

2020 iSight Clear Vision for the Future

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2020 iSight





We are experiencing a New World



COVID-19: What IBM is Doing to Help

COVID-19 HPC Computing Consortium

- Unprecedented compute power to help researchers attack the virus
- 400 Petaflops, hundreds of researchers
- National Labs, MIT, Rensselaer Polytechnic Institute and others

Watson and the The Weather Company

- Trusted data at the fingertips of citizens and health experts
- Watson Assistant for Citizens (Analytics / Speech Recognition)
- “Global Call for Code”

Trusted infrastructure delivering business continuity

- Instant Scaling
- Availability
- Remote Management & Automation



IBM i in a World with COVID-19

The IBM i Portfolio is uniquely positioned to support the remote working environment required by COVID-19 policies



Manage your system from anywhere

- **IBM Navigator for i:** Manage many aspects of your system, control devices and even monitor performance remotely from a web browser at home
- **IBM i Access Client Solutions:** Remote access to IBM i applications

Employee productivity from anywhere

- **IBM i Mobile Access:** Access IBM i remotely from any mobile device that has a web browser
- **IBM Rational Developer for i:** Strategic developer's environment for working unattached from IBM i
- **IBM Db2 Web Query for i:** Data analytics delivered anywhere

Business Continuity

- The most available system in the industry (ITIC Global Server Hardware Reliability Report)
- **IBM Db2 Mirror for i:** Continuous availability for applications & data
- **IBM PowerHA SystemMirror for i:** High availability with one integrated configuration
- **IBM Cloud for IBM i:** IBM i available in IBM Power Systems Virtual Server on IBM Cloud

IBM Cognitive Systems Strategy

Hybrid Cloud Innovation:
Agility, Flexibility & Automation
On-prem and Public Cloud

Resilient, Scalable, & Secure:
Architectural Strength &
Superiority

Application Modernization:
Enterprise AI, Advanced
Analytics, Containerization,
Extension via Microservices

AIX

Extend resilient, scalable and mission critical Unix environment with new innovative on-prem and public cloud offerings with consistent industry automation.

IBM i

Extend the most integrated operating system with innovative resiliency platform in Db2 Mirror, open source languages and AI integration.

Enterprise Linux

Deliver optimized infrastructure for workload modernization and growth on Power Systems through SAP HANA, SAS Viya, OpenShift & Cloud Paks.

IBM Public Cloud

Leverage Power Systems in the IBM Public Cloud across AIX/IBM i and Enterprise Linux as clients adopt mission-critical workloads in public clouds.

Built on Innovative POWER Processor Roadmap in conjunctions with stack integration across Hardware Systems and System Software

POWER9 14nm

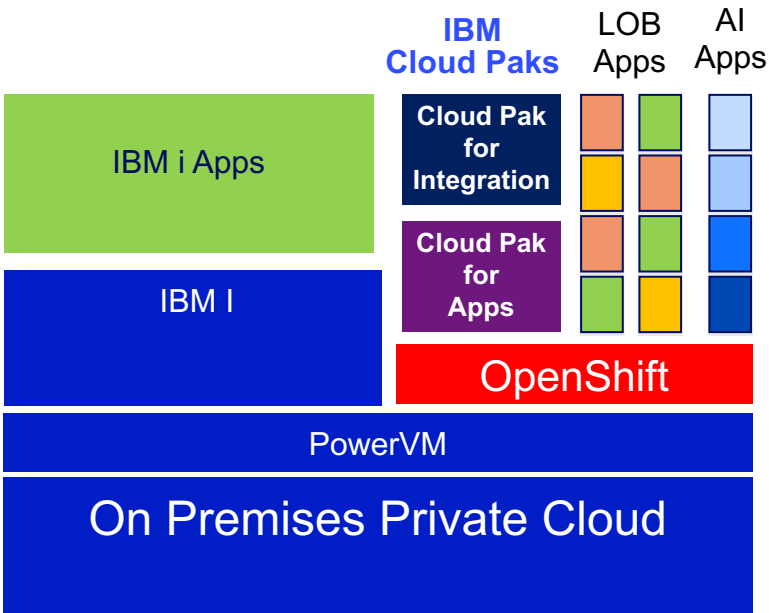
POWER10 7nm

POWER11

Red Hat



IBM i and Red Hat



What is being announced today – April 14, 2020

IBM i 7.4 TR2 and IBM i 7.3 TR8

- Availability & Virtualization
 - Db2 Mirror for i – responding to client feedback
 - Enhancements for PowerHA and BRMS
- Analytics & Db2
 - Highly requested enhancements and extensions
 - Continue to drive AI adoption into IBM i installed clients
- Solution Enablement
 - Additional capabilities to traditional coding environments - RPG
 - Enhancements to traditional languages and tools
 - New Open Source enhancements
- Security
 - 7.3 Support for TLS v1.3
 - 7.3 GUI interface for Digital Certificate Manager



IBM i Db2 Mirror

for small and medium businesses



Bringing leading business continuity to everyone

- Support for internal storage devices
- NVMe
- New entry price



IBM i Solution Editions – Worldwide

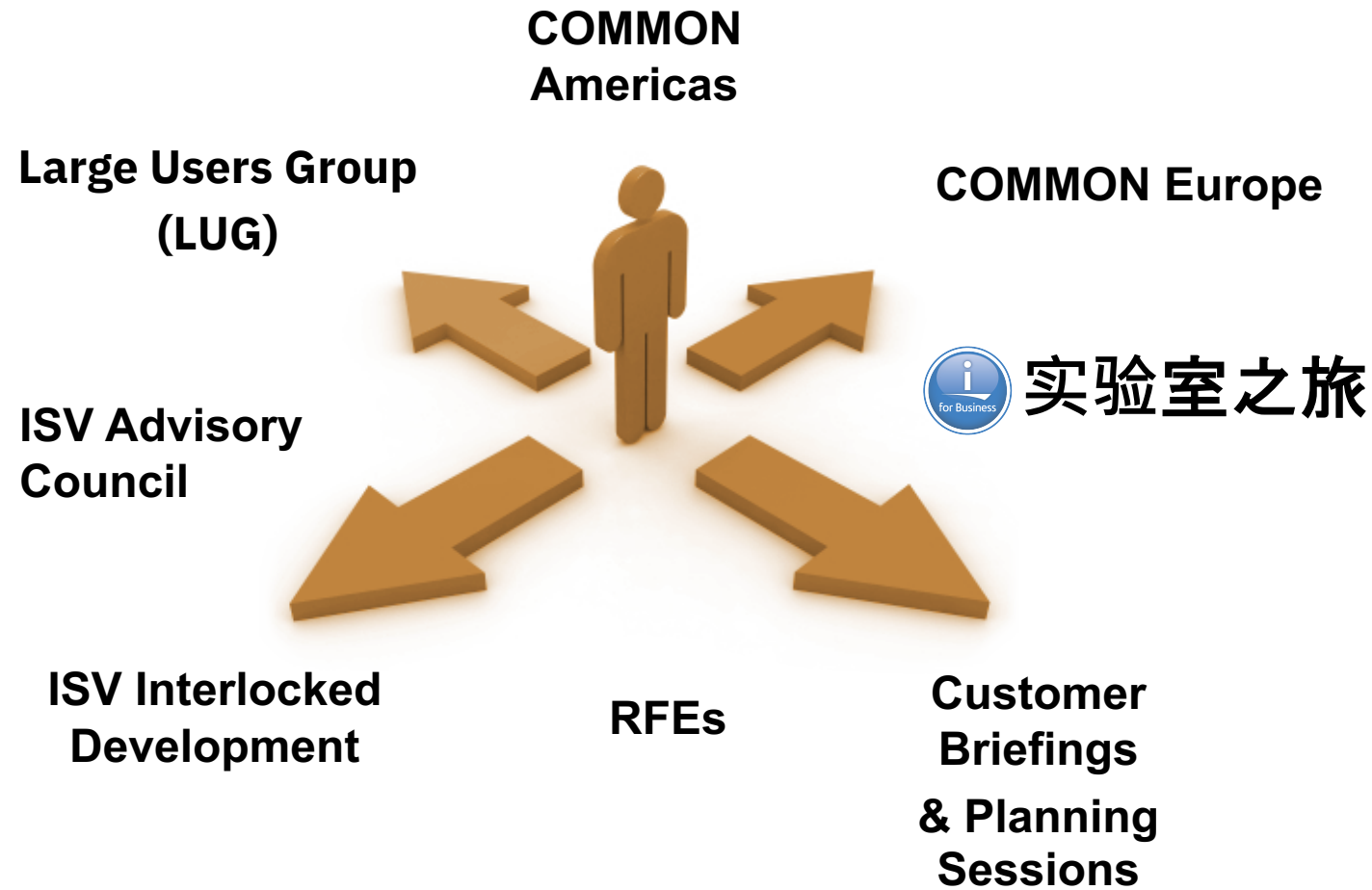
In partnership with industry-leading ISVs

