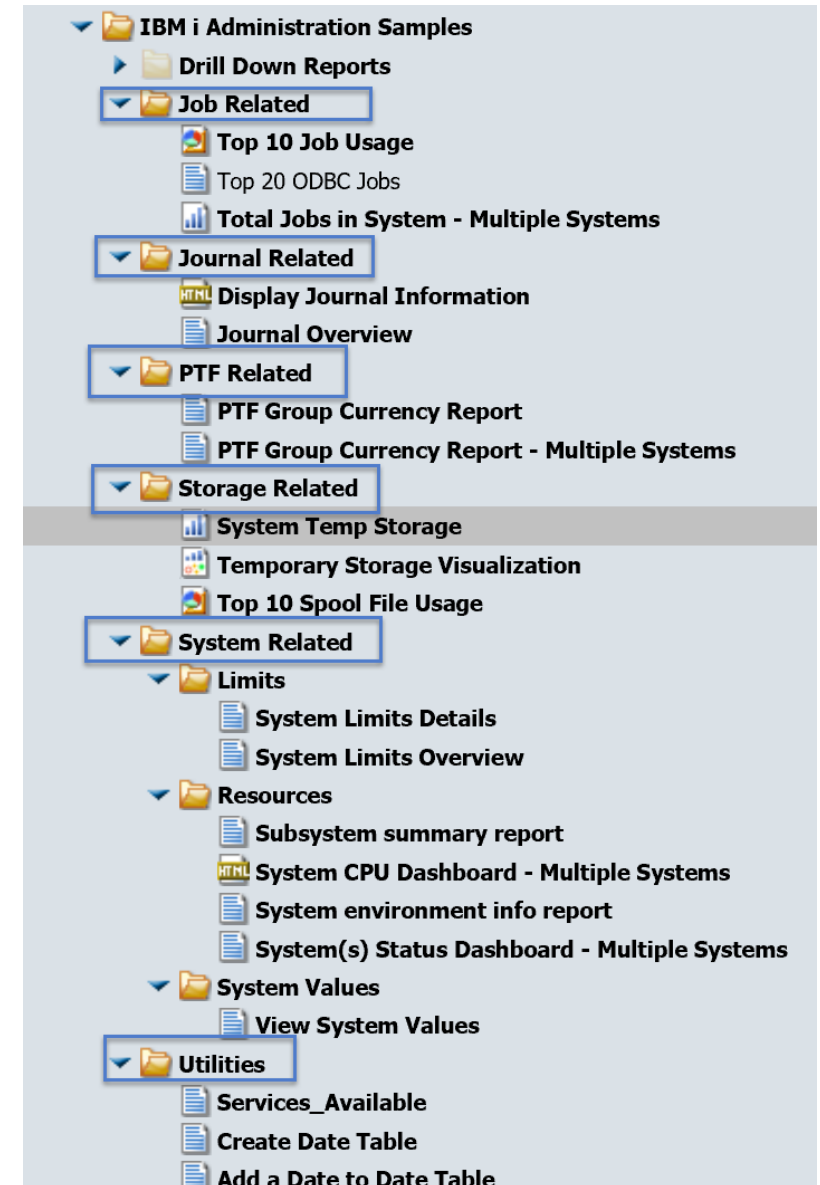
- How close am I getting to system/database limits?
- Who is taking up the most spoolfile storage space?
- What objects are using the most temporary storage?
- What jobs are consuming the most CPU, etc.?

Cross LPAR/Systems Reports/Dashboards

- Am I up to date on my PTF Groups?
- Real time Systems CPU Utilization Dashboard
- System Status (Jobs, CPU, Storage) Dashboard

Utilities

- Reverse Engineer Spoolfiles into PDF, Excel, Etc.
- What IBM i Services are available on my system?
- Create Date Dimension Table(s)



Cross System/LPAR Reports

PTF Currency Report

Status	PTF Group ID	PTF Name	Installed Level	Level Available	Date of last IBM Update
INSTALLED LEVEL IS CURRENT	SF99364	710 WebSphere App Server V6.1	9	9	09/09/2013
	SF99480	720 WebSphere App Server V8.0	6	6	02/01/2016
	SF99637	710 DB2 Web Query for IBM i V1.1.2	9	9	12/12/2013
	SF99747	720 DB2 Web Query for i V2.1.0	14	14	03/30/2016
	SF99766	720 Print PTFs			
UPDATE AVAILABLE	SF99145	710 Performance Tools			
	SF99363	710 WebSphere App Server V7.0			
	SF99366	710 Print PTFs			
	SF99368	710 IBM HTTP Server for i			
	SF99369	710 IBM i integration with BladeCenter and System			
	SF99380	710 WebSphere App Server V8.0			
	SF99381	710 WebSphere App Server V8.5			
	SF99481	720 WebSphere App Server V8.5			
	SF99647	710 DB2 Web Query for i V2.1.0			
	SF99658	720 DB2 Web Query for i V2.1.1			
	SF99701	710 DB2 for IBM i			
	SF99702	720 DB2 for IBM i			
	SF99710	Current Cumulative			
	SF99713	720 IBM HTTP			
	SF99714	720 Performance			
	SF99716	720 Java			
	SF99717	720 Technology			
	SF99718	720 Group Sec			
	SF99719	720 Group Hipe			
	SF99720	Current Cumulative			
	SF99767	720 720 TCP/IP			
	SF99775	720 Hardware			
	SF99776	720 High Availa			

28 August,

System Status

Selected System(s):

