



IBM System i™



OMNI User Meeting

February 19, 2008

i5/OS V6R1: Highlights & Getting Ready

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Acknowledgements

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 - Paul Godtland – IBM, Rochester, MN
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* REDP-4293-00: "i5/OS Program Conversion: Getting Ready for i5/OS V6R1
<http://www.redbooks.ibm.com/redpieces/abstracts/redp4293.html?Open>

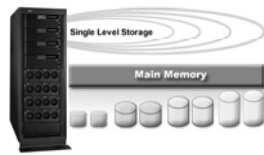
Agenda:

- **i5/OS V6R1 Highlights**
- **Program Conversion**
 - Why and What?
- **Conversion Methods**
- **Next Steps?**



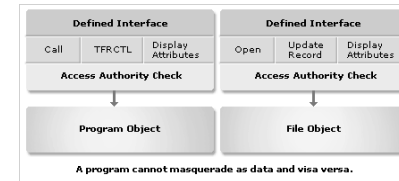
Innovative i5/OS Technology

Single Level Store



i5/OS treats memory & storage as a single pool, automating and optimizing storage management

Object Based Architecture



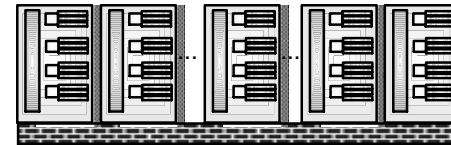
Basis for i5/OS integrity, security, and virus-resistance

Integration



i5/OS is a deeply integrated operating system that contains DB2, security, systems management, ...

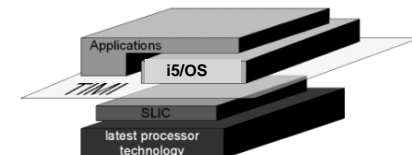
Work Management



Subsystems provide application isolation, performance optimization, & management

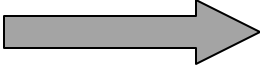
Technology Independent Machine Interface


Enables application programs to take advantage of advances in hardware and software without disruption





January, 2008 Announce Highlights

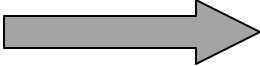
General Availability (GA) 3/21/08

- **Major new operating system release**  **i5/OS® V6R1**

 - Virtualization of i5/OS storage
 - Encryption of backups, data on disk
 - Systems Director management
 - Enhanced Java™ performance
- **Support SAN strategy in large enterprises**  **New Fibre Channel Adapter**

 - Breakthrough performance with DS8000
- **Major new disk clustering product**  **High Availability Solutions Manager**

 - Supports i5/OS Geographic Mirror and IBM Systems Storage Metro Mirror
- **First i5/OS support for BladeCenter®**  **i5/OS runs on BladeCenter JS22**

 - With BladeCenter H
- **New packaging for Rational® tools**  **WDS, RDi, RDi SOA*, RBD*, HATS***

 - Set of Enterprise Modernization tools
 - New packaging and pricing

* Product preview

i5/OS: Efficient, Resilient Business Processing



Go Green & Save

- Integrated middleware for efficient business processing
- Virtualized to manage multiple applications and processes



Manage Growth, Complexity & Risk

- Optimized for exceptional business resilience
- Trusted security with auditing and compliance tools
- Simplified operations and storage management



Realize Innovation

- Designed for open application design choices
- Scalable to enable non-disruptive business growth

i5/OS V6R1

The next step for efficient, resilient business processing



Maximize return on your IT investments



Go Green & Save

- Advanced Systems Virtualization
- SAN Integration
- BladeCenter support
- Support for energy management

Improve responsiveness of systems & people



Manage Growth, Complexity & Risk

- Security enhancements
- Web-based systems management
- High availability initiative
- Performance management enhancements

Drive innovation with technology advancements



Realize Innovation

- Optimizing Java performance
- Integrated Web services
- DB2™ for i5/OS enhancements
- Rational enterprise modernization tools

Security Enhancements



- **Offer software encryption to help meet regulatory requirements**
 - Encrypted BRMS backups of user data to tape or virtual tape
 - Encrypted Backup Enablement – i5/OS Option 44
 - Encryption of data residing in an ASP (user and independent)
 - Encrypted ASP Enablement – i5/OS Option 45
 - Both use AES symmetric key algorithm

- **Enhanced Intrusion Detection and Prevention**
 - Real time notification (e-mail, pagers), improved auditing, Navigator for i5/OS management
 - Dynamic throttling down of clients initiating Denial of Service attacks

- **Strengthen i5/OS Integrity**
 - Digitally sign all i5/OS executables
 - Eradicate any altered programs through automatic retranslation of i5/OS executables



High Availability Solutions Manager

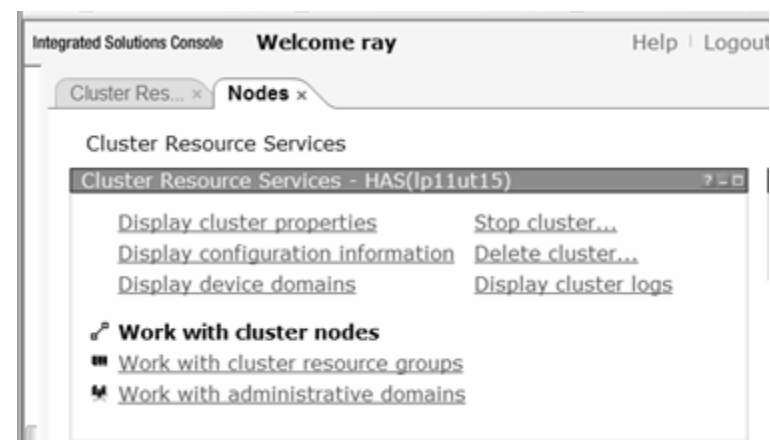


- **IBM storage based clustering product**
 - Can enable near continuous application service
 - Minimize impact from planned & unplanned outages
 - Supports regular and sustained role swap operations

- **IBM® i5/OS and SAN based mirroring**
 - IASP data synchronously replicated for Cross Site Mirroring
 - Geographic Mirroring - i5/OS synchronous mirroring
 - Metro Mirror - DS8000™ synchronous mirroring
 - Global Mirror - DS8000 asynchronous mirroring

- **i5/OS Cluster Management**
 - Enables automatic or manual failover
 - Keeps systems in sync
 - Establishes a heartbeat between the systems
 - Backup recovery operations via Flash Copy

- **Benefits**
 - Hardware based HA/DR solution from IBM
 - Solution requiring minimal day to day administration
 - Trusted on demand role swap operations
 - Many commercial applications IASP enabled



Supported Release

i5/OS V6R1

Prerequisites

HA Switchable Resources (option 41)

IBM DataMirror iCluster®

- **IBM i5/OS logical replication product**
 - Software based solution
 - Optimized for near continuous data recoverability
 - Can provide unlimited geographic dispersion
 - Selectable object replication for lower bandwidth

- **IBM DataMirror iCluster**
 - Asynchronous data replication for disaster recovery
 - Can be adapted for high availability operations
 - Backup copy available for tape backups & data access
 - Active-active replication with iBalance

- **IBM DataMirror iCluster SMB**
 - Near continuous data recoverability for SMB customers
 - Backup copy available for tape backups & data access

- **Benefits**
 - Software based DR solution from IBM
 - Basic to advanced data recoverability



Supported Releases

- i5/OS V6R1, V5R4, V5R3

Prerequisites

- i5/OS Option 12, Host Servers
- IBM TCP/IP Connectivity Utilities

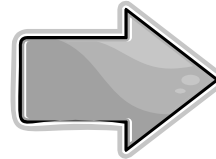


Power Virtualization Technologies

LPAR
Hypervisor

APV
Shared
Processor Pool

VIOS
Micro partitioning



- ✓ Unifying branding & technology between AIX, i5/OS & Linux on POWER
- ✓ Exploit VM awareness and z/VM™ mindshare

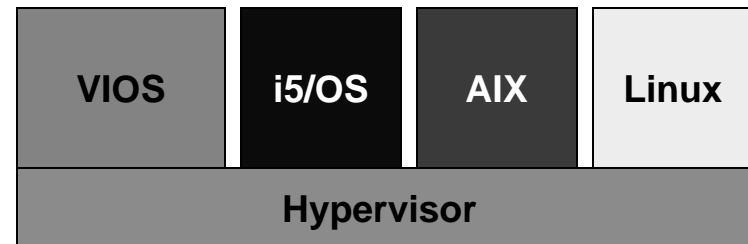
IBM PowerVM™

Virtualization

The leading virtualization platform for UNIX, i5/OS, and Linux enables a more agile and responsive infrastructure

- **PowerVM Technologies**

- Hypervisor
- Logical partitioning
- Micro partitioning
- Virtual I/O Server
- Integrated Virtualization Manager



- **Available with new PowerVM Editions and i5/OS Editions**

- For System i servers, PowerVM Editions provide VIOS and IVM

PowerVM Editions

| | i5/OS Editions | Express | Standard | Enterprise |
|-------------------------|---------------------|------------|---------------------|------------|
| System i servers | POWER5/5+ POWER6 | NA | POWER5/5+ POWER6 | POWER6 |
| Max LPARs | 10/Core | 3 / Server | 10 / Core | 10 / Core |
| Management | HMC | IVM | IVM, HMC | IVM, HMC |
| VIOS | | ✓ | ✓ | ✓ |
| Live Partition Mobility | | | | ✓ ** |

** AIX and Linux Partitions

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Virtual i5/OS Partitions



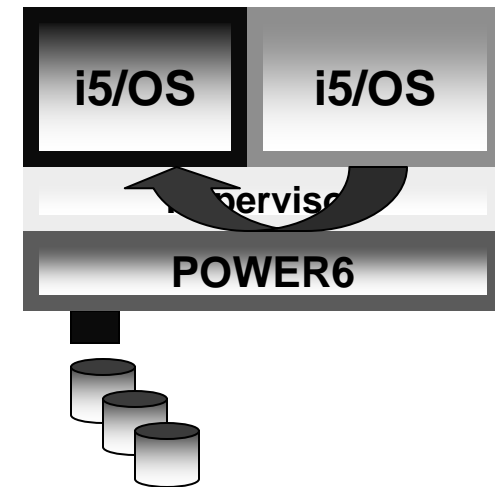
▪ i5/OS Based Virtualization

- i5/OS partition uses I/O resources from another i5/OS partition
- Eliminates requirement to buy adapters and disk drives for each i5/OS partition
- Requires POWER6 processor-based systems with i5/OS V6R1

➤ Supports simple creation of additional partitions
.... e.g., for test and development

▪ Adds to i5/OS Storage Virtualization Capabilities

- AIX® and Linux™ partitions
- Integrated BladeCenter and System x servers running VMware™, Windows™, or Linux



i5/OS Virtual Storage Enhancements



- **Storage Space Snap Shots**
 - Enables backup while partition or integrated server is active
 1. Flush Cache – push data to disk
 2. Checkpoint – save point
 3. Writes go to side file
 4. Normal save while active processing
 - Supports i5/OS*, Windows**, Linux***, AIX****, and VMware**** storage spaces
 - Support provided by BRMS and SAV
- **i5/OS file level backup for Linux**
 - Linux on POWER and integrated servers



- * Works with new i5/OS Quiesce function
- ** iSCSI attached servers
- *** Linux on POWER5 and greater and iSCSI attached servers
- **** Crash consistent

Logical Partitioning Enhancement

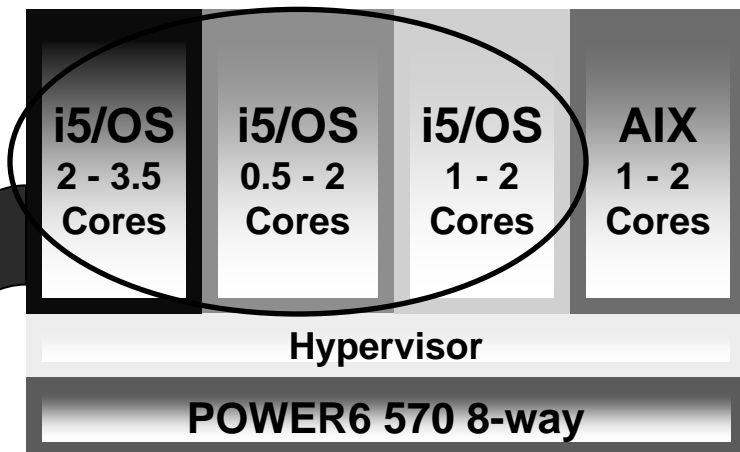


▪ Shared Processor Pools

- Group micro-partitions into separate pools and set limits on the amount of processor capacity each pool can consume
- Supports i5/OS V5R4 and V6R1, AIX, and Linux partitions on POWER6 processor-based systems

- Can help limit required software licenses

Shared Processor Pool Example

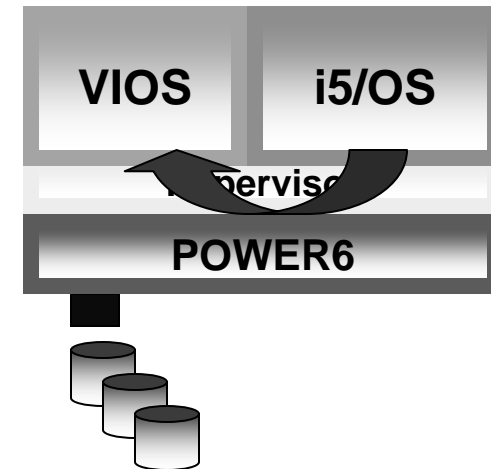


- Group i5/OS partitions
- Cap processor capacity at 6
- Reduces processor based software licenses from 8 to 6