- Complete, integrated solutions for small to mid-sized businesses
- Rapid deployment
- Simplified, flexible and highly secure infrastructure for core business applications
- Minimize risk
- Maximize ROI





Listening to Clients: Community Requests Drive Enhancements





IBM i 7.4 TR2 & 7.3 TR8: Integrating Innovation and Simplicity

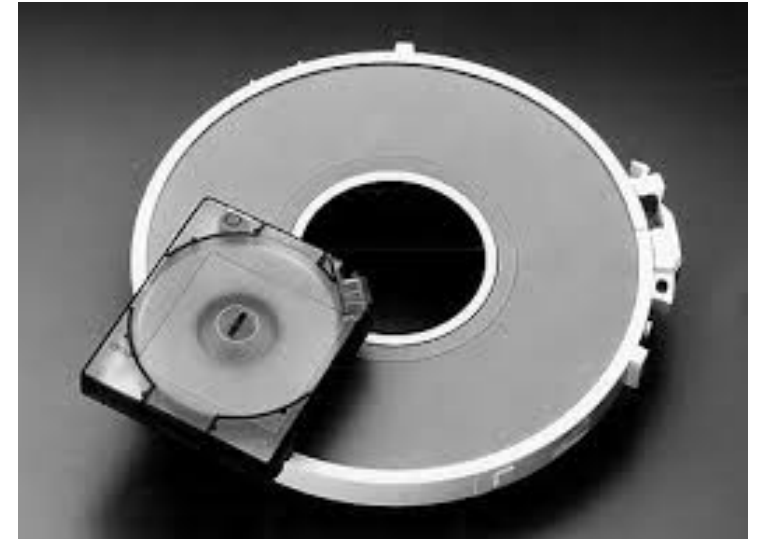
- Semi-annual Technology Refreshes for two most recent releases
 - allow IBM i to be agile in responding to requests
- Focus of these TRs is:
 - Innovation: Helping clients and solution providers provide value through new capabilities
 - Integration: Allowing IBM i technology to be easily consumed, with no disruption to clients
 - Simplicity: Making life easier for IBM i users, administrators and developers
-



Topics covered in today's Session

- Virtual Tape Libraries
 - Easier configuration and use
- Db2 Mirror – New function
 - Direct Attached Storage Support – and Save/Restore Setup
 - Application evaluation in Stand-Alone mode
- Security – Specifically 7.3 Support
 - TLS 1.3, TLS 1.2
 - New Digital Certificate Manager Interface
- Db2 – SQL new function
 - INTERPRET and COMPARE_FILE; and more!
- SQL Services
 - Work Management services are a focus area; IFS authority a highlight
 - Video blog to help you learn
- Rational Developer for i (RDi)
 - With a new tool to help modernize older RPG; and more!
- Db2 Web Query
 - Get started fast; do hard things easily

- **RFE 127631** - NPIV Tape support for IBM i Hosting
 - Want to virtualize a Fibre Channel attached Tape library
 - Want a simple hosting environment without VIOS to get NPIV-like behavior



- **New IBM i Tape Library Virtualization Support**

- Sharing between multiple IBM i partitions – without multiple adapters, a SAN switch, or a VIOS partition
- Sharing of the library device is done via an NWSD, as easily as sharing a stand-alone tape device
- Both server and client partitions can be running **any combination of IBM i 7.4, 7.3, or 7.2**
- Selected entry and midrange IBM Tape Library Devices are supported
- Configuration types:
 - SAS direct-attached devices
 - Fibre Channel direct-attached devices
 - SAN devices connected with a single adapter



IBM TS2900 (3572)



IBM TS3100/3200 (3573)



IBM TS4300 (3555)

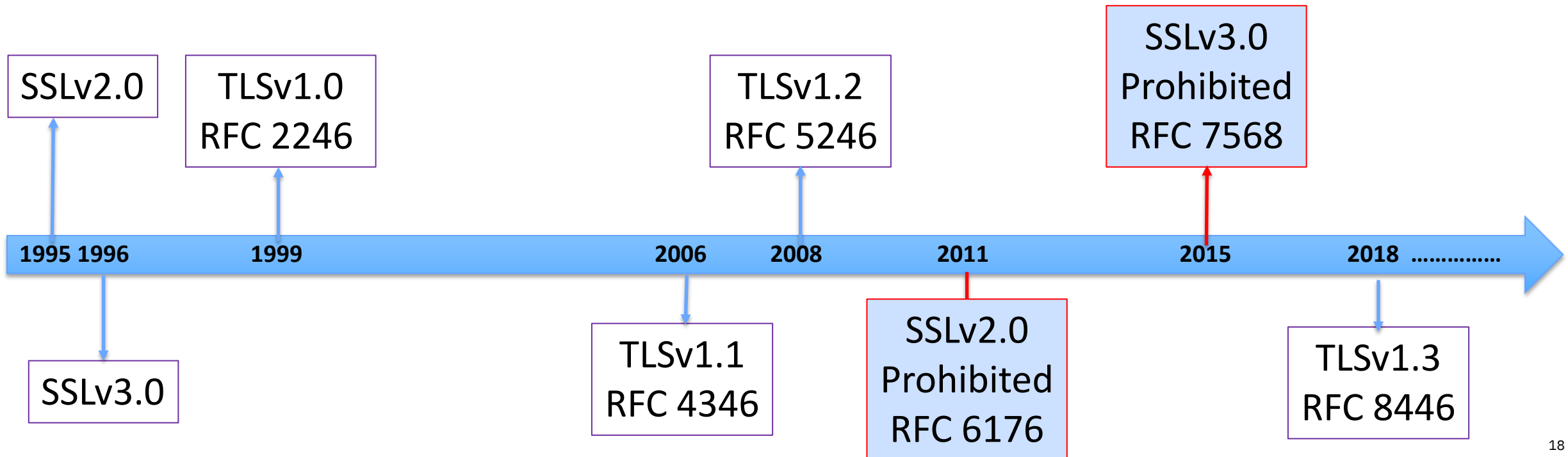


IBM i Virtualization for Tape Libraries

- **Required PTFs**
 - IBM i 7.4 MF66863
 - Requisite PTFs: MF66860, MF66861, MF66862, MF66837, MF66825, MF66840
 - IBM i 7.3 MF64802
 - Requisite PTFs: MF66857, MF66858, MF66859, MF66836, MF66824, MF66839, SI70255
 - IBM i 7.2 MF64803
 - Requisite PTFs: MF66854, MF66855, MF66856, MF66835, MF66823, MF66838, SI70254
- **Additional information (available on April 14th)**
 - The Client Virtual Tape Devices section of IBM i Support website:
<https://www.ibm.com/support/pages/node/1108539>
 - The IBM Knowledge Center:
https://www.ibm.com/support/knowledgecenter/ssw_ibm_i_74/rzam4/rzam4clientvirtdevices.htm

