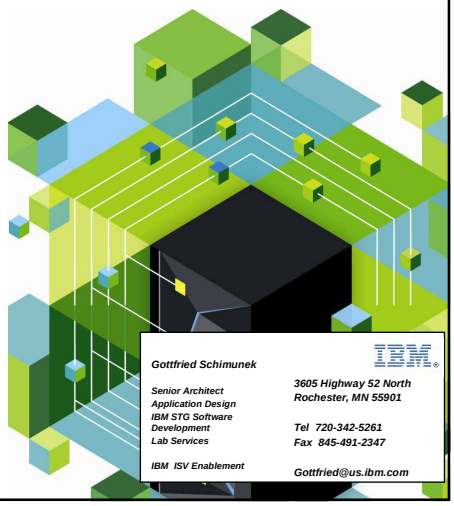
COMMON Europe Fall Tour 2012

IBM i 7.1 and Technology Refreshes



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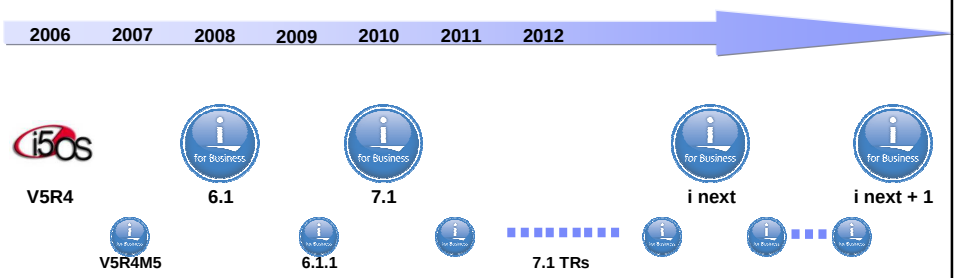
IBM i Roadmap



- Clients requesting fewer operating system releases; and longer support cycles
  - Major release upgrades can be disruptive for a business
- Interim technology refreshes will provide new functions and I/O support
  - Simpler to install on a current release and less disruptive
- **2012 does not have a major release, because key capabilities have been delivered using Technology Refreshes and similar functional updates**

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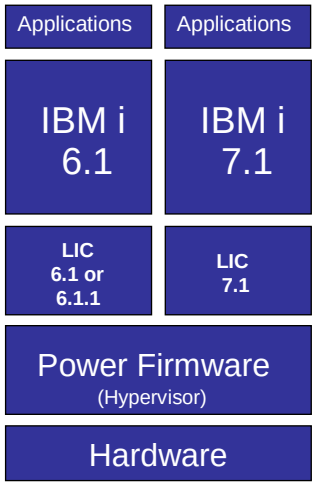
Power Systems running IBM i



- IBM i
  - POWER 7 systems support
    - IBM i 7.1 with LIC level 7.1
    - IBM i 6.1 with LIC level 6.1.1
- LIC: Licensed Internal Code
  - 7.1 with latest Technology Refresh level
  - 6.1 support for pre-POWER7 systems
  - 6.1.1 has POWER7 hardware enablement and is the recommended level for all current and future installs of IBM i 6.1 operating systems
- System Firmware – Power Hypervisor
  - Level depends on System and pre-reqs

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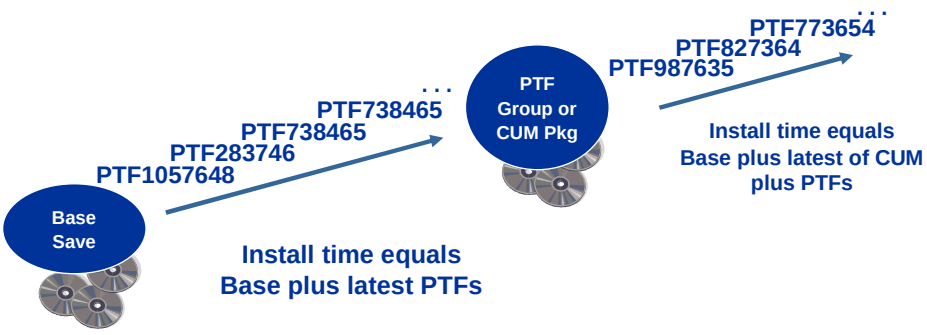
PTFs and CUMs

- PTFs are added to base OS code
- As PTFs increase, rolled into one package called Cumulative PTF Package
  - "Cum Package"
- PTFs/Cum Packages are either specific to program products or for entire system
  - DB PTF groups



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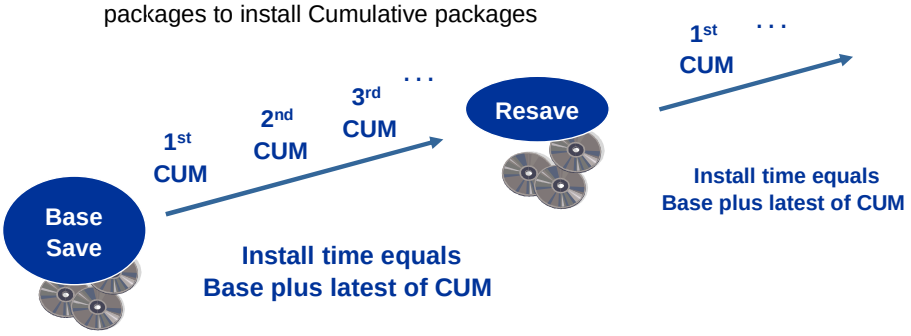
What is a Resave?