System Name	Information Timestamp	Total Jobs in System	Active Jobs in System	Interactive Jobs in System	Active Threads in System	Elapsed Time	Elapsed CPU Used	Current CPU Capacity	Average CPU Utilization	Minimum CPU Utilization	Maximum CPU Utilization	System ASP Storage	Total Auxiliary Storage	System ASP Used	Current Temporary Storage	Maximum Temporary Storage Used
DB2ICOE1	2019/04/18 10:43:19.327279	985	201	.00	705	55	.40	2.00	.04%	.00%	99.81%	1,488,922	1,488,922	62.10%	10,729	13,271
DB2ICOE2	2019/04/17 11:14:50.522439	6,846	245	.00	1,152	825	.44	2.00	.44%	.00%	99.95%	954,437	954,437	68.39%	34,771	34,852
DB2ICOE3	2019/04/18	11,832	280	.00	1,237	53	.30	4.00	.07%	.00%	.18%	6,242,936	6,242,936	39.02%	8,340	9,790
											100.51%	6,242,936	6,242,936	16.70%	27,105	28,658
											.18%	917,345	917,345	66.97%	13,689	16,305
										
										

Systems:

All

DB2ICOE1

DB2ICOE2

DB2ICOE3

DB2ICOE4

L2SYSTEM1

MCV7R1

RCHBSTGE

RCHBSTGE_SSL

Systems CPU Utilization - 1 Hour

2 Hours

8 Hours

24 Hours

Reverse Engineer Spool File Data into Excel or PDF

Spool File Information and PDF Generation

4 of 4 records, Page 1 of 1

Spool File Listing

Output Queue Lib: 'QGPL'

Output Queue:

User: 'BESTGEN' OR 'JIMBAINB' OR 'MACKD'

Starting Date: June 03 2019

Output Queue	Output Queue	File Create	File Entry	PDF Link	Spool
Library	Name	Timestamp	Number	Link	U
QGPL	QPRINT	2019/06/04 09:28:11.235609	1	PDF	B
		2019/06/04 09:28:06.015224	1	PDF	B
		2019/06/03 23:00:06.481802	363	PDF	B
		2019/06/03 13:26:11.009364	1	PDF	B

Report run on Tue, Jun

QUERY NAME REVGPFTRQY

LIBRARY NAME QWQCENT

FILE LIBRARY MEMBER FORMAT

ORDERS QWQCENT ORDERS ORDERS

INVENTORY QWQCENT INVENTORY INVENTORY

DATE 06/04/19

TIME 09:28:11

Revenue and gross profit query

06/04/19 09:28:11

PAGE 1

Product Category	Product Type	Revenue	Gross Profit
Amplifiers/PreAmps/Tuners	Audio		
	TOTAL	42,374,428.00	16,634,858.00
ems	Audio		
	TOTAL	122,345,680.00	40,062,860.00
CD Players and Recorders	Audio		
	TOTAL	53,847,459.00	16,008,999.00
Digital Cameras	Cameras		
	TOTAL	184,103,667.00	50,774,837.00
Digital8 Camcorders	Camcorders		
	TOTAL	13,614,953.00	7,102,353.00
DVD	Video		
	TOTAL	229,872,045.00	87,102,145.00

Speed Dating with the Db2 Web Query Date Dimension Table

The BI/Reporting world uses dates and **date attributes** for virtually everything

- This is true for your applications too – not just BI Reporting
- Today is September 19, 2019
 - But attributes might note that this day is:
 - A Thursday
 - The 4th (or 5th depending on the start of the week) day of the week
 - In the 3rd quarter of the calendar year
 - In a different quarter of your fiscal calendar
 - In a particular season – that is different in the northern hemisphere than the southern hemisphere
 - A day of a FULL MOON
- **BUT YOU HAVE A PROBLEM.....**



MOST Clients are using “Legacy” Dates

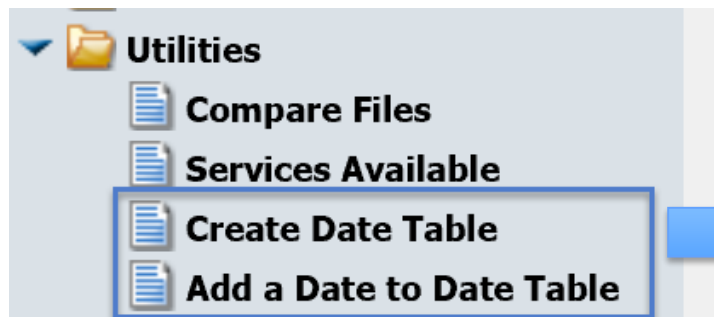
- CHAR(8) MMDDYYYY - '04072019'
- Packed(6,0) YYMMDD - 190407
- Packed(8,0) YYYYDDMM - 20190407
- Julian Date Format: Count of days; Day 0 - January 1, 4713 BC; January 1, 2000 = 2,451,545
- CHAR(6) YYMMDD - 190407 (is this 1919 or 2019)?
- CHAR(7) CYYMMDD - 1190407 (is this 1919 or 2019)?
- CHAR(4) + CHAR(2) + CHAR(2) – 2019 and 04 and 07
- Excel Format INTEGER(4) - 43562