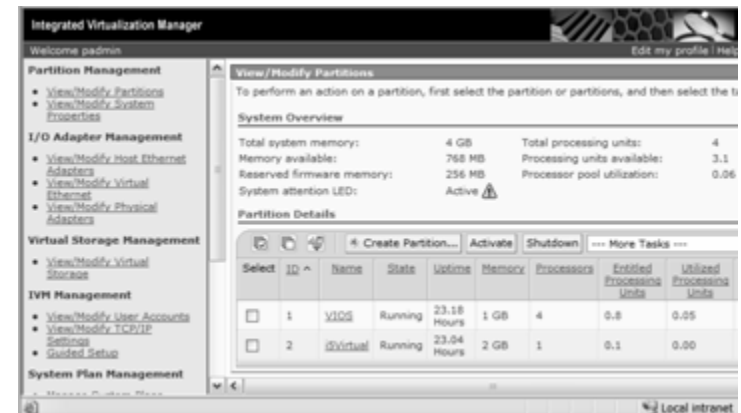
Virtualization with PowerVM



- **PowerVM VIOS Based Virtualization**
 - i5/OS partition uses I/O resources from a VIOS partition
 - VIOS also provides virtualization for AIX and Linux partitions
 - Included with PowerVM Standard Edition
 - Requires POWER6 processor-based systems and i5/OS V6R1
 - Supports DS4700, DS4800, DS8100* and DS8300*



- **Integrated Virtualization Manager**
 - Tool that runs in VIOS partition for creating and managing partitions
 - Provides an alternative to HMC for LPAR management**
 - Requires VIOS to own i5/OS I/O resources
 - Included with PowerVM Standard Edition
 - Requires POWER6 processor-based systems & i5/OS V6R1

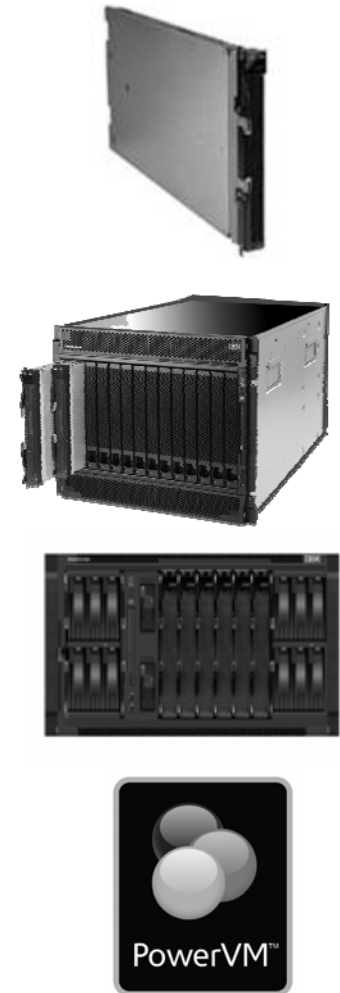


* DS8000 supported only with Blade configurations

** 570 systems require an HMC

Introducing i5/OS Support for IBM BladeCenter

- **i5/OS V6R1 support for BladeCenter JS22**
 - Four core, 4.0 GHz POWER6 processor-based blade
- **Initially in the BladeCenter H Chassis**
 - Supports up to fourteen x86 and POWER blades
- **Statement of Direction (SOD) to support BladeCenter S Chassis**
 - Supports up to six x86 and POWER blades plus 12 disks
- **i5/OS leverages PowerVM Standard Edition**
 - Virtual I/O Server partition owns resources and storage devices
 - IVM used to set up and manage partitions



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

IBM BladeCenter

| Blades | JS22 |
|----------------------|------------------|
| # of Cores | 4 |
| GHz | 4.0 GHz |
| Memory (Min/Max) | 2/32 GB |
| Local Disk (Min/Max) | 0/1 73/146 GB |
| Base Ethernet Ports | 2 |
| Expansion Cards | 0-2 |
| Virtualization | VIOS/IVM |
| AIX V5.3 or V6.1 | Yes |
| Linux- RHEL & SLES | Yes |
| i5/OS V6R1 | Yes |
| CPW | 11,040 |

| Chassis | BCH |
|-----------------------------|------------------|
| # of Blade Bays | 14 |
| # of Disk Drives | 0 |
| Disk Capacity (Max) | 0 |
| Power | 220 |
| Blades | x86 and POWER |
| Redundant Power and Cooling | Yes |
| Management Modules | 1-2 |
| AIX V5.3 or V6.1 | Yes |
| Linux- RHEL & SLES | Yes |
| i5/OS Support | Yes |



BladeCenter H Configuration with i5/OS

- **BladeCenter H Chassis**
 - Fibre, Ethernet, SAS switch(s)
 - DVD

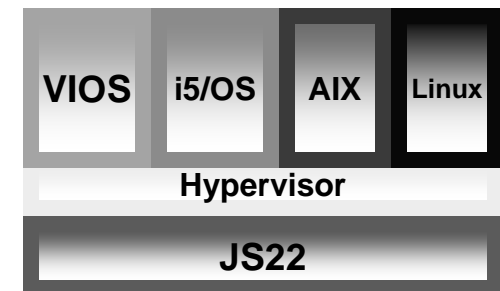
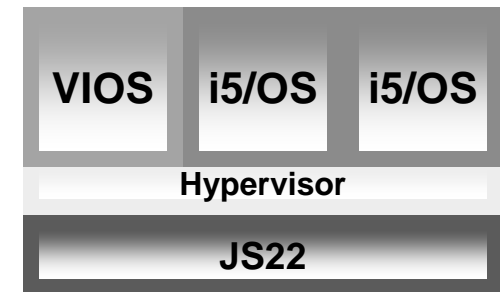
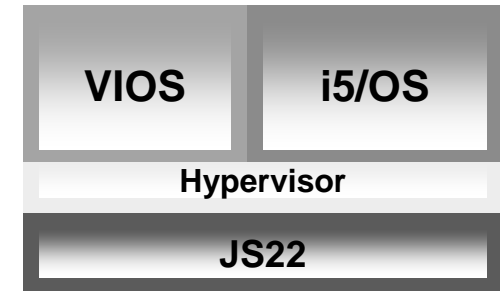
- **JS22 Blade**
 - 4 Cores, up to 32 GB of memory
 - 1 Disk drive
 - Fibre, Ethernet, SAS Adapters

- **Storage**
 - DS4700, DS4800, DS8100, or DS8300
 - External SAS Tape drive

- **VIOS partition manages Blade resources**
 - IVM used to set up and manage partitions
 - i5/OS, AIX, and Linux are client partitions

- **i5/OS V6R1**
 - Processor and User entitlements
 - P20 Software Tier

Partitioned Blade Examples



For more information: <http://www.ibm.com/systems/i/os/i5os/v6r1/blades/>

System i Integration with BladeCenter Enhancements

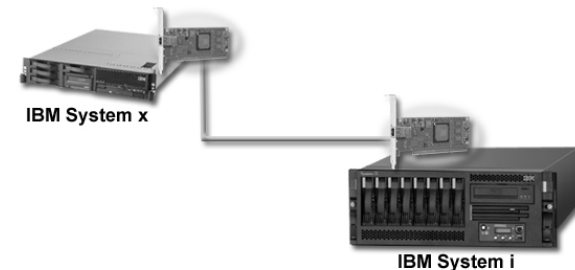
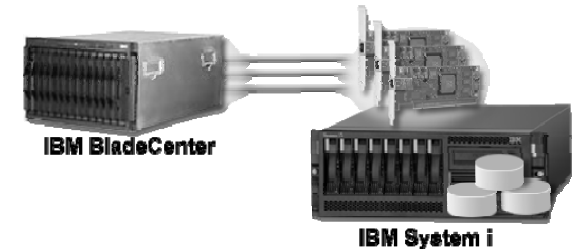
- **VMware VMotion Support**
 - Enabled by shared storage spaces between integrated servers
 - Supports VMotion, HA and DRS functions

- **Virtual Storage Enhancements**
 - Virtual storage space snapshot enables backup while server is active
 - File level backup support for Linux

- **Configuration Enhancements**
 - Direct connect – Systems can be directly connected without an Ethernet switch
 - System i cluster support - replicate iSCSI configuration objects

- **Management Enhancements**
 - Management included in Navigator for i5/OS

- **New Operating System Support**
 - Windows Server 2008
 - Linux – SLES 10 and RHEL5

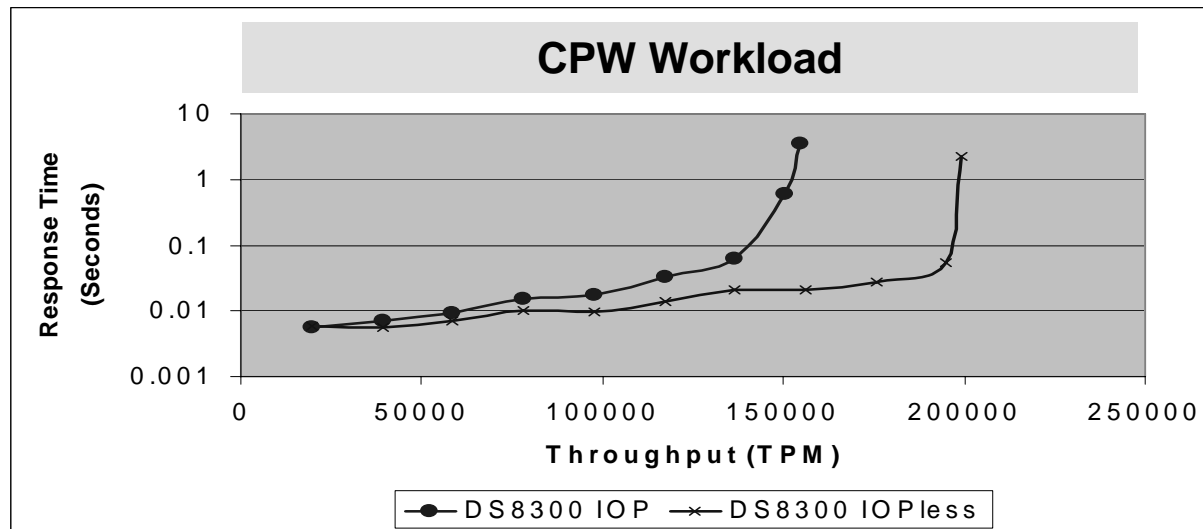


SAN Enhancements



▪ New Fibre Channel Adapter

- **Delivers improved I/O performance - comparable to performance when using internal storage**
 - i5/OS V6R1, POWER6 processor-based systems, and DS8000™
 - 4 Gbit, IOPlless, Dual Port Adapters
 - Increases capacity with up to 64 LUNs per port
 - Enhances flexibility with support for disk & tape attachment
 - Adds support for booting off tape



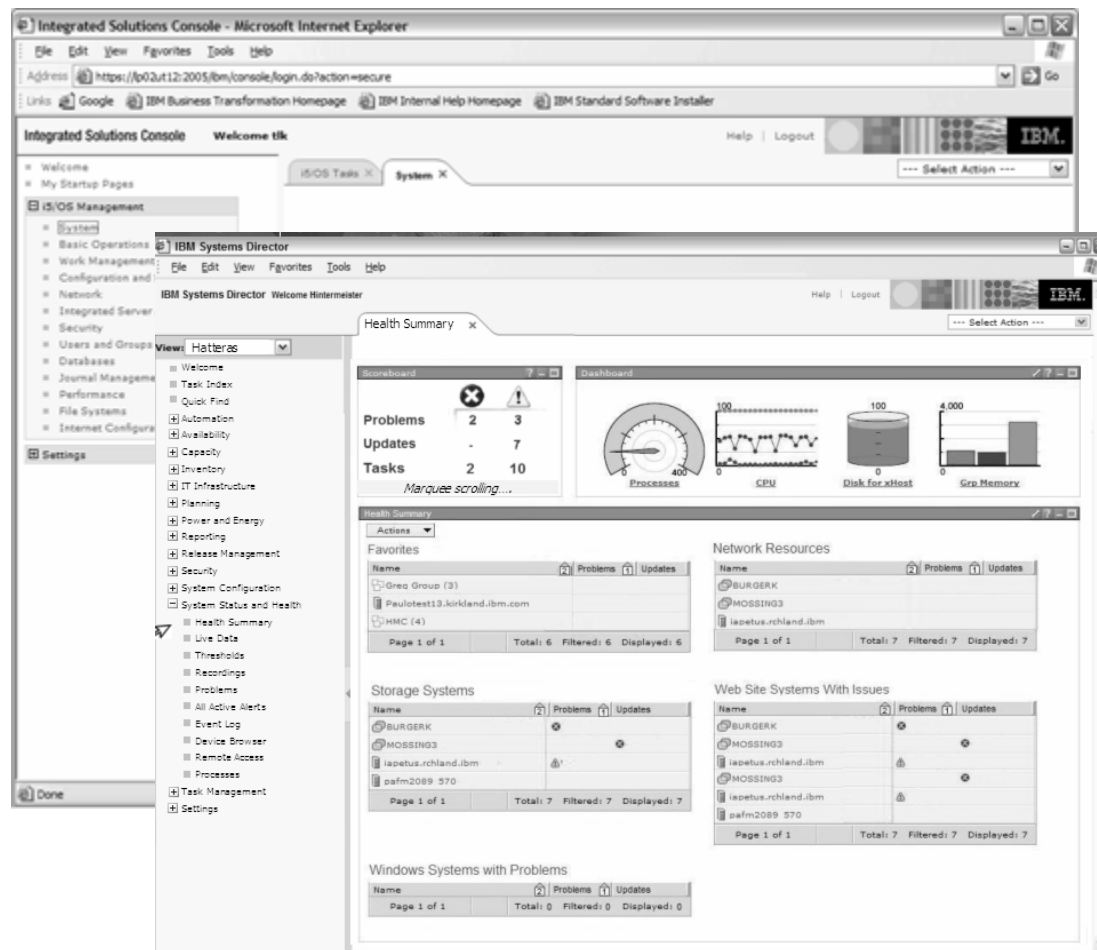
Performance based on workloads and configurations. Improvements shown above are valid only for these specific workloads -- Your results may vary and are dependent on the application and configuration.