- Redistribution of LIC and/or IBM i Operating System
- Provides a new level of install media
  - for new hardware (e.g. new I/O devices or newly announced models)
  - critical fixes in the system install media (for example, install or IPL path fixes)
  - A reduces total install time by reducing the time to install cumulative PTF packages to install Cumulative packages



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Latest IBM 7.1 Resave Info

http://www-947.ibm.com/systems/support/i/planning/resave/v7r1.html

Overview | IBM i 7.1 | IBM i 6.1 | IBM i 5.4 | More information

This page contains the latest IBM i 7.1 Resave media information.

IBM i 7.1 Resave history (with 7.1.0 Machine Code)

Resave release date[1]	Description	5770-999 Resave Level Marker PTF	5770-SS1 Resave Level Marker PTF
10/14/2011	IBM i 7.1 Technology Refresh[2] 3 (TR3) - Support for new POWER7 hardware and other features announced on 12 October 2011	RS-710-D RE11221	RS 710-10 AP11067(*BASE) RS00106 (Option 0003)[3]
05/13/2011	IBM i 7.1 Technology Refresh[2] 2 (TR2) - Support for new hardware features announced on 12 April 2011	RS-710-C RE11067	RS 710-10 AP11067(*BASE) RS00106 (Option 0003)[3]
09/10/2010	IBM i 7.1 Technology Refresh[2] 1 (TR1) - Support for new POWER7 hardware and other features announced on 17 August 2010	RS-710-B RE10187	RS 710-00 AP10070
04/23/2010	IBM i 7.1 GA	RS 710-A RE10084	RS 710-00 AP10070

[1] All dates are shown in MM/DD/YYYY format.

[2] Beginning with the IBM i 7.1 September 2010 GA, IBM i is introducing a new code delivery mechanism referred to as a Technology Refresh. A Technology Refresh is a collection of operating system software that is developed together, packaged together, tested together, and delivered together as a PTF Group for IBM i 7.1. For more information on this new delivery method, refer to IBM i Technology Refresh.

[3] The resave for Option 0003 was done to reduce install time from IBM media.

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What is a Technology Refresh?

IBM i Technology Refresh

Get more from your operating system

Overview | IBM i 7.1 | More information | FAQs

Following the GA of IBM i 7.1, IBM i point / modification releases are being replaced by a new release delivery mechanism called a Technology Refresh. A Technology Refresh is a collection of operating system software that is developed together, packaged together, tested together, and delivered together as a PTF Group for a base release.

The Technology Refresh PTF Group contains a Technology Refresh PTF plus related PTFs, including the most recent pre-GA fixes. The Technology Refresh PTF is Machine Code / Licensed Internal Code (57xx-999) and is part of the code stream of the base release, e.g., IBM i 7.1, rather than being a separate code stream, as is the case with a point release. A Resave associated with the Technology Refresh is also available.

A Technology Refresh may provide:

- Support for new hardware and firmware (for example, new I/O devices or newly announced models)
- Support for new virtualization functions
- Performance improvements
- New function enablement

The Technology Refresh PTF Group, Resave, or PTF may be downloaded, requested on media, and installed using standard procedures and tools. It is recommended that customers either install the Technology Refresh PTF Group plus the most recent Cumulative PTF package, or the Technology Refresh Resave plus the most recent Cumulative PTF package plus the Technology Refresh PTF Group. When a Technology Refresh is installed, the system release level, e.g., V7R1M0, does not change.

A Technology Refresh should be installed:

- To provide support needed for new hardware or virtualization functions
- To take advantage of performance improvements or new function enablement
- When required by subsequent PTFs (for example, fixes to code in the Technology Refresh PTF)

It is a best practice to keep the system up to date with the latest Technology Refresh installed, to avoid unnecessary down time. To determine the Technology Refresh level needed for a specific hardware feature code, refer to the IBM Prerequisite tool. The PTF Cover Letter, or Preventive Server Planning (PSP) information, will identify whether a Technology Refresh is a requisite for that PTF. If a PTF has a Technology Refresh requisite, the Technology Refresh PTF must be permanently applied before the PTF that requires it can be loaded.

http://www-947.ibm.com/systems/support/i/planning/techrefresh/index.html

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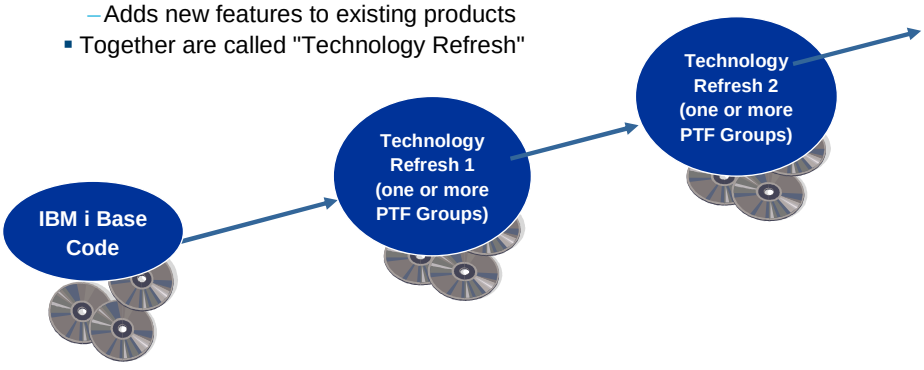
Technology Refreshes and Technology Updates

- Technology Refresh
  - Provides new support for latest hardware and I/O
  - Provides new support for latest Hypervisor
- Technology Update
  - Adds new products and functions
  - Adds new features to existing products
- Together are called "Technology Refresh"