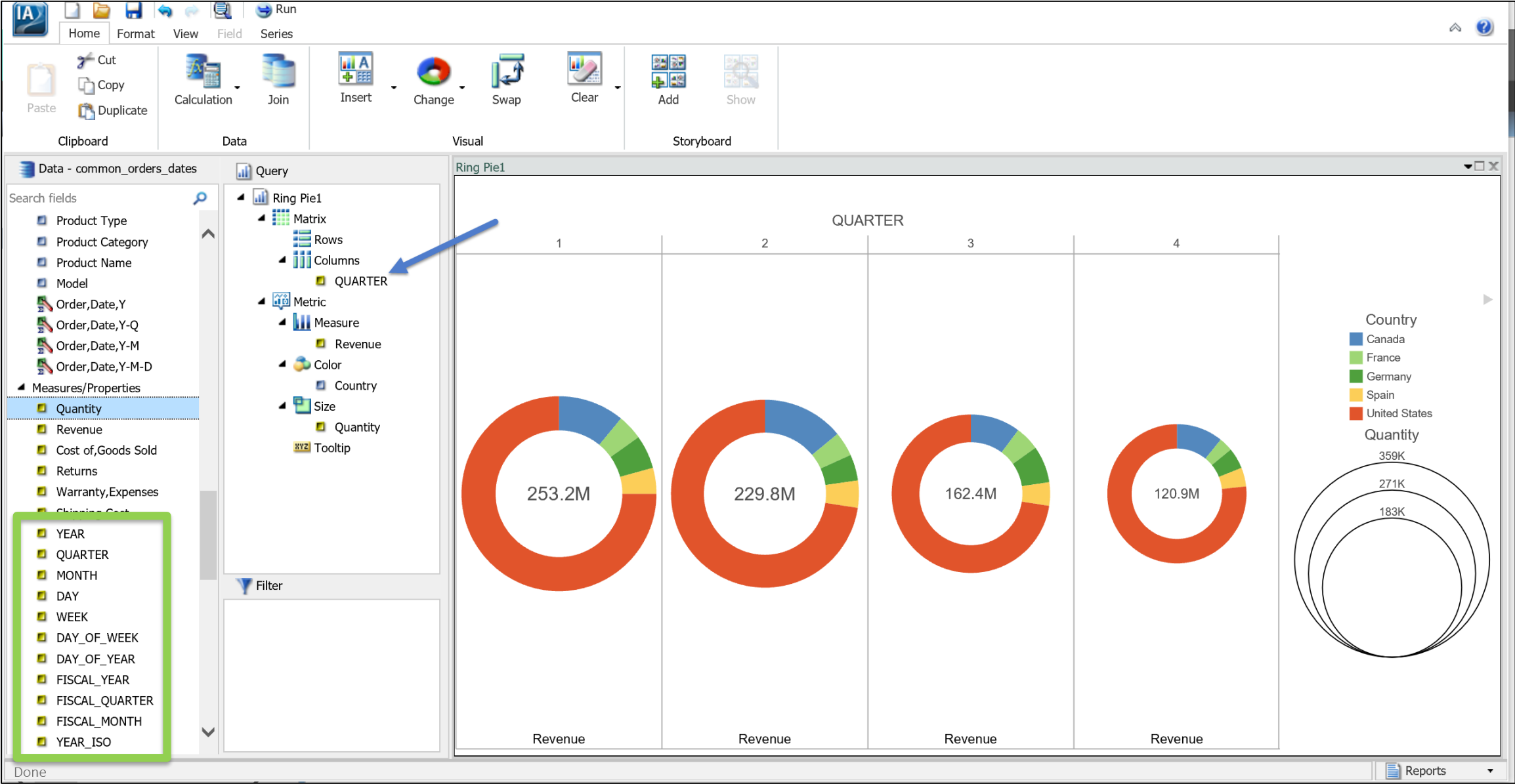
Any of these look familiar?

Simplified, High Performance Approach: Date Dimension Table

- **EZ-Install includes a Create Date Dimension Table Utility**
 - Creates a ROW in the table for EVERY Date in your date range
 - Creates a COLUMN for every legacy date format we could think of
 - You use this to join with your table/file containing YOUR legacy date
 - Creates a COLUMN for many date attributes
 - You can alter or add your own (e.g., holidays in Canada are different than holidays in the U.S)
- To learn more, visit this COMMON Webinar:
 - <http://cmn.informz.net/z/cjUucD9taT04NzUyMjUyJnA9MSZ1PTEwOTUyNDU4ODcmbGk9Njg4Njc5ODg/index.html>
 - Or refer to the Db2 Web Query Nuts and Bolts Redbook at <http://ibm.biz/db2wq-nutsandbolts>

[illegible]

Build Your Report/Chart/Dashboard



Application Development

Tim Rowe

Business Architect, Application

Development and Systems Management

timmr@us.ibm.com



New Enhancements

- RPG language adds new features
- RDi responds to **RFEs**
- IWS Custom Subsystem Support

<https://www.ibm.com/support/pages/rfe-request-enhancement-ibm-i>

OPTIONS(*EXACT) for parameters

2019

- For parameters passed by reference, RPG normally allows
 - a string parameter longer than the prototyped parameter
 - an array with more elements than the prototyped parameter
 - a data structure that is not defined the same as the prototyped parameter
- With OPTIONS(*EXACT), the passed parameter must exactly match the prototype
 - The passed parameter cannot be longer
 - If the prototyped parameter is defined with LIKE, LIKERECD, or LIKEDS, the passed parameter must be defined the same

OPTIONS(*EXACT) for parameters

```
dcl-pr p1;  
    shortParm char(5);  
end-pr;  
dcl-pr p2;  
    longParm char(10);  
end-pr;  
dcl-s fld char(10) inz('abcdefghij');  
  
p1 (fld);  
p2 (fld);
```

- If the procedures display their parameters, p1 displays 'abcde' and p2 displays 'abcdefghij'.

OPTIONS(*EXACT) for parameters

```
dcl-pr p1;  
    shortParm char(5) options(*exact);  
end-pr;  
dcl-pr p2;  
    longParm char(10) options(*exact);  
end-pr;  
dcl-s fld char(10) inz('abcdefghij');
```

```
p1 (fld); // Error: The parameter is too long  
p2 (fld);
```

- The compile fails because parameter 'fld' has a length of 10 which is too long for a char(5) parameter with OPTIONS(*EXACT)

"Overloaded" procedures

2019

- A new type of prototype has an OVERLOAD keyword
- OVERLOAD lists the prototypes for programs or procedures that could be called when the overloading prototype is used in a call

```
dcl-pr print ind overload(printString
                           : printTimestamp
                           : printNum);
```
- This is similar to polymorphism, but for RPG, each procedure has its own name, so it is not strictly “polymorphism”.