New Systems Management Tool



■ IBM Systems Director™ Navigator for i5/OS

- New web based tool for managing i5/OS
- Alternative to iSeries Navigator
- Additions:
 - Performance Data Investigator
 - High Availability Solutions Manager
- Automatically installed with i5/OS
- Plans to snap into IBM Systems Director*



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New Java and Web Services Technology






- **IBM 64-bit Java™ Virtual Machine**
 - Helps ISVs with application portability
 - Works with popular industry tools
 - Improved performance over Classic JVM

- **Integrated Web Application Server***
 - Simplifies the deployment of Java applications
 - Supports applications that use JSF, JSP, and servlets
 - Supports access to DB2 for i5/OS
 - Requires minimal system resources & administration
 - Used by System Director Navigator for i5/OS and DB2 Web Query

- **Integrated Web services environment***
 - Easily expose RPG and COBOL programs as Web services
 - Invocation of Web services from RPG, C/C++, COBOL program

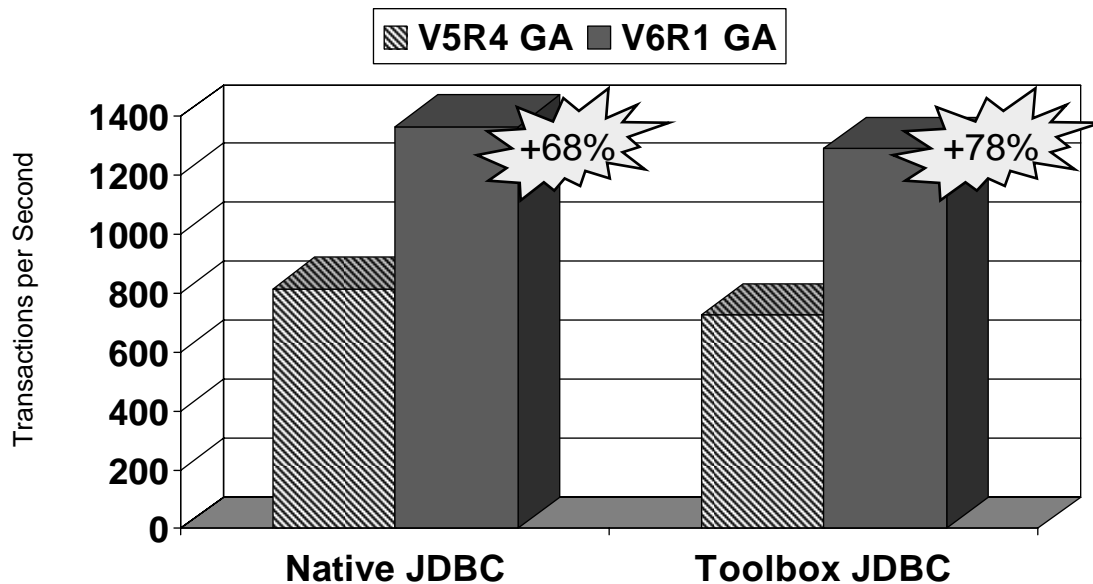
IBM Web Administration for i5/OS

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.

* Also available with i5/OS V5R4

i5/OS V6R1 Java & WebSphere Performance Improvements



Test Environment

- IBM Technology for Java VM
- WebSphere Application Server 6.1
- DB2 for i5/OS
- 2-tier environment
- POWER5+ 2.2Ghz 2-core partition
- Trade 6.1 (stock trading) workload

- **Improvements primarily in JDBC, DB2 for i5/OS and Java**
 - Includes 64K pages (only available on POWER5+ and beyond)
- **Some improvements available via V5R4 PTFs**
 - But majority of improvements available only in V6R1



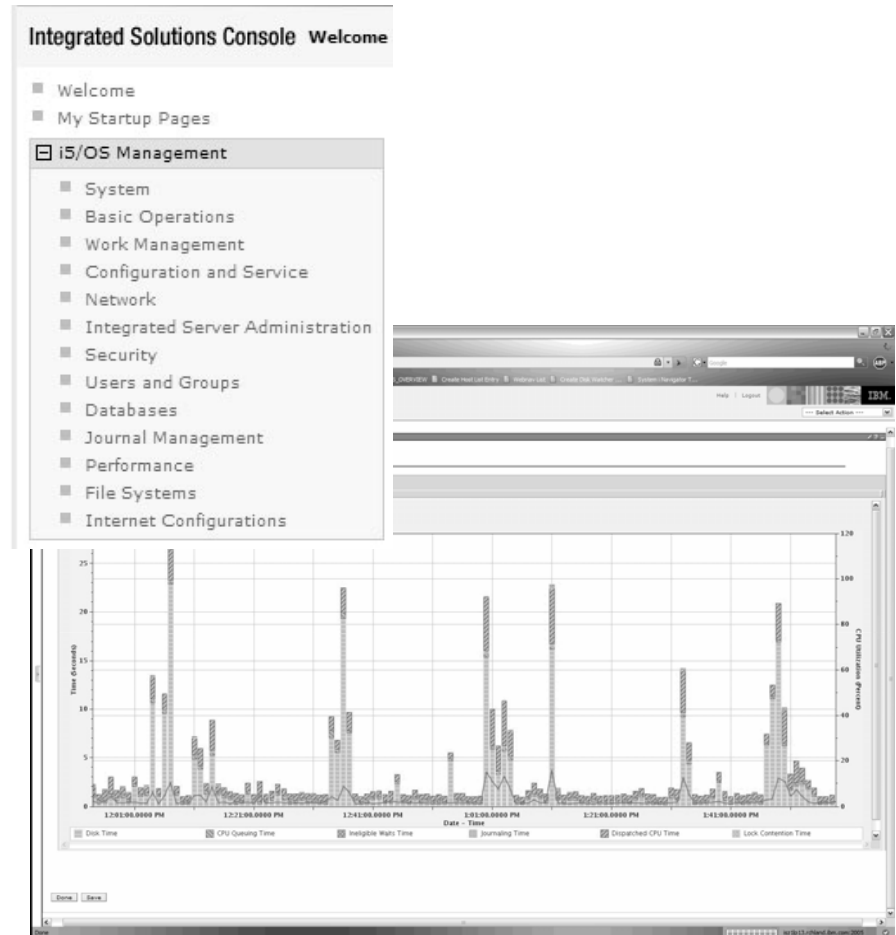
Improvements shown above are valid only for these specific workloads -- Your results may vary and are dependent on the application.

New Performance Investigator Tool



■ Performance Data Investigator

- Enhanced viewing and analysis of i5/OS collection services data
- New Performance group in Navigator for i5/OS
- Visualize data in charts and tables
- Included with i5/OS
- Works with Performance Tools for deep performance analysis



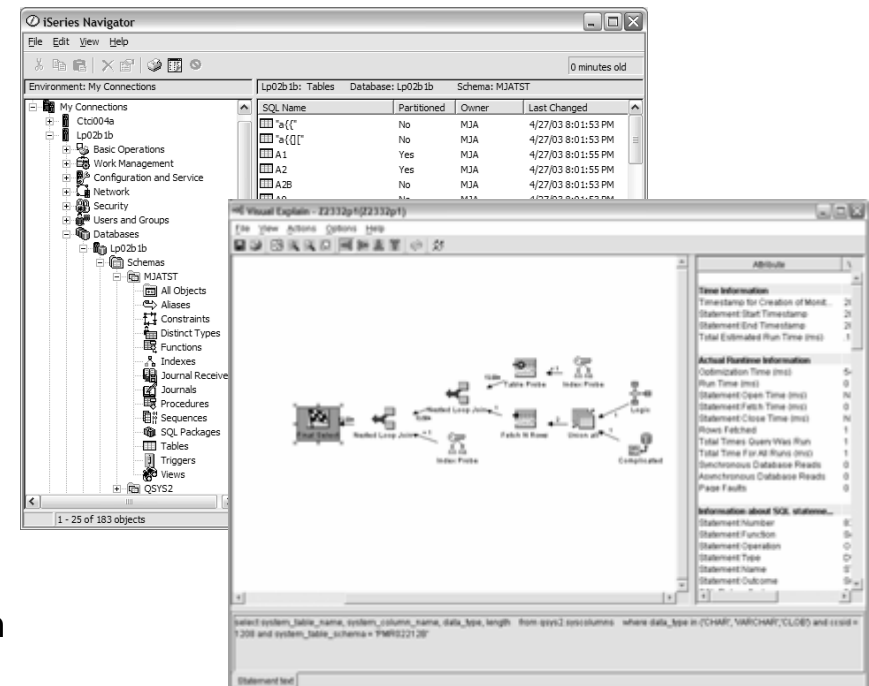
Tip: Collection Services files from a previous release may be converted to a V6R1 format and then viewed via the tool

DB2 for i5/OS Enhancements



- **Extending standard leadership with additional database functions**
 - Full Outer Join, VALUES in FROM Decimal Floating Point, and more
- **Performance Improvements**
 - More queries will take advantage of the new SQL Query Engine
- **Enhancements to On Demand Performance Center**
 - Customizable reports, copy results to a spreadsheet, and more
- **Full text document searching through DB2**
 - OmniFind Text Search Server for DB2 on i5/OS (5733-OMF) *
 - Supports finding a DB2 record based on text contained in a document (e.g., Word, PowerPoint) that is stored in a database column

IBM Information Management software

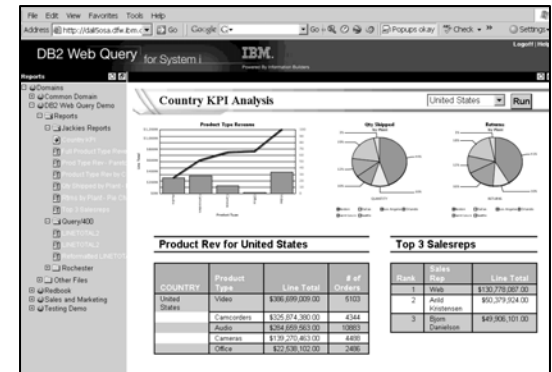


* General Availability (GA) 5/9/08

DB2 Web Query Enhancement

- **New Run-Time User License Enablement Feature**
 - New Flexible Pricing option for i5/OS V5R4 & V6R1
 - Can now define a single user license as either a:
 - Report “Author”
 - Can create/edit reports with web based tools
 - Synonymous with a Named User as known today
 - Run Time Only Group of Users
 - Can only run reports
 - Can Group multiple users into a single license

- **Can significantly reduce prices for scenarios with large number of run-time users**



Named User Pricing

| Tier | Number of Named Users | Price* |
|------|-----------------------|----------|
| P05 | 40 | \$15,200 |
| P10 | 80 | \$32,000 |
| P20 | 150 | \$57,600 |

New Run Time Pricing

| Tier | Number of “Authors” | Number of Run Time Groups | Price* |
|------|---------------------|---------------------------|-----------------|
| P05 | 4 | 5 | \$6,000 |
| P10 | 4 | 10 | \$10,400 |
| P20 | 8 | 20 | \$23,200 |

US list prices, subject to change without notice

Assumes upgrade into QU2 from QU1

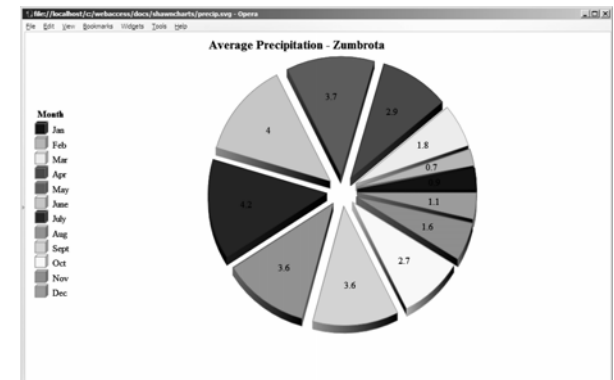
System i Access Enhancements



- **System i Access for Windows**
 - .NET Data Provider supports ADO .NET 2.0
 - Supports the Microsoft Installer Package
 - PC5250 V5.9
 - IPv6
 - ODBC, OLE DB, Data Transfer enhancements

