

Cloud and Service Management on IBM z Systems eGuide

*z Systems provides key capabilities for optimizing workloads
on Public, Private and Hybrid Clouds*



The rapid growth of next generation technologies are supported seamlessly on z Systems

Much of the Cloud, Mobile and Social innovation is starting to be enabled by what is called “systems of engagement” that leverages ubiquitous cloud computing models, pervasive tooling and mobile access to bridge traditional IT “Systems of Record” to drive interactions closer to the customers and leverage relationships that are enabled by this shift.

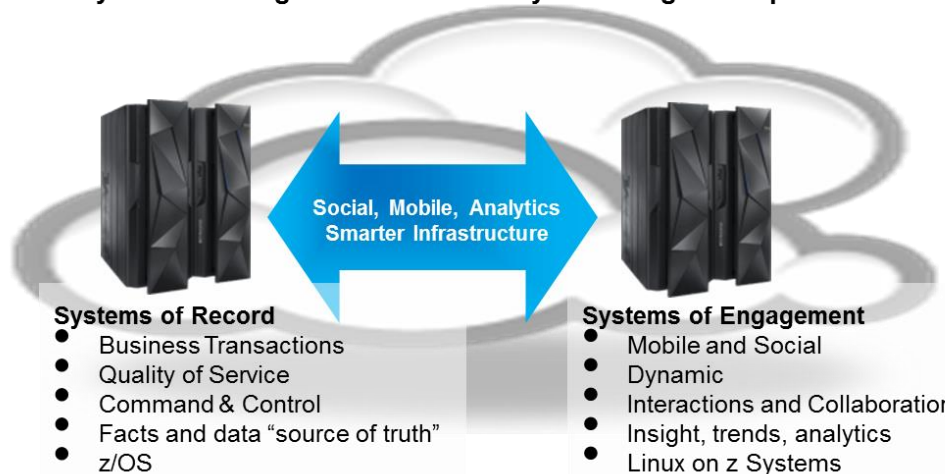
The opportunity to capture markets through optimized customer interaction is driving rapid innovation and iteration in the cloud leveraged by these new systems. At the same time, the infusion of intelligence in physical assets such as automobile, building systems, electrical utilities and traffic control systems, require models that can more easily scale to collect data and deliver content.

Systems of Record are characterized by being what we think of as z Systems today, transactional database, command and control. Systems of Record will be key in providing the data, security and availability needed for the new 24/7 requirements that come from Systems of Engagement.

Systems of engagement are the new technologies, and z Systems can support them just as well. Linux on z Systems is a fantastic platform that provides the security, availability and reliability of z Systems and supports Linux workloads.

Both components are needed to successfully implement new business requirements.

