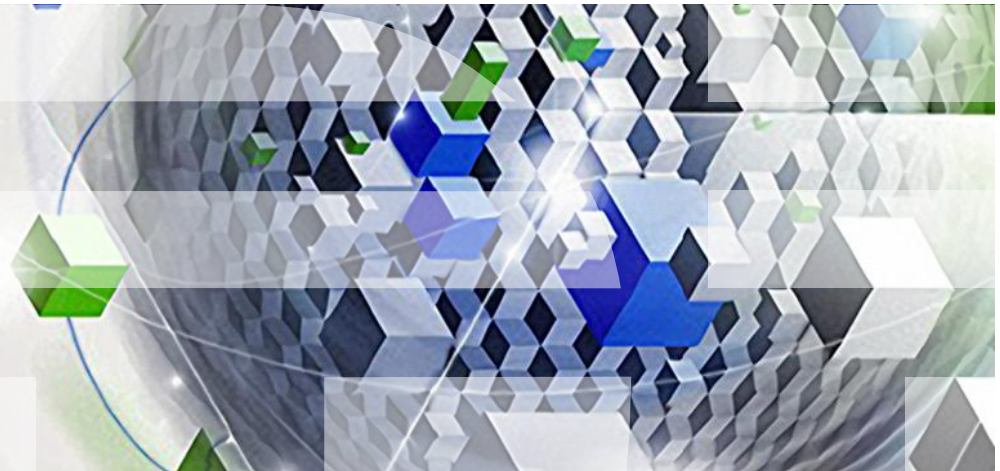


IBM i Application Development Overview

Tim Rowe
timmr@us.ibm.com

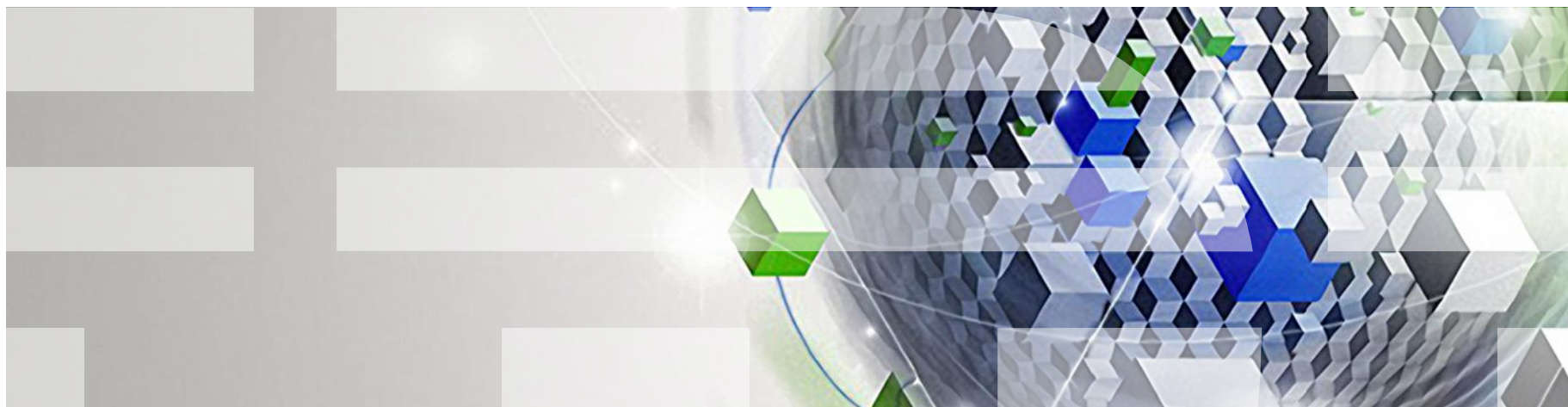


Agenda

- Workload Capping
- Application Runtime Expert
- Web Integration
 - HTTP Server
 - Integrated Web Services
- WebSphere updates
- Rational tools and products
 - Rational Open Access
 - Rational Development Studio
 - Rational Developer for Power
 - Rational Team Concert
- Zend & PHP
- Lotus
- What's new with Java

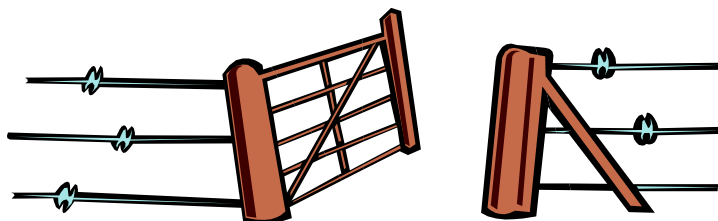


IBM i Workload Capping



What is Workload Capping

- Provide a method for users to set the amount of processing capacity for a Workload.
 - A workload is defined as a job, subsystem, or product
 - Conceptually if a workload is capped at 1 processor core on a multi core system, the capped workload should respond as if its running on a single core 520



Purpose of Workload Capping

■ Workload control

- Fence a workload to a specified number of processors
- Ensure unstable jobs do not have the ability to adversely effect the system performance

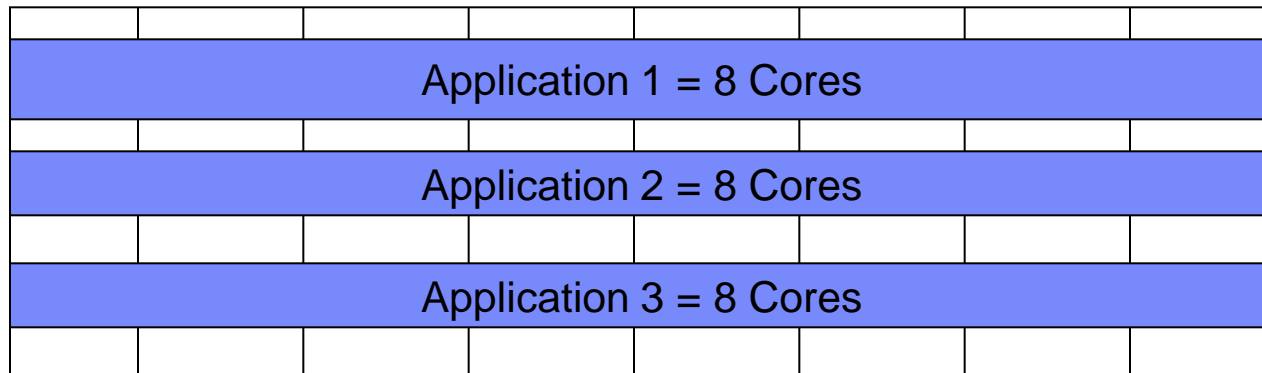
■ Control Licensing cost

- License a product to less cores then in that partition and ensure that product is fenced



IBM i Today

- IBM i Workload Management
 - Subsystems provide workload isolation
 - Priorities are used to schedule work
 - No way to cap a given application to a subset of the processor resources in a partition
- All workloads can access the full number of Cores in the Partition

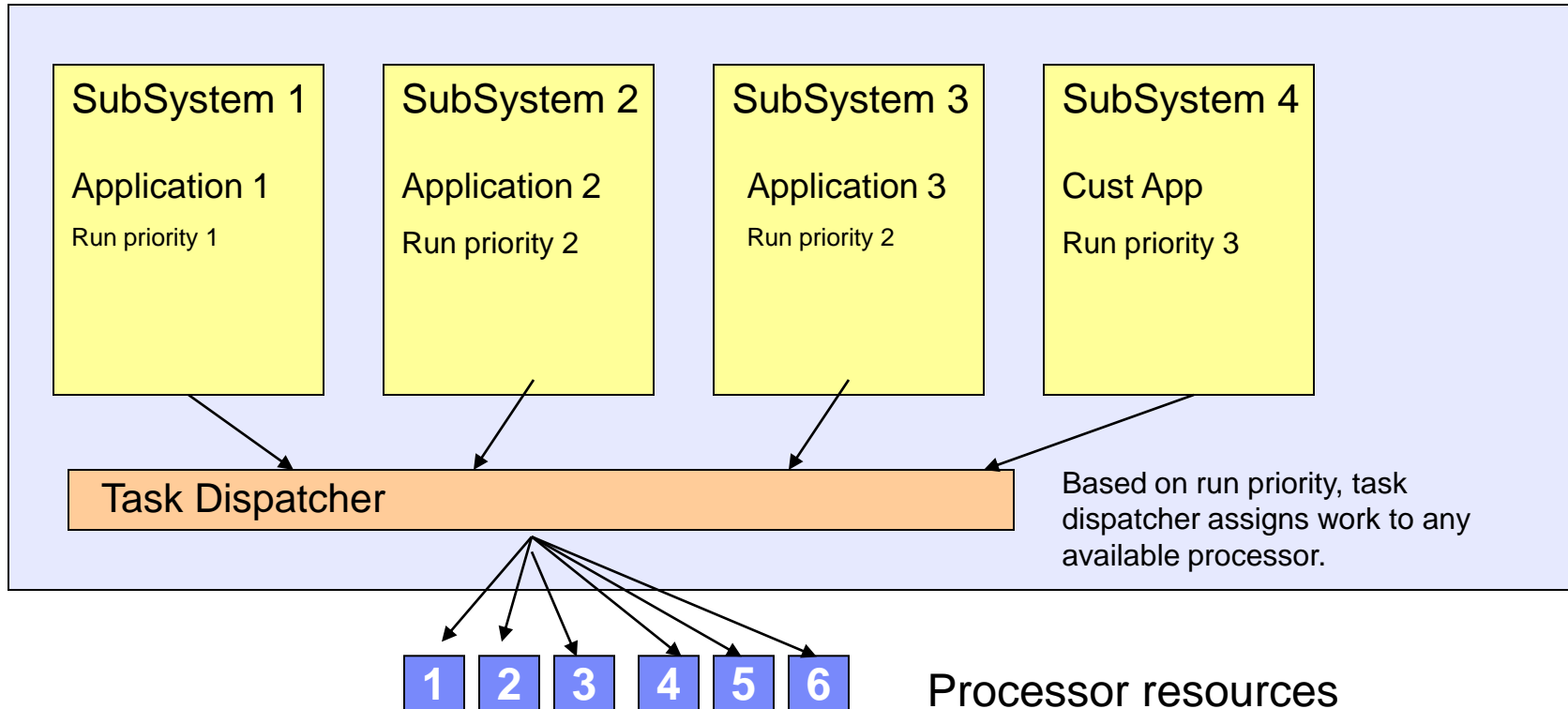


IBM i System / Partition

- Virtually all customers run multiple applications on a single IBM i
- Consistent with integrated value proposition

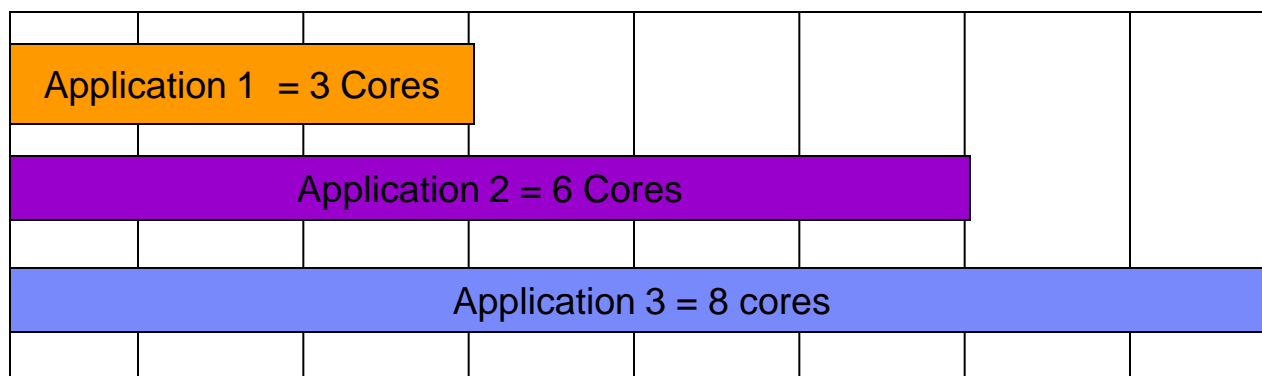
IBM i Today

Every product today has complete access to every processor assigned to a partition. Scheduling is done based on the potential for every processor to be running that product.



IBM i Workload Capping

- Customer specifies a workload to be limited to lower than available capacity, OS enforces that limit.

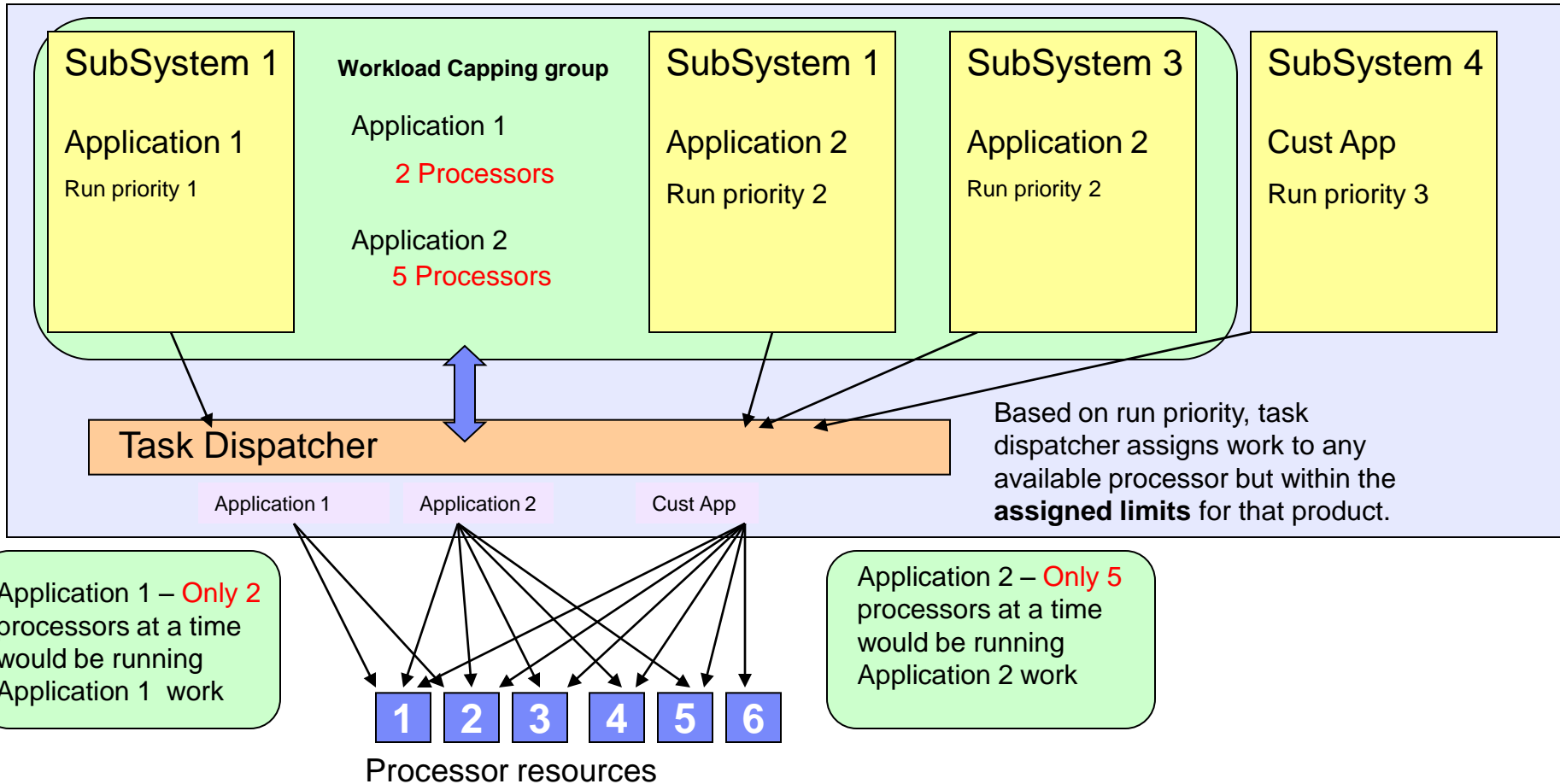


IBM i System / Partition

- Works within a Single IBM i system / partition
- Supported across IBM i subsystems
- Limits placed at the whole processor-core level

IBM i Tomorrow

Products/Applications only have access to the number of processors assigned regardless of the number in the partition. Control is enforced at the task dispatcher.