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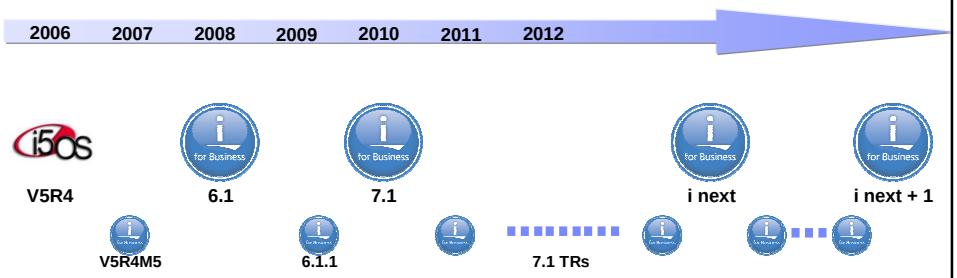
IBM i Roadmap



- Technology refreshes will provide new functions and I/O support
- Technology Refreshes
  - Goal is 2 per year
  - Installed as PTF Packages
- **2012 does not have a major release, because key capabilities have been delivered using Technology Refreshes and similar functional updates**

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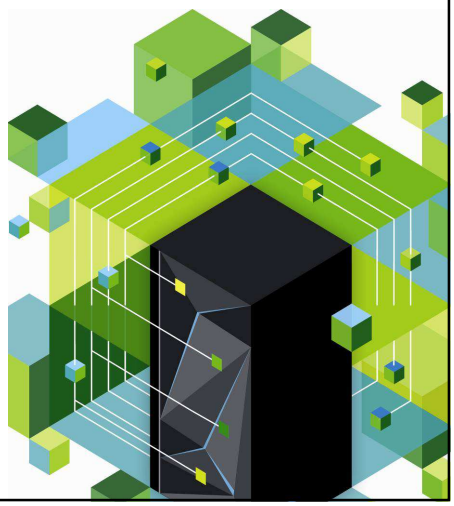
IBM i 7.1

Announced April 2010



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IBM i 7.1 – Building the Foundation

- **Information into insights**
  - Simplify supplier data exchange with native XML in DB2® for i
- **Data protection and compliance**
  - Secure critical client data with DB2 column level encryption
- **Resiliency without downtime**
  - Implement multi-site disaster recovery with PowerHA SystemMirror
- **Virtualization without limits**
  - Test a new release with ease by hosting i 7.1 on a i 6.1 server
- **Management with automation**
  - Reduce costs of fix management with IBM Systems Director
- **Workload optimizing systems**
  - Automate exploitation of solid state drives

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DB2 for i – XML Support

- XML is an industry standard for exchanging informatior between customers, suppliers, and partners
- Rich XML Support now available with DB2 for i
- OmniFind Text Search Server provides support for searching XML documents
- Strategic replacement for XML Extenders Program Product

PO #	Customer #	Date	Purchase Order
123	2468	5/27/09	~ XML ~
456	1357	6/10/09	~ XML ~

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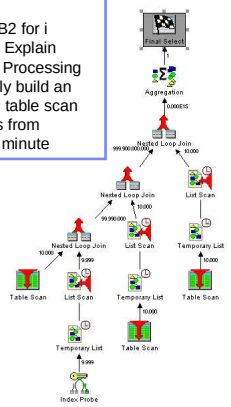
DB2 for i - Additional Enhancements

- **Column Level Encryption**
  - Transparent (no application change) encryption of specific column accessed through SQL or native
  - Solutions from tool providers supply encryption algorithms (Patrick Townsend, Linoma Software, nuBridges, etc)
- **Application Developers**
  - MERGE, Array support, Global Variables, and consuming Result Sets in RPG and COBOL allows for more powerful and efficient programming
- **Performance**
  - Adaptive Query Processing can modify query plan while query is running to improve performance
  - Advanced SQE query optimizer supports native logical files
- **Management**
  - New tooling to monitor long running operations
  - SQL_CANCEL procedure to cancel long running queries.
  - Random or Sequential I/O statistics to identify tables that can benefit from SSDs

First Name	Last Name	City	State	Credit Card#
Megan	Jones	Rochester	Mn	*&^%$
Casey	Smith	Ames	Ia	$%@^

On-Demand Performance Center
- Rich tools for DB2 for i
- Including Visual Explain
- Adaptive Query Processing can automatically build an index to replace table scan …taking queries from 30 minutes to 1 minute



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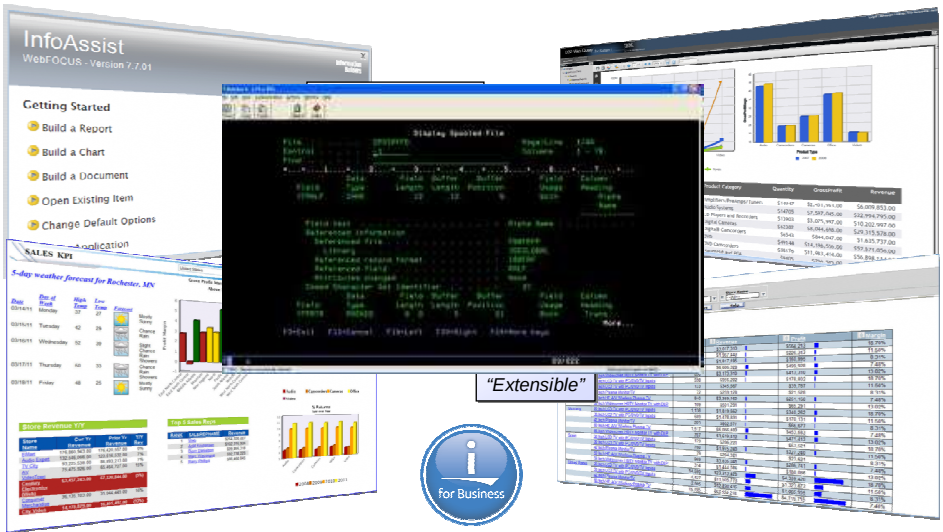
DB2 Web Query – Intuitive, Insightful, Extensible