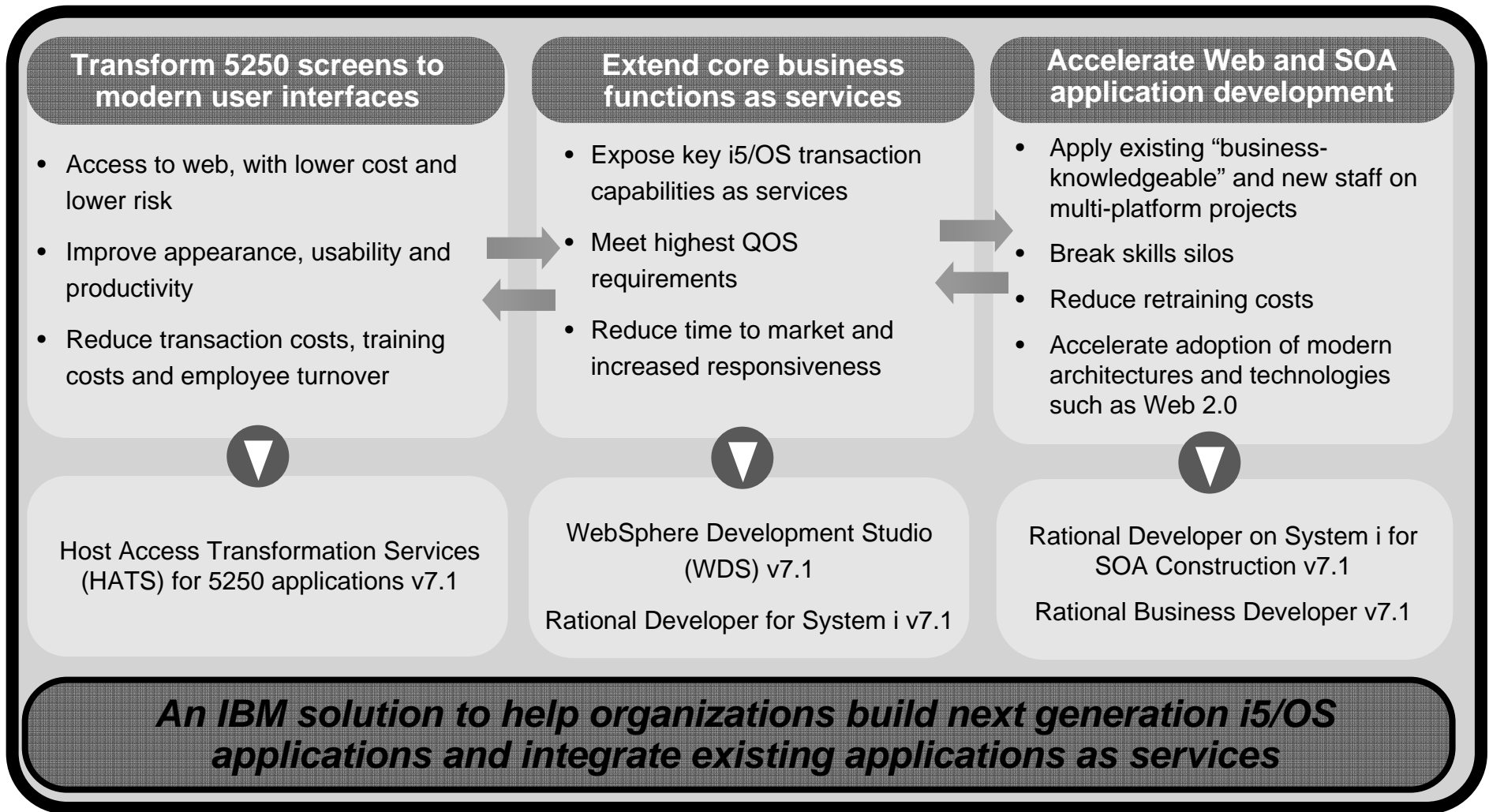
- **System i Access for Web**
 - Single sign-on: Web support authentication using Windows domain login
 - SQL wizard supports joins of multiple tables
 - Chart SQL results in simple graphs
 - Automation and scheduling of tasks

- **System i Access for Linux**
 - IPv6 support for ODBC, Remote Command, and utilities
 - ODBC enhancements



Rational Announcement Highlights

Accelerate your path to reuse and service-oriented architectures for i5/OS



Application Development Tools & Compilers

New and Enhanced!

Host Access Transformation Services (HATS) for 5250 applications

- Combines the HATS and the WebFacing technology in a single product offering
- Simplified pricing and licensing options
- New! Mobile Device Support
- Web services usability improvements
- New! Visual Macro Editor developing HATS macros

WebSphere Development Studio Rational Developer for System i

- Repackaging of compiler and tools offerings in WDS
- ILE Compilers, Heritage Compilers, and ADTS offered as three separate product offerings
- Flexible user based pricing model
- Several compiler enhancements and usability improvements
- Replaces WDSC with a light weight IDE offering - Rational Development for System i (RD*i*)

Rational Developer on System i for SOA Construction Rational Business Developer

- Complete solution for building next generation internet, intranet and wireless application for System i
- Deploy EGL applications and services to either Web Application servers or i5/OS transactional environment
- Rich drag-drop web development tools
- Powerful simplified programming paradigm
- Automatic code generation from models or schemas

Leveraging open eclipse-based IBM Rational Software Delivery Platform to help organizations deliver leading-edge, high-productivity i5/OS solutions

Other Enhancements include



- **IBM Transform Services for i5/OS**
 - Delivers Adobe PDF output support to i5/OS applications
 - Shipped with i5/OS

- **BRMS Enhancements**
 - Encryption of backups
 - Storage Space Snap Shots
 - Support for Systems Director Navigator for i5/OS

- **i5/OS Quiesce Function**
 - Flushes memory to disk before taking a Flash Copy

- **TCP/IP V6 Enhancements**
 - Enabled applications include Apache, DNS, FTP, System i Access servers

- **Faster IPL (Selected environments with large number of spool files)**

- **Network Install**
 - Cumulative Fix Packages and Licensed Program Products

- **i5/OS V6R1 Shipped on DVD Media**

i5/OS V6R1 Enhancements Summary

| For Supported Systems | For POWER6 Processor-Based Systems |
|---|--|
| <ul style="list-style-type: none">▪ Software encryption▪ Intrusion detection and prevention▪ Storage space snapshots▪ File level backup for Linux▪ iSCSI integration enhancements▪ Systems Director Navigator for i5/OS▪ IBM 64-bit JVM▪ Integrated web application server▪ Web services enhancements▪ Java performance improvements▪ Performance Data Investigator▪ DB2 for i5/OS enhancements▪ OmniFind Text Search Server▪ DB2 Web Query enhancements▪ System i Access enhancements▪ TCP/IP V6 enhancements▪ BRMS enhancements▪ Transform Services for i5/OS▪ ... and more | <ul style="list-style-type: none">▪ New Fibre Channel Adapter▪ Virtual i5/OS Partitions▪ i5/OS support for VIOS/IVM▪ Shared processor pools |

Feedback from ISVs



"The process of converting our programs that run on i5/OS V5R3 and V5R4 was fast and provided an accurate/error-free adjustment to run on i5/OS V6R1. All programs are working without any problems after installation. We're looking forward to the restructured Rational tools and the new System i POWER6 hardware, which we are going to install as soon as possible." **Rolf Busch, CIO Busch & Partner**



"IBS is very pleased to see how easy it was to upgrade to V6R1 even though it is a major upgrade for the operating system. The enhancements to this upgrade, which include extending Java functionality and enhancing the already industry leading security, made this an easy choice for us. We are very excited as our clients worldwide go forward with this new update." **André Lundqvist, Technical Manager R&D IBS AB**



"With IBM's announcement of i5/OS V6R1 we enter a new era of this well known, powerful and reliable business-solutions platform. Here at Infonika we are proud to support this announcement and also the new POWER6 Technology. Our Software Development Department has participated in the V6R1 Beta Program and is pleased to announce that all our applications are already prepared for V6R1. During the next two years our System i team will focus on POWER6, V6R1, IBM Enterprise Storage (DS8000) and the integration of the new POWER6 blades with i5/OS." **Hans Reisinger, Managing Director Infonika**



"IBM continues to show its leadership in the area of business computing. This new version of i5/OS is a testament to IBM's continued commitment to the advancement in technology of the most sophisticated business computer on the planet. Inovis remains 100% committed to System i and i5/OS. All currently supported versions of TrustedLink System i and BizManager/400 run on i5/OS V6R1." **Greg Conant, Senior Product Architect Inovis, Inc.**



"Linoma Software has extensively tested our products RPG Toolbox, Surveyor/400, Crypto Complete and GoAnywhere on V6R1 and have encountered no issues. The performance has been great, especially with the new JVM. We fully support V6R1 and look forward to our customers taking advantage of the new features and power available in V6R1." **Brian Pick, Sales Manager Linoma Software**



"Raz-Lee Security looks forward to the upcoming general availability of i5/OS V6R1 for a number of reasons. The very positive impact this announcement will have on the System i market, the new encryption and security-related features of this release, as well as the increased price/performance of the new POWER6 hardware. All make for a winning combination for IBM, ISVs and customers alike!" **Mr. Shmuel Zailer, CEO Raz-Lee Security**



"S4i Systems has found the V6R1 conversion of our document management system S4i Express to be painless and extremely quick. We will release a program fix as some of our installation routines were still compiled using the OPM pre-V5R1 model. Our customers will find that both S4i Express and S4i DASD-Plus will be up and running when they install the new i5/OS version." **Spencer Elliott, President S4i Systems, Inc.**

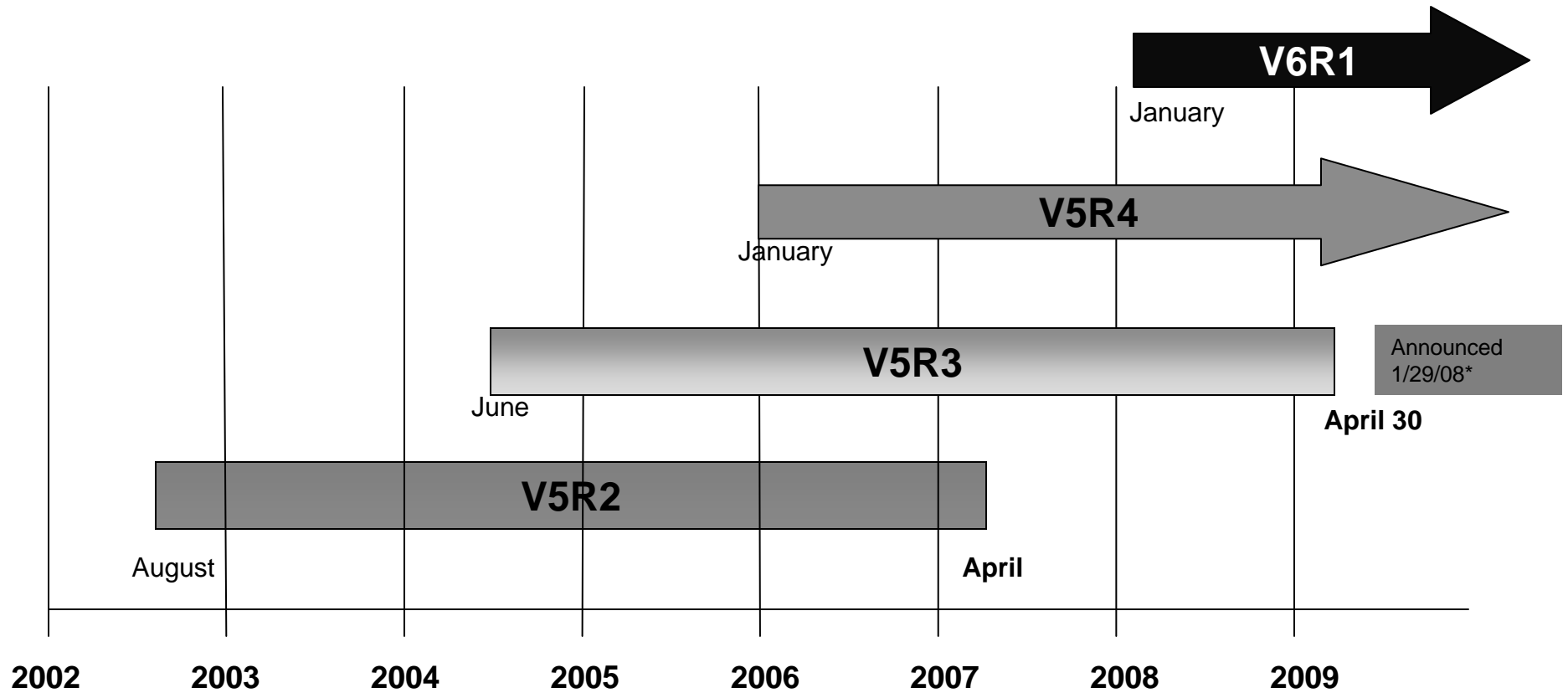


"Attaining and staying in compliance is a challenge for most organizations. The new security features integrated into i5/OS in V6R1, including new encryption capabilities and expanded options for password and other user configuration attributes will help i5/OS shops with their compliance issues. And with the V6R1 enhancements to operating system and data integrity features, i5/OS continues to be one of the most "secure-able" systems available in the market today." **Carol Woodbury, President SkyView Partners, Inc.**



"The security and productivity of i5/OS help make VSSA the best of breed solution for strong user authentication. The new System i and i5/OS technologies strengthen our "Built on IBM Express" VSSA/i5 offerings and make strong and convenient biometric authentication more attractive to customers of every size." **Greg Faust, Principal Valid Technologies**

i5/OS Software Support



Note that it is IBM's current practice to support an i5/OS release until the next two releases have been made available, plus twelve months. So, for example, it is projected that i5/OS V5R3 will be supported for twelve months after V6R1 is available. Exact dates vary according to a variety of factors, including development schedules and IBM's broader software lifecycle support cycles. For example, to simplify customers' software lifecycle management, IBM currently coordinates end of support dates for i5/OS and other IBM software products in April or September. This presentation contains information about IBM's plans and directions. Such plans are subject to change without notice.