Simple Story View

1. Create Workload Capping Group <group name> <# Cores> <product>

```
ADDWLCGRP WLCGRP(MYGROUP) PRCLMT(2)
```

2. Set Group on workload <group name>

- Specify on the Sub System

```
CRTDTAARA DTAARA(QSYS/QWTWLCGRP) TYPE(*CHAR) LEN(2000)  
VALUE('MYQBATCH WLCGRP01 MYSBSNAME MYGROUP ')  
TEXT('Subsystems to use workload capping') AUT(*USE)
```

- Set on an Active Job

```
CHGJOB JOB(123456/QUSER/MYSERVER) WLCGRP(MYGROUP)
```

3. The identified work (every job or thread) is limited to running concurrently on the # Cores specified in the Workload Capping group and it runs happily ever after.

Available with PTF SI39795 - additional details in cover letter

Complete details -

<http://publib.boulder.ibm.com/infocenter/series/v7r1m0/index.jsp?topic=/rzaks/rzaksworkloadcapping.htm>

Web Integration on i & WebSphere



All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Web Server Enhancements

- **IBM HTTP Server for i running Apache**
 - Latest Apache 2.2 release
 - Payment Card Industry (PCI) Compliant
- **IBM Technology for Java**
 - Java 5 and 6 support for 32-bit and 64-bit JVMs
 - No longer shipping Classic JVM on IBM i 7.1
- **Integrated Web Application Server**
 - Part of IBM i
 - Supports running Java 5 and 6 applications
- **Integrated Web Services Server**
 - Create Web Services
 - Call Web Services from RPG!



The screenshot displays the 'IBM Web Administration for i' web interface. The top navigation bar includes 'Setup', 'Manage', 'Advanced', and 'Related Links'. A sidebar on the left lists 'Common Tasks and Wizards' such as 'Create Web Services Server', 'Create HTTP Server', 'Create Application Server', and 'Create WebSphere Portal'. The main content area is titled 'IBM Web Administration for i' and contains a 'Getting started' section with four wizard links: 'Create a New Web Services Server', 'Create a New HTTP Server', 'Create a New Application Server', and 'Create a New WebSphere Portal'. Each link is accompanied by a brief description of the wizard's purpose.

Integrated Web technologies easily support new application deployments

Externalizing Web services with RPG on IBM i

Simplification and Ease of Use

POWER = INTEGRATION + SOLUTIONS



Web Admin: Install Web Service

Access Web Admin <http://hostname:2001/HTTPAdmin>



IBM Web Administration for i5/OS

Setup | Manage | Advanced | Related Links

WebSphere

IBM

Common Tasks and Wizards

- ▶ Create Web Services Server
- ▶ Create HTTP Server
- ▶ Create Application Server
- ▶ Create WebSphere Portal

IBM Web Administration for i5/OS

Getting started - Create and learn about the servers needed to run your Web content.

Create a New Web Services Server ⓘ

Create Web Services Server Wizard provides a convenient way to externalize existing programs running on i5/OS, such as RPG or COBOL, as Web services. This allows Web service clients to interact with these i5/OS program based services from the Internet or intranet using Web service based industry standard communication protocols such as SOAP.

Create a New HTTP Server ⓘ

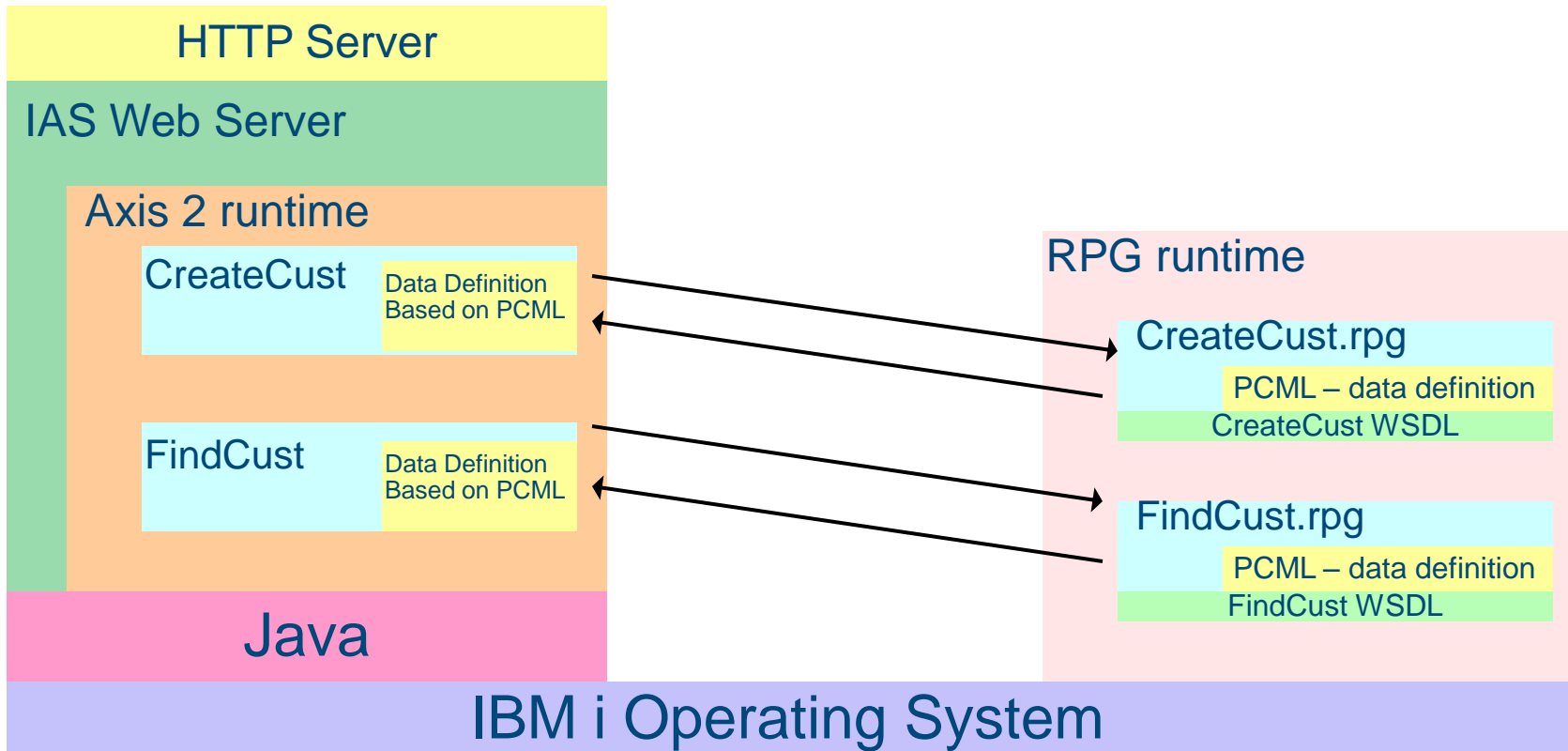
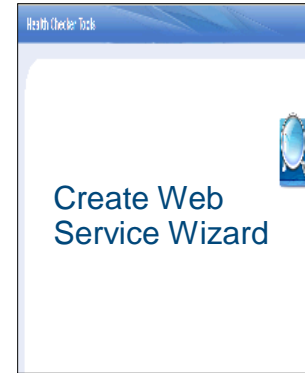
Create a new HTTP Server (powered by Apache) to run your HTTP Web content. This wizard will create everything you need to get started with simple Web serving.

Create a New Application Server ⓘ

Create a new application server to run your dynamic Web applications. Create either an i5/OS integrated application server or a WebSphere Application Server.

Click on the Create New Web Services Server link

Creating a Web Service



Web Admin: Install Web Service

- Step 5: What in the ILE program should be externalized as a Web service?

IBM Web Administration for i5/OS

Setup | Manage | Advanced | Related Links

All Servers | HTTP Servers | Application Servers | ASF Tomcat Servers

Running | Server: WSERVICE1 - V1.3 (web services)

Common Tasks and Wizards

- Create Web Services Server
- Create HTTP Server
- Create Application Server
- Migrate Original to Apache
- Create WebSphere Portal
- Create IBM Workplace

Web Services Wizards

- Deploy New Service

Server Properties

- Properties
- Server Tracing
- View HTTP Servers

Services

- Manage Deployed Services

Web Performance

- Web Performance Advisor

Problem Determination

- View Logs
- View Create Summary

Export procedures:

Select	Procedure name/Parameter name	Usage	Data type	Count
<input type="checkbox"/>	▶ GETCITYNAME			
<input type="checkbox"/>	▶ FINDTOCITIES			
<input type="checkbox"/>	▶ FINDFROMCITIES			
<input type="checkbox"/>	▶ GETFLIGHTINFO			
<input type="checkbox"/>	▶ FINDFLIGHTS			
<input type="checkbox"/>	▶ FINDFLIGHTSDOW			
<input type="checkbox"/>	▶ GETCUSTNAME			
<input type="checkbox"/>	▶ GETCUSTNUMBER			
<input checked="" type="checkbox"/>	▼ FINDCUSTOMERS			
	▣ POSITION	input	char	
	▣ LISTTYPE	input	char	
	▣ COUNTREQ	input	int	
	▣ COUNTRET	output	int	
	▣ CUSTLIST	output	struct	

SELECTED: COUNTRET

Buttons: Select All, Deselect All, Expand All, Collapse All, Back, Next, Cancel

Based on PCML

Web Admin: Install Web Service

- Step 6: Specify User for the Web service

The screenshot displays the IBM Web Administration for i5/OS interface. The top navigation bar includes 'Setup', 'Manage', 'Advanced', and 'Related Links'. The main content area is titled 'Create Web Services Server' and is part of a wizard with 8 steps, currently on step 6. The server selected is 'WSERVICE1 - V1.3 (web services)'. The wizard prompts the user to specify a user ID for the service. The 'Specify an existing user ID' option is selected, and the user ID 'MyUser' is entered in the text field. A checkbox for 'Update the server's user ID to have *USE authority to this user ID.' is checked. The interface includes a left-hand navigation pane with categories like 'Common Tasks and Wizards', 'Web Services Wizards', 'Server Properties', 'Services', 'Web Performance', and 'Problem Determination'. At the bottom of the wizard, there are 'Back', 'Next', and 'Cancel' buttons.

IBM Web Administration for i5/OS

Setup Manage Advanced | Related Links

All Servers | HTTP Servers Application Servers ASF Tomcat Servers

Running Server: WSERVICE1 - V1.3 (web services)

Create Web Services Server

Deploy New Service: Specify User ID for this Service - Step 6 of 8

The service requires an i5/OS user ID to run the program object that contains the Web service business logic.

Specify User ID for this Service: ?

Use server's user ID

Specify an existing user ID

The user ID must have the necessary authority to this program object and any other additional program objects.

User ID:

Update the server's user ID to have *USE authority to this user ID.

Back Next Cancel

Web Admin: Install Web Service

- Step 7: Configure IBM i resources for the Web service

The screenshot shows the IBM Web Administration for i5/OS interface. The top navigation bar includes 'Setup', 'Manage', 'Advanced', and 'Related Links'. The main navigation area shows 'All Servers | HTTP Servers | Application Servers | ASF Tomcat Servers'. The current server is 'WSERVICE1 - V1.3 (web services)'. The left sidebar contains a tree view with categories like 'Common Tasks and Wizards', 'Web Services Wizards', 'Server Properties', 'Services', 'Web Performance', and 'Problem Determination'. The main content area is titled 'Create Web Services Server' and is at 'Step 7 of 8'. The step description is 'Deploy New Service: Specify Library List'. The text explains that the functionality of the i5/OS program may depend on other i5/OS programs, and all libraries must be specified. Below this is a table for 'Library list entries' with a header 'Library name'. The table contains four rows: IWSRIL, QGPL, QTEMP, and FLGHT400. The 'FLGHT400' row is selected with a radio button. Below the table are buttons for 'Add', 'Remove', 'Remove All', 'Move up', 'Move down', and 'Continue'. At the bottom of the wizard are 'Back', 'Next', and 'Cancel' buttons.

IBM Web Administration for i5/OS

Setup Manage Advanced | Related Links

All Servers | HTTP Servers Application Servers ASF Tomcat Servers

Running Server: WSERVICE1 - V1.3 (web services)

Create Web Services Server

Deploy New Service: Specify Library List - Step 7 of 8

The functionality of the i5/OS program you want to externalize as a Web service may depend upon other i5/OS programs in the system. Specify all libraries in which programs exist that the Web service programs depend on. If no library is specified, a default library list is used.

Library list entries:

	Library name
<input type="radio"/>	IWSRIL
<input type="radio"/>	QGPL
<input type="radio"/>	QTEMP
<input checked="" type="radio"/>	FLGHT400

Add Remove Remove All Move up Move down Continue

Back Next Cancel

Web Admin: Install Web Service

- Manage installed Services – view and install new services to this server

IBM Web Administration for i5/OS

Setup **Manage** Advanced | Related Links

All Servers | HTTP Servers **Application Servers** ASF Tomcat Servers

Running Server: WSERVICE - V1.3 (web services) ▼

WSERVICE > Manage Deployed Services

Manage Deployed Services

Data current as of Sep 10, 2008 1:57:20 PM.