Call one of several procedures with one prototypes

```
dcl-pr printString ind;  
    string varucs2(1000) const;  
end-pr;
```

```
dcl-pr printNum ind;  
    num packed(63:15) const;  
    decimals int(10) value options(*nopass);  
end-pr;
```

```
dcl-pr print ind overload(printString  
                           : printNum);
```

```
ok = print ('hello');    // calls printString  
ok = print (salary : 2); // calls printNum  
ok = print (5);          // calls printNum
```

DATA-GEN: generate data (reverse of DATA-INTO)

```
DATA-GEN var  
    %DATA(output-location : options)  
    %GEN(program-or-procedure : options);
```

- **DATA-GEN generates a structured document, such as JSON or CSV, from an RPG variable.**
- It requires a "generator" to generate the document, similar to the way DATA-INTO requires a parser.
- IBM does not provide the generator.
- The output can go to a variable or an IFS file.
- `DATA-GEN var %DATA(outputFld) %GEN('MYGEN');`
- `DATA-GEN var %DATA('x.json' : 'doc=file') %GEN('MYGEN');`

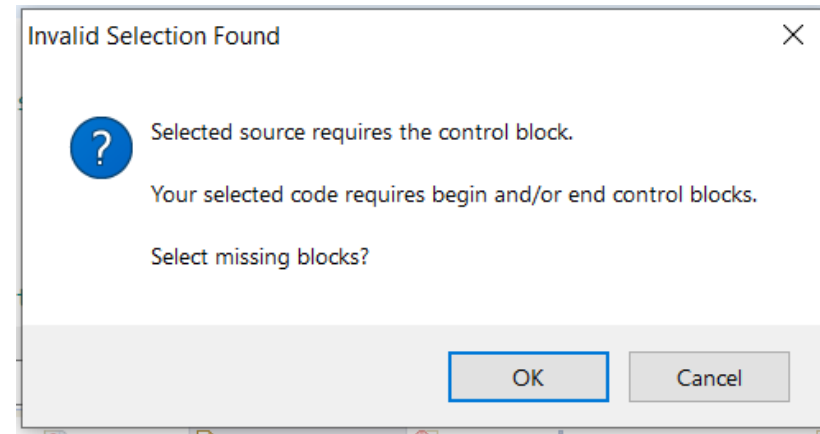
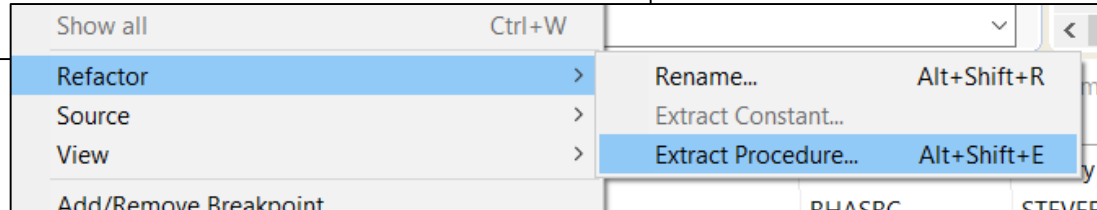
Extract Procedure - Problem

- Eclipse has had a wonder function that allows Java users to select code and extract it to a new method. Wouldn't it be nice to add for RPGLE code?
- Eclipse requires a user to select the full block of code directly. Wouldn't it be nice to ask if we should select the full required block for you? Or better yet, just do it in the case of partial selection.
- Today if I use the New... Procedure wizard, the code is all upper-case and formatting is horrible. Why not learn how my code is and do it for me?

Extract Procedure - Solution

- Make it so!

```
000440
000442 // Go find the best state that we've visited
000443 for index = 0 TO %elem(states);
000444     visiting = states(index);
000445     if (visiting='MN');
000446         best_state_ever = visiting;
000447     endif;
000448 endfor;
000449
```



Extract Procedure - Sample

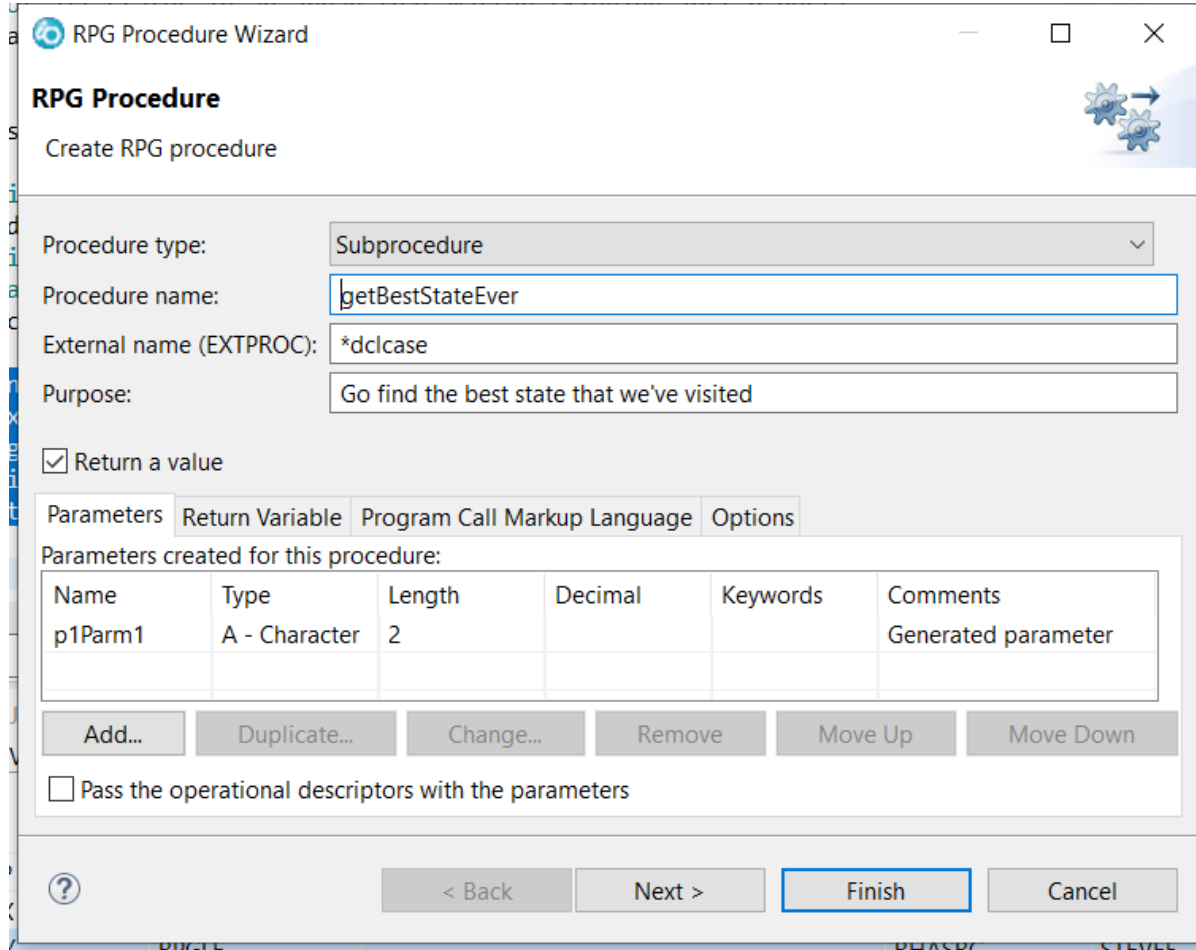
- If you're just missing the start and end of the lines, we'll just auto-select it for you!

```
000440  
000442 // Go find the best state that we've visited  
000443 for index = 0 TO %elem(states);  
000444     visiting = states(index);  
000445     if (visiting='MN');  
000446         best_state_ever = visiting;  
000447     endif;  
000448 endfor;  
000449  
(Main Procedure)
```

```
// Go find the best state that we've visited  
for index = 0 TO %elem(states);  
    visiting = states(index);  
    if (visiting='MN');  
        best_state_ever = visiting;  
    endif;  
endfor;
```


