IBM i

An executive guide to IBM's strategy and roadmap for its integrated operating environment for Power Systems

An IBM® White Paper

May 2014

IBM i is the integrated operating environment for IBM Power Systems™, which is used by midsized companies and large enterprises around the world. With its integrated DB2 database architecture, IBM i is known for providing a cost efficient, highly resilient and secure foundation for running a wide variety of popular industry applications. This white paper is designed to help IT executives understand our strategy and roadmap for the IBM i operating environment.

Since 2008, the IBM i operating environment has run on the IBM Power Systems server platform. These servers, based on industry leading POWER processor technology, also feature applications running in Linux and AIX. IBM i also exploits IBM Power Systems software technologies, including PowerVM for virtualization, PowerVC for cloud management and PowerHA for system resiliency.

If you are a long time user of IBM i or its predecessor IBM iSeries platform, or if you are deploying our systems for the first time, let me first thank you for the trust that you have placed in IBM, and our IBM Business Partners. I want to assure you that IBM is committed to the IBM i platform as a vital component of our Power Systems portfolio. IBM i is key to our broader strategy of investing in enterprise systems and storage. IBM is a leading innovator in server solutions, with best-in-class service and support and a significant presence in both major and growth markets.

Doug Balog
General Manager
IBM Power Systems

In 2014, we are demonstrating our commitment to investing in the long term development and support of IBM i by delivering a major new release, IBM i 7.2. We have carefully prioritized new database security and systems management features in this release with guidance from our user groups and partner advisory councils. In addition, our ongoing commitment to IBM i is also demonstrated by our regular semi-annual delivery of easy-to-deploy IBM i Technology Refreshes.

Of course, IBM i is best known for being a cost efficient workhorse for critical core applications that are at the heart of many businesses IT solutions. But I hope that this white paper will encourage you to consider how businesses are using IBM i in new ways today – especially how they are exploiting IBM i for cloud solutions, mobile applications and business analytics. And, I also encourage you to consider leveraging IBM i with open industry technologies including PHP and Linux applications, which can offer exceptional value when integrated with your core business solutions.

Thank you again for your business.

Doug Balog
General Manager, IBM Power Systems

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Today's IT Environment and IBM i

Today's IT organizations face immense challenges. Systems of record, that for years have been successfully running their businesses, are evolving. They are expanding to include new capabilities, new insights and new interfaces. Today's world is in the middle of a perfect storm. As systems of record evolve to meet new demands, systems of engagement – mobile device interfaces and social interactions – are exploding in use and are driving many of the new demands on core systems of record. These new customer and employee engagement systems must deliver game-changing cloud, analytics and a variety of mobile and social capabilities. As well, they are expected to drive innovation and growth with declining budgets. As a result, more than ever, IT choices matter and IT infrastructure matters.

That's why governments, industry leaders, managed service providers (MSPs) and thousands of businesses around the world are transforming their organizations by infusing intelligence into systems and processes. They're building private and hybrid clouds to optimize the new workloads. They are extending their reach to clients and employees through mobile computing. They are implementing and securing their critical business data to protect their businesses from competitors.

In this new smarter computing era, forward-thinking companies consider more than server performance, existing skills and ease of management when choosing a platform for new applications. They also evaluate how well the platform will help them achieve three core business objectives: delivering transformational services to their business faster, with higher quality, and superior economics.

By implementing their business applications on the IBM i platform, companies can outpace their competitors by delivering services faster. They can differentiate their offerings from the competition by delivering higher quality services. And they can turn operational cost into investment opportunity by delivering services with superior economics.

The complete package provided by IBM i, Power hardware and solutions available from IBM and our family of ISVs enables them to meet the expectations of their businesses and their clients. Smarter companies are embracing the value of integrating applications found in the world of Linux. IBM i clients have a clear advantage in their ability to extend business solution choices to include Linux on Power applications. Linux runs on the same Power Servers as IBM i, providing investment protection while incorporating community innovation.

Power Systems

For many years IBM offered two major server platforms for its IBM i and AIX® (UNIX) customers: System i (formerly AS/400) and System p (formerly RS/6000®). In the early 1990s, IBM successfully consolidated its investments in the POWER processor, server and software technologies so that they could be exploited by both platforms. In the years following, IBM encouraged the sharing of key advancements in both the hardware and software gradually

converging into the announcements of 2008 – one product line supporting AIX, IBM i and Linux environments.