Deployed services: ?

	Service name	Status	Startup type	WSDL - service definition
<input type="radio"/>	ConvertTemp	Running	Automatic	View definition
<input checked="" type="radio"/>	FindCustomers	Running	Automatic	View definition

Common Tasks and Wizards

- Create Web Services Server
- Create HTTP Server
- Create Application Server
- Migrate Original to Apache
- Create WebSphere Portal
- Create IBM Workplace

Web Services Wizards

- Deploy New Service

Server Properties

- Properties
- Server Tracing
- View HTTP Servers

Services

- Manage Deployed Services

Web Performance

- Web Performance Advisor

Problem Determination

- View Logs
- View Create Summary

Consuming Web services with RPG on IBM i The Unlimited Potential

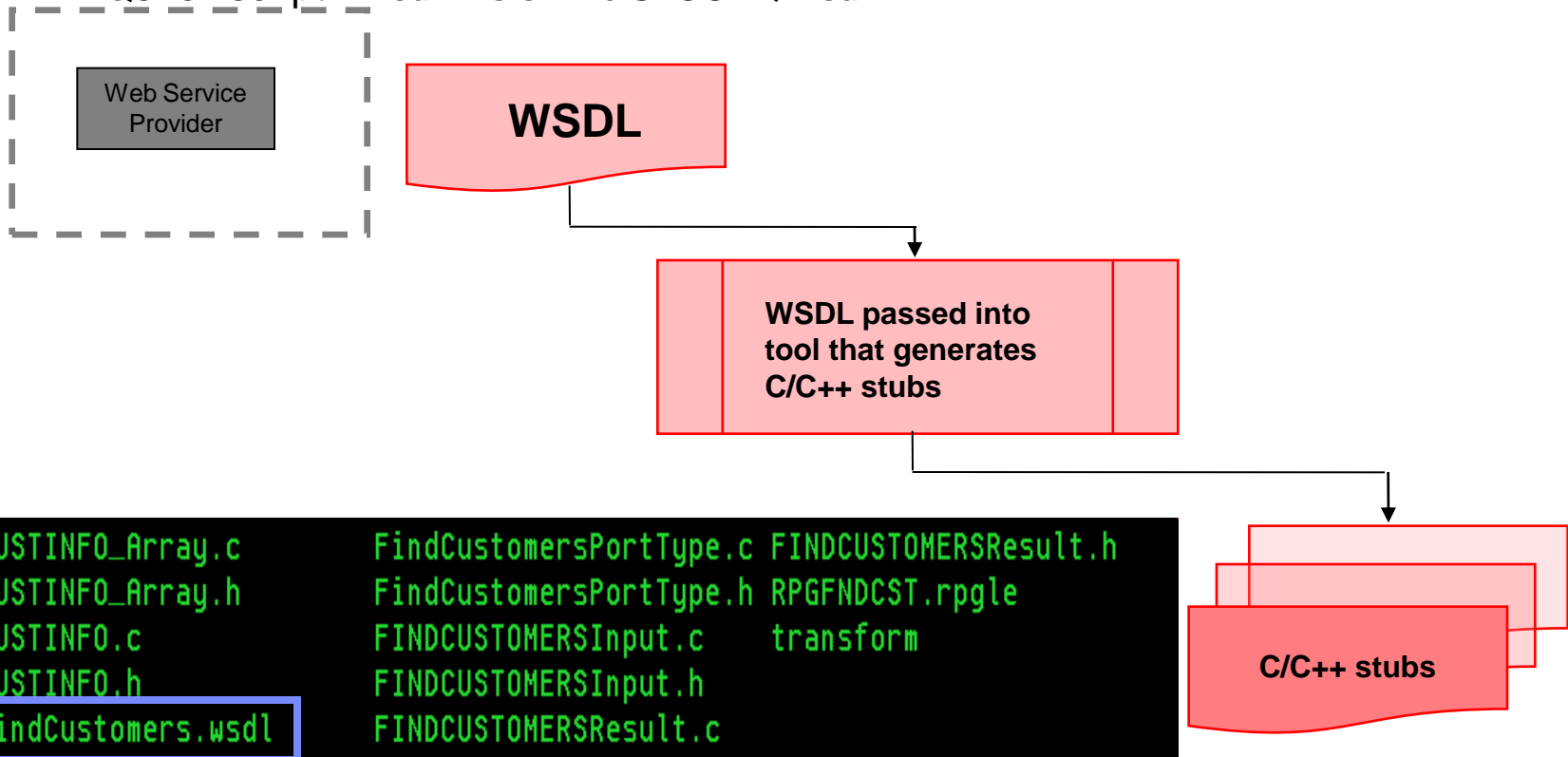
POWER = INTEGRATION + SOLUTIONS



Web Services Client for ILE

Step 1: Stub Generation – Creating a Web Services Proxy

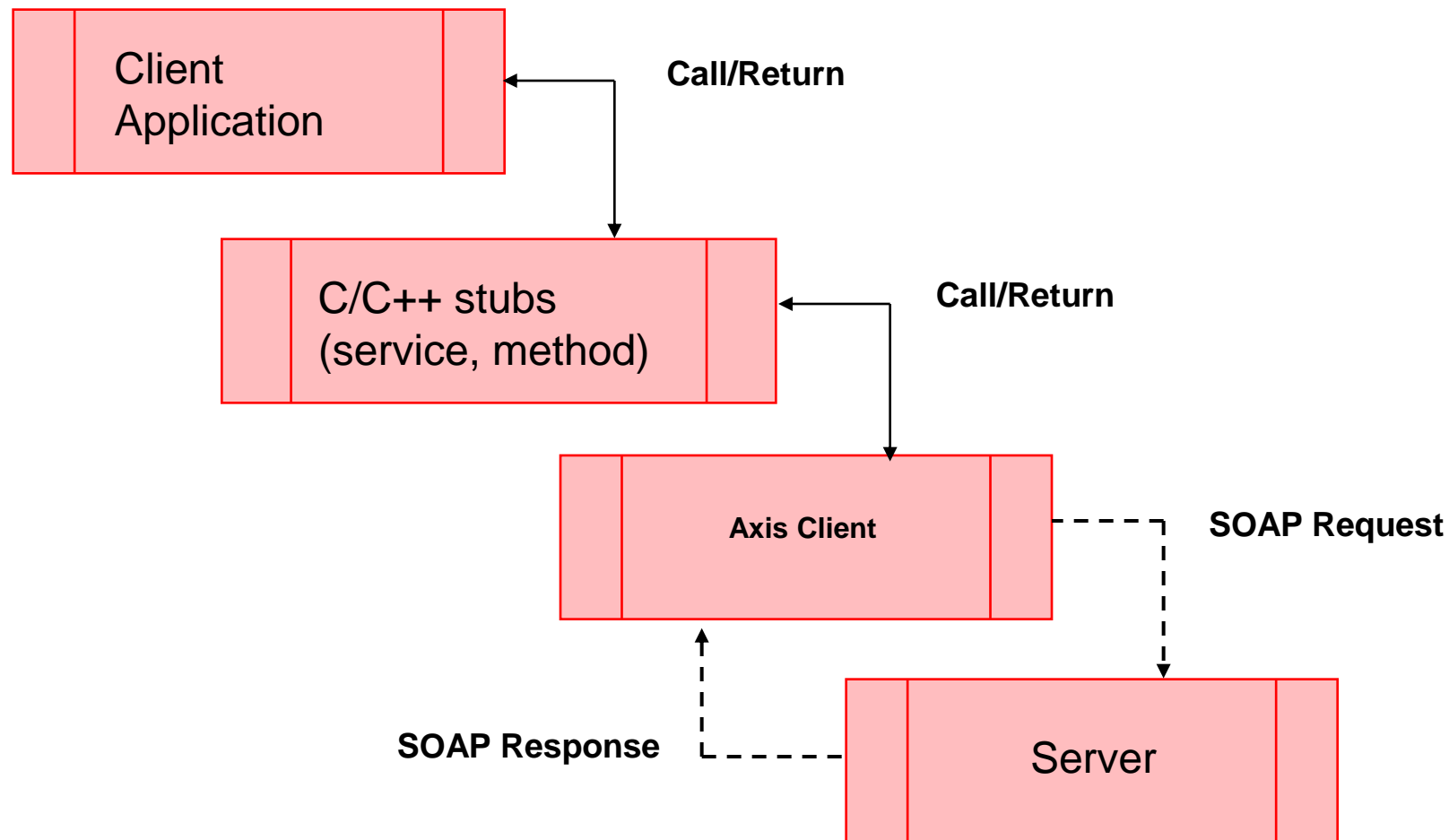
- Developer generates stubs using:
 - Java tools (wsdl2ws.jar)
 - Qshell script - `wsdl2ws.sh -lc STOCKQ.wsdl`



Web Services Client for ILE

Step 2: Compile/Bind and Invocation

- Create the application that uses the stubs to invoke the Web service



How do you get this?

Part of the IBM i OS !!

V5R4, V6R1, V7R1

Latest Group PTFs

- Java
- HTTP Server

Product Web Page

<http://www.ibm.com/systems/i/software/iws>

Step 2. Build the client application

At this point it is assumed that the generated stubs are in a directory called /myconverttemp. The RPG code that uses the generated stubs is located in <inst_dir>/samples/ConvertTemp /CNVRTTMP.C.RPGLE.

To build the CNVRTTEMP client application, complete the following steps from the CL command line.

1. Create a library that will contain the module and program objects. In this example, we create a library called CVTTEMP by issuing the following CL command:
CRTLIB CVTTEMP
2. Change the current working directory to '/myconverttemp' by issuing the following CL command:
CD '/myconverttemp'
3. Copy the RPG code that uses the generated stubs to '/myconverttemp' by issuing the following CL command:
COPY OBJ ('<inst_dir>/samples/converttemp/converttempclient.rpgle')
TODIR ('/myconverttemp')
4. Update the following line in converttempclient.rpgle so that the host name and port is set to the host name and port of the Web services server. The code currently has host name set to "localhost" and the port set to 10000.
Endpoint = 'http://localhost:10000/web/services/ConvertTemp' + X'00';
5. Build the client application using the following commands.

```

CRTCPMOD MODULE (CVTTEMP/CVTTEMPIN)
SRCSTMF ('CONVERTTEMPInput.c')
INCDIR ('/qibm/proddata/os/webservices/v1/client/include') ENUM(*INT)

CRTCPMOD MODULE (CVTTEMP/CVTTEMPRES)
SRCSTMF ('CONVERTTEMPResult.c')
INCDIR ('/qibm/proddata/os/webservices/v1/client/include') ENUM(*INT)

CRTCPMOD MODULE (CVTTEMP/CVTTEMPPT)
SRCSTMF ('ConvertTempPortType.c')
INCDIR ('/qibm/proddata/os/webservices/v1/client/include') ENUM(*INT)

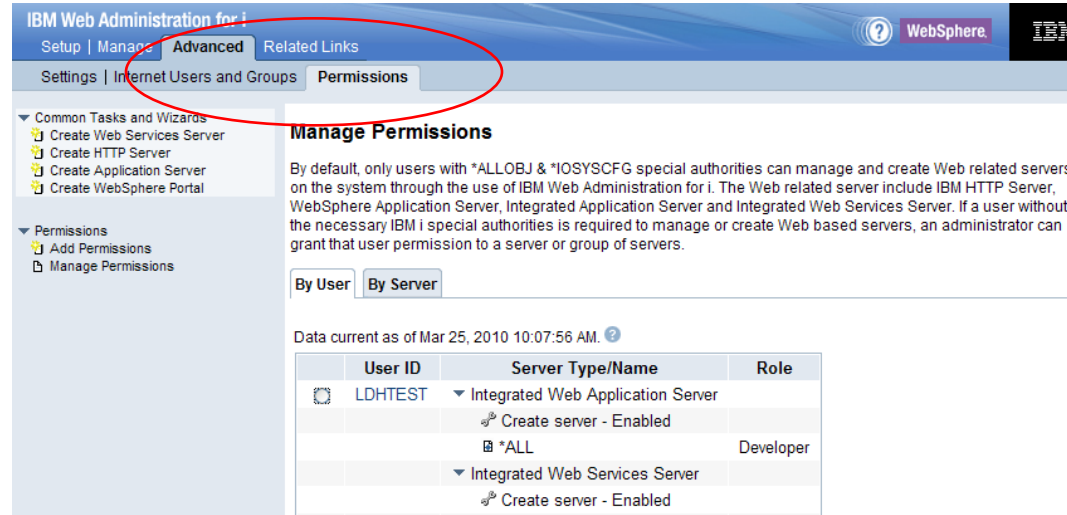
CRTPGM PGM (CVTTEMP/CNVRTTEMP)
MODULE (CVTTEMP/*ALL) BNDSRVPGM (QSYSDIR/QAXIS10CC)

```

Web Integration New Features

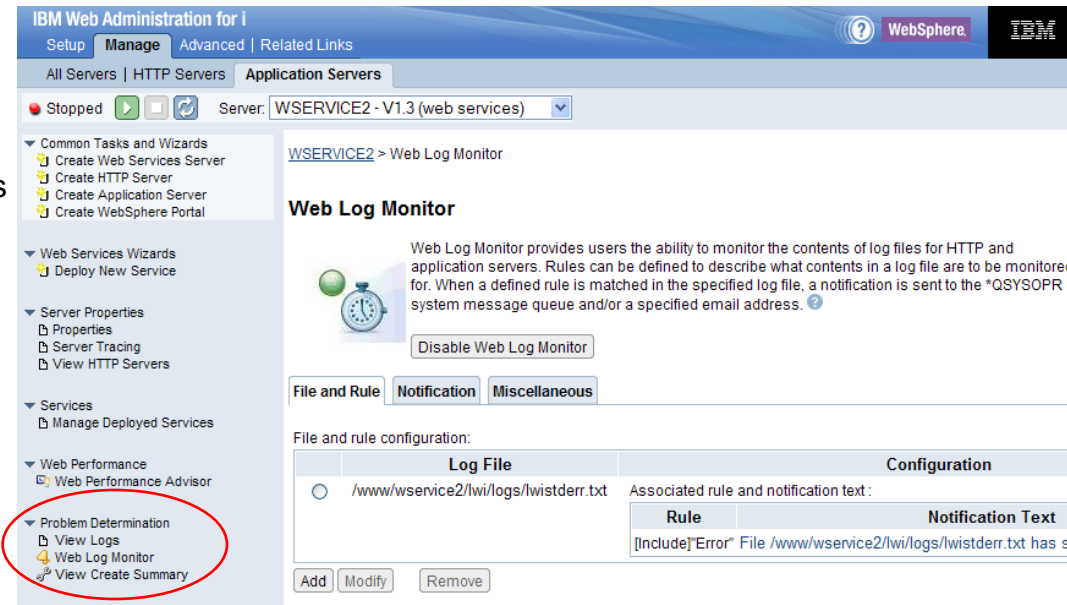
■ Developers can use Web Admin

- No longer need *ALLOBJ special authority
- Administrators can grant users 'Permission'
- Empowering the User