Extract Procedure - Sample

- We'll default what we can, based upon the fields.



The image shows a screenshot of the 'RPG Procedure Wizard' dialog box. The title bar reads 'RPG Procedure Wizard'. The main heading is 'RPG Procedure' with a sub-heading 'Create RPG procedure'. There is a gear icon with a right-pointing arrow in the top right corner. The form contains the following fields and controls:

- Procedure type:** A dropdown menu set to 'Subprocedure'.
- Procedure name:** A text box containing 'getBestStateEver'.
- External name (EXTPROC):** A text box containing '*dclcase'.
- Purpose:** A text box containing 'Go find the best state that we've visited'.
- Return a value:** A checked checkbox.
- Tabs:** 'Parameters' (selected), 'Return Variable', 'Program Call Markup Language', and 'Options'.
- Parameters created for this procedure:** A table with one row of data.

Name	Type	Length	Decimal	Keywords	Comments
p1Parm1	A - Character	2			Generated parameter

Below the table are buttons: 'Add...', 'Duplicate...', 'Change...', 'Remove', 'Move Up', and 'Move Down'.

At the bottom, there is an unchecked checkbox labeled 'Pass the operational descriptors with the parameters'.

The bottom of the dialog features a help icon (?), and three buttons: '< Back', 'Next >', and 'Finish' (which is highlighted with a blue border). A 'Cancel' button is also present.

Extract Procedure - Sample

- We'll replace the inline code for you and place the cursor on the start of the procedure so you can control-click into the new procedure.

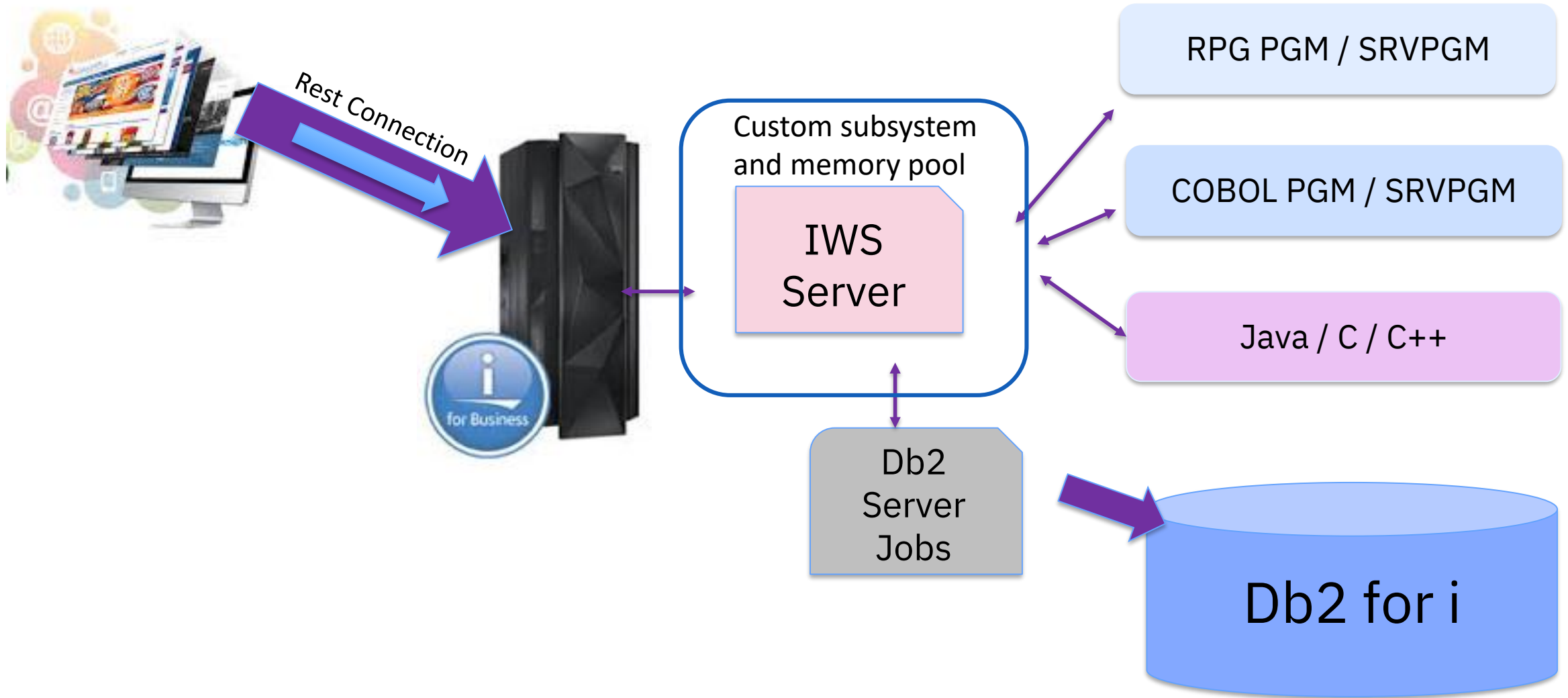
```
000440  
000442 // Go find the best state that we've visited  
000443 bestStateEver = getBestStateEver('MN');  
000444  
000493
```