The result has been that the Power Systems platform is simpler for customers to buy, and simpler for ISVs and business partners to sell and support. It also has ensured that companies using IBM i applications are positioned in the mainstream of IBM's server and storage technology investments, alongside companies that use AIX and Linux. Now, when IBM ships a new Power Systems server, it provides concurrent support for all three operating systems, which has accelerated access to new technology for IBM i clients.

The current Power Systems servers, blades and Compute Nodes feature POWER8 processors and the latest IBM i 7.2 release. Clients can easily upgrade from earlier releases of IBM i, preserving the decades long heritage of binary compatibility and application investment protection. In fact, some companies continue to run applications on today's POWER8 systems that were first written on the System/38 in 1979, with little change or disruption.

In addition to common hardware technologies, Power Systems offers common software technologies, such as PowerVM for server virtualization, PowerHA for high availability, and PowerSC for security and compliance. Using common platform software technologies with AIX and Linux, positions IBM i in the mainstream of IBM's systems software portfolio and brings innovation together from all three environments.

The Power Systems platform offers businesses a highly flexible deployment platform for new applications. With a wide variety of IBM i, AIX and Linux applications to choose from, it is easier than ever before to optimize workloads deployed across multiple operating systems on the Power Systems platform.

The Value of IBM i

IBM i running on an IBM Power Systems server offers a highly scalable and robust architecture with a proven reputation for exceptional business resilience and low operational costs. Running applications based on IBM i has helped companies over many years to focus on innovation and on delivering new value to their business, not on managing their data center operations.

IBM i provides a fully integrated and optimized combination of relational database, trusted role and object based security model, integrated networking and the storage management capabilities required to run business applications. The integrated SQL standards-compliant DB2® for IBM i database includes advanced database management utilities. IBM i also includes additional integrated middleware components such as multiple file systems, LDAP directory, an HTTP Web-server powered by Apache, WebSphere Application Server and an integrated security environment.

IBM's integration, optimization and testing of IBM i is a key factor in helping companies to realize lower operations costs by enabling them to deploy applications faster and maintain them with fewer staff. IBM develops, fully tests and pre-loads the core middleware components of

IBM i together, up front; whereas, on other platforms, the operating system, database and middleware are typically integrated and tested by clients in their data center.

This broad and highly stable database and middleware foundation is ideal for efficiently deploying business applications, with support for over 2,300 solutions from over 850 ISVs. IBM i solutions are offered through an extensive, highly skilled worldwide network of certified IBM Business Partners that is backed by IBM's trusted services and support infrastructure.

Virtualization also enables businesses with IBM i to consolidate and run multiple applications and components together on the same system, driving up system utilization and delivering a better return on IT investments. IBM i has included subsystem virtualized workload management within the operating system since 1979, which enables application components to be assigned different runtime priorities and resource allocation within a single operating system image. IBM i also takes advantage of scalable and secure PowerVM server virtualization, which enables multiple operating system images to run on a single server in separate virtual machines or 'logical partitions'. PowerVM also features dynamic resource allocation and balancing, extensive virtual I/O capabilities, and live partition mobility to move active workloads between servers.

The value of virtualization can be realized in new technology areas for many i clients. Linux on Power applications available today can be easily integrated into a total business solution. This is especially true in adoption of products such as those that provide a complete Business Analytics solution, such as Cognos. And these leading virtualization capabilities make private and public clouds extremely popular with IBM i clients. Virtualization is also the key for implementing external storage solutions, a key to establishing a highly available solution using PowerHA or avoiding planned downtime using Live Partition Mobility.

IBM i Marketplace

The IBM Power Systems family offers the latest POWER7+ and POWER8 processor-based systems supporting small, mid-sized, and enterprise clients, on everything from a four-core server, to some of the largest and fastest servers in the industry.

IBM i is used by over 150,000 companies in more than 115 countries around the world to run their business applications. It is primarily used for transaction processing workloads such as ERP and banking applications that exploit its integrated database. It is designed explicitly for *commercial* workloads like warehouse management or retail banking, *not high performance computing* workloads like oil exploration analysis or weather forecasting. IBM i is typically used in industries such as wholesale distribution, retail distribution, manufacturing, banking and financial services, insurance, travel & transportation, media and entertainment (e.g. music publishing and casino management), local government, school administration.