■ Monitor Web Server Log files

- Monitor log and error files for ALL Web servers
- Send notifications on discovery
 - *QSYSOPR or Email



Integrated GUI interface now available to Developers and Operators without compromising your system security

WebSphere Support for IBM i 7.1

- **WebSphere Application Server**
 - WebSphere Application Server Express V6.1 and V7.0
 - WebSphere Application Server V6.1 and V7.0
 - WebSphere Application Server Network Deployment V6.1 and V7.0
 - Fix Packs 6.1.0.29 and 7.0.0.7 contain IBM i 7.1 level support

- **WebSphere MQ**
 - WebSphere MQ V7.0.1
 - WebSphere MQ File Transfer Edition V7.0.2.1

- **WebSphere Portal**
 - WebSphere Portal 6.1.5
 - WebSphere Portal 7

- **WebSphere Commerce Server**
 - WebSphere Commerce Server 7 (with fix pack 1)
 - Supported on IBM i 6.1 and 7.1

WebSphere offers rich Web application server solutions for IBM i

WebSphere software

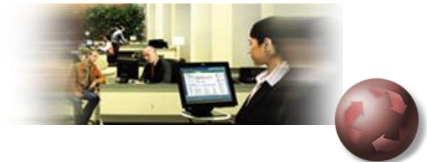
Access information



Customer retention



Operational efficiency



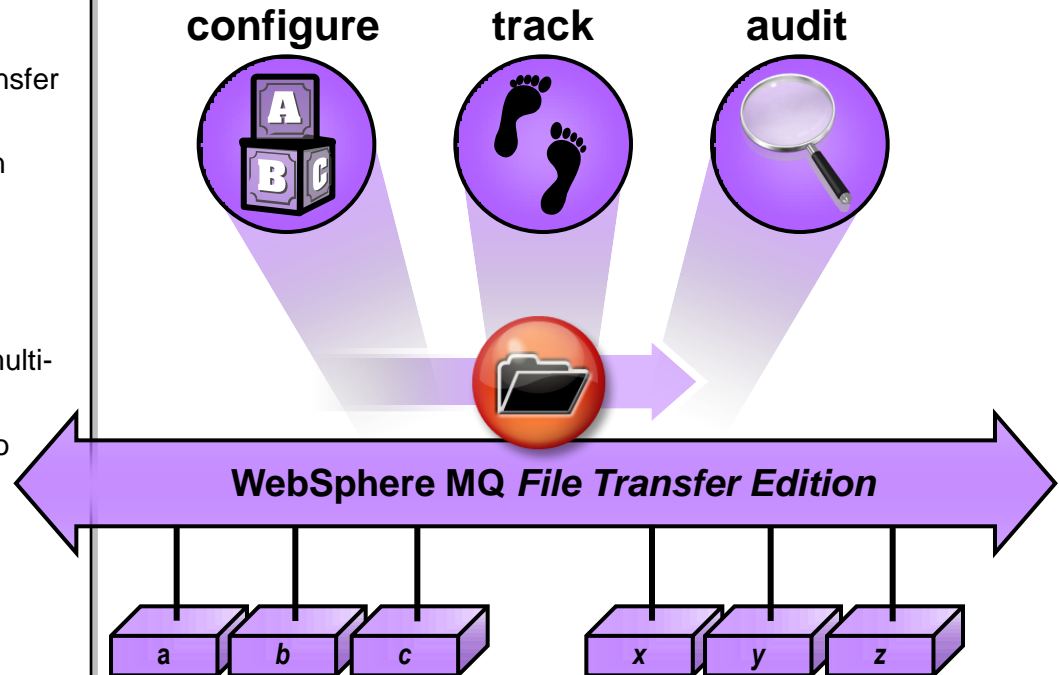
Cost reduction



WebSphere MQ File Transfer Edition

- Adds file transfer services to WebSphere MQ to enable managed file movement
- Multi-purpose solution combining file transfer and messaging
- Supported on IBM I 5.4 and IBM I 6.1 & IBM I 7.1

- ✓ Reliability that comes with leveraging MQ transport
- ✓ Multi-purpose – use for messages and files
- ✓ Auditable with logging subsystem that tracks transfer at source and at destination
- ✓ Centralized monitoring, control and configuration
- ✓ Graphical tooling enables remote configuration
- ✓ No need to program – no need to use APIs
- ✓ Command line interface – for advanced users
- ✓ Powerful scripting support – enabling complex multi-step transfers using XML and Ant
- ✓ Flexible backbone – move files from anywhere to anywhere in network
- ✓ Massive files – larger than MQ messages
- ✓ Integration with MQ-enabled apps and ESBs
- ✓ Automatic file character conversion
- ✓ Security of file payload using SSL
- ✓ Visual transfer status reporting
- ✓ Support for range of platforms



Application Development - **Rational.** software



All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Rational Direction for Power Systems



Extending the Software stack with "Power Tools"

Rational. software

Accelerating importance of compilers in multi-core & parallel environments



Common developer desktop across operating systems and languages

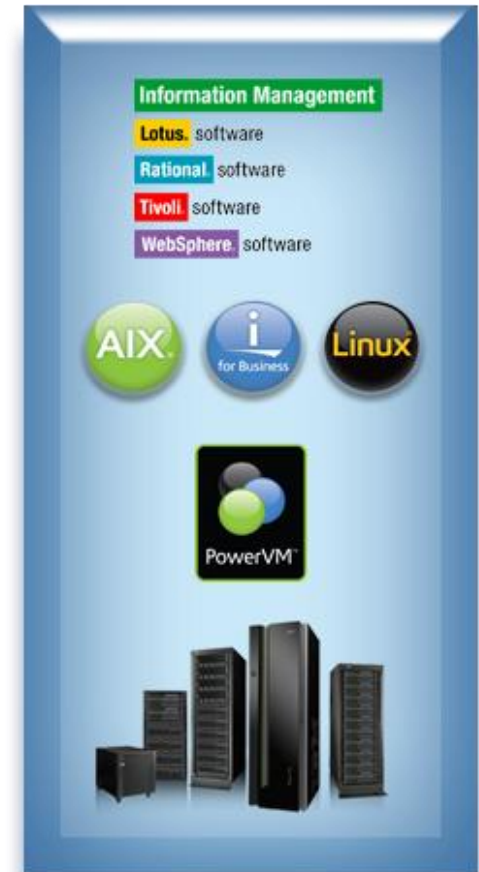


Common development infrastructure for Power and the world around Power



Agenda

- **Rational Open Access: RPG Edition**
- Rational Development Studio for i
- Rational Developer for Power Systems Software
- Rational Team Concert for Power Systems Software



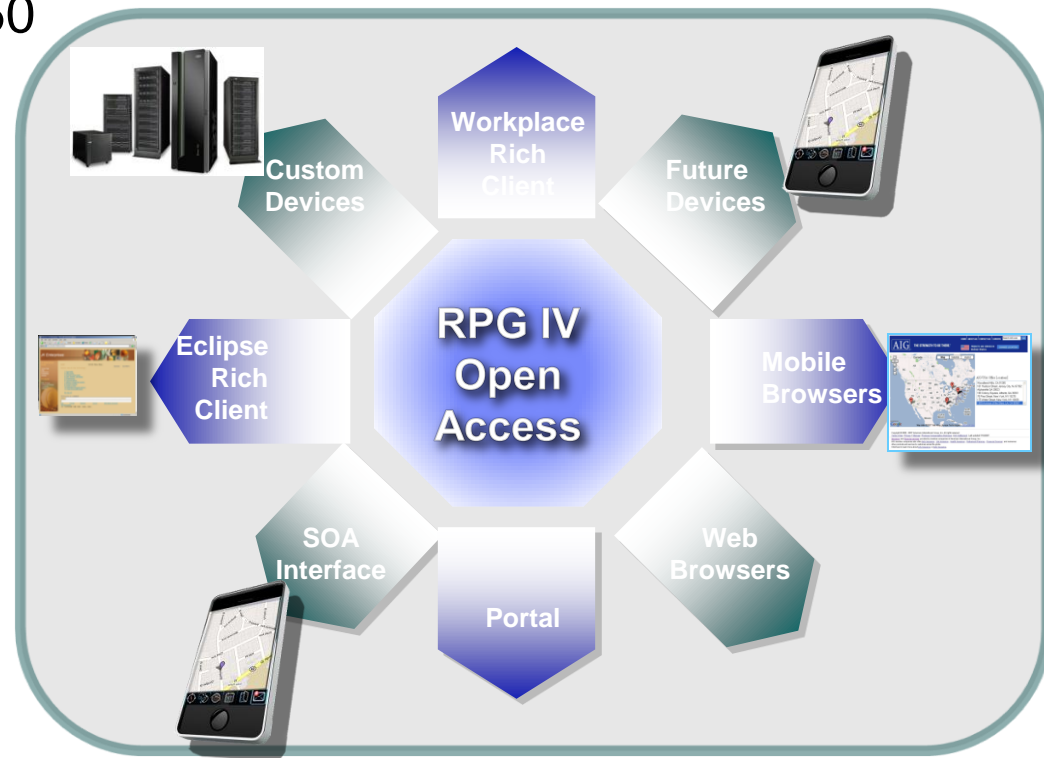
Open up RPG!

IBM has opened the RPG I/O interface to allow programmers to extend their applications to access resources beyond the native interfaces available in previous releases of RPG.

Developers are able to direct RPG IV native I/O operations to devices other than traditional 5250 screens, printer files, or native database.

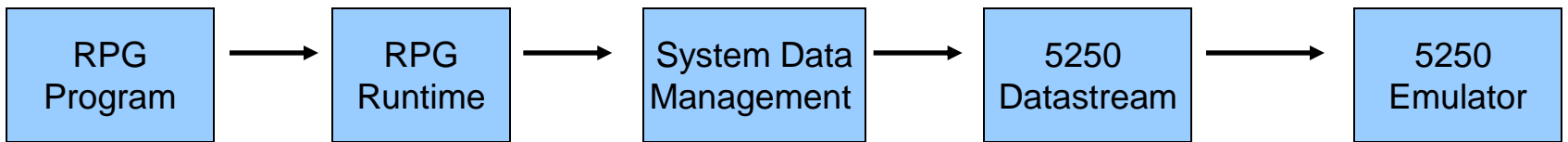
Such as:

- Web browsers
- Mobile devices,
- Web services
- XML
- Spreadsheets
- Limitless

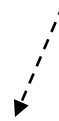


How Does Open Access Work?

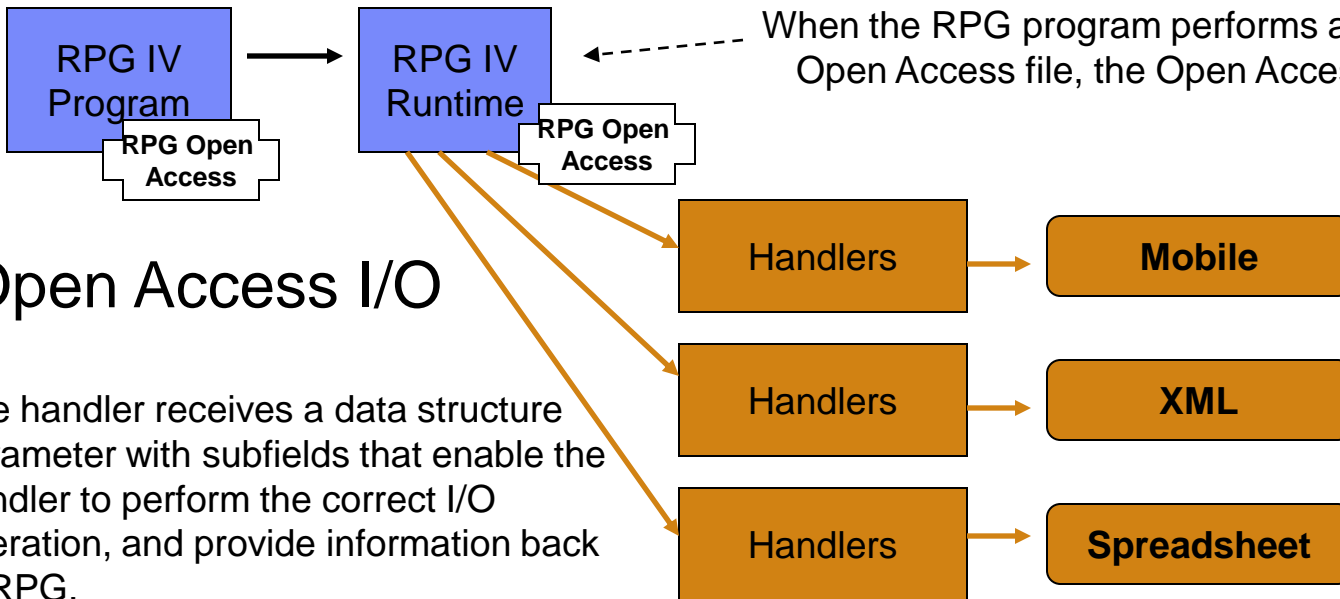
Traditional I/O



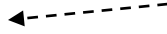
When an RPG program performs an I/O operation for a "normal" file, a system data management function is called to handle the operation



Open Access I/O



When the RPG program performs an I/O operation for an Open Access file, the Open Access handler is called.