* http://www-01.ibm.com/common/ssi/rep_ca/4/897/ENUS908-014/ENUS908014.PDF

i5/OS System Support

| System i Models | V5R3 | V5R4 | V6R1 | Next release* |
|---------------------------------|------|------|------|---------------|
| POWER6 JS22 | | | ✓ | ✓ |
| POWER6 570 | | ✓ | ✓ | ✓ |
| POWER5+ 515, 525 | | ✓ | ✓ | ✓ |
| POWER5/5+ 520, 550, 570, 595 | ✓ | ✓ | ✓ | ✓ |
| 800, 810, 825, 870, 890 | ✓ | ✓ | ✓ | |
| 270, 820, 830, 840 | ✓ | ✓ | | |

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

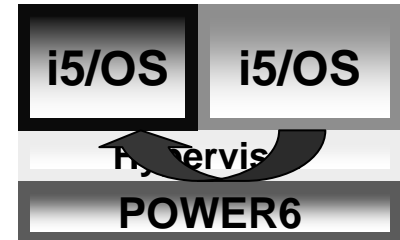
<http://www-304.ibm.com/jct01004c/systems/support/i/planning/upgrade/futuresftwr.html>

<http://www-304.ibm.com/jct01004c/systems/support/i/planning/upgrade/osmapping.html>

Maximize Return on your IT Investments



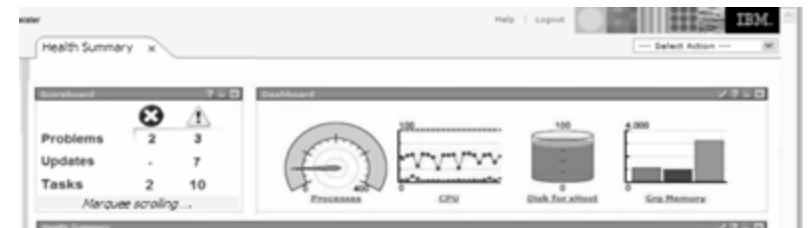
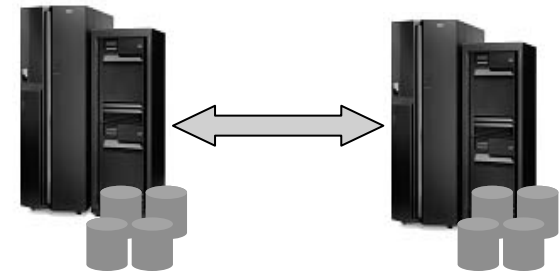
- Reduce costs and simplify creation of i5/OS test and development environments through virtualization of i5/OS storage
- Deliver improved performance for i5/OS and IBM Systems Storage environments through improved SAN support
- Enable consolidation of i5/OS and x86 servers with an IBM BladeCenter solution



Improve Responsiveness of Systems & People



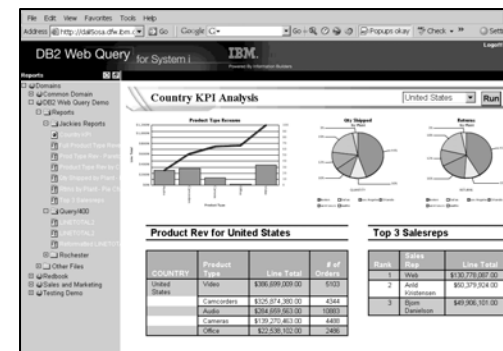
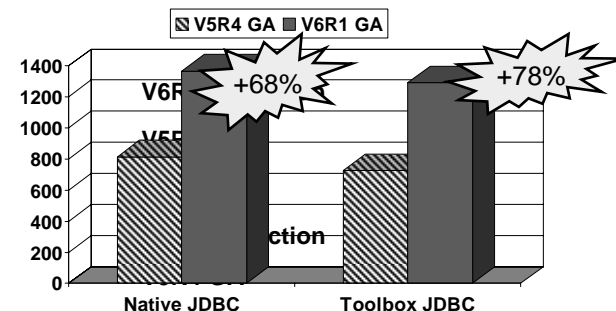
- Reduce impact of planned and unplanned outages with high availability solution from IBM
- Meet regulatory requirements by protecting data at rest and backups of critical business information through advanced encryption
- Reduce IT costs with easy, integrated, web-based management environment for i5/OS



Drive Innovation with Technology Advancements



- Improve performance for Java and WebSphere applications with i5/OS V6R1 enhancements**
- Simplify deployment of Java applications and extend value of business applications through built in web application server and web services environment**
- Enhance application functionality and performance with new DB2 database functions and management tools**



Want to find out more about i5/OS V6R1?



- **IBM sponsored Webcast on System i Network (1/30/08)**
 - http://www.systeminetwork.com/content/f3/index.cfm?fuseaction=webcast.view_webcasthome (Recording is available)
- **No charge COMMON Webcast “An Update from IBM” - Feb. 5, 2008**
 - <http://www.common.org/webcasts/>
- **System i Conferences including**
 - COMMON (Spring 2008)
<http://www.common.org/conferences/2008/annual/index.html>
 - System i Technical Conference (Fall 2008)
<http://www-304.ibm.com/jct03001c/services/learning/ites.wss/us/en?pageType=page&c=a0000058&eventGeo=Americas>
 - And others as well ...
- **V6R1 Information Center** <http://publib.boulder.ibm.com/series/>
 - V6R1 Memo to users
- **V6R1 Web site** <http://www.ibm.com/systems/i/os/i5os/v6r1/index.html>



FYI: Finding out more about V6R1 in *Europe...*



<https://www-304.ibm.com/jct03001c/services/learning/ites.wss?pageType=page&c=a0014898>



<http://www.comeur.org/common/>



i5/OS V6R1 Program Conversion

- Why and What?**
- Conversion Methods**
- Next Steps?**

First... an 'Acronym Glossary'

- **ILE = Integrated Language Environment**
- **LIC = Licensed Internal Code**
- **MI = Machine Interface**
- **OPM = Original Program Model**
- **PASE = Portable Application Solutions Environment**

Conversion – a Historical Look

Previous MI program refreshes:

- **System/38 CPF to OS/400 V1R1 – 1988**
- **‘CISC to RISC’ (V3R6) – 1995**



What is Being Done?

- **(Re-)create ALL Machine Interface (MI) programs**
 - MI programs from all previous releases
 - Integrated Language Environment (ILE), Original Program Model (OPM) programs
 - Applications, plus i5/OS and other IBM products
 - Many applications, some IBM products re-created via conversion



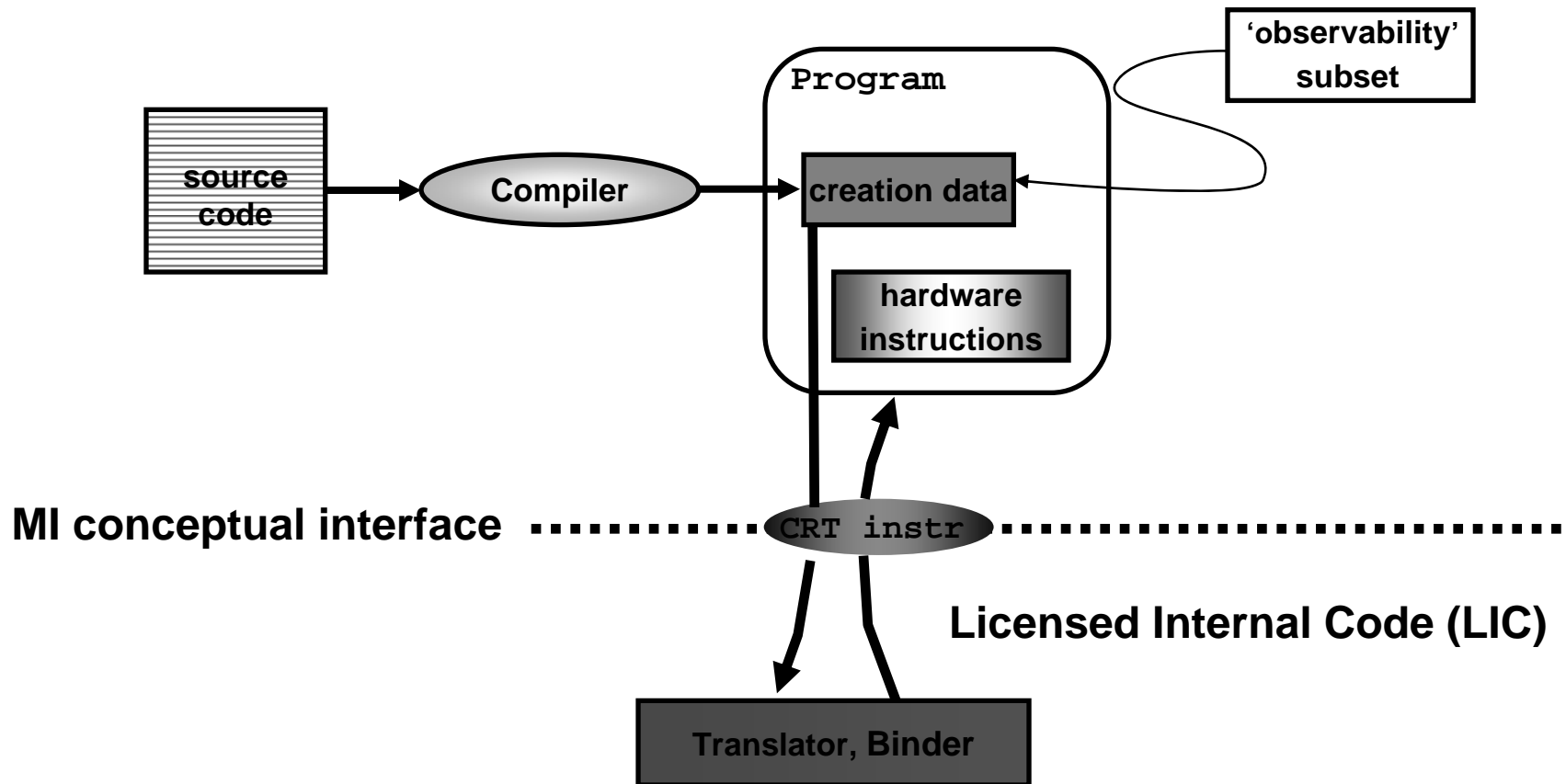
Why Conversion?



- **IMPROVE software**
 - Capitalize on MI's object-based, abstract definition
 - Convert programs to faster, better implementations
 - No source code changes needed; usually source not even needed
 - Immediately use POWER6 features without need to recompile

- **Increase overall system value**
 - Provide improvements to already robust system integrity, safety
 - Demonstrate system technical vitality
 - Prove ability to adapt to new hardware and software designs
 - Add functions for easier application development, deployment

Program Creation (Simplified)



About Program Conversion

- **Replace existing program object *without compile***
- **One-time process, but *required either direction***
 - V5R4 or V5R3 → V6R1
 - V5R4 or V5R3 ← V6R1
 - Program TGTRLS does ***NOT*** affect need for conversion
- **Part of all V6R1 systems**
 - No options or added fees
- **Average per-program convert times, large sample**
 - *Sub-second* on fastest processors, *< 4 seconds* on slowest
 - Programs with many modules can take *a lot longer*

Program Conversion Exception Cases

- **Program creation data is *not* available, even to LIC**
 - Program or constituent module target release before V5R1 AND creation data was removed
 - *Must compile from source IF* creation data is gone
- **Program relies on *unsupported* alterations**
 - Conversion removes such modifications
 - Must use supported interfaces instead

However, please note that *most* programs can be converted!

- Created at V5R1 or later
- Older programs also, unless creation data removed

Integrity Improvement Examples

- **Eradicate any altered programs that may already exist**
- **Extend unique ability to remove code corruption**
 - Every runnable MI application includes creation data, so can be converted without source
 - **No** ongoing updates needed
- **Load 'system state' program only if i5/OS**



Performance Improvement Examples

- **General improvements**

- Memory access, pointer use, procedure calls, activation
 - C/C++ programs benefit more than RPG & COBOL

- **Adaptive Code Generation**

- Exploit latest hardware, without penalty on older hardware
- Used by default, with no compile needed

- **New create options, no source changes required:**

- Optimize procedure call argument passing, between modules
- Defer service program activation (*significantly improves startup of applications*)