The IBM i market has a dual nature: an extensive small and mid-sized customer community and a strong but select group of IBM i users in large enterprises. Approximately seventy percent of IBM i users are small and mid-sized enterprises and thirty percent large enterprises with over 1000 employees.

IBM i has a strong base of clients in major markets, like North America, Western Europe and Japan, which accounts for approximately 80% of IBM i sales annually. IBM i is realizing strong growth in the emerging markets such as Latin America, Eastern Europe, and the ASEAN region, especially in the banking and distribution sectors. While China is a growth market strongly dominated by UNIX, IBM i also has a strong presence there in the banking and financial services sectors.

In 2013 approximately 85% of IBM i shipments were on the entry Power Servers, ideal for mid-sized companies. In large companies, IBM i generally is run in the data center on highly virtualized, enterprise class Power Systems. Large companies highly value the exceptional system resiliency and capacity on demand features of the high-end Power systems that scale up to 256 cores on the largest POWER7+ model.

Through the IBM Academic Initiative for Power Systems, IBM has built strong local relationships between universities, colleges, clients, partners, Independent Software Vendors, and user groups to help ensure IT professionals have the skills needed to meet the needs of the IBM i ecosystem. The curriculum content is reviewed for appropriateness by industry experts, and selected members of the IBM i advisory councils.

IBM i and Mid-sized Companies

Many thousands of mid-sized companies around the world rely on IBM i because they want a more resilient, more secure and more cost efficient alternative to Windows-based servers for their most important business data and applications.

Mid-sized companies have two key requirements - to maximize their IT investments and to exploit them as they grow. Unlike Windows-based servers, the IBM i operating environment is almost always used to run multiple business applications *and* database securely and efficiently on the *same* server. As a result, clients always report that they have fewer servers to manage with IBM i compared to Windows. That helps a company better utilize its IT assets today, while avoiding the costs of deploying and managing a new server every time the business needs another application.

Since their focus is on growing their business, mid-sized companies need proven solutions, and experts who know their industry. The thousands of solutions that run on IBM i are sold through an extensive network of experienced solution providers who have successfully demonstrated their ability to help small and mid-sized companies solve business issues. Experienced IBM i solution providers deliver business value beyond the installation and patch management that is typical for Windows-based servers.

Of course, mid-sized companies are also focused on improving productivity and keeping operating costs low. Deploying IBM i solutions can help businesses improve employee productivity and customer service by securely integrating information from across the company into its built-in database. Unlike Windows-based servers, IBM i has an all-in-one system design that helps integrate the wide range of information and processes that lie behind a successful business.

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A top priority for all growing companies is to keep the business up and running and it is especially important for those companies delivering information and services to their customers on the Web. Over many years and in many businesses, IBM i has developed a well-earned reputation as the business system that "just keeps running". It helps companies avoid down time and keep their business secure.

For companies running Windows-based servers, security and virus management are major challenges in terms of time and money. Compare that with the simple-to-deploy security of the IBM i platform. Its virus resistant design helps companies keep their business more secure, safeguarding data against hackers with built-in intrusion detection. This secure operating environment has been the studied over the years and most recently in the ITG Management Brief: IBM i for Enterprise Businesses: Quantifying the Value of Excellence - October 2012.

There are many communities and user groups that represent mid-sized companies using IBM i. These include COMMON US, COMMON Europe, the Intermediate Systems User Group in Japan, and numerous other local user groups and online communities around the world. IBM meets regularly with the COMMON Americas Advisory Council (CAAC) and COMMON Europe Advisory Council to understand and prioritize requirements for future releases of IBM i. Roxanne Reynolds-Lair, CIO of the Fashion Institute of Design and Merchandising, and member of the CAAC, notes that "the collaborative discussions between the CAAC and IBM refine user requirements and prioritize them for inclusion in future releases. The end result benefits the entire IBM i community."

Large Enterprises and IBM i

Originally, the AS/400 was deployed in large enterprises as part of a 'distributed computing' model to support departmental or regional business operations outside their main datacenter environment. The distributed system model offered large companies the flexibility and cost effectiveness of deploying local line of business applications, with line of business data that was then consolidated back to a central mainframe in the datacenter.