Fast, easy access to business information assets for query, reporting and analysis



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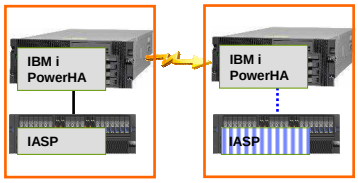
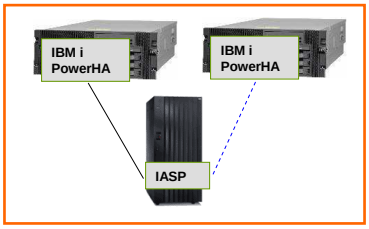
PowerHA SystemMirror for i

- **Asynchronous Geographic Mirroring for multi-site DR solution**
  - IBM i based mirroring for geographically dispersed systems
  - Asynchronously mirrors disk writes to target system
  - Support for automatic failover
  - Supports IASPs on integrated disk, SAN, and virtual disk



- **LUN level switching for local HA solution**
  - Switch IASP on DS8000 or DS6000 between local systems
  - Support for automatic failover
  - Supports native and VIOS with NPIV attached SANs



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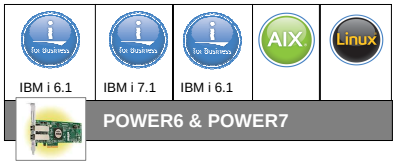
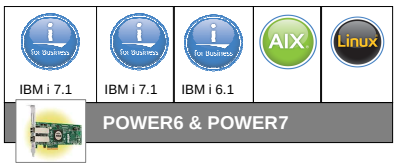
Virtualization Enhancements for IBM i

- **Deploy new IBM i 7.1 partitions**
  - IBM i 6.1 can host I/O for i 7.1 partition
  - Minimize change while deploying new release
  - iSCSI attached System x and BladeCenter



- **Maintain current IBM i 6.1 partitions**
  - IBM i 7.1 can host I/O for i 6.1 partition
  - Continue to run applications with IBM i 6.1 while leveraging new capabilities of IBM i 7.1
  - iSCSI attached System x and BladeCenter



- **PowerVM VIOS can host**
  - IBM i 7.1 and 6.1 partitions
  - AIX and Linux partitions
  - VIOS supports advanced virtualization technologies including Active Memory Sharing and NPIV

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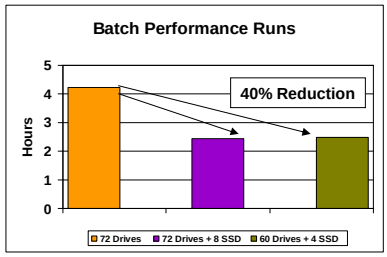
IBM i Workload Optimization for Solid State Drives (SSD)

- **Total integration with IBM i of database, storage management and performance management enable automated SSD optimization**
- **IBM i automatically moves most active data to SSDs**
- **Clients and ISVs can easily optimize applications for SSD**
  - DB2 for i supports specifying SSD as target for specific, high use files
- **SSD Analyzer Tool**
  - Designed to help determine if SSDs can help improve application performance
  - Runs on IBM i 5.4, 6.1 or 7.1
  - Plus additional enhancements and utilities

Associated Bank Reduces Batch Run Time by 40% with SSDs*



72 Drives replaced by 60 Drives + 4 SSD

*http://www.ibmsystemsmagpowersystemsibmidigital.com/nxtbooks/ibmsystemsmag/ibmsystems_power_200909/index.php#/16
Download http://www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/PRS3780

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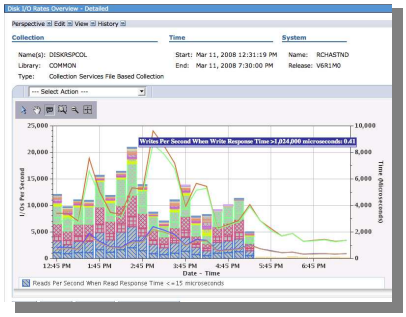
Systems Management Enhancements

- **Systems Director Navigator for i**
  - Ability to manage a target IBM i 5.4, 6.1 or 7.1 system
  - Support for Tape and Journal management and BRMS
- **Performance Management Enhancements**
  - More metrics into Collection Services: DS8000, 12X Bus, Save/Restore, and Tape
  - Performance Data Investigator is enhanced to include Disk response time and Java memory perspectives
- **Systems Director Enhancements**
  - New functions for managing IBM i
  - Management server runs on AIX, Linux, or Windows
  - Manages IBM i 6.1 and 7.1 environments



Systems Director	6.1.1 2Q 09	6.1.2 4Q 09	6.2 2Q 10
Support Group and CUM PTFs	✓	✓	✓
6.1.2 Agent for IBM i		✓	✓
Additional monitors			✓

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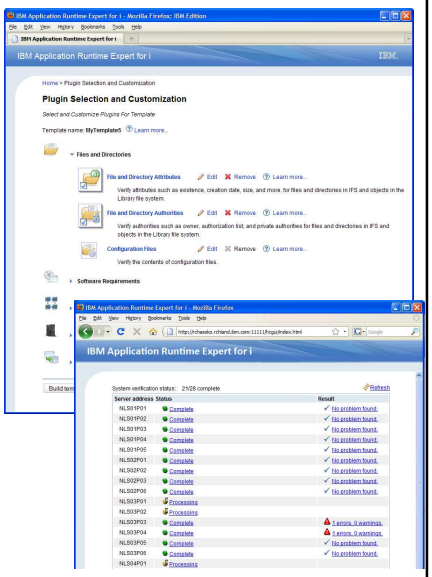
Application Runtime Expert for i