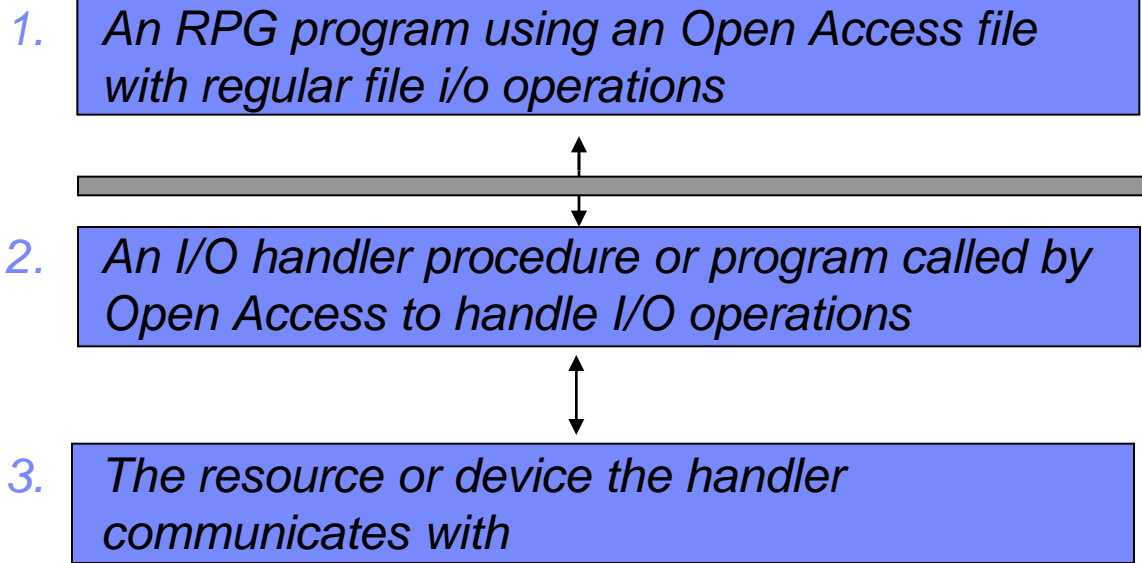
The handler receives a data structure parameter with subfields that enable the handler to perform the correct I/O operation, and provide information back to RPG.





Using Rational Open Access: RPG Edition

An Open Access RPG application is made up of :



RPG Open Access runtime 5733-OAR
Available for IBM i 6.1 and 7.1

Open Access does not provide the handler

- ❖ Anyone can write the handlers
- ❖ Software Tool Vendors
- ❖ Business Partners
- ❖ Services organizations
- ❖ Developers

Open Access is the linkage between 1 and 2.



Example: RPG Program Defining an Open Access file

The HANDLER keyword has an optional second parameter that allows the RPG program to pass information directly to the handler. For example, to process an IFS file, the handler needs to know the path to the IFS file. The RPG programmer provides this through the second HANDLER keyword parameter.

```
EmyIfsFile if e disk extdesc('MYLIB/READIFS') USROPN  
F handler(readIfs : ifsDs)  
/copy MYLIB/QRPGLESRC,READIFS  
D ifsDs ds likeds(readIfs_t)  
/free  
 ifsDs.path = '/home/mydir/myIfsFile.txt';  
open myIfsFile;
```



Rational Open Access: RPG Edition

- New Licensed Program Product
 - ▶ Required for both development and runtime servers
 - ▶ 5733-OAR
 - ▶ Available for 6.1 and 7.1

- Tier Group Price
 - ▶ Priced by processor based on software tier

- Requires *RDPower: RPG and COBOL Development for i* as the development environment
 - ▶ For syntax checking, semantic checking, etc





IBM STG Lab Services

- FM Handler – manages protocol between client applications and OAR
- Web Services Handler - converts OAR to XML and transport
- Socket Handler – converts OAR to a socket message over TCP/IP



looksoftware

- Delivery of multi-channel user interfaces from a single RPG program
- Includes support for smartclient, riaclient, thinclient and mobileclient



PKS Software

- Fully integrated in RDP as plugin – therefore IBM-based end-to-end-solution
- Highly automated, easy to use, zero deployment solution for RPG OA
- No special knowledge necessary for services



Profound Logic Software

- Native graphical user interface platform for IBM i
- Rapidly create rich browser based applications visually
- Uses native RPG operations and programming techniques



Rocket Seagull Software – LegaSuite

- Converts traditional RPG applications into high performance SOA services
- Expedites building complex IBM i application orchestrations,
- Leverages RPG expertise to SaaS/Cloud development paradigms



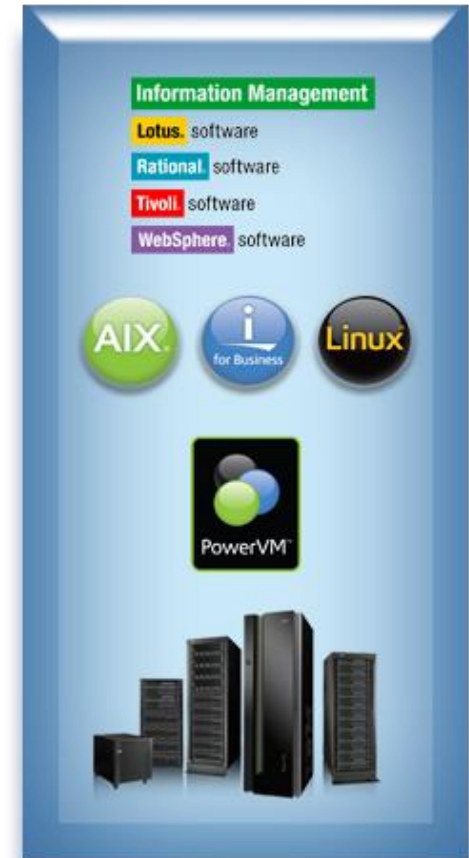
Vormitag Associates, Inc

- Member of ISV Advisory council
- Key driver of this solution
- Building handler for use in ERP application



Agenda

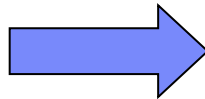
- Rational Open Access: RPG Edition
- **Rational Development Studio for i**
 - ▶ **RPG Compiler Updates in 7.1**
- Rational Developer for Power Systems Software
- Rational Team Concert for Power Systems Software



Re-Branding of WebSphere Development Studio for IBM i

WebSphere. software

WebSphere Development
Studio for IBM i



Rational. software

Rational Development
Studio for i

- Feature 1 – ADTS
 - Stabilized
 - no new tool enhancements
 - no new language enhancements
- Feature 2 - OPM Compilers
 - Stabilized
- Feature 3 – ILE Compilers
 - RPG/COBOL enhancements



Compilers for Optimized Performance

- Compilers tightly integrated with operating systems and POWER7 hardware
- Binary compatibility
 - ▶ Applications will move to POWER7 with no recompile required
 - S/36 and S/38 environment applications also
- Rational Open Access: RPG Edition - new offering for RPG
 - ▶ Long requested feature from customers and partners



Compilers on IBM i



- Rational Development Studio
 - ▶ RPG, COBOL, C, and C++ compilers for IBM i
 - ▶ Previously called WDS: “WebSphere Development Studio for System i”
 - ▶ Designed for creating modern business applications

Rational Development Studio 7.1

New Enhancements

Feature: ILE Compilers

- ILE RPG
- ILE RPG *PRV Compiler
- ILE COBOL
- ILE COBOL *PRV Compiler
- ILE C
- ILE C++
- IXLC for C/C++

Stabilized

Feature: Heritage Compilers

- S/36 Compatible RPG II
- S/38 Compatible RPG II
- RPG/400 (RPG III)_
- S/36 Compatible COBOL
- S/38 Compatible COBOL
- OPM COBOL

Stabilized

Feature: ADTS

- PDM
- SEU
- SDA
- RLU



RPG IV: A Modern Business language...

7.1 enhancements are based on user feedback, system changes, and language improvements

Performance

- Better performance when returning large numbers

Maintainability

- Support for ALIAS names in externally-described data structures
- New built-in function %PARMNUM
- Free form Calculations
- Qualified DS and Record formats
- Subprocedures

Productivity

- Sort and search DS
- Sort Ascend or Descend
- New Built-in functions: %LEN, %SCANRPL
- Optional prototype

Mixed environment

- Implicity Unicode conversion
- New options for XML-INTO
- Easy to use data types: arithmetic, string manipulations, and date and time.

System Integration

- Integration with DB2, Display and printer files
- Integration with other features of the system
 - Data areas and Data queues
 - XML documents
 - Embedded SQL and PCML

Open and Modern

- XML Opcodes
- Passing files as parameters
- Open Access



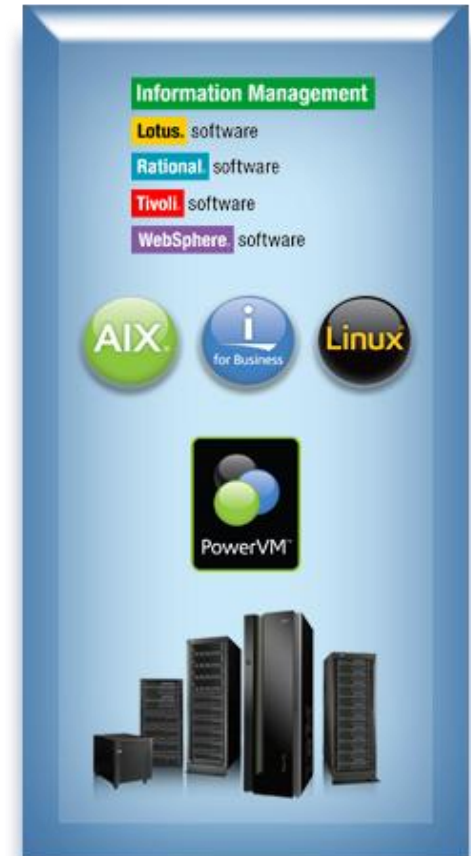
What's new for both RPG and COBOL

- Freeze SEU syntax checking at the V6R1 level
- Encrypt the listing debug view
- Teraspace storage model



Agenda

- Rational Open Access: RPG Edition
- Rational Development Studio for i
 - ▶ RPG Compiler Updates in 7.1
- **Rational Developer for Power Systems Software**
- Rational Team Concert for Power Systems Software

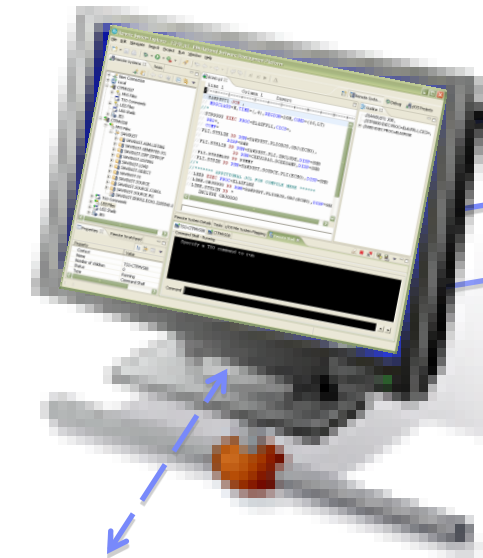


Rational Developer for Power

Developer's Desktop

- RPG and COBOL Development for IBM I
- C/C++ Development for AIX
- C/C++ Development for Linux
- COBOL Development for AIX

NEW!



IBM i, AIX or Linux Server



Edit

Search/Index/Navigation

Build




Debug



Rational Integrated Development Environments for Power Systems

The IBM Rational family of products includes integrated development environments for the major development workloads on Power.

■ Rational Developer for Power Systems Software

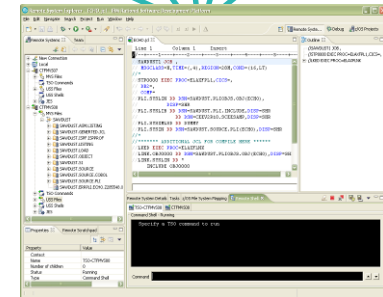
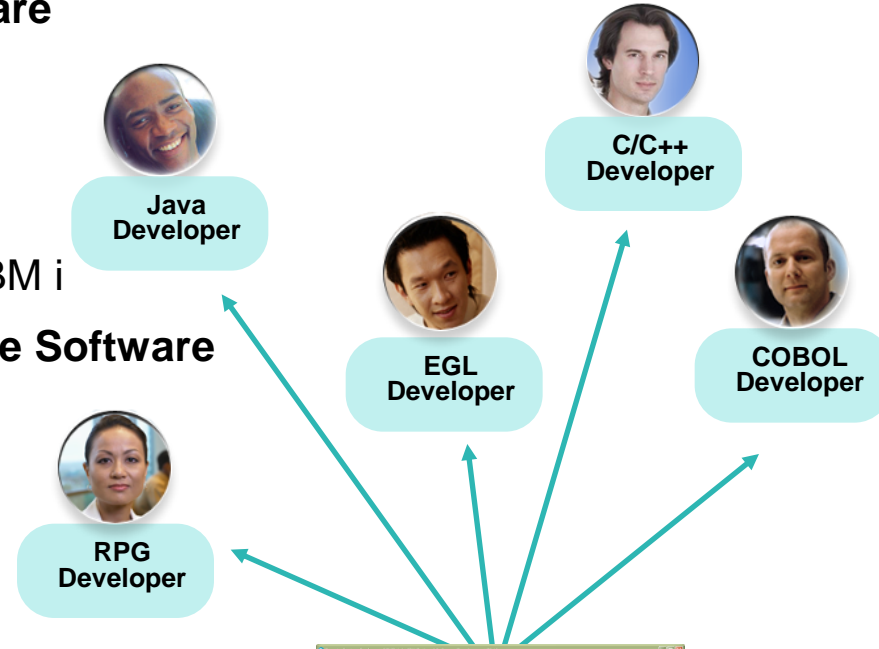
-  C/C++ development tools for AIX
-  COBOL development tools for AIX
-  C/C++ development tools for Linux
- ▶ RPG and COBOL development tools for IBM i

■ Rational Application Developer for WebSphere Software

- ▶ Java & Java Enterprise Edition tools
- ▶ Tools for Web, Web Services, & SOA designers and developers

■ Rational Business Developer (RDi SOA)

- ▶ EGL development tools
- ▶ For Business Developers
- ▶ Tools for Web, Web Services, & SOA designers and developers



Rational Developer for Power Systems Software

RPG and COBOL Development Tools for IBM i

- Modern development tools for RPG, COBOL, CL, DDS, and SQL on IBM i
 - ▶ SEU and PDM still supported but no longer being enhanced
 - ▶ Replaces Rational Developer for i (no charge entitlement)
- Features
 - ▶ Lightweight, graphical, development tools for RPG, COBOL, CL, DDS, and SQL
 - ▶ Integrated file access, search, edit, compile and debug
 - ▶ Rich editing features such as outline view, content assist, formatting, color tokenizing, filtering, searching, compare
 - ▶ Visualize program structure with Application Diagram
 - ▶ Easily debug batch, interactive, and Web applications and Web services with a common visual debugger




```

Session A - [24 x 80]
Columns: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
Edit
YANTZI/ORDPGLSRC
ORDENTR
FMT *
* 1 ..... 2 ..... 3 ..... 4 ..... 5 ..... 6 ..... 7 .....
***** Beginning of data *****
B0801.00
-----
B0802.00
B0803.00
B0804.00 * Program: ORDENTR
B0805.00
B0806.00 * This program allows a user to enter and confirm an order. It sends
B0807.00 * a print request to a batch job via a data queue. The program only
B0808.00 * handles District 1 and Warehouse '0801'.
B0809.00
B0810.00 * Don was here
B0811.00
B0812.00 * INDICATOR USAGE:
B0813.00 * 03 - F3=Exit
B0814.00 * 04 - F4=Prompt
B0815.00 * 06 - F5=Accept order
B0816.00 * 12 - F12=Cancel

F3=Exit F4=Prompt F5=Refresh F6=Retrieve F10=Cursor F11=Toggle
F16=Repeat Find F17=Repeat change (C) COPYRIGHT IBM CORP. 1981, 2005.
    
```

The screenshot displays the Rational Developer for Power Systems Software interface. On the left, the 'Remote System Explorer' shows a tree view of the system's objects, including libraries and programs. The central pane is a code editor showing RPG code for 'ORDENTR.RPGLE'. The code includes comments and data structures, such as 'FORBENTR' and 'FORBENTR' with fields like 'CF', 'E', 'K', 'DISK', 'K DISK', 'COMMIT', 'CONST', 'D Warehouse', 'D District', 'D Pname11', 'D Pname12', and 'D Change'. The right pane shows an 'Outline' view of the code structure. At the bottom, there is a 'Remote Tasks' pane showing a list of tasks and their members.