Extract Procedure - Sample

- Your new code is generated and formatted for you and can be un-done with undo.

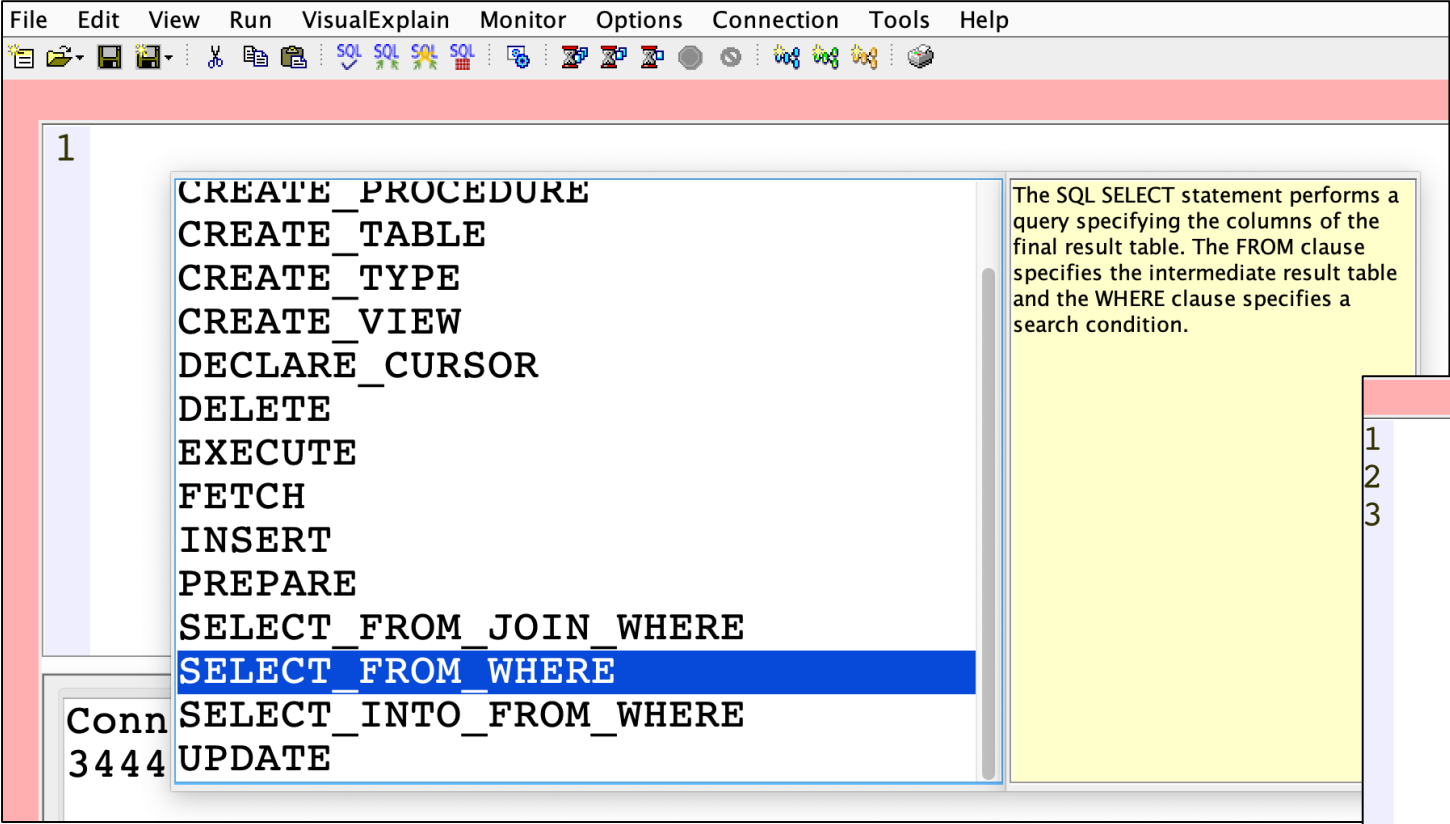
```
000660 // -----
000661 // Procedure name: getBestStateEver
000662 // Purpose:      Go find the best state that we've visited
000663 // Returns:      Return field generated by Extract Procedure.
000664 // Parameter:    p1Parm1 => Generated parameter
000665 // -----
000666 dcl-proc getBestStateEver;
000667   dcl-pi *N LIKE(best_state_ever);
000668     p1Parm1 CHAR(2);
000669   end-pi;
000670   // Local fields
000671
000672   dcl-s p_bestStateEver LIKE(best_state_ever);
000673   // Go find the best state that we've visited
000674   for index = 0 TO %elem(states);
000675     visiting = states(index);
000676     if (visiting=p1Parm);
000677       best_state_ever = visiting;
000678     endif;
000679   endfor;
000680
000681   return p_bestStateEver;
000682 end-proc;
(getBestStateEver)
```