z Systems scaling model and security to manage and optimize both

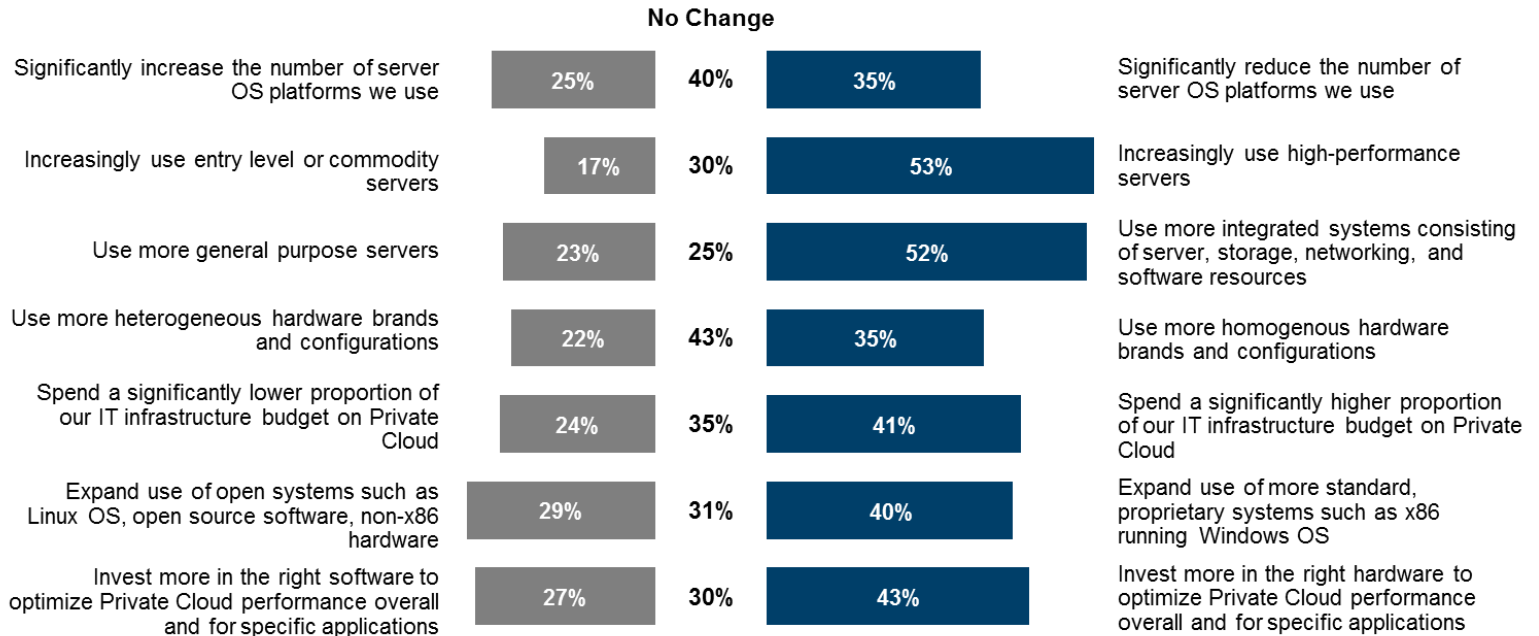


This e-guide will show you how a cloud and service management strategy that meets all your constituents’ needs can be quickly developed by connecting to the mainframe.



Half of companies intend to use more high-performance servers and integrated systems to support Private Cloud

A new IBM study of more than 1,400 IT Executives from 13 countries captured some interesting Cloud data and trends for 2015. One of these is the expected IT changes to support Private Cloud deployments over the next one to two years.



Note: No significant differences by type of Cloud adoption

Up arrows indicate blue bars are significantly higher than gray bars

IBM 2014 STG NDB Study: Cloud Report



Deploying hybrid clouds on z Systems increases productivity, provides higher utilization, a more efficient data center and overall greater reliability and availability

Increased productivity

- Advanced workload management that provisions resources on the fly for 90%+ utilization and maximizes ROI
- Significant software license savings due to z Systems power
- 32% cheaper than x86 and 60% cheaper than public cloud

Higher utilization

- Maintain service levels with up to 100% CPU utilization
- “Shared everything” architecture
- Improved scalability up to 8,000 virtual servers in a single system
- Unmatched scalability with 24X more scale than x86

Efficient data center

- Up to 80% less energy than existing distributed servers
- Less floor space
- Fewer parts to manage

Reliability and availability

- Built-in hardware redundancy
- Decades of RAS innovation
- Real time capacity on demand to manage growth and handle workload spikes
- Highest security rating for any commercially available server

Sub-second response times
for mobile, every time

2.8x faster
response times
than the competition

Apply analytics across
100% of transactions

Up to 2.8 billion
transactions/day
make it a digital business workhorse

Cloud infrastructure that
costs 50% less than other alternatives

8,000 virtual servers
on one system
enable consolidation like no other platform



The advantage is even clearer with IBM z13

Up to 10 TB Memory on z13

Improves consolidation ratios

GDPS for Linux on z Systems

Disaster Recovery solution for mission-critical workloads

Increase in # of LPARs on z13

Improves TCO and QoS

Increase in # of LPARs on z13

Improves TCO and QoS

Cloud Manager w/ OpenStack V4.2

Heterogeneous platform management from z Systems

SMT technology on z13

Improves performance and throughput of workloads

KVM

New industry-standard hypervisor (SOD)

Elastic Storage for Linux on z Systems

Enables new class of workloads



Private
Cloud



Hybrid
Cloud



Public
Cloud



z Systems

Resources

[Video: Why Enterprises Need DevOps to Deliver Cloud in a z Systems Environment](#)

[Redbook: Cloud Workloads on the Mainframe \(May 2014\)](#)



Advantages of Deploying Cloud Workloads on z Systems.

Economics

Superior cloud services at up to 32% lower cost than x86 and up to 60% less than public cloud alternatives

Quality of Service

Offer differentiated, unmatched SLAs to support mission critical workloads

Availability

Redundant subsystems and enterprise grade architecture enable 99.999% uptime and beyond

Security

Leveraging z Systems cryptographic capability to reduce risk and enhance the security of workloads



What issues are clients and MSP/CSP's trying to solve...



IBM tools for every stage of the cloud journey.