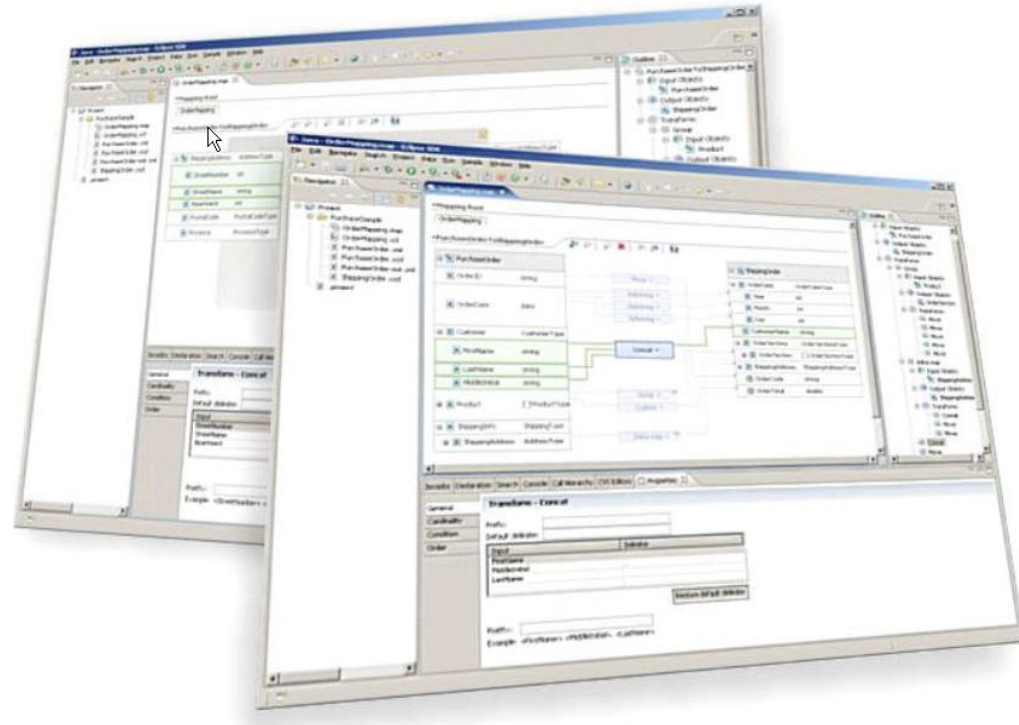
Rational Developer for Power 2010 Releases

- RD Power 7.5 (February)
 - ▶ First release of “RD Power”
 - ▶ IBM i only content: RPG and COBOL Development Tools for IBM i
 - Major function: DDS Screen Designer and Report Designer
- RD Power 7.6 (April)
 - ▶ Focused on AIX development tools (C/C++ and COBOL)
 - ▶ Adds support for IBM i 7.1
- RD Power 8.0 (October) 
 - ▶ **Announce: October 7th / eGA: October 26th**
 - ▶ New: C/C++ Development Tools for Linux on Power
 - ▶ New: xLinux client (in addition to Windows)
 - ▶ New: *Power Tools* packages
 - ▶ New capabilities for C/C++ and COBOL on AIX

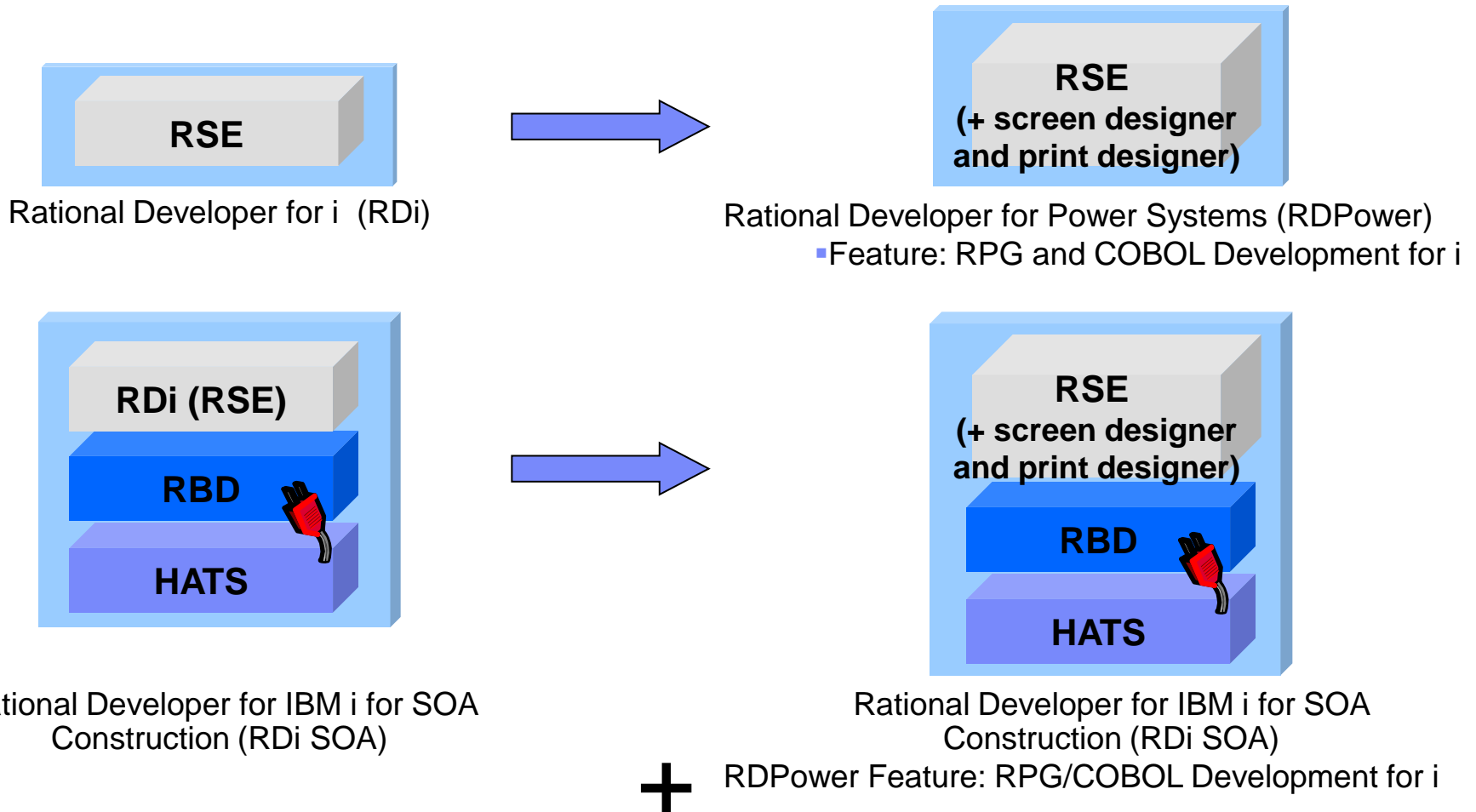


IBM Rational Application Developer Standard Edition for WebSphere Software V8.0

- Rich set of Eclipse-based tools for developing applications using
 - Java, Java EE
 - Portal
 - Service oriented architecture (SOA)
 - Web 2.0
- Rational Application Developer Standard Edition includes features that simplify development and increase programmer productivity.
 - Wizards
 - Visual designers
 - Rich source editors
 - Integrated WebSphere Application Server test environments
- Mission critical ready!
 - ▶ Award Winning! – Evans Data 2009 Users Choice: Software Development



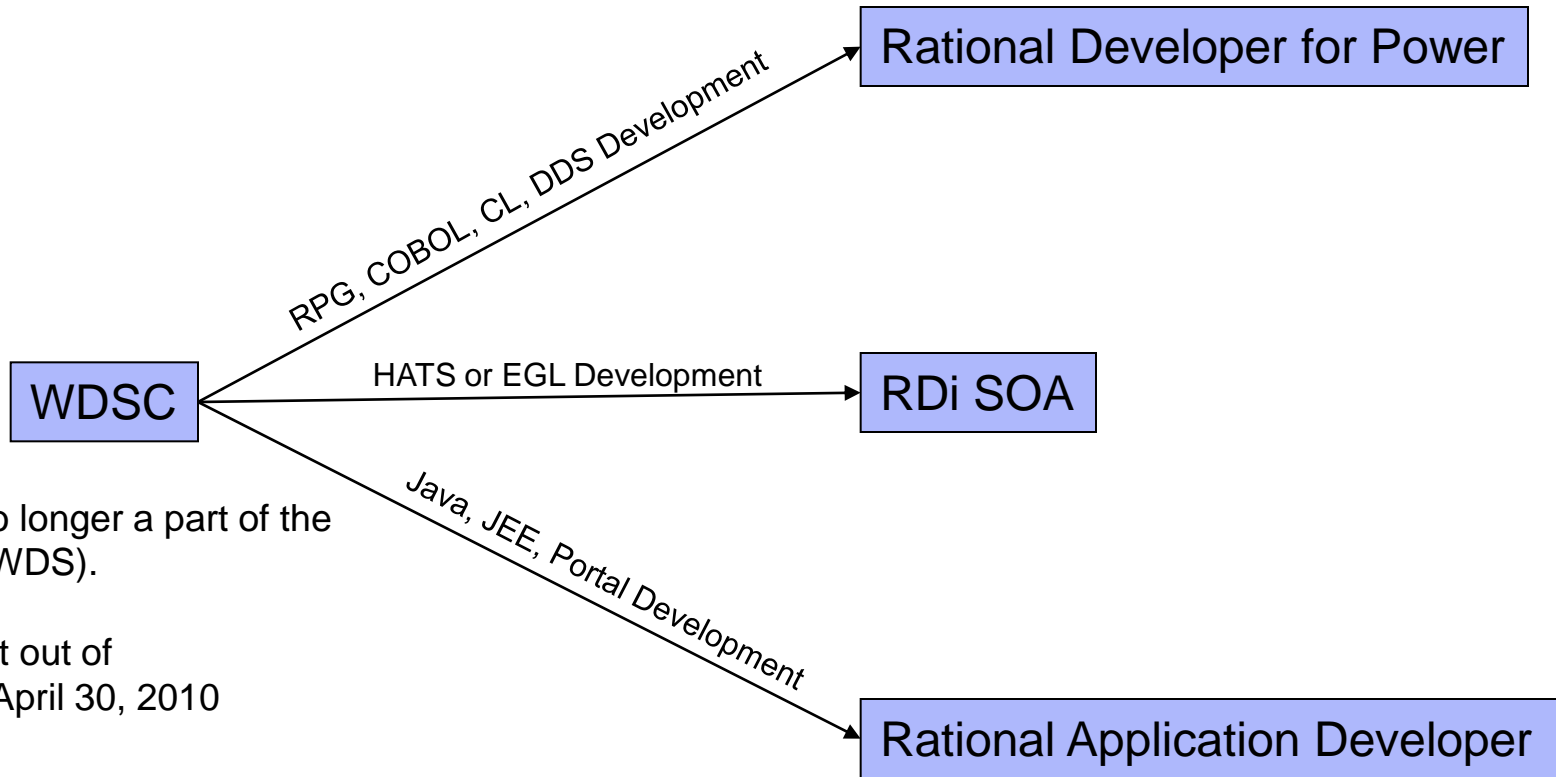
Upgrade Path for i Tools



• Upgrade available for tools ordered via Passport Advantage OR eConfig with valid SWMA
RDi to be withdrawn from Marketing effective May 11, 2010



WebSphere Development Studio Client (WDSC) Migration Paths



WDSC is no longer a part of the compilers (WDS).