IWS Custom Subsystem support

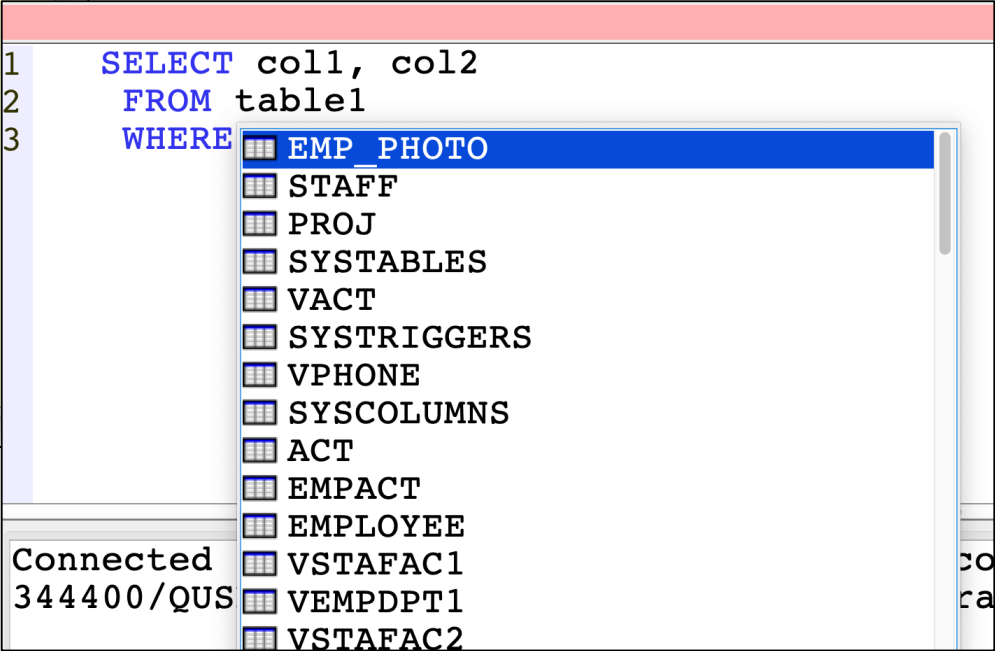


Access Client Solutions

Number 1 voted RFE – Prompting in Run SQL Scripts



Prompt for Db table columns



More to follow in the follow up Db session!!!

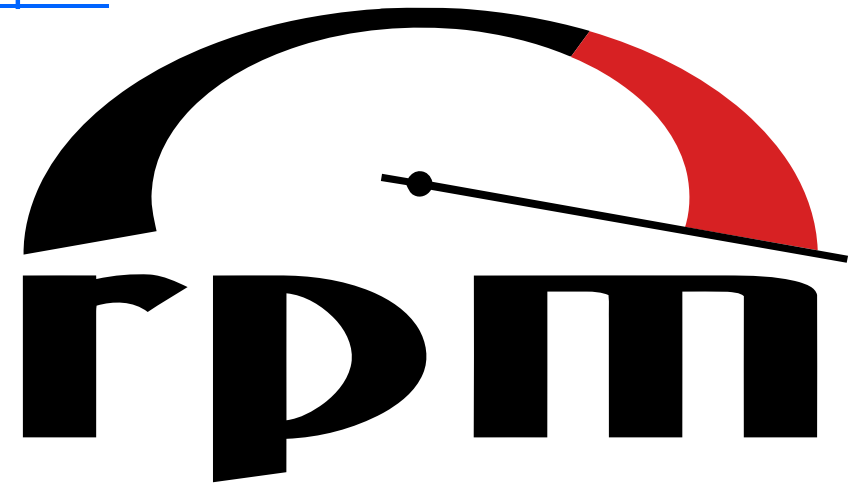
Open Source

Jesse Gorzinski

Business Architect, Open Source

OSS Themes

- Integration, integration, integration!!
- Continued investment in:
 - Language (Python, Node.js, PHP) integration libraries
 - Various MQ technologies (ActiveMQ, ZeroMQ)
 - Integration with cognitive and quantum technologies
 - Db2 enhancements
 - Db2 connectivity (ODBC)
- To learn about RPMs and get started, see <http://ibm.biz/ibmi-rpms>



ZeroMQ

- What?
 - Open source universal messaging library
- Why?
 - It is an important building block, as numerous applications rely on this technology. For more information, see <https://zeromq.org/>
- How?
 - The ZeroMQ core engine in C++ (libzmq) available in RPM form
 - Python bindings (pyzmq). For more information, see <https://pyzmq.readthedocs.io/>



Redis

- What?
 - An open source in-memory store mechanism (with persistence/durability options)
 - Many types of noSQL data: strings, lists, maps, sets, sorted sets, bitmaps, streams, and more.
 - World's fastest database?
 - For more information, see <https://redis.io>
- Why?
 - Important building block. Commonly used as message broker, cache, or database.
 - It is great for enabling applications that use this technology or is commonly used to support new development of web applications (particularly Node.js).
- How?
 - Redis engine available in RPM form



Offering Updates

Linda Hirsch

llhirsch@us.ibm.com

IBM i Product Manager



IBM i 7.2 Withdrawal Announcement

IBM i 7.2 withdrawal announcement - September 10, 2019

"Software withdrawal and support discontinuance: IBM i 7.2 selected programs and services"

- **Effective end of marketing: 04/30/2020**
- **Effective end of service: 04/30/2021**

Geo	Announcement Letter Number and Link
IBM Americas - United States	919-147
IBM Japan	JP19-0450
IBM Europe Middle East and Africa	ZP19-0451
IBM Asia Pacific	WP19-0106
IBM Americas - Latin America	LP19-0445
IBM Americas - Canada	A19-0551

IBM Support Transition for IBM i

IBM Support transition for IBM i effective September 14, 2019

- Replaces IBM Service Request Tool
- Review the new support site at <http://www.ibm.com/mysupport>

Important information:

- Familiarize yourself with the new support site by reviewing the videos below
- Problem Management Records (PMRs) will become "Case" numbers in the format, TS123456789
- Review any automation or process you have for sending documentation to IBM
- If you have an IBM ID, verify that your profile is up-to-date with the correct email address, phone number, and preferred language. If you don't have an IBM ID, create one at <https://myibm.ibm.com>
- The process to open cases by voice and IBMLink will remain the same
- There will be a phone menu change for North American IBM i clients to connect to IBM i support. Listen closely for this phone menu change to get properly routed to IBM i support

IBM Support Transition for IBM i

Videos for reference

- [Introducing the IBM Support Site for IBM i clients](#)
- [Introducing the IBM Support Community | Open and manage cases](#)
- [Introducing the IBM Support Community | Search](#)
- [Introducing the IBM Support Community | Forums](#)
- [Requesting access to your company's IBM Support Account](#)
- [Managing your IBM Customer Number \(ICN\)](#)

IBM i License Topics – new/updated materials

<https://www.ibm.com/support/pages/ibm-i-license-topics>

Reference Documentation

- Map Systems and IBM i Version/Releases — updated with POWER9, refer to next chart
- Java and IBM i
- IBM i Self-Serve Interim Keys — self-serve keys for qualifying situations
- IBM License Metric Tool (ILMT) and IBM i

IBM i License Topics – new/updated materials

<http://www-01.ibm.com/support/docview.wss?uid=ssm1platformibmi>

Reference Documentation

- Map Systems and IBM i Version/Releases

System to IBM i maps

↓ Additional resources

← Select another map set

Power and IBM i model to operating system level mapping

Family	Type	Model	7.4	7.3	7.2	7.1	6.1	V5 R4
POWER9	9009	42A	x	x	x			
POWER9	9223	42H	x	x	x			
POWER9	9009	41A	x	x	x			
POWER9	9009	22A	x	x	x			

Reminder: Power Systems Vouchers

IBM vouchers for Power Systems

Learn more about the capabilities and features of your servers

With the IBM i and selected Power Systems servers, education and services vouchers are included at no additional charge

For eligible systems, duration of vouchers, voucher redemption information, refer to <https://www.ibm.com/it-infrastructure/power/resources/vouchers>

Miscellaneous Updates

Alison Butterill

akbutter@us.ibm.com

IBM i 2H 2019 Marketing Strategy

A Platform for Innovators, by Innovators

Protect & Grow Client Base

- Continue drumbeat of innovation messaging
- Build on momentum from IBM i 7.4 announcement
- Showcase customer successes

Drive IBM i Revenue

- New Product Marketing Content
- DDR and Sales Enablement Assets
- IBM i integrated in worldwide campaigns
- Targeted DDR Call Blitzes

Increase Client Advocacy

- New Community Badge Program
- IBM Champions
- Fresh Faces
- User Group Engagement

Roll Out of IBM Db2 Mirror

- Initial target audience LUG-sized clients
 - China Merchants Bank
- Post-April-announcement
 - Some interest from medium-sized clients
 - Requests for internal storage
- Roll Out
 - Field Enablement ongoing
 - Established geo focals; education and materials
 - Lab Services established offerings
 - assessment, implementation
 - Next:
 - drive more education to partners



Marketing Themes

- 2019 Theme – Innovation
- Feature new technologies – integration
- Highlight Customer Stories
 - Q: How many new stories are on the site this year?
 - Please send in more candidates
- Collateral available shortly following announcement



Wijnen Van Maele
Tracking wine production with blockchain
on IBM i

[Read the customer story →](#)

Vision Banco - Paraguay

H₂O.ai



Large User Group (LUG)



Large User Group

Questions? +1.5075338035

lbenedict@the-lug.com

HOME

LISTEN

UNDERSTAND

GUIDE

MEMBERSHIP

September schedule

Check out the NEW recommendations for joining LUG


JOIN THE CONVERSATION
LISTEN.
UNDERSTAND.
GUIDE.

- Recruiting new members
- www.the-lug.org

LUG membership includes nearly one hundred large companies who have a significant investment in IBM i™; currently, over 53 million CPW is in use by LUG members. Member companies are active in many industries, such as finance



For More Information:

Some Links You Need	Twitter	#Hashtags
<p>IBM i Home Page: www.ibm.com/systems/i</p> <p>IBM 30th Anniversary http://ibmi30.mybluemix.net/</p> <p>IBM Systems Magazine IBM i Edition: http://ibmsystemsmag.com/ibmi/</p> <p>Support Life Cycle: https://www-01.ibm.com/software/support/ibmi/lifecycle/</p> <p>License Topics: https://www-01.ibm.com/support/docview.wss?uid=nas8N1022087</p>	 <p> @IBMSystems @COMMONug @IBMChampions @IBMSystemsISVs @IBMiMag @ITJungleNews @SAPonIBMi @SiDforIBMi </p>	<p> #IBMi30 #PowerSystems #IBMi #IBMAIX #POWER8 #LinuxonPower #OpenPOWER #HANAonPower #ITinfrastructure #OpenSource #HybridCloud #BigData </p>

For More Information:

Blogs	
<p><u>IBM Blogs:</u></p> <ul style="list-style-type: none">• IBM Systems Magazine You and i (Steve Will)• IBM Systems Magazine i-Can (Dawn May)• IBM Systems Magazine: Open your i (Jesse Gorzinski)• IBM DB2 for i (Mike Cain)• IBM DB2 Web Query for i (Doug Mack) <p><u>IBM Champion's Blogs:</u></p> <ul style="list-style-type: none">• IBM Systems Magazine: iDevelop (Jon Paris and Susan Gantner)• IBM Systems Magazine: iTalk with Tuohy	<p>http://ibmsystemsmag.com/blogs/you-and-i/</p> <p>http://ibmsystemsmag.com/blogs/i-can/</p> <p>http://ibmsystemsmag.com/blogs/open-your-i/</p> <p>http://db2fori.blogspot.co.uk/</p> <p>http://db2webqueryi.blogspot.co.uk/</p> <p>http://ibmsystemsmag.com/blogs/idevelop/</p> <p>http://ibmsystemsmag.com/ibmi/trends/italk-with-tuohy/</p>