Patterns of use of IBM i in large enterprises, however, have dramatically changed over the past decade. With significant changes in networking costs and dramatic advances in server virtualization technology, large enterprises have taken advantage of significant cost savings by consolidating their distributed servers back into the datacenter. Now, large enterprises typically run IBM i for high volume transaction processing on fewer, highly virtualized systems.

The trends for storage architecture and deployment have also changed for large enterprise users of IBM i. For many years, IBM i users typically used internal storage, optimized for transaction processing with high performance internal storage adapters. Today, the trend for large users is balanced with a growing use of storage area networks, such as IBM DS8000 and IBM V7000. This trend has brought IBM i users into the mainstream of datacenter strategies for both storage area networks and its associated software like IBM Flashcopy, Metro Mirror and Global Mirror. External storage has provided the ability for moving workload from system to system using Live Partition Mobility. This is another critical capability for companies using cloud technology and wanting to provide 24 x 7 availability.

The community of large enterprises using IBM i is represented by the aptly named Large User Group (LUG), a client sponsored group of over 100 major companies that use the IBM i platform. The LUG provides a forum for IT professionals from large enterprises to exchange information about topics of particular interest and to discuss strategy and requirements for the IBM i platform.

Business Partners and ISVs

IBM i is offered through a strong network of local, regional, and national IBM Business Partners. Since the introduction of the AS/400 in 1988, Business Partners have played an integral role in the sales, installation, and support of IBM i-based systems. IBM Business Partners have consistently been responsible for over 80% of IBM i system sales. Not only are these partners trained and certified on Power Systems servers and IBM i, but they also bring their own specific industry expertise, as well as offering a wide range of IT services.

The AS/400 was launched as an *Application System*, delivering thousands of application solutions to small and mid-sized business. This solution focus remains strong today, with the majority of IBM i customers running a solution from an Independent Software Vendor. These solutions are offered by a wide range of partners from global ISVs such as Infor, SAP, and Oracle JD Edwards, as well as from key regional solution providers such as Misys, Fiserv, and Silverlake. IBM i has a very strong group of solution providers focused on high availability, security and compliance, application development and modernization, printing solutions, and systems management. Today, more than 2,300 applications from over 850 independent software vendors are supported on the IBM i 7.1 and in process of certifying to the new IBM i 7.2 release.

Many IBM i partners and ISVs have taken on a new role, that of Managed Service Providers (MSP). These MSPs provide alternate environments for the clients no longer wishing to manage their own servers. Software-as-a-Service has been offered by many ISVs for more than 10 years, allowing clients to run their line-of-business applications in an environment hosted on the ISV-owned platform. Many IBM i partners offer Disaster-Recovery-as-a-Service, providing a good resiliency option without asking clients to manage multiple machines.

POWER Processor Technology

IBM has a consistent track record of delivering on its POWER processor roadmap for IBM i, AIX, and Linux operating environments. The current POWER7+ and POWER8 processor-based servers offer the fastest processors in the industry. From 4 to 256 core servers, POWER7+ and POWER8 processor-based systems offer the performance and scalability to meet the varied requirements of IBM i clients.

In April of 2014, IBM continued to deliver new Power Server technology by announcing new scale-out, or entry level servers, beginning a new POWER8 family. Based on the POWER8 chip technology, this new family will deliver increased power and processing speed for most entry clients. The new POWER8 processor, with features designed to process big data, offers clients new ways to incorporate analytics, mobile, social, and cloud applications into their environments.

IBM has a long and strong track record in delivering new hardware. In 2010, IBM delivered a POWER7 family of systems that extended from blades to high-end systems, all supporting AIX, IBM i and Linux. These POWER7 systems were further enhanced with new models announced in 2011, offering greater memory capacity and latest I/O capabilities. In 2013, IBM introduced the POWER7+ product line, providing even greater performance characteristics. The POWER7 and POWER7+ technologies are also delivered in the IBM PureSystems family of Power Compute Nodes.

A strong advantage for the Power architecture is its range of scalability, so that it can be used for small companies wanting to run an entry ERP solution, to mid-sized companies deploying business analytics solutions along with ERP, to large banks running core financial services operations.

IBM i 7.1 and IBM i 7.2 are supported on POWER8, while IBM i 6.1.1, 7.1 and 7.2 are supported on POWER7 processor-based servers. With binary compatibility, clients are easily able to deploy new systems based on the latest processors without changing, recompiling or re-optimizing their applications.