WDSC went out of support on April 30, 2010



RD Power 8.0: Packaging

Rational Developer for Power (Separate chargeable components)

Development Environments

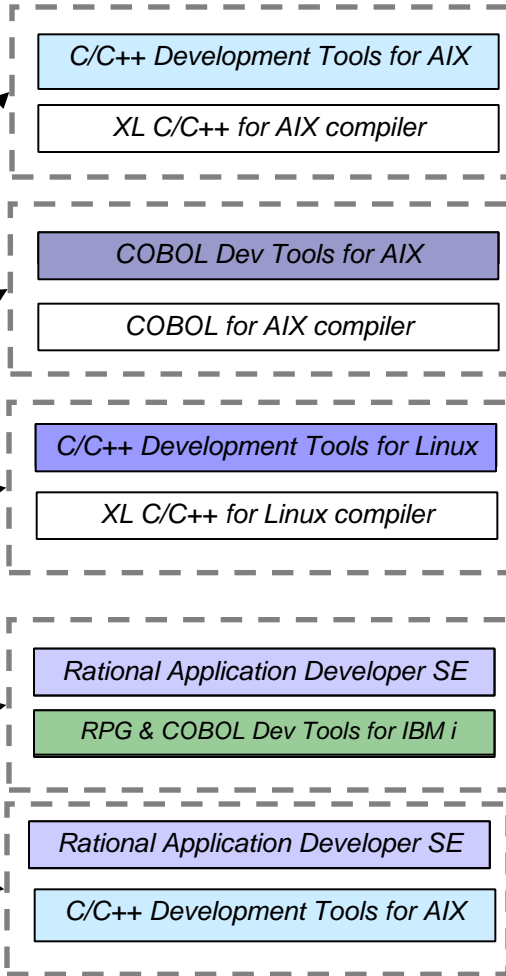
- C/C++ Development Tools for AIX
- COBOL Dev Tools for AIX
- RPG & COBOL Dev Tools for IBM i
- C/C++ Development Tools for Linux

Studio Bundles
(tools and compiler)

- C/C++ Development Studio for AIX
- COBOL Development Studio for AIX
- C/C++ Development Studio for Linux

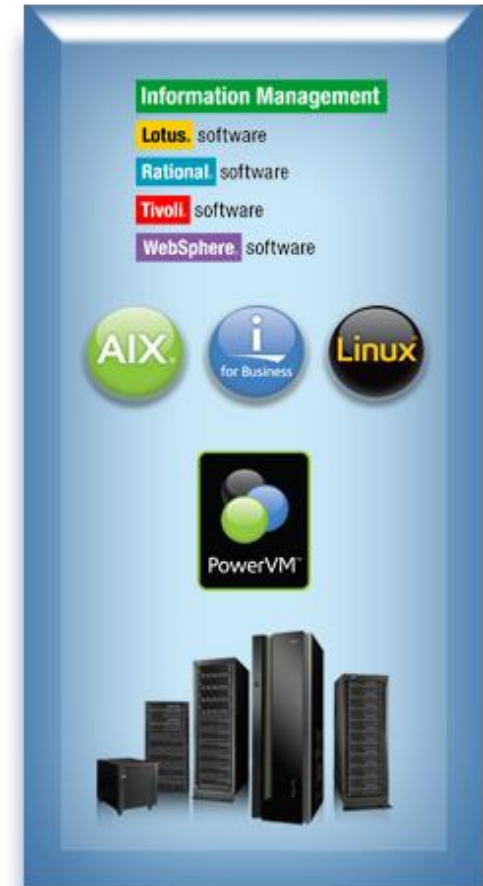
Power Tools Bundles

- Power Tools for IBM i
- Power Tools for AIX



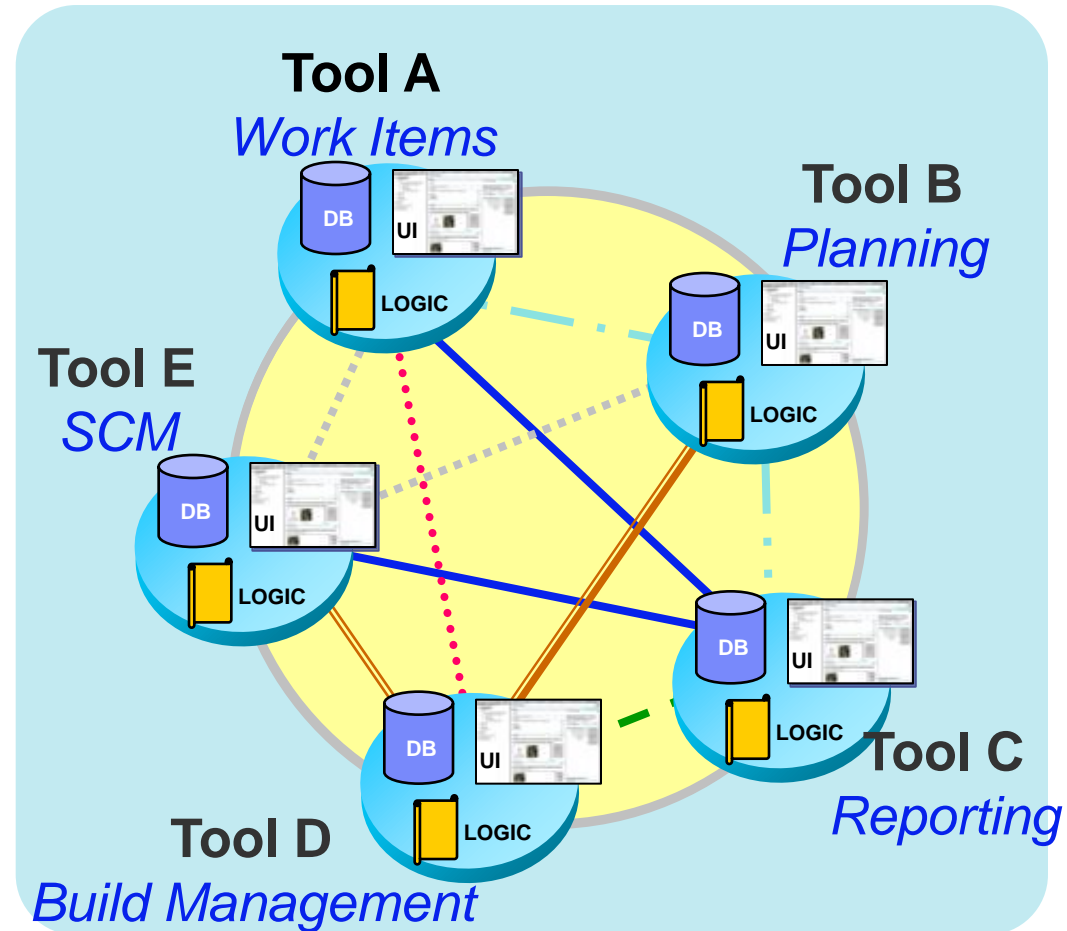
Agenda

- Rational Open Access: RPG Edition
- Rational Development Studio for i
 - ▶ RPG Compiler Updates in 7.1
- Rational Developer for Power Systems Software
- **Rational Team Concert for Power Systems Software**



Our customers have invested in a diverse set of ALM tools...

- Traditionally, each tool came with its own
 - ▶ UI - Web and desktop presentations of views and tasks
 - ▶ Logic – Workflow, process, search, query, scale, security and collaboration
 - ▶ Storage – Availability, traceability
 - ▶ Privacy, backup/archive
- Resulting in...
 - ▶ Brittle integrations
 - ▶ Silos everywhere
 - ▶ High cost to maintain and administer
 - ▶ Proprietary API's



How do you solve this?



But with Rational Team Concert, you get...

A unified client



Work Items

Planning

SCM

Reporting

Build Management

One Tool!

With unified storage



- Unified Work Items, Agile Planning, SCM, Build Mgmt, Reporting
- Single UI, storage and process
- Reduces Cost of Ownership
 - ▶ Administrative costs
 - ▶ Training/Adoption
 - ▶ Customizations



IBM Rational Team Concert

Software innovation through collaboration

- **Collaborate in-context**
 - ▶ Integrated release planning and reporting, source control, document collaboration, work item, build management, chat and process guidance
- **Streamline agile development**
 - ▶ Out-of-the-box agile process configurations
- **Automate governance**
 - ▶ Assess project status and trends in real-time with web-based dashboards, metrics and reporting
- **Scale to the enterprise**
 - ▶ Supports teams ranging from a few to thousands of developers and stakeholders
- **Unify diverse teams**
 - ▶ Supports J2EE, .NET, AIX, IBM i, System z, co-existence with popular toolsets

IBM Rational Team Concert

transparent *integrated presence*
 wikis **OPEN** real-time reporting
 chat documents **Web 2.0** *custom*
dashboards automated data gathering
EXTENSIBILITY *Eclipse plug-ins* services
 architecture **FREEDOM TO CREATE**

JAZZ TEAM SERVER

Open and extensible on

- ✓ Collaborate
- ✓ Automate
- ✓ Report



Zend & PHP



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IBM Relationship...

Zend IBM i Solution Suite (AS/400 – Power i Platform)

- Long term OEM agreement for Zend Core for IBM i
- Studio for Eclipse, i5 Edition
- Zend Server for IBM i

Deep technology partnership working on:

- Zend Framework
- Ajax & Web 2.0
- SOA & Web Services
- Eclipse
- mySQL DB2 Storage Engine
- Viper (DB2) XML database integration
- Search, Security, SDO, and more...

“ Today's announcement is an expansion of the relationship between the two companies to further enhance PHP-based offerings for IBM i customers. Our customers asked for PHP and we brought Zend PHP to the platform. The enthusiasm for—and utilization of—Zend PHP has exceeded our expectations.”

Scott Handy: VP, WW Marketing, Strategy, Sales Support, Power Systems



.. a large number of PHP based Packaged Applications can be run on the IBM i

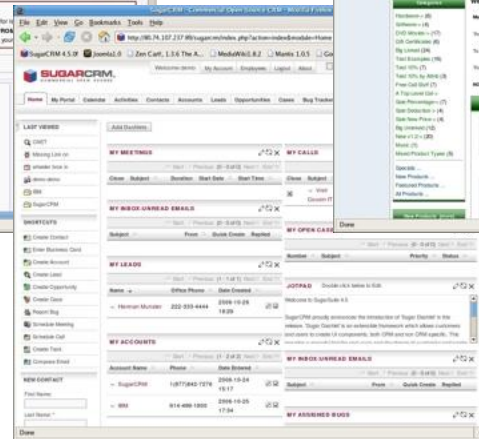
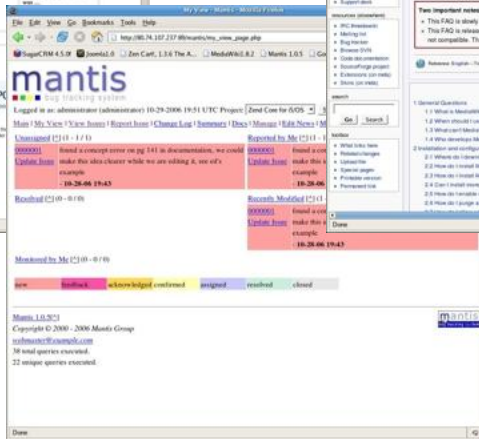
Content Management



Wiki



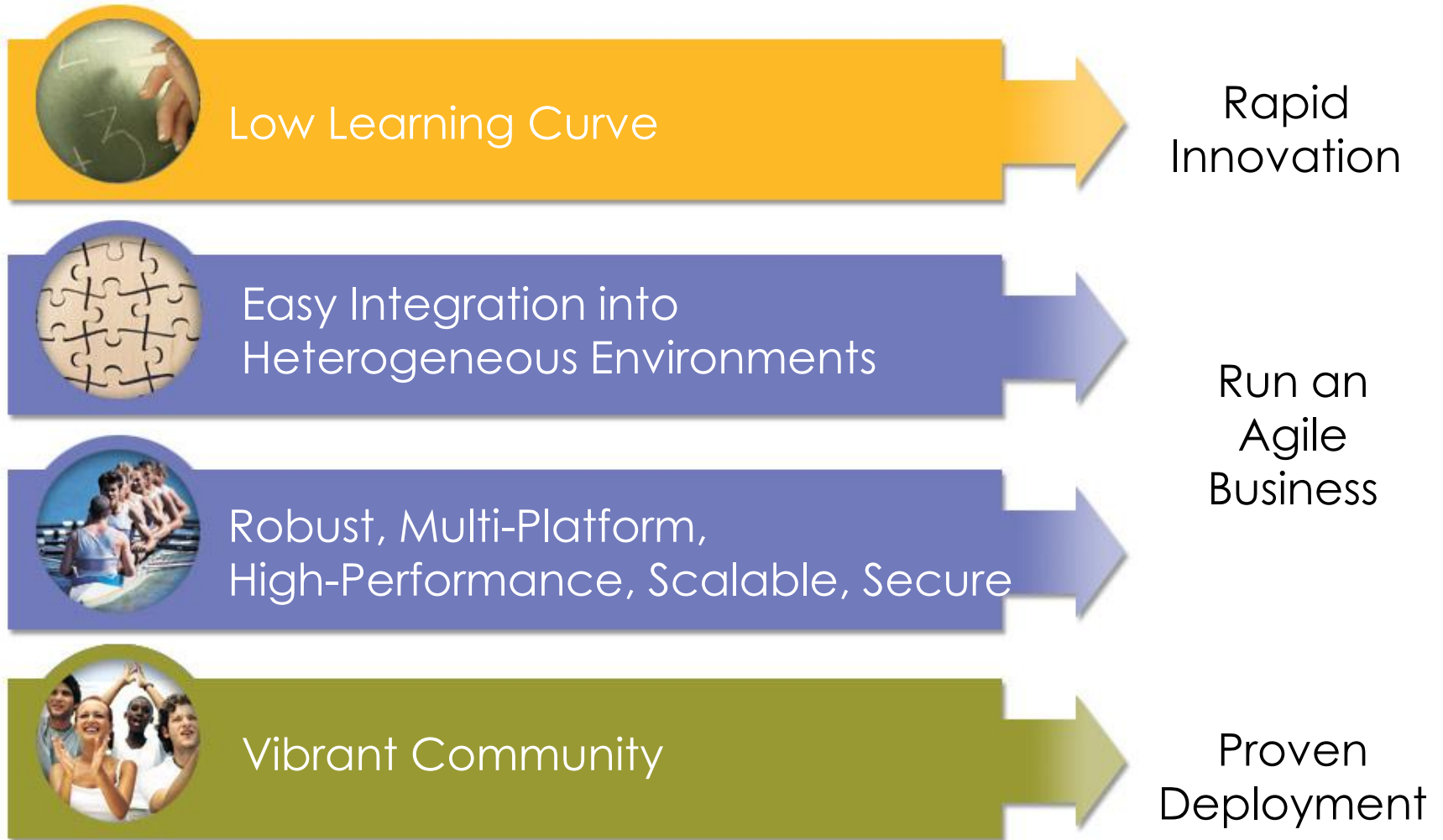
E-Commerce



Bug Tracking

CRM

PHP helps IBM i organizations Rapidly Modernize Applications with existing staff



Modernization on IBM i with PHP

Leverage Existing Infrastructure to Develop & Run Dynamic Web Applications Easily