TLS - Transport Layer Security v1.3

- Newest and most secure version of the TLS/SSL protocols replacing TLSv1.2
 - All key negotiation protected by elliptical curve algorithms
 - Majority of handshake messages are encrypted
 - Fixed or removed features susceptible to existing named vulnerabilities
 - Used at IBM i 7.4 when QSSLPCCL is set to *OPSYS



Transport Layer Security (TLS) version 1.3 (IBM i 7.3)

- IBM i 7.4 and 7.4 TR1 TLS 1.3 support moved back to IBM i 7.3
- TLS 1.3 is newest and most secure version of the TLS protocols
- Replaces TLSv1.2 (eventually, long transition period with both protocols)
- All key negotiation protected by elliptical curve algorithms
 - Including the popular Curve25519(x25519) and Curve448(x448) curves
- System Value Enablement
- QSSLPCL *OPSYS now includes TLS 1.3
- QSSLCSLCTL *OPSYS now includes new TLSv1.3 and 1.2 cipher suites
- Admins need to explicitly add new values when *OPSYS is not used
- Many applications will automatically try use TLS 1.3 because they use the System TLS defaults.



Transport Layer Security (TLS) version 1.2 (IBM i 7.3)

- IBM i 7.4 TR1 TLSv1.2 support moved back to IBM i 7.3
- ChaCha20 Poly1305 cipher suites
- TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA256
- TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256
- Additional elliptic curve Diffie-Hellman key exchange support
 - Curve25519(x25519)
 - Curve448(x448)
- Online Certificate Status Protocol (OCSP) stapling





Retrieve TLS Attributes (QsoRtvTLISA) API (IBM i 7.3)

- Programmatic way to retrieve System TLS system wide attributes
 - Use instead of Advanced Analysis Command: `TLSCONFIG –display`

Supported protocol list

Eligible default protocol list

Default protocol list

Supported cipher suite list

Eligible default cipher suite list

Default cipher suite list

Supported signature algorithms

Default signature algorithms

Supported signature algorithm certificates

Default signature algorithm certificates

Supported named curves

Default named curves

Default minimum RSA key size

Renegotiation without RFC 5746 allowed

Handshake protocol counters

Secure session caching

RFC required (EtM, EMS, RFC5746 etc)

Middlebox compatibility mode

Audit Secure Telnet handshakes

- View all the certificates in the store, filter and sort them for quick identification
- Tabbed interface with each tab representing a certificate store
 - Work with multiple certificate stores at the same time
- Hovering capabilities to provide instant help on fields, buttons, tasks
- Visually see certificates that are expiring or already expired
- To access this new GUI, apply the required PTFs and enter `http://hostname:2001/DCM` from the web browser.
- Original GUI interface still available





What's new with SQL in Db2 for i

- SQL Language Enhancements:
- Built-in functions
- Embedded SQL for RPG
- Extending usage of Extended Indicators
- Easier shredding of JSON using SQL
- And more...
- Add it up and there are many gains in programmer productivity

A blue, rounded rectangular graphic with a white border and a drop shadow, resembling a certificate. The text 'Certificate of Awesomeness' is centered in a bold, black, serif font.

***Certificate
of
Awesomeness***



INTERPRET built-in function

- Q: How do I transform data from IBM i internal data types?
A: INTERPRET(expression AS data-type)
- The expression must be binary or character (bit data or 65535)
- Length of expression must exactly match the result data type

```
VALUES INTERPRET(X'0003C1C2C3' AS VARCHAR(3));
```

```
=> 'ABC'
```

```
VALUES INTERPRET(X'00000011' AS INTEGER);
```

```
=> 17
```



COMPARE_FILE

- An efficient tool that compares two files
- Compare file object attributes, data, or both
- Compare files on the same IBM i or against a remote IBM i
- Compare using Db2 SMP parallel processing (5770SS1 Option 26)

IBM i 7.4 only

```
select * from table(qsys2.compare_file(  
  LIBRARY1 => 'DATALIB', FILE1 => 'CUSTMAST',  
  LIBRARY2 => 'TESTLIB', FILE2 => 'CUSTMAST',  
  PARALLEL_DEGREE => '2', COMPARE_TYPE => 'BOTH'));
```




What's new with IBM i Services?

- SQL alternative to APIs and CL Commands
- 15 new QSYS2 services
- 9 enhanced QSYS2 services
- 4 new tools with source code in SYSTOOLS
- Add it up and there are 28 new ways to gain iSight

Work Management Services

QSYS2.ACTIVE_JOB_INFO – UDTF
QSYS2.AUTOSTART_JOB_INFO – VIEW
QSYS2.GET_JOB_INFO – UDTF
QSYS2.JOB_DESCRIPTION_INFO – VIEW
QSYS2.JOB_INFO – UDTF
QSYS2.JOB_LOCK_INFO – VIEW
QSYS2.JOB_QUEUE_INFO – VIEW
QSYS2.MEMORY_POOL – UDTF
QSYS2.MEMORY_POOL_INFO – VIEW
QSYS2.OBJECT_LOCK_INFO – VIEW
QSYS2.PRESTART_JOB_INFO – VIEW
QSYS2.PRESTART_JOB_STATISTICS – UDTF
QSYS2.RECORD_LOCK_INFO – VIEW
QSYS2.ROUTING_ENTRY_INFO – VIEW
QSYS2.SCHEDULED_JOB_INFO – VIEW
QSYS2.SUBSYSTEM_INFO – VIEW
QSYS2.SUBSYSTEM_POOL_INFO – VIEW
QSYS2.SYSTEM_STATUS – UDTF
QSYS2.SYSTEM_STATUS_INFO – VIEW
QSYS2.SYSTEM_VALUE_INFO – VIEW
QSYS2.WORKSTATION_INFO – VIEW



New or Enhanced @ IBM i 7.3 TR8 and IBM i 7.4 TR2



IFS_OBJECT_PRIVILEGES

- 1 row returned for an IFS object's public and private privileges
- Similar to OBJECT_PRIVILEGES for QSYS objects

```
select * from table (  
  qsys2.ifs_object_privileges(path_name =>  
  '/usr/local/tap.ini')
```

OWNER	AUTHORIZATION_NAME	DATA_AUTHORITY	OBJECT_OPERATIONAL	OBJECT_MANAGEMENT	OBJECT_EXISTENCE
SCOTT	*PUBLIC	*RWX	YES	NO	NO
SCOTT	SCOTT	*RWX	YES	YES	YES



- Combine services to gain more insight

```
with ifsobjspath as (  
    select path_name from table(qsys2.object_ownership('SCOTT'))  
    where path_name is not null  
)  
select z.* from ifsobjspath i, lateral (select *  
    from table(qsys2.ifs_object_privileges(path_name=>path))) z  
where authorization_name = '*PUBLIC'  
order by data_authority;
```

- Study IFS security deployment with SQL

PATH_NAME	OBJECT_TYPE	DATA_AUTHORITY	OBJECT_OPERATIONAL	OBJECT_MANAG
/usr/local/guardium/uninstall	*STMF	*EXCLUDE	NO	NO
/usr/local/guardium/istap_console.socket	*FIFO	*EXCLUDE	NO	NO
/usr/local/guardium/LICENSE.TXT	*STMF	*R	YES	NO
/usr/local/guardium/iso-swid/1986-03.com.ibm_IBM_Securi...	*STMF	*R	YES	NO
/usr/scott.out	*STMF	*RW	YES	NO
/usr/local/guardium/guard_itap.stderr.1.txt	*STMF	*RW	YES	NO
/tmp/guard-stap-setup-180418_120550/guard_stap_setup.log	*STMF	*RW	YES	YES
/usr/local/guardium/install_out.txt	*STMF	*RW	YES	NO
/tmp/guard-stap-setup-180502_093030/guard_stap_setup.log	*STMF	*RW	YES	YES
/foo.out	*STMF	*RW	YES	NO
/tmp/guard-stap-setup-180502_093030/update	*DIR	*RWX	YES	YES