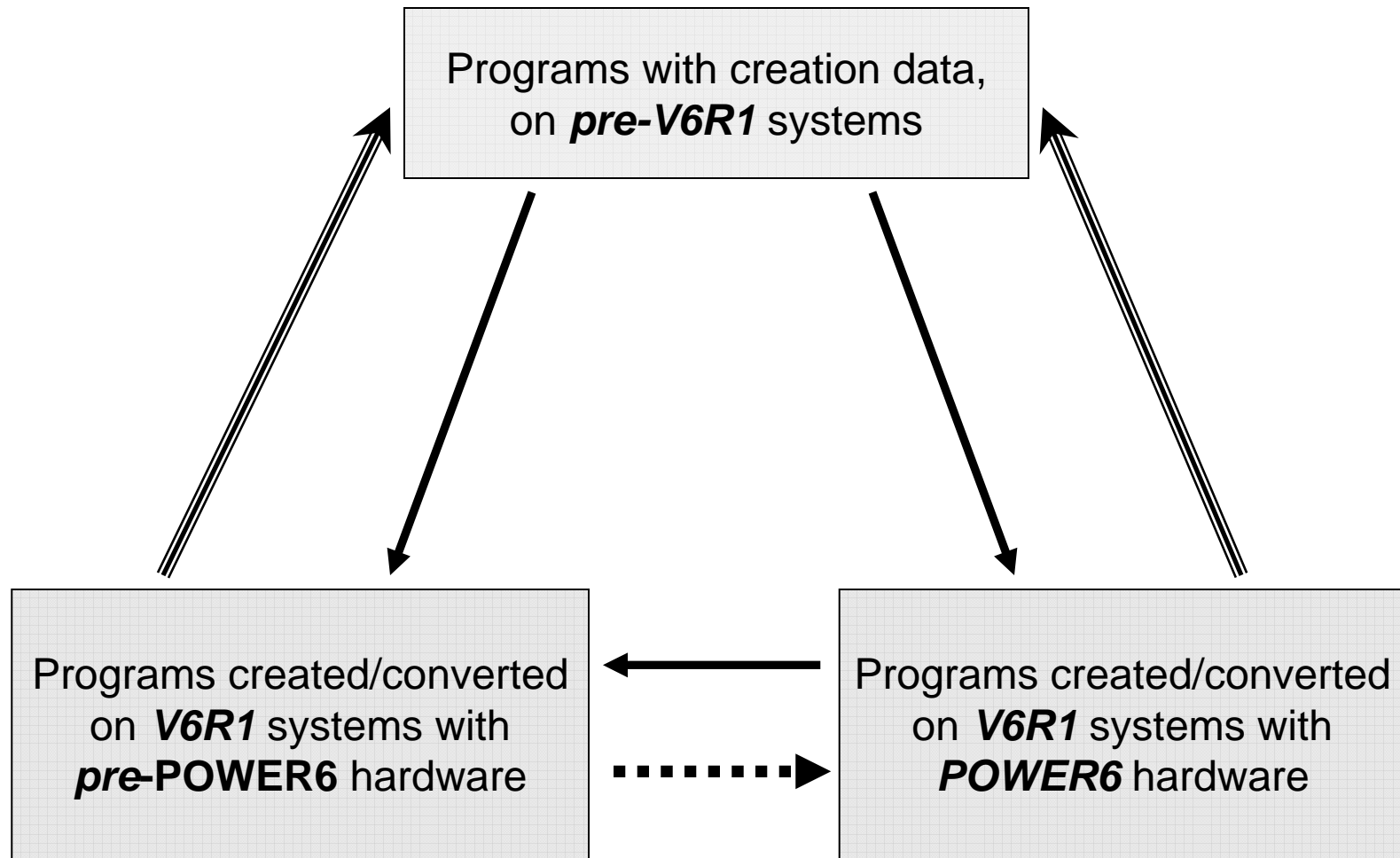


Function Improvement Examples

Ease application development, deployment

- **All programs can now use teraspace**
 - Utilize teraspace capabilities, without limitation concern for cooperating programs
 - Teraspace supported directly by hardware
- **Add thread local static storage**
 - Ease thread-safe programming,
- **Trace function, Performance EXplorer, always available**
 - No need to recompile first with different options





- Optional conversion during restore, mandatory before running
- Mandatory conversion during restore
- No conversion required

Conversion Methods and Next Steps

When Does Program Conversion Occur?

Combination of 3 conversion methods on V6R1:

- **At restore/install**
 - FRCOBJCVN(*YES *ALL) or change QFRCCVNRST >= 2
- **Scheduled (you initiate)**
 - STROBJCVN by library (*ALLUSR or by name)
- **At first call/activation**
 - Consider any potential affect on end users

NOTE: Must *regenerate* applications that won't convert (compile from source or acquire...)

Next Steps... Preparation is Essential

- **Utilize V6R1 information:**

- Obtain “i5/OS Program Conversion ... for i5/OS V6R1” Redpaper
<http://www.redbooks.ibm.com/redpieces/abstracts/redp4293.html>
- See the System i planning site
<http://www-304.ibm.com/jct01004c/systems/support/i/planning/upgrade/index.html>
- V6R1 conversion Frequently Asked Questions
<http://www-304.ibm.com/jct01004c/systems/support/i/planning/upgrade/v6r1/index.html>
- V6R1 Information Center (*available later*)
<http://publib.boulder.ibm.com/series/>

- **Use Analyze Object Conversion (ANZOBJCVN) tool on V5R4 or V5R3 systems – available now!**

- Identifies potential conversion issues, *estimates* times
 - If a purchased application will not convert, contact Software Provider to discuss (e.g. ask for a version compiled for V5R1 or later)
- Refer to Info APAR II14306 for PTFs to download
<http://www.ibm.com/support/docview.wss?uid=nas23af47a966c4df94586257306003c6868>

- **Consider using the new ‘as-is’ IBM Pre-Upgrade Verification tool**

- Refer to later FYI Appendix for download site and more details

“i5/OS Program Conversion: Getting Ready for i5/OS V6R1” Redpaper

<http://www.redbooks.ibm.com/redpieces/abstracts/redp4293.html>

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Abstract

IBM® plans to deliver i5/OS® V6R1 in 2008. With V6R1, IBM exploits the capabilities of the Machine Interface (MI) architecture to significantly improve programs. Programs can benefit from better performance, a range of new operating system and processor capabilities, and even stronger system integrity. To enable these improvements, all MI programs created for previous releases must be converted to run on V6R1. MI programs include ILE (integrated language environment) and OPM (original program model) programs.

To convert a program, its creation data (which is a subset of observability) must be available. MI programs retain creation data by default, so most programs can be converted, going all the way back to programs originally created for System/38. Even if an option was taken to remove creation data from external access, Licensed Internal Code (LIC) can still access the creation data if the target releases of the program and its constituent modules are V5R1 or later. Thus a program lacks sufficient creation data for conversion only if the program or at least one of its modules was created for OS/400® V4R5 or an earlier release AND creation data was explicitly removed.

You can run the Analyze Object Conversion (ANZOBJCVN) command on V5R4 or V5R3 to help plan for your i5/OS upgrade. ANZOBJCVN identifies programs that won't convert to run on V6R1, if any, and estimates the times required for program conversions. It also provides information about two other types of conversions: integrated file system names and spooled files. You can get the ANZOBJCVN command by loading and applying the appropriate PTFs that are listed in this Redpaper.

Note: This Redpaper is in “draft” mode and is undergoing both technical and grammatical reviews. While in draft mode, this document may contain minor omissions, technical inaccuracies or spelling errors. The intention in publishing this draft is to provide the information as quickly as possible and to provide the greatest value to the System i™ technical community. Please note that this draft will continue to be updated on a regular basis until it is complete and ready for publication. For the latest draft, go to the IBM Redbooks® Web site:
<http://www.redbooks.ibm.com/>

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- Chapter 1. Overview of program conversion process
- Chapter 1. Introduction to program conversion

Profile

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System i Planning Web site -- Upgrade Planning -- V6R1

<http://www-304.ibm.com/jct01004c/systems/support/i/planning/upgrade/v6r1/index.html>

The screenshot shows a web browser window displaying the IBM System i Planning website. The browser's address bar shows the URL: <http://www-304.ibm.com/jct01004c/systems/support/i/planning/upgrade/v6r1/index.html>. The website features the IBM logo and a navigation menu with links for Home, Products, Services & industry solutions, Support & downloads, and My account. The main content area is titled "Upgrade planning" and includes a sub-section for "Planning to upgrade to V6R1". A sidebar on the left lists various categories like System i, Hardware, Editions, Operating systems, Software, Solutions, Support, Services, and Resources. A sidebar on the right lists "Additional resources" such as Entitled Software Support, System i Redbooks, System i Storage Solutions, Printers, iSeries Information Center, and IBM Systems. The bottom of the browser window shows a "Local intranet" icon.

Info APAR II14306 – ANZOBJCVN

http://www-912.ibm.com/n_dir/nas4apar.nsf/51d11a683a56a5cc862564c000763b23/3af47a966c4df94586257306003c6868?OpenDocument

← System i

Support

Technical databases

- APARs
- Preventive Service Planning - PSP
- PTF Cover Letters
- Software Knowledge Base
- Registered Software Knowledge Base

Related links

- Register
- Feedback

| | |
|--------------------|--------------------------------|
| APAR#: | II14306 |
| Component: | INFOAS400 - AS/400 Information |
| Release(s): | R530, R540 |

Abstract
ANALYZE OBJECT CONVERSION (ANZOBJCVN) FOR V5R3M0 AND V5R4M0

Error Description
Analyze Object Conversion

The Analyze Object Conversion (ANZOBJCVN) command is available through a set of fixes (PTFs) to assist you in preparing for an i5/OS upgrade to a target release.

After you run the ANZOBJCVN command, you receive information to help you determine the impact that object conversions will have on your system. The ANZOBJCVN command analyzes the following types of object conversions:

- 1) Conversion of program objects in libraries.
- 2) Conversion of Java programs attached to stream files.
- 3) Conversion of spooled files.
- 4) Conversion of integrated file system names in file systems that are not case-sensitive.

The ANZOBJCVN command is distributed as PTFs for V5R3M0 or V5R4M0. For this function you must order an MRI PTF. By ordering the appropriate MRI PTF for your language, the proper requisites will be ordered also. For example, for English (2924) on V5R3, order the MRI PTF SI28425 and the requisite PTFs will automatically be ordered.

The MRM PTFs for V5R3 are: SI29369, SI25504 and SI27473.
The MRM PTFs for V5R4 are: SI29370, SI25502 and SI26706.

Note: May use DSPPGM or DSPSRVPGM, instead of ANZOBJCVN, to check a few programs. Creation data unavailable for conversion if:

- For ILE (service) programs, 'All creation data' is *NO
- For OPM programs, 'Observable information' is *NONE

Useful Resources

- IBM System i home page: <http://www.ibm.com/systems/i>
- IBM Announcement Letters Web site <http://www-01.ibm.com/common/ssi/index.wss>
- i5/OS V6R1 preview announcement: http://www-01.ibm.com/common/ssi/rep_ca/0/897/ENUS207-170/ENUS207170.PDF
- V6R1 Information Center <http://publib.boulder.ibm.com/series/>
 - V6R1 Memo to users
- IBM i5/OS and OS/400 release support site: <http://www-03.ibm.com/servers/eserver/support/series/planning/software/i5osschedule.html>
- IBM i5/OS and OS/400 release life cycle: <http://www-03.ibm.com/servers/eserver/support/series/planning/upgrade/suptschedule.html>
- System i & iSeries and supported i5/OS levels: <http://www-304.ibm.com/jct01004c/systems/support/i/planning/upgrade/osmapping.html>
- i5/OS Program Conversion Redpaper (REDP-4293): <http://www.redbooks.ibm.com/redpieces/abstracts/redp4293.html>
- 9/19/07 iSociety Fireside Chat on 'i5/OS V6R1 Program Conversion' - transcript online at <http://www.isociety.org/Chat20070919.html>
- Info APAR II14306 (ANZOBJCVN PTFs): http://www-912.ibm.com/n_dir/nas4apar.nsf/51d11a683a56a5cc862564c000763b23/3af47a966c4df94586257306003c6868?OpenDocument
- System i Upgrade Planning Web site (e.g. V6R1 FAQs): <http://www-304.ibm.com/jct01004c/systems/support/i/planning/upgrade/v6r1/index.html>
- IBM Electronic Software Delivery site: http://www-304.ibm.com/jct01004c/systems/support/software/delivery/en_US/downloadinfo.html
- IBM Prerequisite tool (use to verify software requirements for hardware models/features) http://www-912.ibm.com/e_dir/eServerPrereq.nsf
- IBM Pre-Upgrade Verification Tool
 - http://www-912.ibm.com/s_dir/slkbases.nsf/1ac66549a21402188625680b0002037e/5a6b33f04dcc093a8625736a00590072?OpenDocument&Highlight=2,pruv

FYI Appendix: IBM Pre-upgrade Verification (‘As-is’ tool)

FYI - IBM Pre-Upgrade Verification Tool

- **New 'as-is' tool developed to help ensure a successful i5/OS upgrade**
 - Tool checks to see if key required pre-upgrade steps have been successfully completed
 - If not, the steps that were missed or completed incorrectly are flagged
 - YOU then have the opportunity to successfully complete the required steps
 - Important – the tool itself does not automatically perform the corrective actions/missed steps

- **Useful to 'anyone preparing for an upgrade'**
 - Source: OS/400 V5R2M0 and later
 - Target : up to i5/OS V6R1M0