IBM i Software Roadmap

For many years, IBM had a practice of delivering a major IBM i software release approximately every two years. Feedback from IBM i clients, however, was that upgrading to new software releases required extensive testing, and in some cases certification to adhere to local compliance regulations. In response, IBM has extended the period between major releases, providing regular IBM i Technology Refreshes (TR) that enable new capabilities without requiring a release upgrade. IBM has also increased the support lifecycle for major releases. IBM i 7.1 was made available in April 2010, for example, and since then IBM has delivered Technology Refreshes approximately every six months. Technology Refreshes do require IBM i 7.1 and cannot be applied to earlier IBM i releases.

IBM i Roadmap
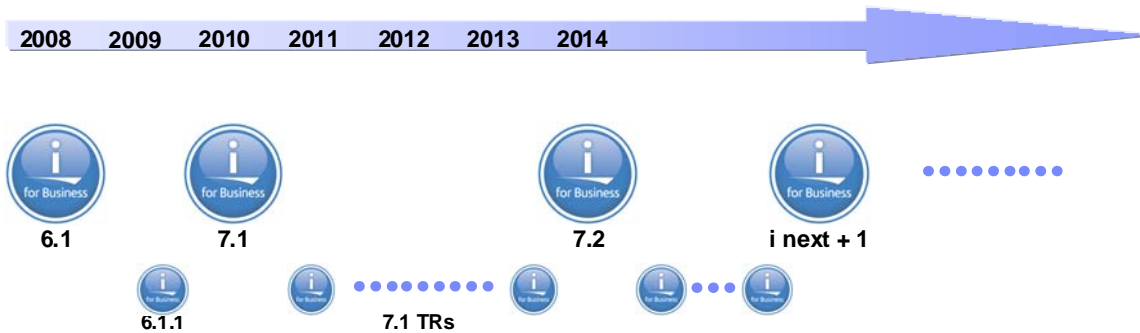
IBM i Technology Refreshes enable IBM to both provide support for new hardware, and to enhance system software and virtualization capabilities. For example, some of the key enhancements delivered via Technology Refresh are simplifying the installation of new virtual images from stored images on the network (TR1), support for virtual image suspend / resume

(TR2), enabling Virtual Partition Manager to create IBM i virtual images with virtual I/O (TR3), and providing Live Partition Mobility between servers (TR4 May 2012).

IBM i 6.1

IBM i 6.1 was a key release that was delivered at the same time as the new Power Systems product line in 2008. The release integrated and optimized IBM i capabilities with IBM's broader strategies for blades, storage, virtualization and platform management. For example, the release supported running IBM i on a POWER processor-based blade, enabling the consolidation of i and x86 workloads within a single IBM BladeCenter®. It also significantly enhanced the performance and integration between IBM i and IBM System Storage servers – both via direct fibre channel attachment and through the PowerVM Virtual I/O Server. It also provided the foundation for a new disk clustering solution, IBM PowerHA, which provides a cost effective and simple-to-operate high availability and disaster recovery solution. A new optimized IBM Java Virtual Machine (JVM), shared with AIX and Linux, also provided significant increases in web application performance.