- **Verify runtime attributes of an application**
  - Creates a template for running application
  - Performs health check against current environment
  - Identifies differences between template and actual runtime attributes
  - Provides option to fix some of the differences
- **Application Runtime Attributes**
  - File/Directory Authorities and Attributes
  - Attributes in property/http/xml configuration files
  - User profiles
  - PTFs
  - System Values
  - Products installed
  - TCP/IP Network verification and configuration
  - Environment variables
  - Ports in use
- **Problem diagnostics, the first stop**



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Rational Open Access: RPG Edition

Extending RPG to reach new interfaces

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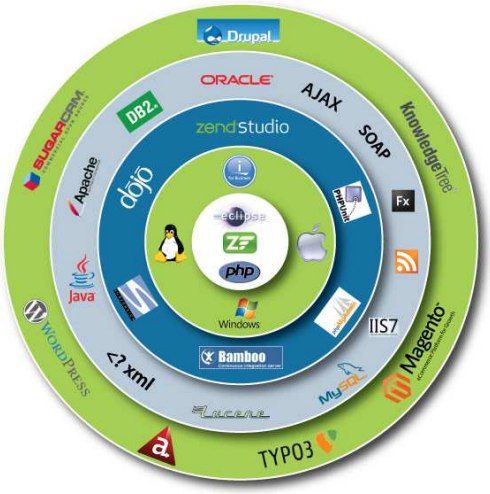
Zend Delivers an Open Solution Stack for IBM i

- **Zend Server Community Edition for i**
  - Preloaded with IBM i 7.1, 6.1, 5.4
  - Simplified Set Up and Management
    - FastCGI support between ILE Apache and PHP
    - Eliminates 2nd copy of Apache and reverse proxy
    - Software fixes via PTFs
- **Zend Server for i**
  - Provides advanced functions
  - Available from IBM with advanced support offerings
- **Zend Studio for i**
  - Eclipse-based development environment
  - Available with one year of Silver support from Zend for no additional charge



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7.1 Additional Enhancements

- **IBM Transform Services for i Enhancement**
  - Delivers Adobe PDF output support to IBM i applications
  - New support to transform existing Spool Files to PDF format
  - Shipped with IBM i

- **Encrypted ASP Enhancements**
  - Added ability to start/stop encryption on an existing iASP
  - Encryption key management enhancements
- **BRMS Enhancements**
  - Improved functions for managing backups, media, backup history, and recoveries
- **Support for additional Tape Libraries with NPIV through PowerVM VIOS**
  - 3577 (TS3400) with (TS1120/TS1130) drives
  - 3584 (TS3500) with (TS1120/TS1130) drives
  - 3576 (TS3310) with LTO drives

- **Remove Disk without IPL**
  - Removing a disk unit from a disk pool
  - http://ibmsystemsmag.blogs.com/i_can/

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7.1 Additional Enhancements

- **IBM i Access Family Enhancements**
  - IBM i Access for Windows 7.1 offers:
    - Enhancements to the .NET, ODBC, and OLE DB
    - Enhancements to Data Transfer
    - Updated PC5250 Display and Printer Emulation
    - Help files converted to html help format
    - Enhancements to Install, including install-time support for secondary languages
    - Additional options for viewing spooled files as PDF documents

- **Security Enhancements**
  - Expiration of user profiles
  - More granular access to individual spooled files

- **And more…**

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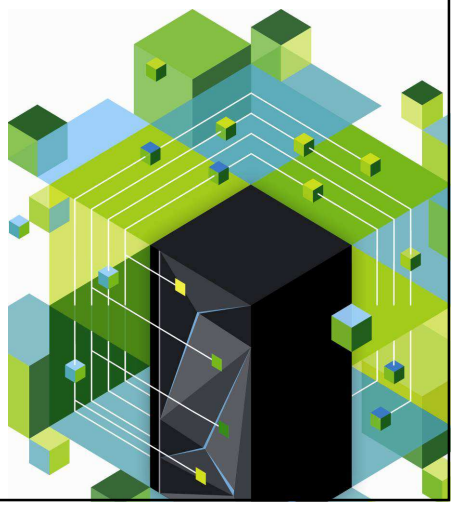
Technology Refreshes



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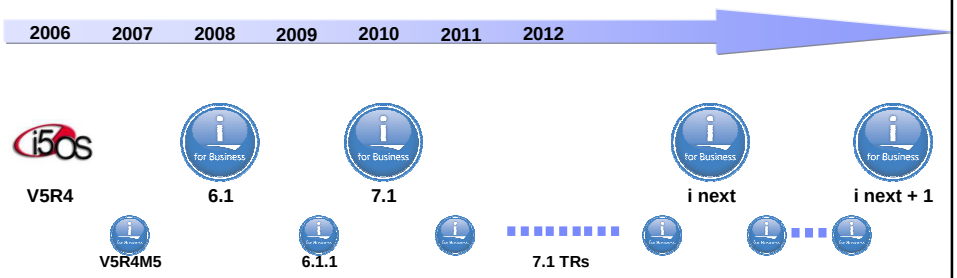
IBM i Roadmap



- Clients requesting fewer operating system releases; and longer support cycles
  - Major release upgrades can be disruptive for a business
- Interim technology refreshes will provide new functions and I/O support
  - Simpler to install on a current release and less disruptive
- **2012 does not have a major release, because key capabilities have been delivered using Technology Refreshes and similar functional updates**