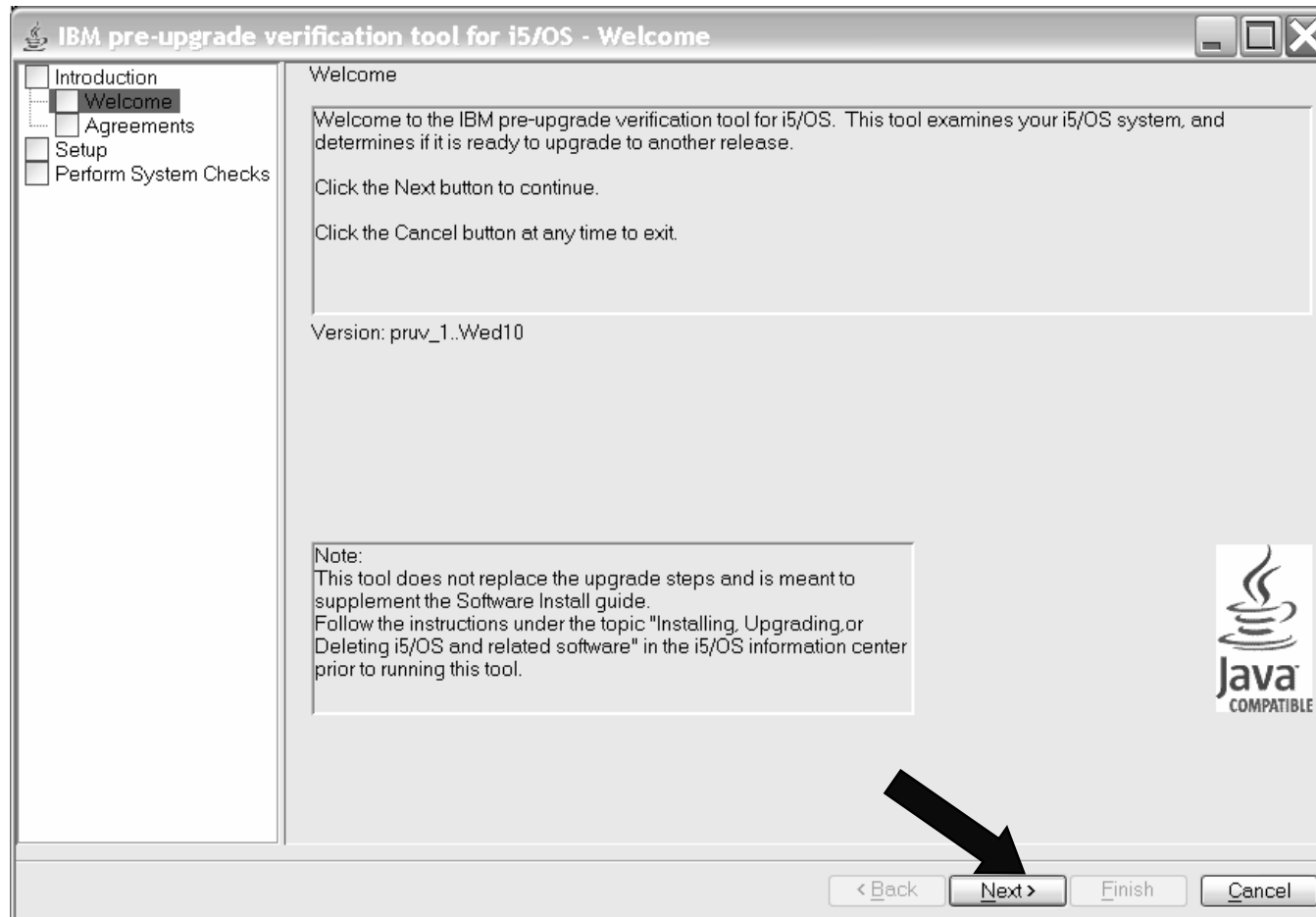
FYI - Pre-Upgrade Verification Tool verifies

- **Prepare for Install steps**
 - Prerequisite PTFs
 - Acceptance of Software Agreements
 - Allocation of additional LIC space
 - System values
 - ANZOBJCVN PTFs (V6R1 only)
 - etc.
- **Other items that may prevent a successful upgrade**
 - Damaged system profiles
 - Duplicate/extension files in system libraries
 - etc.
- **Optionally performs other 'checks', including useful items to collect PRIOR to the upgrade**
 - Performance data
 - BRMS recovery report
 - etc...

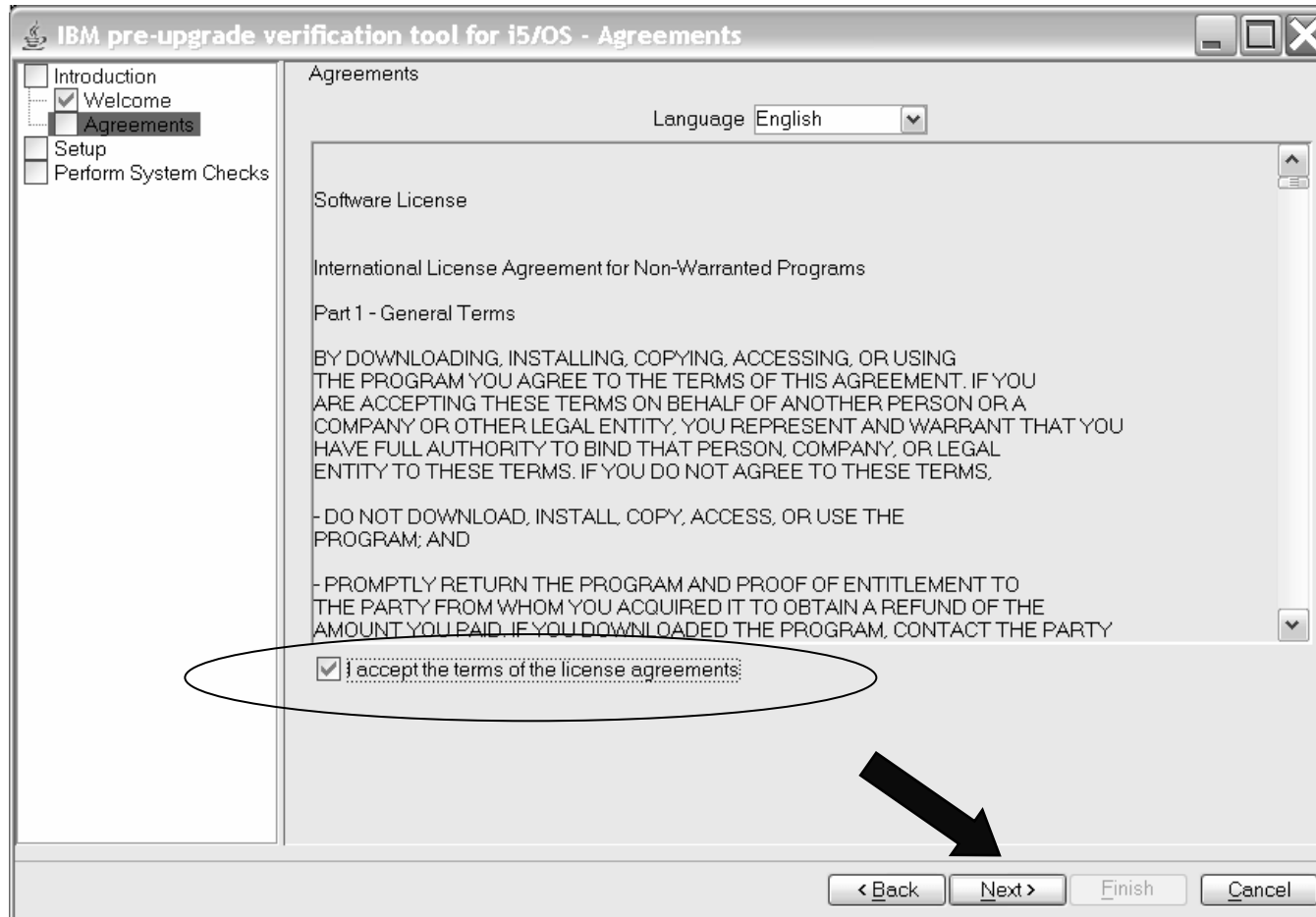
FYI - “PRUV” Tool Requirements

- **Client: Windows PC**
- **Server**
 - i5/OS or OS/400 (V5R2 or later)
 - and Host Servers (Option 12)
- **Download tool from IBM site:**
 - The URL/Web site is contained in the knowledgebase document KB465353483. (or search for keyword “PRUV”)
http://www-912.ibm.com/s_dir/slkbase.nsf/1ac66549a21402188625680b0002037e/5a6b33f04dcc093a8625736a00590072?OpenDocument&Highlight=2,pruv

FYI: Pre-Upgrade Verification tool for i5/OS



FYI: Pre-Upgrade Verification tool for i5/OS



FYI: Pre-Upgrade Verification tool for i5/OS

Signon to desired system

IBM pre-upgrade verification tool for i5/OS - Signon

Introduction
 Setup
 Signon
 Select target OS level
 Checks to Run
 Perform System Checks

Signon

System Name

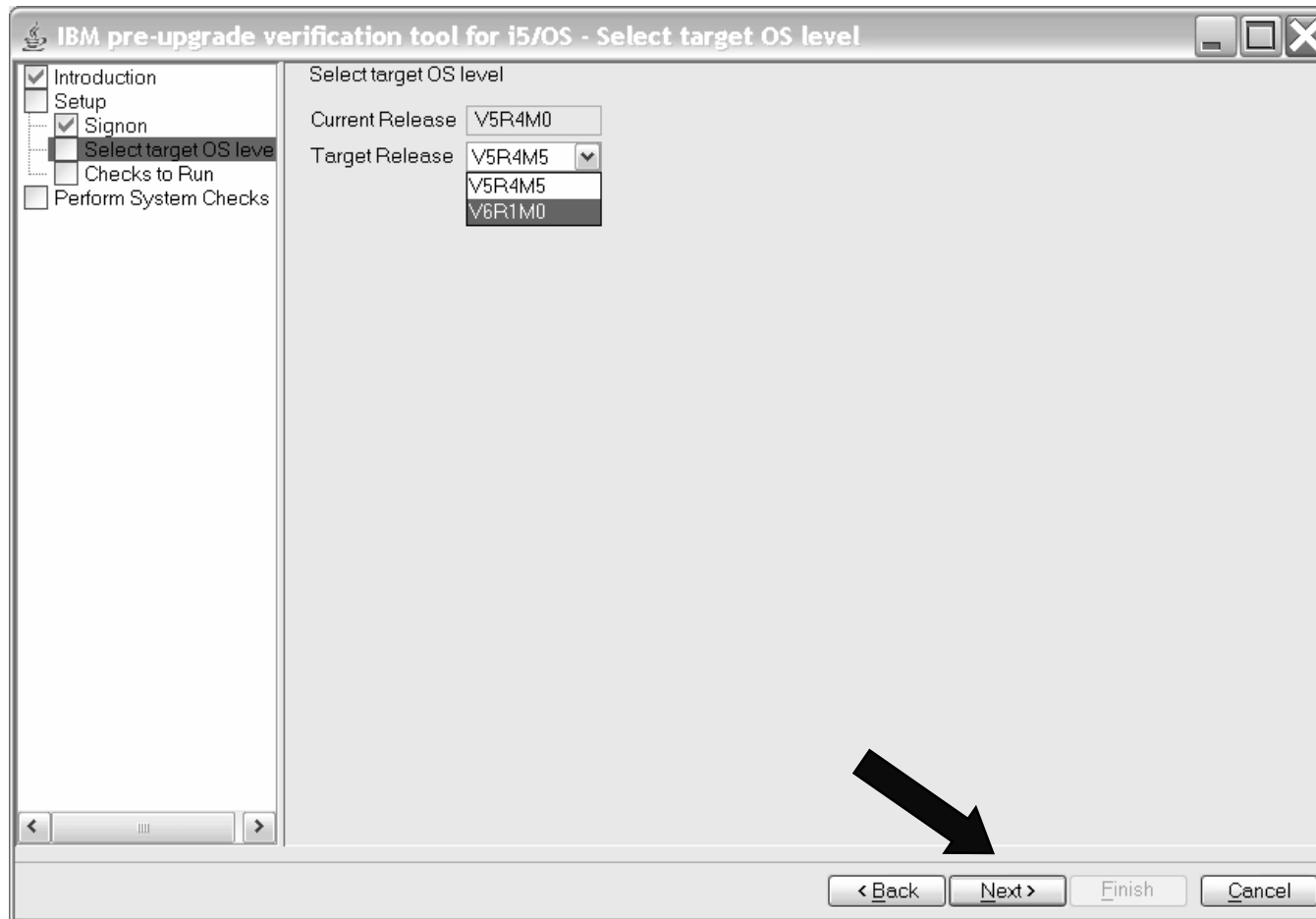
User ID

Password

< Back Next > Finish Cancel

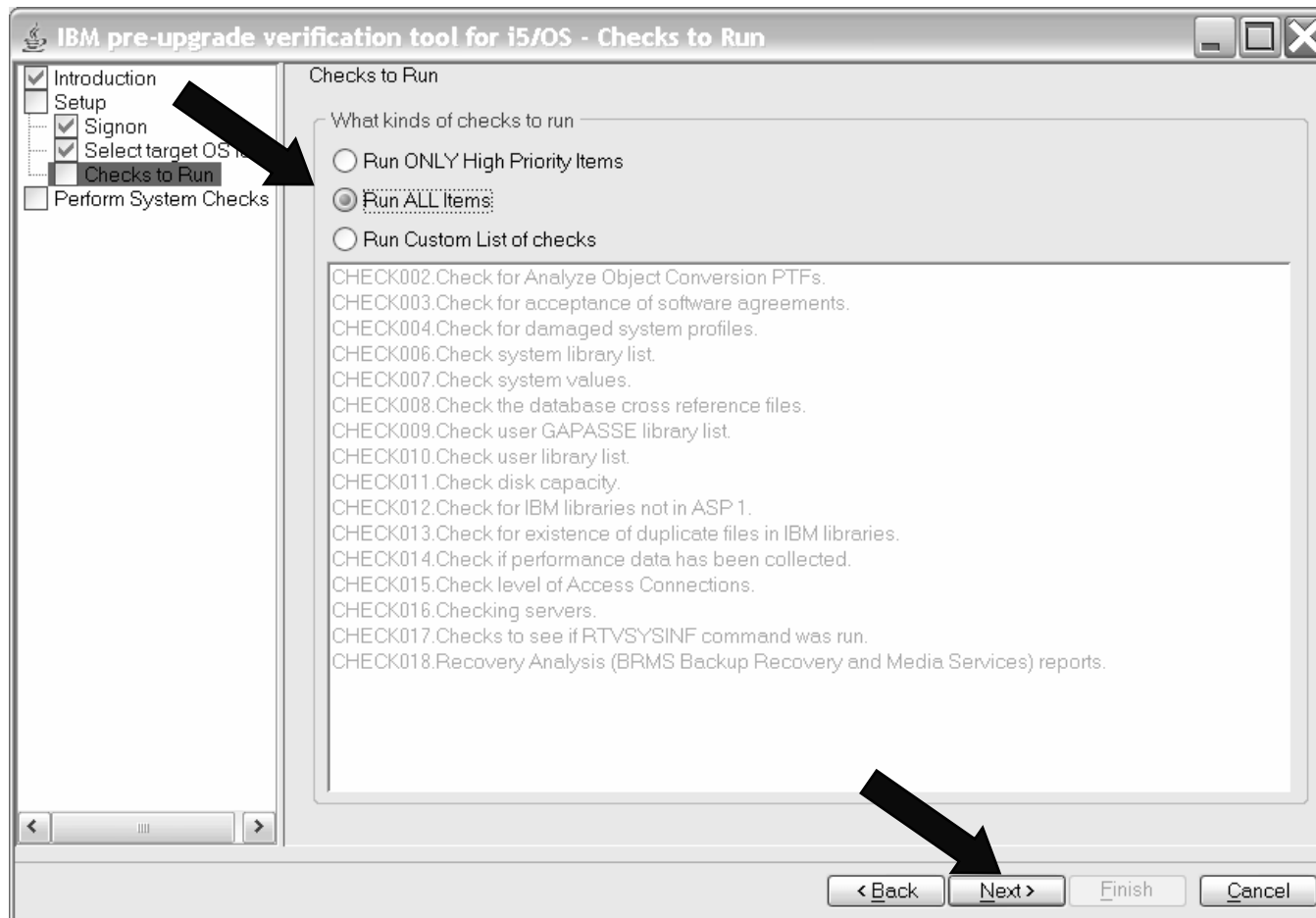
FYI: Pre-Upgrade Verification tool for i5/OS