New Video Blog

2020
iSight




i See

IBM ^{MEDIA} Systems

<https://ibmsystemsmag.com/tags/isee-video-blog>

Db2 Mirror Update

Spring 2020 Announcements

Kris Whitney
STSM,
IBM i Development
whitneyk@us.ibm.com



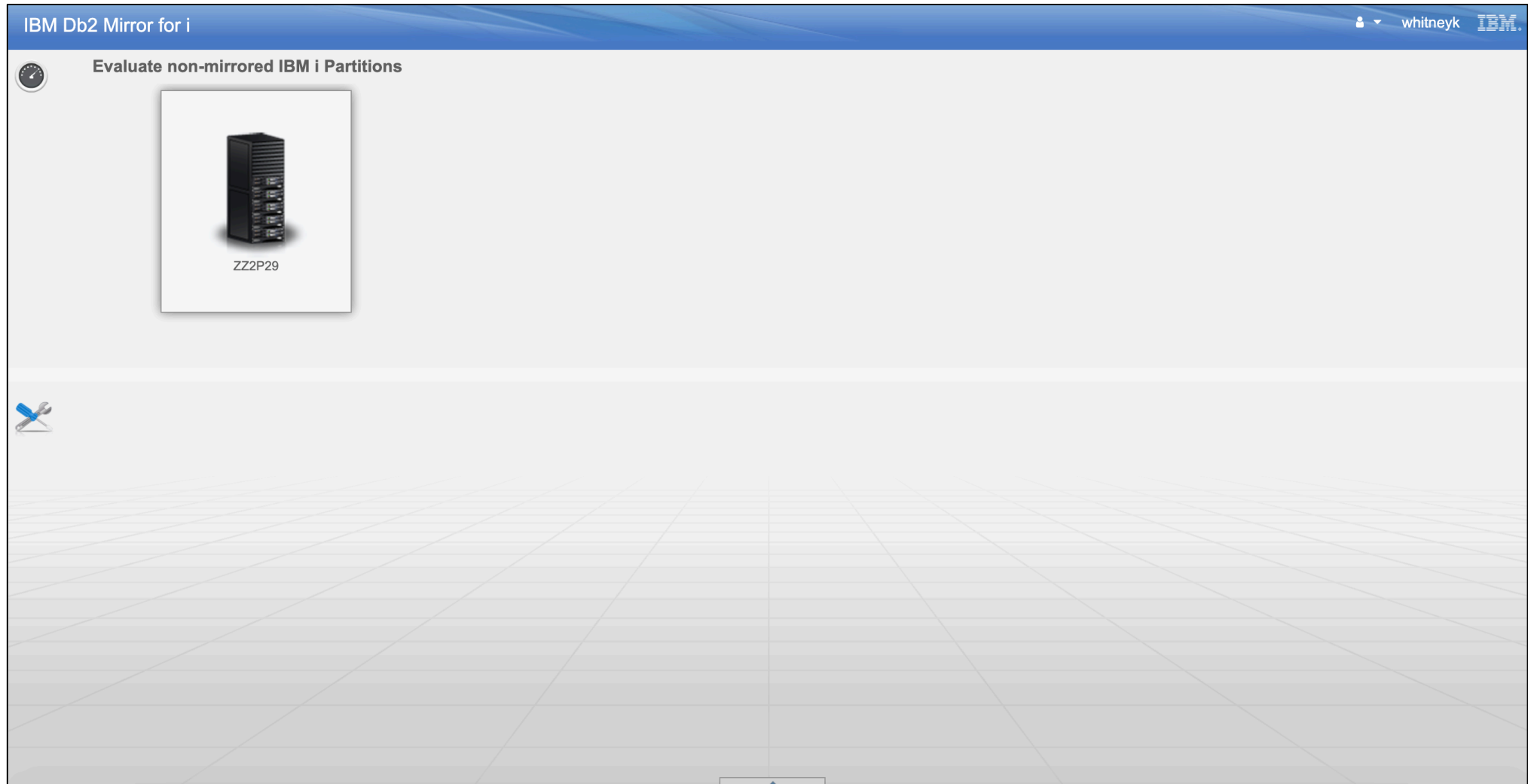
[Kris Whitney@i_virtualize](#)

Db2 Mirror for i now supports Direct Attach Storage

- Can configure Db2 Mirror for i regardless if the storage has copy service functionality.
- Db2 Mirror for i can use save and restore to configure mirroring
- Enables support for storage such as NVMe or SAS SSD



- From an IBM i LPAR with the base 5770-DBM installed it is possible to point to another IBM i LPAR that is at 7.2, 7.3 or 7.4 to gain insight into some considerations for Db2 Mirror.



- Drill down on which Libraries and Objects are eligible to be replicated

IBM Db2 Mirror for i System Name: ZZ2P29 whitneyk IBM

Application Evaluation - Replication Eligibility

STORE42

Library Name	Replication Eligibility	Object Count
QXMLSERV	Eligible	5
QXML563V4	Ineligible	5
QXML563V6	Ineligible	5
QXSLDEV110	Ineligible	1
QXSL112V4	Ineligible	1
QXSL112V6	Ineligible	1
QYPSFMWSTS	Eligible	1
RVD	Ineligible	1
SYSIBMADM	Ineligible	89
SYSPROC	Ineligible	2
SYSTOOLS	Ineligible	60
TRANSWL	Eligible	19
TRANS1000	Eligible	1000
TRANS10000	Eligible	10000
VOLANO	Ineligible	25

Showing 246 of 246

Object Type	Replication Eligibility	Object Count
*DTAARA	Eligible	10
*DTAQ	Definition Only	1
*FILE	Eligible	218
*JOB	Eligible	1
*JOBQ	Eligible	1
*JRN	Eligible	2
*JRNRCV	Ineligible	5
*MODULE	Ineligible	5
*SQLPKG	Eligible	1
*SQLUDT	Eligible	19
*SQLXSR	Eligible	1
*SRVPGM	Eligible	74
*USRIDX	Ineligible	2
*USRSPC	Ineligible	2