IBM i 7.1

Available since 2010, the highlights of the current IBM i 7.1 release included enhancements and extensions to many of the core functions. Native support for XML was included into the integrated DB2 database, enabling easier storage and searching of XML documents and data. DB2 for IBM i was enhanced to provide column level data encryption. PowerHA added support for asynchronous replication, extending the disk clustering-based disaster recovery solution over longer distances. Solid State Disk (SSD) drives can be utilized automatically, with the operating system moving frequently accessed data for optimal application performance. IBM RPG, a common language for transaction processing application development, was enhanced to simplify integration with a broad range of client applications and devices, including web services, mobile devices and XML.
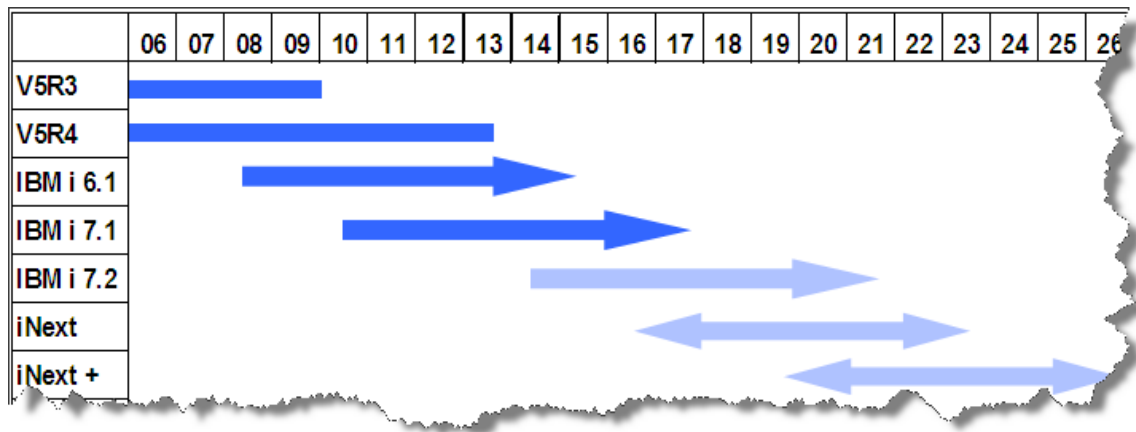
IBM i 7.2

Announced on April 28, IBM i 7.2 has only recently become available. The release contains updates and extensions to almost all of the integrated components of IBM i and to other program products as well. Row and Column Access control added to the integrated DB2 for i provides a more consistent interface for locking down critical business data as the world continues to move toward mobile and social applications. System Management is made easier with the new features and functions of IBM Navigator. The Integrated Web Application Server (IAS) previously based on Apache Tomcat, is now built on the same Liberty Profile on which all WebSphere Application Server products are written today. This change will provide near seamless transition as clients move from the lighter weight web applications to a more robust environment found in the WAS family of products. There were many other enhancements made to security, networking and PTF installation to name just a few.

IBM i Support Life Cycle

IBM's software support and life cycle strategy reflects the fact that most companies using IBM i run their most critical business applications on the platform. This strategy includes the practice of supporting an IBM i release until the next two releases have been made available, plus at least twenty four months – which translates to approximately six years of support. Automated operating system upgrades are available to easily move up to the next two releases providing for an ongoing supported IBM i environment. For example, customers running IBM i 5.4 or 6.1 can easily upgrade to IBM i 7.1.

IBM i Support

IBM i 6.1.1, IBM i 7.1 and IBM i 7.2 are the currently supported releases.

IBM i Strategies

Systems Storage

Historically, most IBM i clients deployed integrated or *internal* storage, that was managed and optimized directly by the operating system. The use of high speed RAID adapters, ensured that internal storage provided optimal performance, especially for high volume transaction processing applications. Over time, however, more IBM i clients have adopted storage area networks, or *external* storage that is managed both by the operating system and the SAN server. Investments in SAN optimization in IBM i 6.1, ensured that performance is now comparable between internal and external storage.

IBM i clients have a variety of storage requirements based on capacity, performance and cost. IBM i supports many storage servers including IBM DS8000®, Storwize V7000, Storwize V3500, Storwize V3700, XIV, SVC and DS5000 storage solutions. Attachment can be through a variety of methods providing the flexibility to match customer requirements.

In addition, Solid State Drives with their ultra-fast I/O performance have enabled many IBM i users significantly to reduce the run-times of their daily, weekly, and monthly batch jobs. IBM i maintains its leadership position in the intelligent management of data on SSDs, placing the most frequently accessed data onto the SSDs and managing a hierarchy of storage options.

IBM continues to make enhancements in hardware and software to support all of these storage options, providing flexibility to meet all of our client's requirements.

Server Virtualization and Cloud Technologies

IBM i has a heritage of virtualization technology going back over 40 years. The operating system design featured subsystems that enabled multiple applications to run separately in a single system image. Originally, subsystems were used to differentiate interactive and batch applications, but over time they have grown to be used for assigning priorities and system resources to a wide variety of processes and services.