Customer Challenge

Shorter test cycles
Reduced provisioning time
Reduced license management

Customer Challenge

Diversity leads to cost
Manual process
Time to deploy

Customer Challenge

Operating in Silo's
No central point of control
Low server utilization

**WORKLOAD
PATTERN
DEPLOYMENT**

SELF SERVICE

AUTOMATION

STANDARDIZATION

VIRTUALIZATION

IBM Cloud Orchestrator

End-to-end process management
Workload level deployment
Public/Private Cloud management

Cloud Manager for OpenStack

Open standards support
Works with existing tools
Consistent delivery model

IBM Wave

Single point of management
Simple user interface
Speed of deployment




[IBM Cloud Manager with OpenStack](#) is an easy to deploy and use cloud management software offering based on OpenStack with IBM enhancements and support. Enables rapid IT response to ever-changing demands of business via self-service provisioning of infrastructure services. Provides virtualization operational efficiency and greater overall business effectiveness. Supports production-grade cloud operations & interoperability at scale via enhanced foundation and full OpenStack API compatibility. Provides optimized infrastructure usage, reduced cost of cloud ownership, and higher workload quality of service.

[IBM Infrastructure Suite for z/VM and Linux](#) is a complete solution for administration and management of your z/VM and Linux on z Systems environment as you increase workloads with consolidation and look to utilize private Cloud for multiple platforms. The Suite for Linux on z Systems includes OMEGAMON XE with monitoring to simplify cloud operations and increase productivity, and Tivoli Storage Manager for file level backup and recovery to increase the availability of cloud data. For z/VM, the Suite includes IBM Wave, a simple, intuitive and graphical management tool for managing, provisioning and automation; OMEGAMON XE; Backup and Restore Manager for z/VM; and Operations Manager to facilitate automated operations and take actions based on events.

[IBM Cloud Orchestrator](#) incorporates all the components necessary to manage and monitor your Cloud resources, handle workload management and Service Management across an open standards based environment. Provide security and availability through the Cloud Orchestrator for z Systems solution.

Leverage the power of cloud computing in the data center to provide a consistent, flexible and automated way to integrate the policies, processes and infrastructure across Compute, Storage and Network domains.

IBM z13 the perfect platform for public, private and hybrid.

IBM z Systems	Cloud Type
	<p>Public <i>Multi-tenant environment where compute resources are purchased in desired increments</i></p> 
	<p>Private <i>Internally owned, deployed and controlled compute resources</i></p> 
	<p>Hybrid <i>Uses a mix of private, dedicated IT resources in conjunction with public infrastructure</i></p> 

Enabling MSPs/CSPs to deliver differentiated mainframe-based service offerings

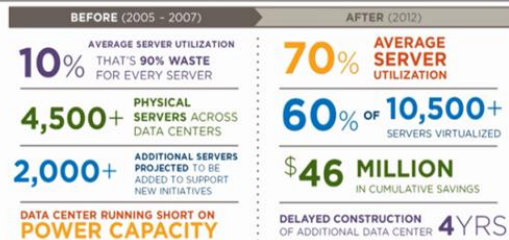
Linux on System z and z/OS as the foundation of the most secure, scalable private cloud infrastructure

Leveraging BlueMix and interoperability with SoftLayer, AWS and other public cloud offerings



Linux on z Systems IT Economics client successes.

Nationwide VIRTUALIZATION AT SCALE



Benefits Realized:

- With virtualization the server utilization increased from 10% to 70%
- Developed more capabilities, grew the environment and achieved a higher level of virtualization
- Cloud-based solution reduced power, cooling and floor space requirements by 80% and saved the company an estimated \$46 million to date

“ By moving workload from thousands of distributed processors to a very small number of powerful mainframe processors, we have made enormous savings in software licensing costs .

More significantly, z/VM also gives us the ability to create new virtual servers within minutes, boosting the ability of the business to respond to new challenges and opportunities quickly and effectively.

-- Brian Callaghan, VP of middleware-emerging technologies at Nationwide

Sicoob



Benefits Realized:

- Enormous growth within the same physical and environmental footprint
 - Enabled growth of 600% in mobile, 200% in internet, and 60% in in-branch transactions
- Delivers new services faster
- Avoiding USD 1.5 million in electricity costs annually

“ We have reduced the complexity of our technology, with fewer servers, less administration, lower software maintenance costs, and a significant reduction in energy consumption.

-- Marcos Vinicius, Head of Technology Infra, Sicoob

... we are spending 40% less on power than if we had a distributed environment instead.