Select desired 'Target Release'

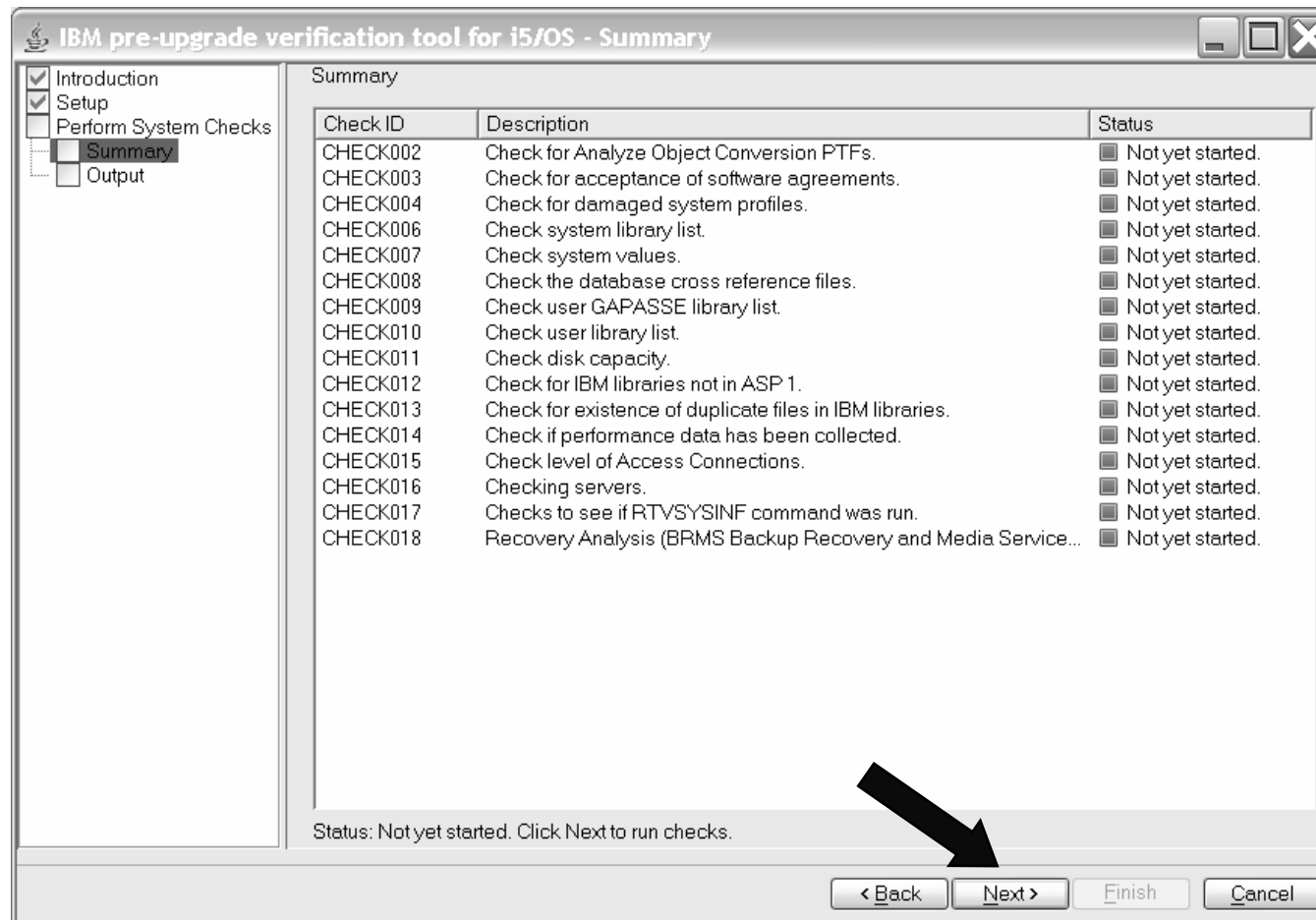


FYI: Pre-Upgrade Verification tool for i5/OS

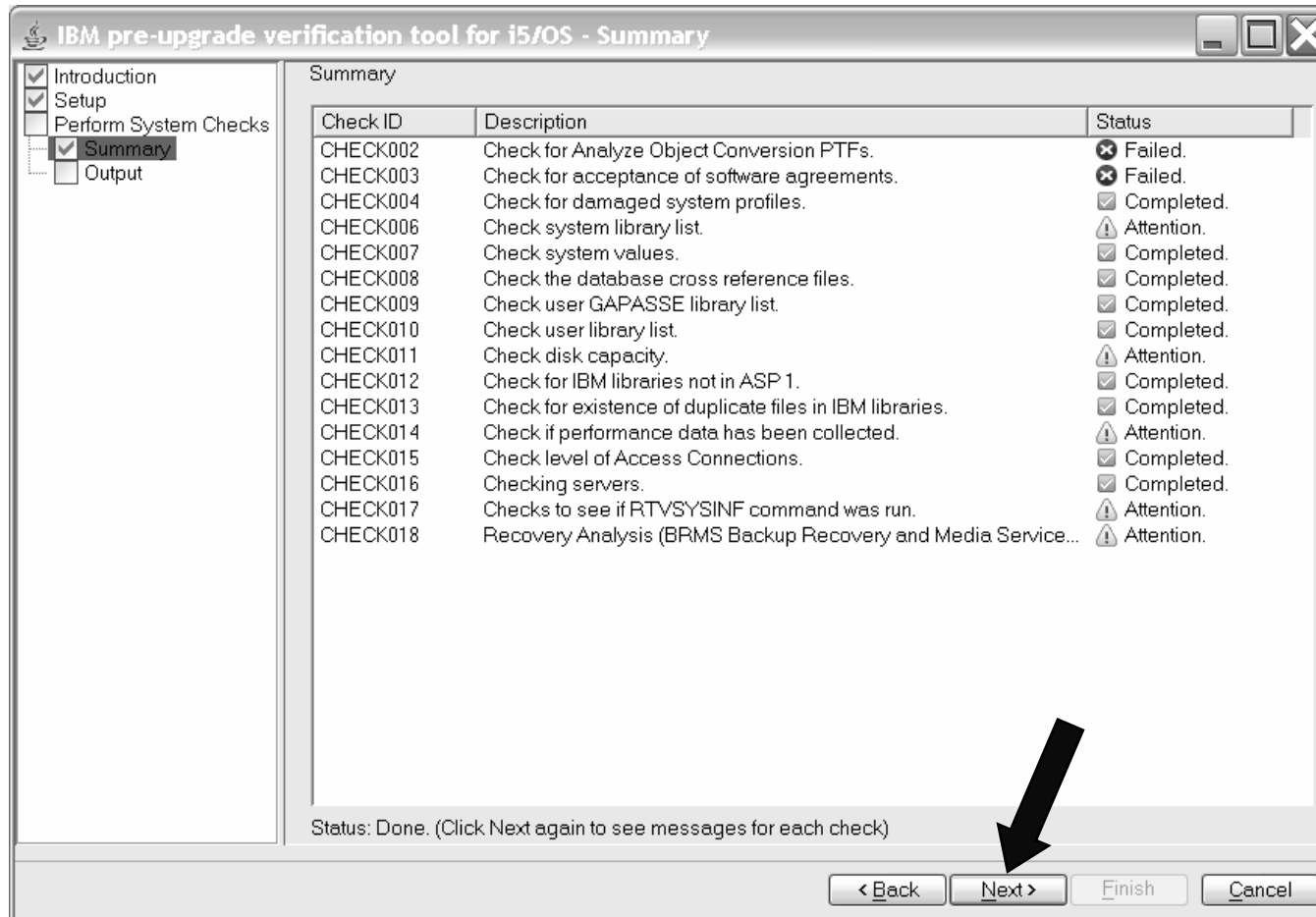
Choose the kind of checks to run



FYI: Pre-Upgrade Verification tool for i5/OS



FYI: Pre-Upgrade Verification tool for i5/OS



FYI: Pre-Upgrade Verification tool for i5/OS

The image displays two overlapping screenshots of the 'IBM pre-upgrade verification tool for i5/OS - Output' window. The top window shows a tree view on the left with 'CHECK002' selected. The 'Messages' pane on the right displays details for CHECK002: 'Check ID: CHECK002', 'Check for Analyze Object Conversion PTFs.', and a note that the ANZOBJCVN command is available through a set of fixes (PTFs) for i5/OS upgrades. The bottom window shows the same tool with 'CHECK003' selected. The 'Messages' pane displays details for CHECK003: 'Check ID: CHECK003', 'Check for acceptance of software agreements.', and a note that software agreements for LIC and i5/OS have not been accepted for the specified target release (V6R1M0). A large black arrow points to the 'Finish' button at the bottom right of the bottom window. The bottom window also shows a list of other checks (CHECK004 through CHECK018) in the tree view.

Click Finish after reviewing messages

FYI: Pre-Upgrade Verification tool for i5/OS



C:\gpinstallstuff\PRUV Nov 28 07\pruv\output\results.html - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Print Mail Stop

Address C:\gpinstallstuff\PRUV Nov 28 07\pruv\output\results.html Go

Check ID: CHECK003

Check for acceptance of software agreements.

This check will determine if the software agreements for LIC and i5/OS have been accepted for the specified target release.

Check performed on: 11/28/2007

Target Release: V6R1M0
Check results: Failure
Severity: High

SfwAgrmnts - 0004 -
 Software Agreements for V6R1 have not been accepted.
 NOTE: Ignore this check if this system will be upgraded using redistribution media.
 RECOMMENDED ACTION: Follow the instructions under the topic Installing, Upgrading, or Deleting i5/OS and related software in the i5/OS information center for V6R1.

- V6R1M0
 - o CHECK002
 - o CHECK003
 - o CHECK004
 - o CHECK006
 - o CHECK007
 - o CHECK008
 - o CHECK009
 - o CHECK010
 - o CHECK011
 - o CHECK012
 - o CHECK013
 - o CHECK014
 - o CHECK015
 - o CHECK016
 - o CHECK017
 - o CHECK018

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Thank you!

Appendix: Questions & Answers

i5/OS V6R1 – Questions & Answers:

- **Question 1: Will ALL the functions in the System i (iSeries) Navigator be available in the new interface?**
- **Answer 1: The IBM Systems Director Navigator for i5/OS is a new tool in addition to System i Navigator that will be available in V6R1 for managing an i5/OS environment. There are about 300 management tasks that will be available in this new interface. However, it does not include all tasks that exist in System i Navigator today. Examples of functions not included are Management Central functions, Database functions that involve graphing or charts such as Database Navigator, SQL Scripts, SQL Assist and Visual Explain and Disk Management functions that involve graphing or charts (e.g. graphical view, disk unit physical location, disk unit/ASP capacity chart). Also, please note that the new interface includes several functions which will not be available in System i Navigator such as the Performance Data Investigator and System i High Availability Solutions Manager (HASM).**
- **Question 2: Will the new OmniFind Text Search Server for DB2 on i5/OS (5733-OMF) licensed product have a charge associated with it?**
- **Answer 2: There is no charge for OmniFind Text Search Server for DB2 on i5/OS (5733-OMF). Also, please note that the planned general availability date is May 9, 2008. Please see the [announcement letter](#) for additional product details as well as ordering and terms & conditions.**
- **Question 3: How can I determine if there are programs with unsupported alterations on my system?**
- **Answer 3: It is important to note that programs with unsupported alterations are rare. The ANZOBJCVN tool reports on one type of unsupported alteration: i.e. the use of system state by an application program. However, ANZOBJCVN will not find other even rarer types of unsupported program alterations, such as the modification of the hardware instruction stream using a service tool.**
- **Question 4: Will there be charges associated with the new encrypted BRMS backups of user data function and the ability to encrypt data residing in an ASP (user and independent)?**
- **Answer 4: There are charges for both of these V6R1 enhancements. Please see the IBM [announcement letter](#) for pricing details on the following i5/OS V6R1 options:**
 - Encrypted Backup Enablement – i5/OS Option 44
 - Encrypted ASP Enablement – i5/OS Option 45

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