Showing 100 of 100

Object Name	Object Long Name	Object Type	SQL Object Type	Replication Eligibility	Object Attributes	Object Created
"/BIC/I2"	/BIC/FZZFLAT001/99	*FILE	INDEX	Eligible	LF	2020-01-13 13:56:51
"/BIC/M2"	/BIC/FZZFLAT001/99	*FILE	TABLE	Eligible	PF	2020-01-13 13:56:52
"/BIC/V2"	/BIC/FZZFLAT001/99	*FILE	VIEW	Eligible	LF	2020-01-13 13:56:44
"/BIC/999"	/BIC/FZZFLAT001/99	*FILE	TABLE	Eligible	PF	2020-01-13 13:56:41
"/BIC0001"	/BIC/FZZFLAT001	*FILE	TABLE	Eligible	PF	2020-01-13 13:56:31
"/BIC0002"	/BIC/FZZFLAT001/99	*FILE	TABLE	Eligible	PF	2020-01-13 13:56:42
"/BIC0003"	/BIC/FZZFLAT001/99	*FILE	VIEW	Eligible	LF	2020-01-13 13:56:43
"/BIC0004"	/BIC/FZZFLAT001/99	*FILE	ALIAS	Eligible	DDMF	2020-01-13 13:56:45
"/BIC0005"	/BIC/FZZFLAT001/99	*FILE	ALIAS	Eligible	DDMF	2020-01-13 13:56:45
"/BIC0006"	/BIC/FZZFLAT001/99	*FILE	INDEX	Eligible	LF	2020-01-13 13:56:51
"/BIC0007"	/BIC/FZZFLAT001/99	*FILE	TABLE	Eligible	PF	2020-01-13 13:56:53
A_DIF00001	A_DIFFERENT_NAM	*FILE	ALIAS	Eligible	DDMF	2020-01-13 13:51:47
A_VIE00001	A_VIEW_TO_A_VIEW	*FILE	VIEW	Eligible	LF	2020-01-13 13:51:38
ACT	ACT	*FILE	TABLE	Eligible	PF	2020-01-13 13:14:05
AUDIT	AUDIT	*FILE	TABLE	Eligible	PF	2020-01-13 13:15:15
A55	A55	*FILE	TABLE	Eligible	PF	2020-01-13 13:56:36
A55PG	A55PG	*FILE	INDEX	Eligible	LF	2020-01-13 13:56:37
A5501	A5501	*FILE	INDEX	Eligible	LF	2020-01-13 13:56:37
A5502	A5502	*FILE	INDEX	Eligible	LF	2020-01-13 13:56:38
A5504	A5504	*FILE	INDEX	Eligible	LF	2020-01-13 13:56:39
A5505	A5505	*FILE	INDEX	Eligible	LF	2020-01-13 13:56:40

Showing 218 of 218

Application Evaluation

Replication Eligibility

Journal Evaluation

Sequence Objects

Launch to evaluate Db2 Mirror object level replication eligibility



- Gain some insight into how the file is being used

[illegible]

- Journal tuning could change the performance of Db2 Mirror

IBM Db2 Mirror for i System Name: ZZ2P29 whitneyk IBM

Application Evaluation - Journals

Journal Configuration and Statistics Filters X

Journal Library	Journal Name	Journal Type	Receiver Max Size	Remove Internal Entries	ASP Number	Attached Journal Receiver Name	Attached Journal Receiver Library	Journal Text	Journal State	Journal Cache	Journalized Object Limit	Journalized Objects
QMGTC	QYPSDBJRN	*LOCAL	*MAXOPT2	NO	1	QYPSDB0180	QMGTC		*ACTIVE	NO	*MAX250K	11
QRECOVERY	QDBJRNCOLM	*LOCAL	*MAXOPT3	YES	1	QDBJNC0131	QRECOVERY		*ACTIVE	NO	*MAX250K	45
QRECOVERY	QDBJRNFILE	*LOCAL	*MAXOPT3	YES	1	QDBJNF0132	QRECOVERY		*ACTIVE	NO	*MAX250K	183
QRECOVERY	QDBJRNRFQ	*LOCAL	*MAXOPT3	YES	1	QDBJXQ0001	QRECOVERY		*ACTIVE	NO	*MAX250K	3
QRECOVERY	QSQTJRNR	*LOCAL	*MAXOPT2	YES	1	QSQTJT0012	QRECOVERY		*ACTIVE	NO	*MAX250K	1
QSRVAGT	QSJJRN	*LOCAL	*MAXOPT2	NO	1	QSJJRN0180	QSRVAGT		*ACTIVE	NO	*MAX250K	11
QSYS2	QSQJRN	*LOCAL	*MAXOPT2	YES	1	QSQJRN0018	QRECOVERY		*ACTIVE	NO	*MAX250K	108
QUSP	QJRAI	*LOCAL	*MAXOPT2	YES	1	QJRAI0152	QUSRBRM		*ACTIVE	NO	*MAX250K	189
			*MAXOPT2	YES	1	QJRAI0153	QUSRBRM		*ACTIVE	NO	*MAX250K	163
			*MAXOPT2	YES	1	QSQJRN0181	QUSRDIRDB		*ACTIVE	NO	*MAX250K	266
						QICC000143	QUSRICC		*ACTIVE	NO	*MAX250K	161
						QAOSDI1187	QUSRSYS	Journal for DIA files	*ACTIVE	NO	*MAX250K	153
			*MAXOPT2	YES	1	QASOSC1187	QUSRSYS	JOURNAL FOR SOCKS CONFIGURATION FILE	*ACTIVE	NO	*MAX250K	66
QUSRSYS	QCQJMNR	*LOCAL	*NONE	NO	1	QCQJRN1483	QUSRSYS	JOURNAL FOR MANAGED SYSTEM LOG	*ACTIVE	NO	*MAX250K	63
QUSRSYS	QDSNX	*LOCAL	*MAXOPT2	YES	1	QDSNX1186	QUSRSYS	JOURNAL FOR DSNX LOG	*ACTIVE	NO	*MAX250K	64
QUSRSYS	QLZALOG	*LOCAL	*MAXOPT2	YES	1	QLZALO1186	QUSRSYS	Journal for license management	*ACTIVE	NO	*MAX250K	64