Expose part of RPG Application



New/Packaged Web Application on IBM i

Access DB2/400 Data via Browser

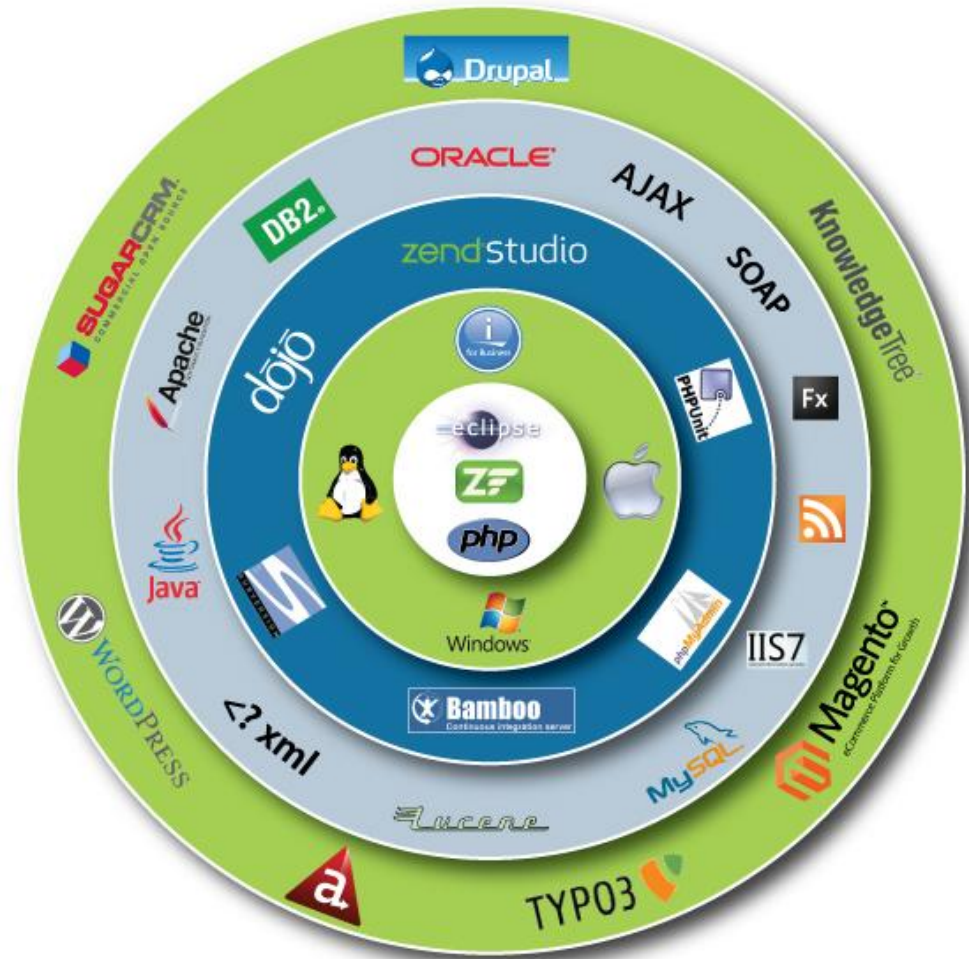
Access RPG Programs & Data as Web Services

Zend Delivers an Open Solution Stack for IBM i

- **Opens up a vast ecosystem of technologies**
 - Development tools
 - Application frameworks
 - Applications

- **Zend Framework enables simple, scalable, best-practice, application development**
 - 10M+ downloads
 - Built into Zend Server and Studio

- **4+ million trained PHP developers**



Zend PHP Enhancements

- **Zend Server Community Edition for i**
 - Preloaded with IBM i 7.1, 6.1, 5.4
 - Includes one year of Silver support from Zend
 - Provided for no additional charge
 - Also available for download from zend.com
 - Replaces Zend Core
- **Zend Server for i**
 - Provides advanced functions
 - Available from IBM with advanced support offerings
 - Also available from zend.com
 - Replaces Zend Platform
- **Zend Studio for i**
 - Eclipse-based development environment
 - Integrates with Rational Developer for Power
 - Available with one year of Silver support from Zend for no additional charge
 - Advanced support offerings available
- **Simplified Set Up and Management**
 - FastCGI support between ILE Apache and PHP
 - Eliminates 2nd copy of Apache and reverse proxy
 - Software fixes via PTFs
- **Significant Performance Enhancements**
- **New and improved features**

Power your planet.



Zend provides open, easy to use PHP-based development and deployment solutions for i

New Zend Product Offerings for IBM i

Zend Server Community Edition
Replaces Zend Core

Zend Server
Replaces Zend Platform

	Zend Core	Zend Server CE
Native installation		✓
Certified PHP	✓	✓
DB2 Drivers	✓	✓
Bundled MySQL DB & Drivers	✓	✓+
Web-based administrator	✓	✓
Debugger interface	✓	✓+
Bytecode acceleration		✓
Zend Framework	✓	✓
IBM i Toolkit	✓	✓
Caching API		✓
Java connector		✓
Performance via Fast CGI		✓
Software updates & hot fixes	✓	✓
Technical support	✓	✓

	Zend Platform	Zend Server
Native installation		✓
Certified PHP	✓	✓
DB2 Drivers	✓	✓
Bundled MySQL DB & Drivers	✓	✓+
Web-based administrator	✓	✓
Debugger interface	✓	✓+
Bytecode acceleration	✓	✓+
Zend Framework	✓	✓
IBM i Toolkit	✓	✓
5250 Bridge	✓	✓
Caching API	✓	✓+
Java connector	✓	✓
Application monitoring	✓	✓+
Performance via Fast CGI		✓
Page Caching		✓
Code tracing		✓
Job Queue	✓	✓+
Software updates & hot fixes	✓	✓
Technical support	✓	✓

New products provide more function, improved performance and deeper integration into IBM i

Lotus on IBM i



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Lotus Support for IBM i 7.1

■ Lotus Notes and Domino

- Collaboration beyond e-mail
- Domino 8.5.1
- Domino 8.5.2

■ Lotus Sametime

- Real-Time community collaboration
- Sametime 8.5.1

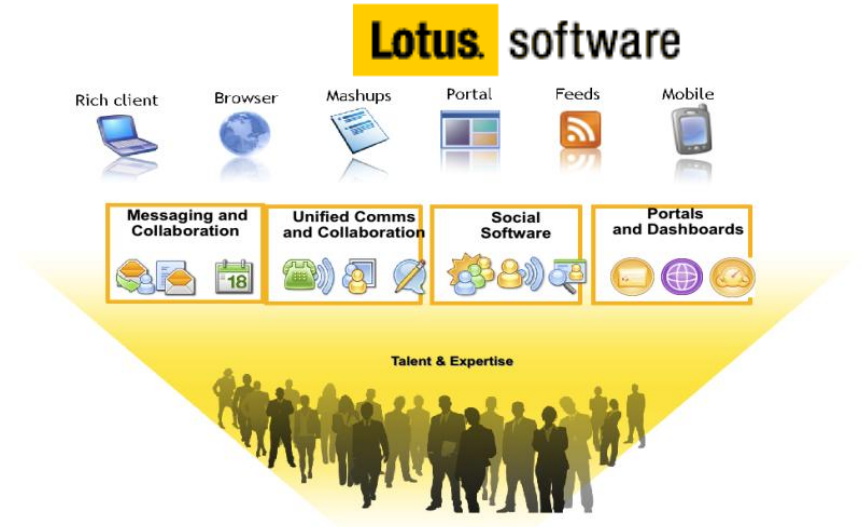
■ Lotus Quickr

- Share everyday content
- Quickr 8.5

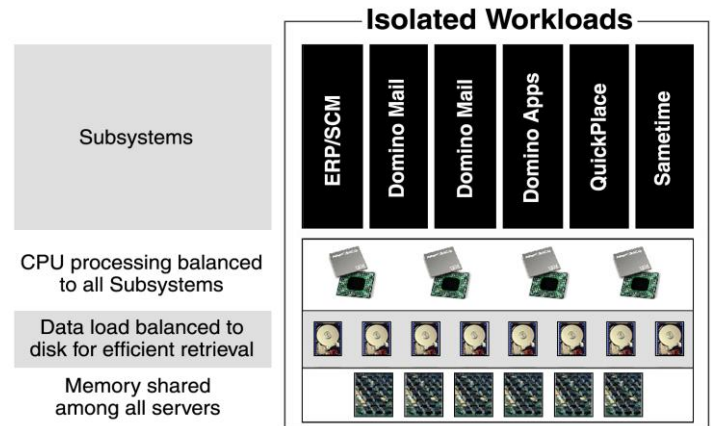
■ Additional Products

- Enterprise Integrator 8.5.2
- Forms 3.5.1
- Domino Fax V4R5

IBM i offers platform for consolidation of Lotus collaboration solutions



IBM i Supports Consolidation of x86 Workloads



For the latest information, see:
<http://www.ibm.com/systems/resources/releasesupport.pdf>

Java for IBM i 7.1

IBM Technology for Java



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Introduction – Java on IBM i

The venerable 64-bit "Classic VM"

On the platform since V4R3

Has evolved to support each new JDK from Sun

Leverages Sun's licensed codebase

V5R4: adds a new "IBM Technology (32-bit)" VM

New code – not just a port of prior IBM VMs

Independent of Sun's licensed code

Supports JDK 1.5 only

V6R1: adds new "IBM Technology (64-bit)" VM

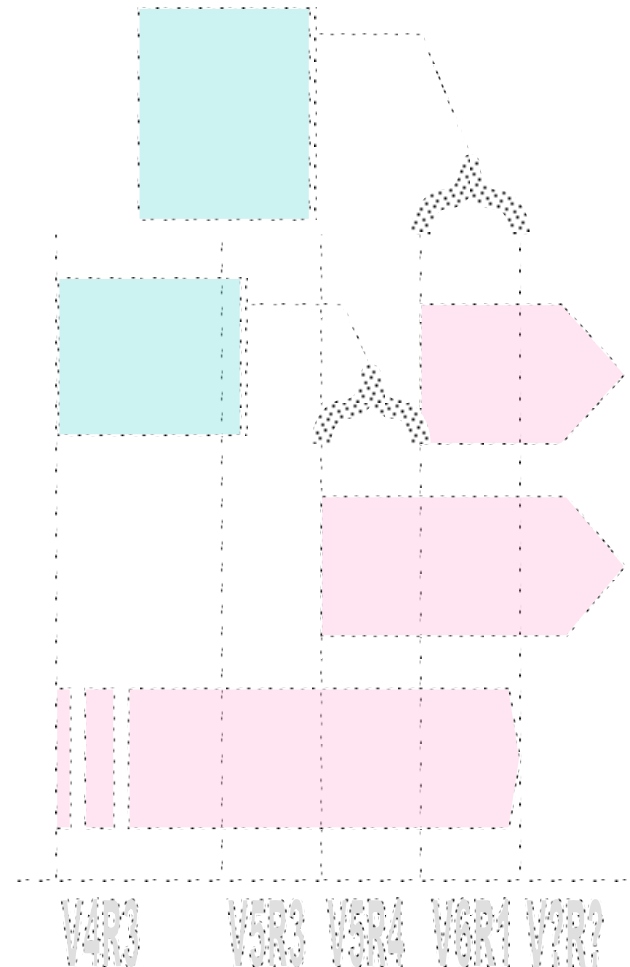
Based on same codebase as new (32-bit) version

Support JDK 1.5 and 1.6

V7R1: Only IBM Technology for Java VM

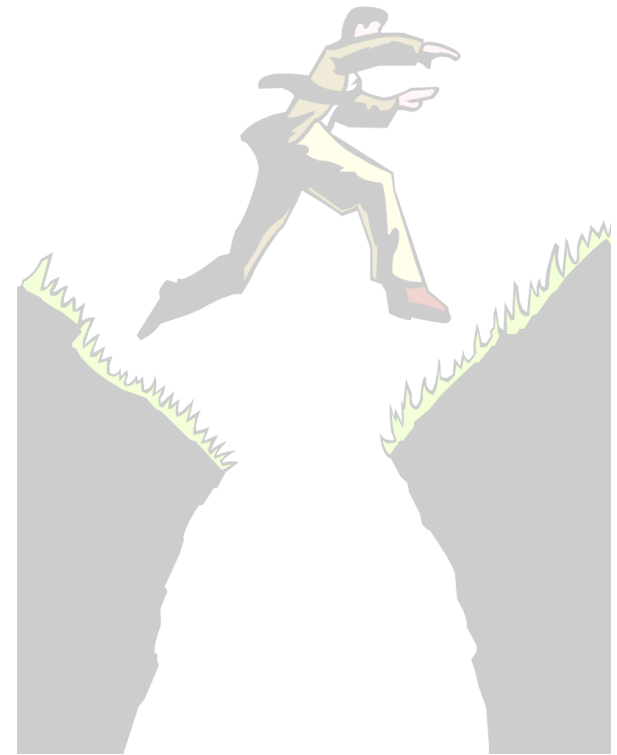
Based on same codebase as new (32-bit) version

Support JDK 1.5 and 1.6



Introduction

- IBM i has embraced IBM's new VM for Java.
- This new VM is called the IBM Technology for Java Virtual Machine (IT4J).
- IT4J has replaced the Classic VM, which runs only in 64-bit mode.
- IT4J has both 32-bit and 64-bit versions
- Known as the 'J9' version



Why would I try the new VM?

- Better Performance
 - Usually a 20% (or more) improvement found in real applications
- Smaller Memory Footprint
 - Usually 50% or more reduction in heap size with 32-bit version.
- Best of IBM Research and Development
 - The JVM that runs on all IBM Systems
 - This is the future of Java running on IBM i
- Positioning of the new JVM
 - Should provide a “great fit” for small applications on small systems
 - Small to Medium Business (SMB) market on IBM i ripe for small JVM
- Classic VM support will go away
 - IT4J is default VM in V6R1
 - IT4J is the only VM in V7R1

Things you will no longer have

- ANZJVM
 - Replaced with WRKJVMJOB
- DMPJVM
 - Replaced with GENJVMDMP
- Detailed PEX information
 - PEX still available but with slightly less Java information
- Java leak analysis via PTDV
 - IBM Support Assistant has tools for debugging Java leaks
- Classic native macros in Advanced Analysis
 - Replaced with “jvminfo”
- Java frames in “processinfo” macro from Advanced Analysis
 - Still have frames of native methods that are running in PASE
- Java (4300) VLOG’s
 - Now have 4700 VLOG’s in crash scenarios



Things you'll still have

- Collection Services
- JobWatcher
- Green Screen Debug
- Java Debug Wire Protocol (JDWP)
- DSPJVMJOB
- Java stacks in WRKJOB



New things you'll be getting!!!

- All the industry-standard Java debug tools available for the VM on other platforms.

PLUS:

- “jvminfo” Advanced Analysis macro, and new CL commands (V6R1+) that make it easy to:
 - Display live statistics and information
 - Generate dumps
 - Enable/Disable Verbose GC (live!)



IBM i “Extras”

- WRKJVMJOB (V6R1+)
- PRTJVMJOB (V6R1+)
- GENJVMDMP (V6R1+)
- Advanced Analysis



What's new for Java in IBM i 7.1

- The licensed program is the same as in IBM i 6.1.
- Difference between IBM i 6.1 and IBM i 7.1 is that Java Developer Kit, which is also referred to as Classic Java, is no longer supported in IBM i 7.1.
- Classic Java support has been replaced by IBM Technology for Java.
- The default JVM is IBM Technology for Java SE 6 32 bit.
- Recommend upgrading to IBM Technology for Java NOW
- Recommend upgrading to IBM Technology for Java prior to moving to IBM i 7.1
- A Java V6R1 Upgrade Planning statement is located at <http://www-947.ibm.com/systems/support/i/planning/upgrade/v6r1/planstmts.html>
- See the IBM I 7.1 Information Center under IBM Technology for Java for additional information.