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Technology Refresh 1 – Highlights

- **Hardware Enhancements**
  - **Virtual Media Auto-Changer**
    - Client partitions can change the image loaded in the server's IMGCLG
  - **Virtual optical media library**
    - Migrate optical libraries into a virtual optical media library backed by disk
  - **Y4 Cryptographic card for IBM i customers**
    - PCIe attached so it can plug into the newer PCIe slots
  - **Support for LTO5 in TS2900 Tape Library**
    - Low Profile Entry level Tape Library TS2900 will now support the newest LTO5 tape drive.
- **Full Network install**
  - Initial (scratch) install of an IBM i 7.1 system from a network device
- **Web Services – WSDL2RPG Client support**
  - Previously calls to Web Services from RPG required Apache AXIS C++ skills
  - Now can call Web Services natively from RPG using RPG
    - WSDL converted to native RPG to encapsulate Web Service call

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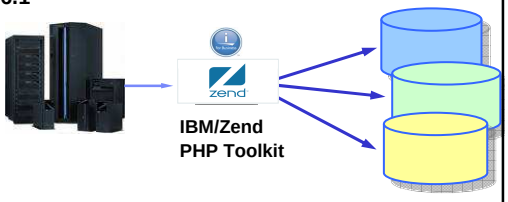
Technology Refresh 2 - Highlights

- **IBM i Suspend/Resume partitions (Hibernation)**
- **IBM i to IBM i Virt Tape**
  - Share the tape drives across IBM i partitions (6.1.1 and 7.1)
- **Hardware Support**
  - **DS5K NPIV support**
  - **IBM i 6.1.1 support for previously announced PCIe-based SSD Offering**
  - **SFF DASD Drawer – upt o 24 SFF disks in 2U 19 inch rack**
  - **177 GB SFF SSD**
  - **571 GB 10K RPM SFF Disk Drive**
- **Director Navigator (web console) 7.1 & 6.1**
  - Improved usability
- **DB2 for i semi-annual updates**
  - Performance updates
  - Building on XML support (7.1)
- **Zend/PHP Enhanced Database Support**
  - Local DB support for MySQL, DB2



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Technology Refresh 3 - Highlights

- **System and I/O Support**
  - Bus level statistics for 12x loops
- **Virtualization**
  - Thin Provisioning for DS8700 and DS8800 storage servers using VIOS Shared Storage Pools reduces amount of real disk storage required
  - Virtual Partition Manager is enhanced to create up to 4 IBM i partitions
- **PowerHA SystemMirror for i**
  - Support replication through V7000
  - Metro Mirror, Global Mirror and FlashCopy support
- **DB2 for i**
  - Security – Simplify Authentication with new keyword
  - DB2 Monitoring Tool Improvements – Filters
  - Fulfilled vendor requests for performance, SQL package size
- **IBM DB2 Web Query for i**
  - New interface that allows users to generate URLs to query reports for report
- **Zend Server Community Edition**
  - PHP environment preloaded with IBM i
  - New extensions and toolkit for accessing DB2 for i
- **Solution Edition: IBM i for Business Intelligence**
- **Solution Edition: IBM i CBU for HA**

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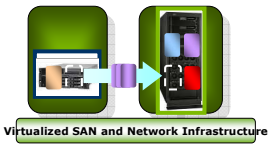
IBM i Technology Refresh 4 - Highlights

- Moving running workloads from one machine to another with **Live Partition Mobility** delivers the next step for cloud environments
- **DB2 for i enhancements** improve performance as well as delivering additional security, error monitoring and SQL functions



- **DB2 WebQuery for i** simplifies ordering with Express and Standard offerings
- New options in **Application Runtime Expert** allow access to the tool without granting high security levels

- **IBM i Workload Groups** allows clients to license SWG products at "less than capacity" level
- **PowerHA** for IBM i now includes support for IBM Storage Systems Storwize V7000 and San Volume Controller (SVC)

PowerVM
PowerHA

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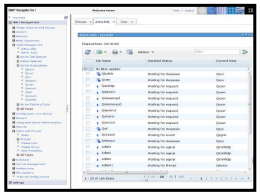
IBM i Technology Refresh 5 - Highlights

- Self-managing value proposition of **DB2 for IBM i** extended with improvements for better performance and usability
- Extract maximum value from POWER7 with **DB2 Symmetric Multiprocessing**
- **IBM SmartCloud Entry** available for IBM I
- **PowerSC** components identified in IBM i

PowerSC



- Manage IBM i with significant performance and usability updates of the Web based **IBM Navigator for i**
- **XML Service** provides a language independent method to access native IBM i objects either local or remote
- New **Enterprise Functions in BRMS** to manage and automate networked BRMS installations

- Access IBM i native data in Java based mobile applications by leveraging the new small format **JTOpen Lite**
- Latest Releases of Selected **IBM Software Group Offerings** available on IBM i
- **New I/O Device** support including USB-attached tape drives

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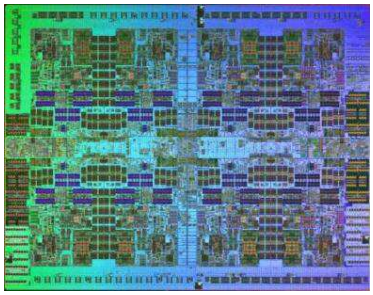
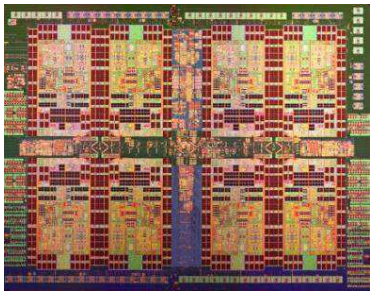
POWER7+