Total Rows: 28

Application Evaluation

Replication Eligibility

Journal Evaluation

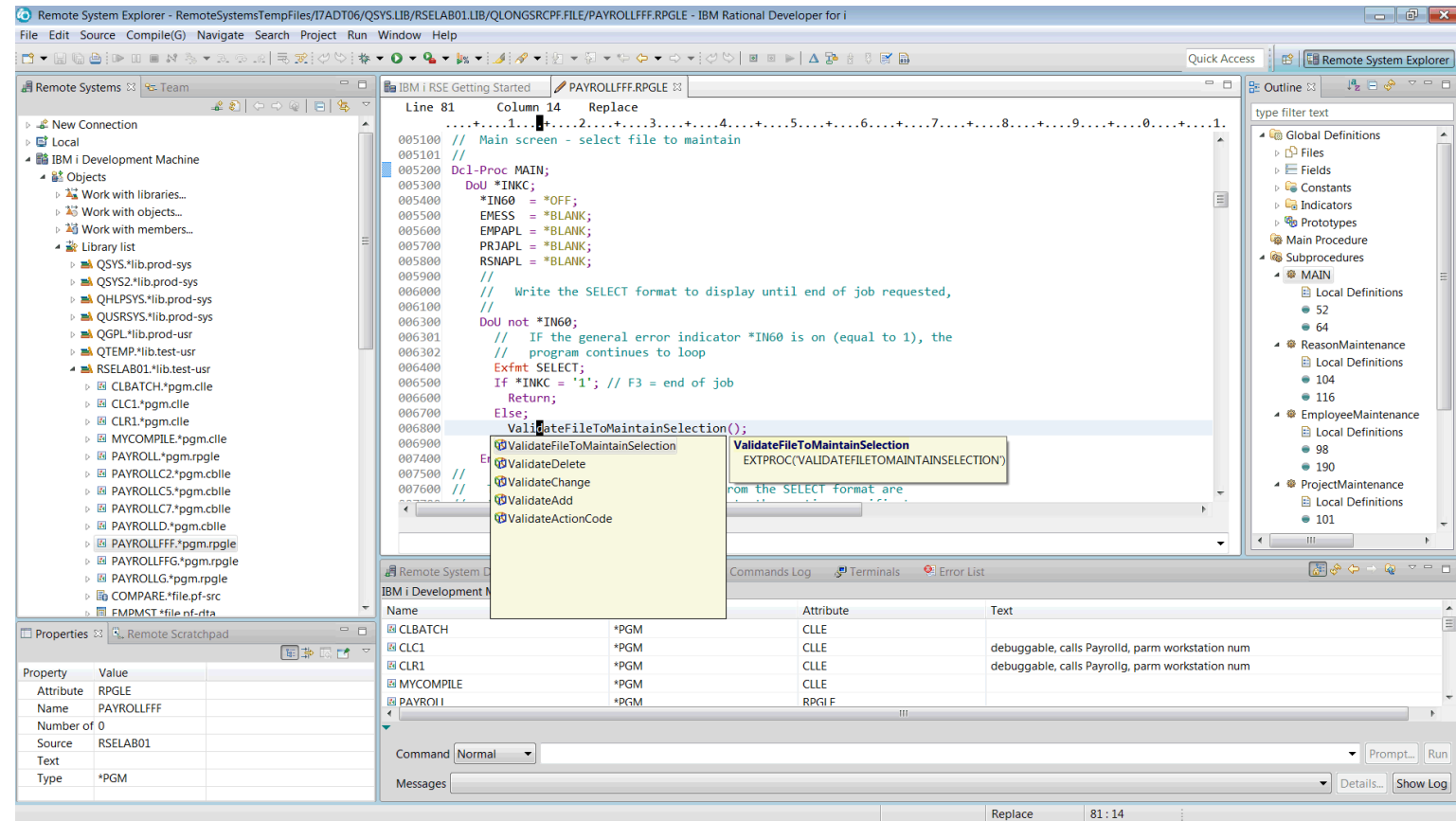
Sequence Objects

Launch to review and evaluate journal configurations and statistics



Rational Developer for i 9.6.0.7

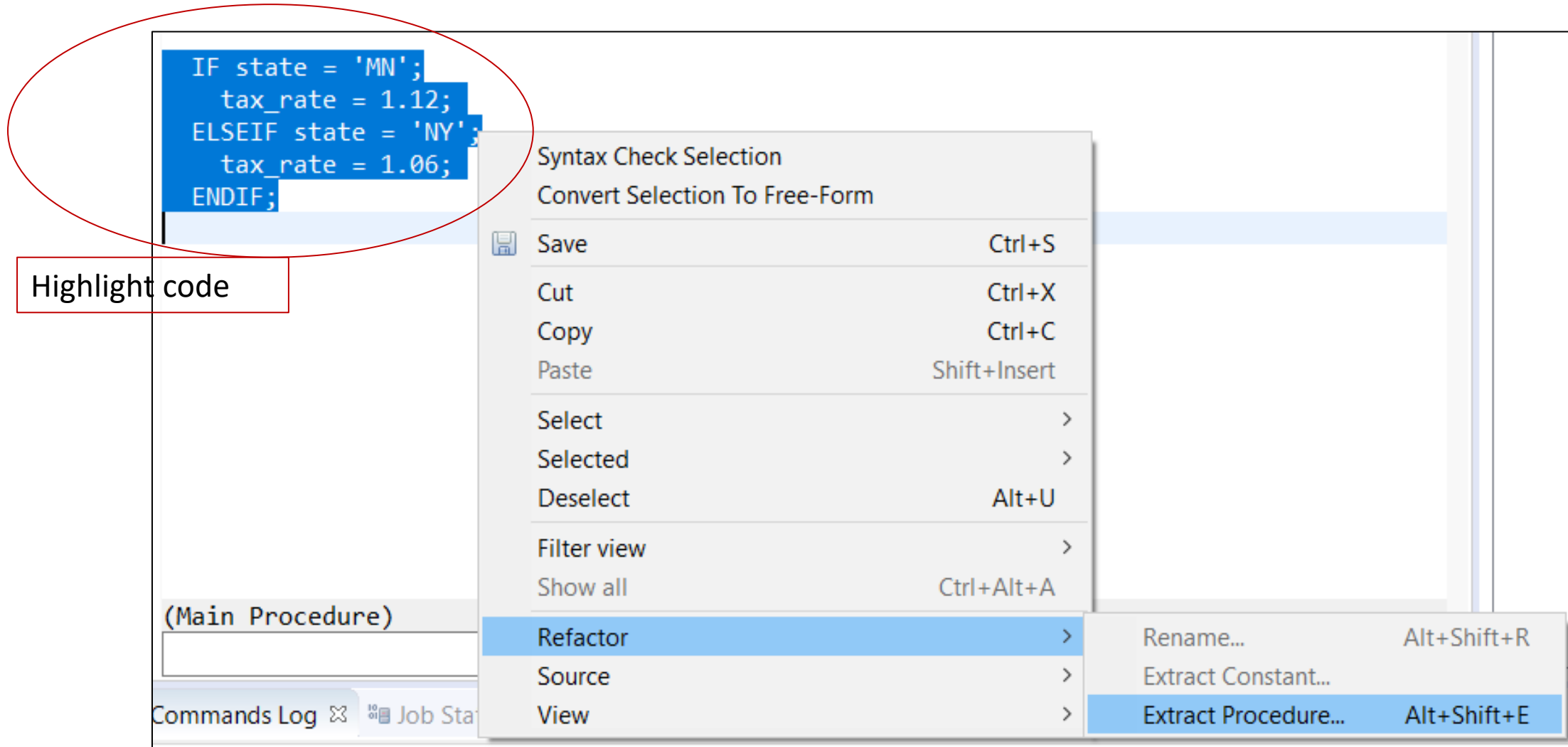
- Refactoring – Extract Procedure
- Realtime
 - SQL Validation
 - SQL Formatting
- Conditional Set Breakpoint
- Much more...



120 Day Free Trial

<https://www.ibm.com/us-en/marketplace/rational-developer-for-i>

- Refactoring – Extract and Create Procedure



RPG Procedure Wizard

RPG Procedure
Create RPG procedure

Procedure type: Subprocedure

Procedure name: getTaxRate

External name (EXTPROC): *dclcase

Purpose: calculate tax rate based on state

☒ Return a value

Parameters | Return Variable | Program Call Markup Language | Options

Parameters created for this procedure:

Name	Type	Length	Decimal	Keywords	Comments

Add... Duplicate... Change... Remove Move Up Move Down

☐ Pass the operational descriptors with the parameters

Name calculated

Parameters calculated

< Back Next > Finish Cancel

RPG Procedure Wizard

RPG Procedure
Create the return value of RPG procedure.

Name: p_taxRate

Comment: Return field generated by Extract Procedure.

Type: ☒ Define like ☐ Define field type: A - Character

Define like

tax_rate

☒ Field ☐ Data Structure ☐ Record Format

☐ CCSID 0 - 65535

Array entries (DIM):

Other keywords

☐ ALTSEQ(*NONE) ☐ ASCEND ☐ DESCEND ☐ NOOPT

Return type calculated

? < Back Next > Finish Cancel

Parameters calculated

Refactoring – Extract and Create Procedure

Procedure call inserted



```
// calculate tax rate given state  
taxRate = getTaxRate();
```

Reusable procedure generated



```
// -----  
// Procedure name: getTaxRate  
// Purpose:         calculate tax rate given state  
// Returns:         Return field generated by Extract Procedure  
// -----  
dcl-proc getTaxRate;  
  dcl-pi *N LIKE(tax_rate);  
  end-pi;  
  // Local fields  
  
  dcl-s p_taxRate LIKE(tax_rate);  
  IF state = 'MN';  
    p_taxRate = 1.12;  
  ELSEIF state = 'NY';  
    p_taxRate = 1.06;  
  ENDIF;  
  
  return p_taxRate;  
end-proc;
```

Realtime SQL Validation & Formatting

```
*showAnnotations.sqlrpgle
```

Line	Column	Annotation
5	25	Insert 6 changes

```

.....1.....2.....+.....3.....+.....4.....+.....5.....+.....6.....+.....7.....+.....8
/free
exec sql
"SELECT" expected instead of this input ,last_name ,addr
  fromx myfile into(:first_name_fld, :last_name_fld, :addr_fld)
  where id =| :id_fld;

name_fld = %trim(first_name_fld) + ' ' + %trim(last_name_fld);