“

-- Ricardo Antonio, CIO at Sicoob



Trusted Cloud. Simply Delivered.



- Red Hat/SUSE
- 3000+ Applications

Fully Automated Cloud Management & Monitoring

IBM Deployment Expertise done in the factory with on-site personalisation



z13 (SOD), zEC12 and zBC12 compute in any configuration

Storwize V7000 or DS8870 in any config



OpenStack support

Factory Integrated and Tested Delivered in 1/2 time of other Integrated Systems*
z13 support forthcoming (SOD)

"The new z13 certainly isn't the first IBM mainframe to be "cloud ready," but it offers numerous features that are crucial to the success of every cloud-bound service provider and business."



Scale up to 8000 VMs
Industry Leading Availability
Proven Security
32% cheaper than x86
60% cheaper than Public Cloud



What is included in Enterprise Cloud System.

Server



**zSystems
z13 (SOD)**

or



**zSystems
EC12**

or



**zSystems
BC12**

Storage



**Storwize
V7000**

or



DS8870

Software

- **z/VM with following priced features:**
 - Directory Maintenance
 - Resource Access Control Facility
 - Performance Toolkit
 - Single System Image
- **IBM Wave for z/VM**
- **OMEGAMON XE on z/VM and Linux**
- **Tivoli Storage Manager Extended Edition**
- **Cloud Manager with OpenStack (SOD)**
- **Operations Manager for z/VM**
- **Backup and Restore Manager for z/VM**
- **RHEL or SLES Linux for z Systems**

Services

- **Integration Services**
 - Performed by WW Customized Solutions Center in Poughkeepsie, NY
 - Will integrate server and storage devices and pre-install software prior to shipment to the customer
- **On-Site Personalization Services**
 - Performed by STG Lab Based Services to complete SW installation and personalize Enterprise Cloud System for the customer



IBM continues to invest in cloud capabilities on z Systems to deliver and support our clients and our partner and ISV ecosystem.

- All components of Enterprise Cloud System are generally available today
 - A customer can put together the same solution by themselves
- The “secret sauce” of Enterprise Cloud System is the **integration**.

Integration means:

- Pre-loaded software – The software is installed and configured at IBM prior to delivery to customer
- Pre-tested Server & Storage Configurations – The server and storage are put together at IBM and pre-tested *together* prior to shipment to ensure no missing parts
- Single Order – The IBM salesperson orders all parts of solution as part of the same order
- Single Simplified Contract – Instead of having separate contracts for server, storage, software and services, a single contract is provided to the customer to sign
- Single Invoice – A single invoice is provided to the customer that covers all four components
- Bottom Line Price – A single bottom line price is provided to the customer for full solution
- Coordinated Planning & Delivery – All components of the solution are in one shipment and arrive at same time at the customer



Resources

ibm.com: z Systems on Cloud

[Solitaire Interglobal Analyst Paper: System z and Managed Service Providers](#)

[Redbook: Cloud Workloads on the Mainframe](#)

[Whitepaper: Managed Service Providers - Gaining Operational Efficiency and Competitive Advantage by Leveraging IBM's Mainframe](#)

[Clipper Analyst whitepaper: IBM's Enterprise Cloud System — A Faster and Better On-Ramp to Cloud Infrastructure](#)