POWER7
45 nm



POWER7+
32 nm

Increase in GHz
2.5X more L3 Cache
Specialized hardware accelerators

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High End Power System Enhancements

Power 780
- POWER7+
- Higher GHz
  - up to 4.2GHz
- Elastic CoD

Power 780
- POWER7+
- Higher GHz
  - up to 4.4GHz
- Up to 128-core
- Elastic CoD
- Power Pools

Power 795
- 2x memory,
  - up to 16TB
- PCIe Gen2 function
- Elastic CoD
- Power Pools

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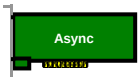
IBM i I/O News

- **RDX support**
  - Strategic alternate entry media option to DAT160
  - Can improve performance, reliability, operations
  - POWER6 and POWER7 config options

- **USB DAT160 support**
  - Potential performance vs SAS DAT160



- **Lower cost 2-port PCIe Async comm adapter**
  - Async and Fax
  - NOT Async PPP

- **900/856 GB 10k RPM Disk**
  - Lower cost / GB
  - Density saves footprint, energy/cooling, adapters

- **POWER7+ 770/780 Native I/O support**
  - IBM i 7.1 native I/O support
  - IBM i 6.1 **NO** native I/O support
    - I/O supported as client of IBM i 7.1 or VIOS

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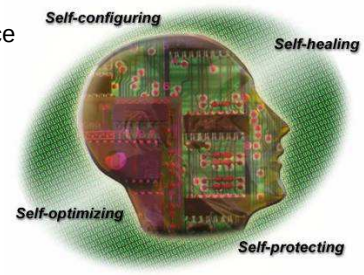
DB2 for i: Value Proposition Enhanced

- DB2 for i - My Data is My Business, and the Data is on i
  - Self-teaching, self-monitoring to ensure ease of management
- Improved ROI
  - New mobility features
  - Additional function to secure critical business data
- Full DB2 implementation
  - Fully integrated and fully available
  - Continuous enhancements to SQL
  - Continuous enhancements to performance



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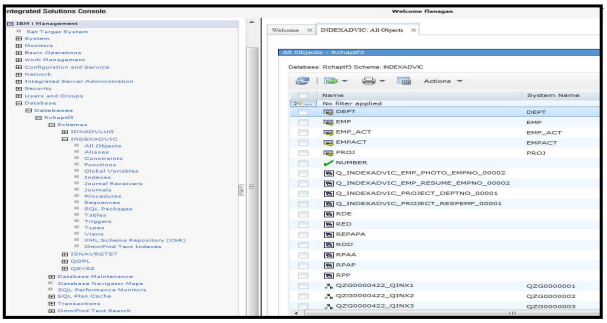
IBM Navigator for i

- New product name – IBM Navigator for i
- New look – no Windows client to manage
- Dynamic navigation area allows easy navigation to folders/area
- Tab support provides improved object list
- Additional database capabilities
  - Procedure and Function creation/definition
  - view/edit table contents



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JTOpen Lite (JTLite) – Java Toolbox for the Mobile World

- Significantly smaller footprint Java toolbox for IBM i
- Supports mobile devices capable of a Java environment
- Targeted to high use elements:
  - Database -- JDBC (SQL) and record-level access (DDM)
  - Integrated File System – open, read, write, delete
  - Program calls (RPG, COBOL, service programs, etc)
  - Commands
  - Job Information
  - Messages, Message Information (DSPMSG QSYSOPR)
  - Disk Status (WRKDSKSTS)
  - Object Information (WRKOBJ)
  - User and group Information

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DB2 WebQuery: Accessing Mobile Content

- New look and feel
- Improved Mobility Support with 'My Mobile Favorites'
  - DB2 Web Query signon
  - Interactive / Live reporting
- eMail
  - Active Technologies or Static Reports
- Optionally save content for offline analysis
- Mobile Faves App required for iPad and iPhone
- Web based user management
- User Role Based Security
- Consolidated report development tool (InfoAssist)
- And lots more
  www.ibm.com/systems/i/db2/webquery

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Multi-threading on POWER7 and SMP

- DB2 Symmetric Multiprocessing exploits the power of POWER7 machines
  - Chargeable feature (57xxSS1 Option 26)
- Will reduce the throughput time needed for things like:
  - Index builds
  - Index rebuilds
  - SQL Query execution
  - User Defined Function
  - User Defined Table Functions
- IBM's Lab Based Services offers assistance and education for IBM i SMP
  - Mike Cain at mcain@us.ibm.com

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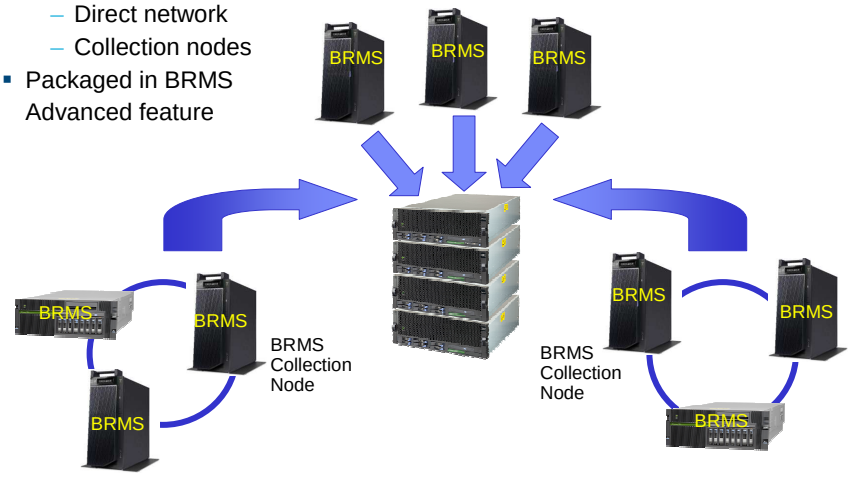
BRMS Enterprise Function