In 1999, IBM also introduced the first PowerVM logical partitioning technology, enabling separate virtual machines to run on the same Power Systems server. PowerVM, which ships on over 90% of mid-range and high-end Power System servers, provides scalable and secure server virtualization for AIX, IBM i, and Linux environments. PowerVM features micro-partitioning with up to 20 partitions per core, live partition mobility between servers (available with IBM i 7.1 TR4 May 2012), dynamic or automatic movement of processor and memory resources, and a wide range of I/O virtualization capabilities, PowerVM and IBM i subsystem virtualization are both extensively used by IBM i clients and a key driver of lower operations costs.

PowerVM virtualization also provides the foundation technologies for implementing cloud computing. The unprecedented interest in and projected IT spend on cloud computing is coming from all types of organizations, businesses and governments who are seeking to transform the

way they deliver IT services and improve workload optimization so they can respond to changing business demands. Cloud computing can significantly reduce IT costs and complexities while improving workload optimization and service delivery.

Implementing a private cloud with IBM i can help reduce administrative tasks and improve productivity by enabling you to automate provisioning of resource requests from authorized users. It helps improve compliance and reduce errors by enabling you to standardize deployments and configurations while leveraging approval policies to maintain oversight and the optimal performance of your cloud, while workload metering capabilities support a transition to pay-per-use business models. By deploying an effective cloud computing environment, you enable organizations to reduce IT costs, improve service delivery and enable business innovation.

Resiliency and High Availability

There are two approaches to providing high availability / disaster recovery solutions for IBM i – logical replication and hardware clustering. Both solutions replicate data from a production system to a backup system and enable switching (also known as a role swap) between the two systems in the event of an outage on the production system.

IBM PowerHA provides a disk clustering solution for IBM i. PowerHA is an easy-to-manage clustering solution that makes it simple to switch between systems, is easy to maintain, and is supported directly by IBM. As more IBM i customers transition to storage area networks, PowerHA also offers the advantage of a resiliency solution that that is tightly integrated with both the IBM i operating system and IBM System Storage servers and software.

Logical replication solutions are available from ISVs that base their software on the remote journaling capability of the IBM i operating system. These ISVs include Vision Solutions, Maxava, Traders, and Rocket Software.

With both disk clustering and logical replication options, IBM i clients continue to have a broad range of choices for their high availability and disaster recovery needs.

Business Analytics and Optimization

Studies show that organizations that apply analytics outperform their peers. And those with a high "Analytics Quotient" – that is, a broad-based, analytics-driven culture – perform, on average, three times better. Business analytics helps organizations to recognize subtle trends and patterns allowing them to anticipate and shape events and improve outcomes. Not only is it possible to drive more top-line growth and control costs, but risks are more easily identified upfront, allowing correction before derailing business plans.

IBM business analytics software enables organizations to apply analytics to decision-making, anytime, anywhere. IBM i clients can better analyze their data to reduce costs and improve service across their business with DB2 Web Query for IBM i. IBM in cooperation with

Information Builders offers a full suite of query, reporting, OLAP, and dashboard technologies to meet a wide variety of business intelligence solutions. With DB2 Web Query, customers have fast access to current data, while avoiding the complications of offloading data to another system.

Clients using the IBM i platform also often implement IBM Cognos business intelligence and SPSS predictive analytics solutions, which are deployed on a Linux on Power or AIX partition running on the same Power Systems server with PowerVM. Clients choosing this approach see the best of both worlds. They preserve their investment in IBM i applications and database while incorporating a more advanced analytics solution.

Mobile Computing and Mobile Access

By the end of 2010, the world of mobile devices was becoming a key consideration for delivering applications. End users were just starting to demand mobile websites and mobile applications that would allow them to transact business with a wide variety of enterprises and to do so whenever and wherever they wished.

Since 2010, IBM i has provided numerous enablers to assist companies as they embrace mobile computing and mobile access. Building on top of IBM i integrated security and the ability to easily lock down critical business data, tools such as IBM Rational HATS and IBM Access for Web allow clients to expand the application user interfaces to mobile phones and tablets.

Extending the reach of IBM's own tools for managing and monitoring systems, there are many vendors who provide tools to assist companies who are building a mobile interface to a line-of-business application.

Enterprise Modernization

While many IBM i clients run industry specific applications from Independent Software Vendors (ISVs), many clients also develop and maintain their own applications. IBM i offers a broad choice of development languages including RPG, COBOL, C, C++, Java, PHP, and EGL. Typically, Java and PHP are used to develop web actions, whereas RPG and COBOL are used for transaction processing applications. IBM i has an integrated language environment, which makes it simple to mix and match languages to fit application requirements.