```

IBM Db2 Web Query for i

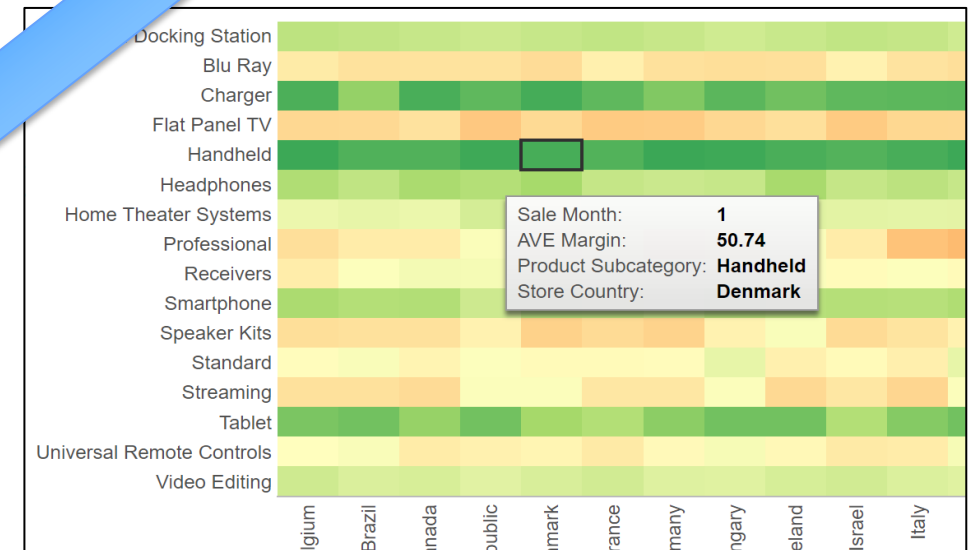
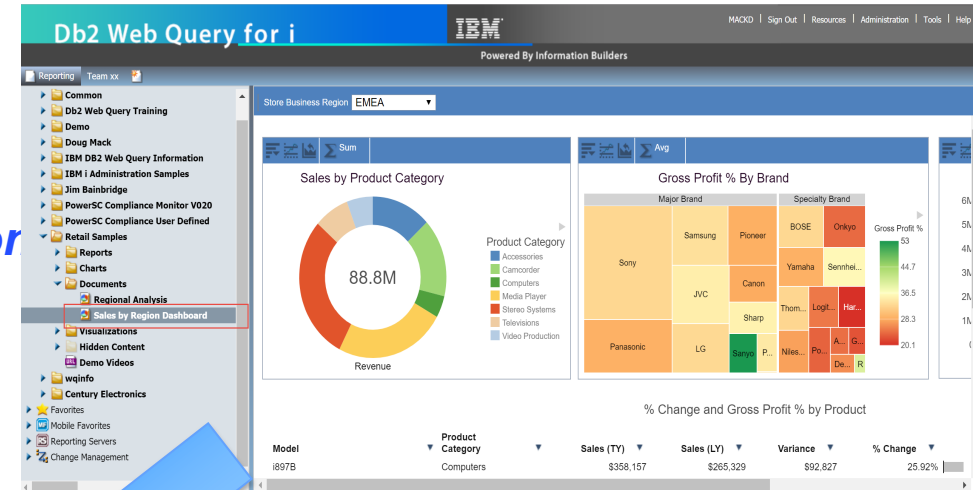
Doug Mack,
Senior Consultant,
IBM Lab Services
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Updated Db2 Web Query EZ-Install Package

- Business Partner “Demo in a box”
- Simplified First Time Installation
- Simplified Upgrade from Previous Version
 - **Do NOT use for applying PTF Group in same version**
- **Jump Start the Learning Process**
 - **Test Drive** what you now have
 - **Learn** how to build reports/dashboards tutorial
 - 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





EZ-Report: Auto generate Synonym and Report from SQL

- Have already delivered auto generate for Query/400, now adding it for SQL
- Use Cases
 - Fast report over a Table/File
 - Fast report over IBM i Services
 - Copy/Paste from ACS Run SQL Scripts Examples
 - Fast report over SQL Statement
 - Converting other BI/Query tools to Db2 Web Query
- What does it do?
 - Auto creates a synonym (meta data) over data source
 - Auto creates a “fex” object (i.e. report) in folder specified
 - Run report as is, or modify
- How it will be shipped
 - As a utility in the next Db2 Web Query EZ-Install

Db2 Web Query for i

Powered By Information Builders

Reporting Team xx Doug's Faves Team 01 Page 1 SystemsMag Page Qty Sold by Store Guatemala Panama Managua

192 of 192 records, Page 1 of 4

ORDERNUMBER	PRODUCTNUMBER	ORDERDATE	REQUESTEDSHIPDATE	SHIPDATE	INVOICEDATE	RECEIVED
28003	2005	2019/10/17	2020/01/20	2019/11/21	2019/12/03	2019
	3004	2019/10/17	2020/01/18	2020/01/16	2020/01/29	2020
	4022	2019/10/17	2019/11/27	2019/12/14	2019/12/24	2019
	5002	2019/10/17	2019/11/17	2019/12/04	2019/12/06	2019
	5004	2019/10/17	2019/11/26	2019/12/01	2019/12/11	2019
28012	1012	2019/10/17	2020/01/08	2020/01/07	2020/01/19	2020
	2002	2019/10/17	2019/12/25	2019/12/28	2020/01/12	2020
	2024	2019/10/17	2019/12/16	2019/12/23	2020/01/08	2020
	3001	2019/10/17	2019/12/08	2019/12/24	2020/01/01	2020
	5011	2019/10/17	2020/01/03	2020/01/20	2020/01/25	2020
28015	1004	2019/10/17	2020/01/19	2020/01/04	2020/01/17	2020
	1015	2019/10/17	2019/11/18	2019/11/19	2019/11/20	2019
	2001	2019/10/17	2020/01/01	2019/12/27	2020/01/09	2019
	2003	2019/10/17	2019/12/06	2019/12/20	2019/12/21	2020
	2004	2019/10/17	2019/11/21	2019/12/02	2019/12/11	2019
28020	1024	2019/10/17	2019/12/17	2020/01/02	2020/01/16	2020
	1032	2019/10/17	2019/12/12	2020/02/25	2020/03/14	2020
	1041	2019/10/17	2020/01/04	2020/03/11	2020/03/15	2020
	1054	2019/10/17	2019/12/04	2020/02/09	2020/02/22	2020
	4004	2019/10/17	2020/01/16	2020/01/23	2020/01/28	2020

Planned for Mid April



EZ-Report: Auto generate Synonym and Report from SQL

Db2 Web Query Training

- As a pct of
- demo
- HBedoyaTest
- jimtest
- team 20
- dougs vis
- gbm_revpgftqry.q
- mar 14 report
- matrix pie chart viz
- stockh_revpgftqry
- Test SQL Script
- Test_SQL_Script_2

Filter Values

Domain Name: Db2_Web_Query_Training

Report Name: Dougs_SQL

SQL Stmt: select * from qwqcent/orders where orderc

Description:

Output Format: AHTML

Create a Report

Paste SQL



192 of 192 records, Page 1 of 4

ORDERNUMBER	PRODUCTNUMBER	ORDERDATE	REQUESTEDSHIPDATE	SHIPDATE	INVOICEDATE	RECEIVEDATE
28003	2005	2019/10/1		2019/11/21	2019/12/03	2019/12/03
	3004	2019/10/1		2020/01/16	2020/01/29	2020/01/29
	4022	2019/10/1		2019/12/14	2019/12/24	2019/12/24
	5002	2019/10/1		2019/12/04	2019/12/06	2019/12/06
	5004	2019/10/1		2019/12/01	2019/12/11	2019/12/11
28012	1012	2019/10/1		2020/01/07	2020/01/19	2020/01/19
	2002	2019/10/1		2019/12/28	2020/01/12	2020/01/12
	2024	2019/10/1		2019/12/23	2020/01/08	2020/01/08
	3001	2019/10/1		2019/12/24	2020/01/01	2020/01/01
	5011	2019/10/1		2020/01/20	2020/01/25	2020/01/25
28015	1004	2019/10/1		2020/01/04	2020/01/17	2020/01/17
	1015	2019/10/1		2019/11/19	2019/11/20	2019/11/20
	2001	2019/10/1		2019/12/27	2020/01/09	2020/01/09
	2003	2019/10/1		2019/12/20	2019/12/21	2019/12/21
	2004	2019/10/1		2019/12/02	2019/12/11	2019/12/11
28020	1024	2019/10/1		2020/01/02	2020/01/16	2020/01/16
	1032	2019/10/1		2020/02/25	2020/03/14	2020/03/14
	1041	2019/10/1		2020/03/11	2020/03/15	2020/03/15
	1054	2019/10/1		2020/02/22	2020/02/22	2020/02/22
	4004	2019/10/1		2020/01/28	2020/01/28	2020/01/28
28024	1052	2019/10/1		2020/03/11	2020/03/15	2020/03/15
	1054	2019/10/1		2019/12/15	2019/12/15	2019/12/15

Sort Ascending
Sort Descending
Filter
Calculate
Chart
Rollup
Pivot (Cross Tab)
Hide Column
Freeze Column
Unfreeze All
Grid Tool
Chart/Rollup Tool
Pivot Tool
Show Records
Comments
Send as E-mail
Save Changes
Export
Print
Window
Restore Original

HTML
CSV (comma delim)
XML (Excel)
All records
Filtered only



Search Synonyms and Report Objects

- Adds to additional utilities for the Db2 Web Query Administrator
 - Reverse engineer Spool File into Excel or PDF
 - Create Date Dimension Table
 - Compare Files
- Use Cases
 - Document field usage in synonyms for end users
 - Provides administrator with where used information
 - Eliminate redundancy of reports or synonyms
 - Search reports for common keywords (in the generated code)
 - Categorize reports via search to know what's available
- How it will be shipped
 - As a utility in the next Db2 Web Query EZ-Install

The screenshot shows the 'Db2 Web Query for i' interface. On the left, a tree view under 'Reporting' shows folders like 'IBM Db2 Web Query Information', 'IBM i Administration Samples', 'Drill Down Reports', 'Java Related', 'Job Related', 'Journal Related', 'PTF Related', 'Spool File Related', 'Storage Related', 'System Related', 'User Related', and 'Utilities'. Under 'Utilities', 'Compare Files', 'Services Available', 'Synonym Fields', and 'Create Date Table' are listed. The 'Synonym Fields' option is highlighted. On the right, a 'Filter Values' section shows a 'Folder:' dropdown set to 'DEMO'. Below this, a table displays 1390 records, page 1 of 25. The table has columns 'FOLDER', 'SYNONYM_NAME', and 'FIELD_NAME'. The 'FOLDER' column shows 'DEMO' and the 'SYNONYM_NAME' column shows 'aparm_sillysql'. The 'FIELD_NAME' column lists various fields including 'BASE_TABLE_CATALOG', 'BASE_TABLE_MEMBER', 'BASE_TABLE_NAME', 'BASE_TABLE_SCHEMA', 'COLUMN_COUNT', 'CONTROL', and several 'DEFINE' statements for timestamps and refresh times.

FOLDER	SYNONYM_NAME	FIELD_NAME
DEMO	aparm_sillysql	BASE_TABLE_CATALOG
		BASE_TABLE_MEMBER
		BASE_TABLE_NAME
		BASE_TABLE_SCHEMA
		COLUMN_COUNT
		CONTROL
		DEFINE LAST_ALTERED_TIMESTAMP_DAY/12=DTPART(LAST_ALTERED_TIMESTAMP, DAY);
		DEFINE LAST_ALTERED_TIMESTAMP_MONTH/12=DTPART(LAST_ALTERED_TIMESTAMP, MONTH);
		DEFINE LAST_ALTERED_TIMESTAMP_QUARTER/12=DTPART(LAST_ALTERED_TIMESTAMP, QUARTER);
		DEFINE LAST_ALTERED_TIMESTAMP_YEAR/12=DTPART(LAST_ALTERED_TIMESTAMP, YEAR);
		DEFINE LAST_ALTERED_TIMESTAMP_YEAR_D/YMD=DTRUNC(LAST_ALTERED_TIMESTAMP, DAY);
		DEFINE LAST_ALTERED_TIMESTAMP_YEAR_M/YMD=DTRUNC(LAST_ALTERED_TIMESTAMP, MONTH);
		DEFINE LAST_ALTERED_TIMESTAMP_YEAR_Q/YMD=DTRUNC(LAST_ALTERED_TIMESTAMP, QUARTER);
		DEFINE LAST_ALTERED_TIMESTAMP_YEAR_Y/YMD=DTRUNC(LAST_ALTERED_TIMESTAMP, YEAR);
		DEFINE REFRESH_TIME_DAY/12 MISSING ON ALL=DTPART(REFRESH_TIME, DAY);
		DEFINE REFRESH_TIME_MONTH/12 MISSING ON ALL=DTPART(REFRESH_TIME, MONTH);
		DEFINE REFRESH_TIME_QUARTER/12 MISSING ON ALL=DTPART(REFRESH_TIME, QUARTER);
		DEFINE REFRESH_TIME_YEAR/12 MISSING ON ALL=DTPART(REFRESH_TIME, YEAR);
		DEFINE REFRESH_TIME_YEAR_D/YMD MISSING ON ALL=DTRUNC(REFRESH_TIME, DAY);
		DEFINE REFRESH_TIME_YEAR_M/YMD MISSING ON ALL=DTRUNC(REFRESH_TIME, MONTH);

Planned for Mid April



Other technologies with new capabilities

- Db2 SQL new functions – compare file, JSON, INTERPRET and more
- Clustering – more automation
- PowerHA – Automation, use of SQL services, simplified updates
- BRMS – a large number of popular RFEs
- Hybrid Networking – Making full use of high-speed fabric with Live Partition Mobility
- RPG – growing the language to have features expected by new developers
- Access Client Solutions – improved content assist support plus more ease-of-use functions
- Open Source – including a way to use RPM when IBM i is not connected to the Internet



Rochester Executive Briefing Center

- In addition to the regular briefings held for clients, Rochester now hosts
- A Co-creation Center
 - What is that?
 - Joint workshops to develop plans/ best practices
 - Who can come there?
 - Business Partners
 - Customers
- Direct access to IBM i development team
- On-line briefings and webcasts also available.



Submit requests for briefings, meetings or web events at

<https://briefingsource.dst.ibm.com/site/switchBriefingCenter?briefingCenterId=54>



Helpful Links

IBM i Home Page:

- http://bit.ly/ibm_i_home

Technology Refresh Updates home page:

- <https://www.ibm.com/support/pages/node/1119129>

– Specific TR pages:

- <https://supportcontent.ibm.com/support/pages/ibm-i-73-tr8-enhancements>
- <https://supportcontent.ibm.com/support/pages/ibm-i-74-tr2-enhancements>

Blog

- "You and i" home is <http://bit.ly/You-and-i> --
 - IBM i in Spring 2020
 - Fresh Faces and Finding Developers
 - Announce blog

IBM Support

Search support or find a product

IBM i Technology Updates

	Enhancement Landing Pages
IBM i 7.4	TR1 - Base Enhancements
IBM i 7.3	TR7 - TR6 - TR5 - TR4 - TR3 - TR2 - TR1 - Base Enhancements



You and



are in this together!



**CAN'T
DO IT**