- For environments where there are multiple sites running BRMS
- Centralized site in enterprise for collection of BRMS data
  - Direct network
  - Collection nodes
- Packaged in BRMS Advanced feature



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PowerSC and and IBM i

- i = Integration
- Many components of PowerSC are built-in

PowerSC Product			
PowerSC	Exp	Std	IBM i Equivalent
Security and Compliance + Real-time Compliance	✓	✓	Base function in IBM i; Industry Vendors add automation and reporting http://www-03.ibm.com/systems/power/software/i/security/partner_showcase.html
Trusted Logging		✓	PowerSC Trusted Audit Data Repository in IBM i
Trusted Boot		✓	PowerSC Trusted Digital Signature Verification in IBM i
Trusted Network Connect and Patch Management		✓	No IBM i equivalent functionality
Trusted Firewall		✓	Base feature works with IBM i VMs
Trusted Surveyor			Base feature works with IBM i VMs

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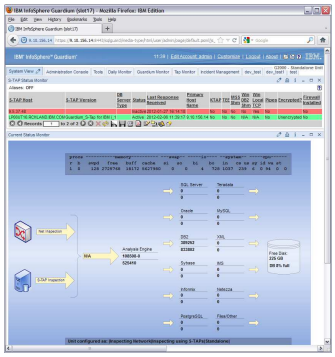
IBM Infosphere Guardium V9

- **Real-time** Database Protection and Compliance
  - Standardized auditing policies
  - Proactive security e.g. alerts signal critical tables changes
  - Automates security monitoring, replacing manual processes
    - Saves labour and capital cost



- Simplified compliance processes meet audit requirements
  - HIPAA
  - PCI
  - SOX
  - Etc.
- **IBM i enhancements delivered in Guardium V9**
  - Two sources of DB2 data
    - Database monitor data (via monitor)
    - Audit entries from QSYS/QAUDJRN
  - Extensive and meaningful filters for selecting information
  - Real-time data collection and alert capabilities
- Future enhancements in progress

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WebSphere Product Updates Available on i

- WebSphere Application Server V8.5
  - Fast, flexible, and simplified application development
  - Intelligent Management & Enhanced Resiliency
  - Improved Operations, Security, Control & Integration

- WebSphere Portal V8.0
  - Seamless, Integrated Social
  - Mobile experience themes
  - Instrumented with Web Analytics
  - Pre-built popular Web experience templates

- WebSphere Commerce V7.0 Feature Pack 5
  - Improved Foundation
  - Mobile Commerce
  - Precision Marketing
  - Management Centre for Business Users

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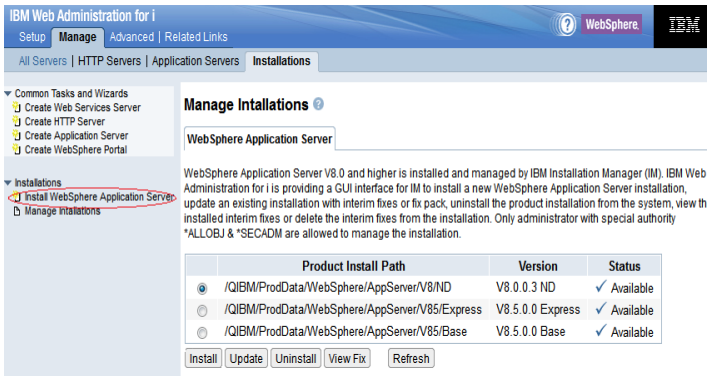
Integrated Install of WebSphere Products

IBM Web Administration GUI
- Admin server http://*hostname*:2001/HTTPAdmin
- Install WebSphere from IFS, remote network location or Internet
- Install and Manage Fix packs



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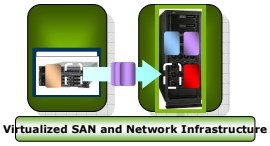
Other Enhancements

- Partitions described to 1/20th of a core
- Support for LPM on PureFlex systems
  - Announced for Power Servers in April (TR4)



- System Pools Support for new 780 and 795 Processors
  - New option to create pools of high end Power Systems servers that allows sharing of processor and memory resources in support of planned maintenance events

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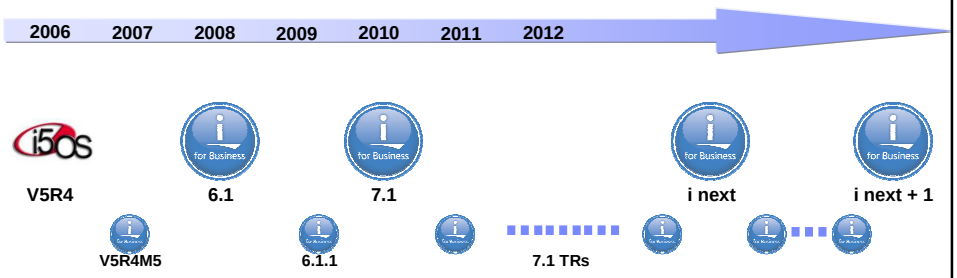
IBM i Roadmap



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IBM i updates on developerWorks

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