IBM Rational software provides compilers and a range of development tools and enterprise modernization capabilities for IBM i. Based on the Eclipse standard, Rational Developer for i and Rational Team Concert for i maximize developer productivity and application deployment. Additional application development tools for IBM i are available from tool providers such as Arcad, LANSA, Linoma Software, looksoftware, Profound Logic and many others.

Given that many IBM i clients use RPG and COBOL for their core transaction processing applications, IBM is committed to invest in and support these languages on IBM i. IBM Rational recently introduced RPG Open Access that enables RPG to directly interface with a wide range of new devices and resources. Many IBM i clients are capitalizing on the opportunity to interface directly to mobile devices and they are updating applications to be rendered on devices such as mobile phones and tablets.

With the announcement of RPG IV Free Format capability in IBM i 7.1 Technology Refresh 7, IBM Rational has re-vitalized the RPG language. The new format allows modern developers to learn and use RPG as they would with other languages such as Java, PHP, Ruby, etc.

For clients extending their application portfolio to include Java or the web, IBM i is tightly integrated with the IBM WebSphere portfolio of products. IBM WebSphere Application Server Express ships as part of IBM i, allowing easy installation, configuration and management of web application serving.

IBM has also worked with Zend to deliver the popular open source scripting language, PHP, for IBM i. The Zend Server PHP product is shipped with IBM i, providing the PHP runtime and a toolkit to provide easy access to IBM i applications and data. With PHP, clients can easily develop web applications that tie into IBM i DB2 data and applications. The most current release of Zend Server supports PHP applications split between server components and code running on mobile devices.

Social Media

Lotus Domino was first introduced on the AS/400 in the mid-90s and there are hundreds of IBM i enterprises who use Domino as their strategic email server. Domino 9 is the latest version and now includes IBM Traveler. Many IBM i Domino shops are taking advantage of Traveler's ability to provide access to email from phones and tablets.

IBM Connections is a leading social software platform that can help organizations to engage the right people, accelerate innovation and deliver results. It is a collaborative environment establishing a network of experts to share ideas or store critical team documents securely. Since March of 2013, IBM Connections has run on the IBM i platform

IBM Sametime products integrate real-time social communications into your business environment, providing a unified user experience through instant messaging, online meetings, voice, video and data. Sametime has been available for IBM i clients for many years.

Systems Management

Systems Management is a broad term used when referring to the ability to configure hardware and software, allocate resources, distribute workload, monitor performance, maintain security and access to the system, plan capacity and execute other tasks that pertain to efficient resource allocation.

The IBM Navigator for i offers an easy-to-use, web-based management solution for a single IBM i server environment. IBM System Director provides the ability to manage multiple IBM i systems as well as servers running AIX and Linux on Power. There is also a wide range of additional integrated service management tools available from IBM Tivoli software, as well as from IBM i focused management tools providers such as Help/Systems, Halcyon, Centerfield Technology, and Midrange Performance Group.

IBM i Community Resources

In addition to the user groups referenced earlier in the paper, there are a wide range of resources available to the IBM i community.

- The *developerWorks IBM i* zone is aimed at technical professionals, containing a wide variety of easily accessible technical articles, tutorials, new release and IBM i Technology Refresh information.
- The *You and i* blog by Steve Will, the Chief Architect of IBM i, discusses trends and strategies for the IBM i platform.
- The *i Can* blog written by Dawn May, IBM i Business Architect, shares "hidden gems" and best practices advice for IBM i technical professionals.
- The *Modern-i-zation* blog by Tim Rowe, Business Architect for Application Development, focuses on best practices used by application developers.
- Tips found in the *DB2 for i* blog by Mike Cain, Team Leader DB2 for i Center of Excellence, can assist database administrators and database programmers in learning new features and functions but also learning new ways to do old things.
- The *IBM Champions* program recognizes thought leaders from the business and technical community of IBM clients and business partners. These respected IBM i subject matter experts comment on a wide range of topics, and can be accessed at the *Power Champions* website.
- For RPG developers, IBM Champions Jon Paris and Susan Ganter's *iDevelopment* blog is an outstanding resource.
- *IBM Technical Conferences* feature Power Systems and IBM i topics for IT professionals.