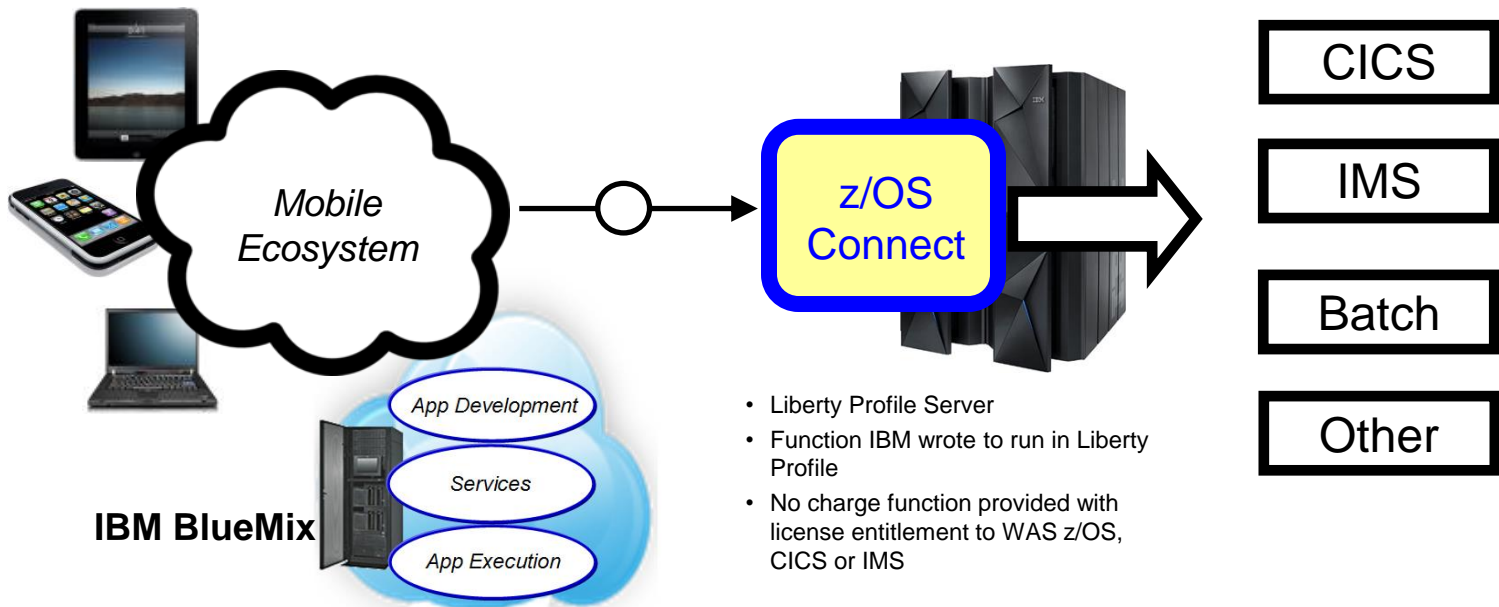
[YouTube: World inside z Systems animation series - Cloud](#)



Bring the power of your z Systems of Record to your mobile System of Engagement through z/OS Connect

WebSphere Liberty z/OS Connect

WebSphere Liberty z/OS Connect is software that enables z/OS systems such as CICS and IMS to better and more easily participate in today's Mobile computing environment. It runs inside Liberty Profile for z/OS and provides an interface between mobile and cloud devices and backend systems. It provides RESTful APIs and accepts JSON payloads, and communicates with backend systems for data and transactions.



- Provides a common and consistent entry point for mobile access to one or many backend systems
- Provides point for authorization of user to invoke backend service

- Liberty Profile Server
- Function IBM wrote to run in Liberty Profile
- No charge function provided with license entitlement to WAS z/OS, CICS or IMS

- Provides point for capturing usage information using SMF
- Simplifies front-end functions by allowing them to pass RESTful and JSON rather than be aware of or involved in data transformation

Simplify your operations with integrated monitoring and management for the enterprise

Application performance management and infrastructure performance management tools allow IT to fine-tune hardware and software settings in order to guarantee maximum uptime. The latest tools can work across traditional, private cloud, public cloud and hybrid architectures to enable greater flexibility, better visibility, improve application uptime and ensure that IT departments meet service level agreements (SLAs).

[OMEGAMON Performance Management Suite](#) provides a complete solution for improved visibility and management for z/OS and subsystems. High-level views help executives understand how systems performance influences business and the bottom line as they have insight into the health and performance of z/VM and Linux. With granular views, the product can help IT staff to more easily track complex problems that span multiple systems and platforms, and share related information. Persistent historical views allow management of real and virtual resources across peak periods and downtimes for a clear view of resource usage and constraints.

[Tivoli Asset Discovery for z/OS \(TADz\)](#) gives a clearer view of the products and applications shared by users and business processes across an enterprise. Because TADz monitors software usage, clients can use it to proactively plan for their future capacity needs. Its deep discovery capabilities can also help you reduce costs by removing unused and obsolete software. TADz provides enhanced asset reliability and availability to deliver the most optimal service to the business.



As big data proliferation becomes more prevalent in the z/OS environment, it is even more critical to manage this data as efficiently as possible.

[IBM SmartCloud Application Performance Management \(APM\)](#) running on Linux on z Systems intelligently manages traditional IT, virtualized, cloud and hybrid environments. It gives you the ability to quickly determine the root cause of critical cross-platform applications while meeting demands to develop new applications and modify existing ones. You gain the visibility, control and automation you need to manage today's more complex and interdependent applications throughout your enterprise.

In addition, as big data proliferation becomes more prevalent in the z/OS environment, it is even more critical to manage this data as efficiently as possible. Inefficiencies add cost, risk and impact the services needed within an enterprise.

[IBM System z Storage Management](#) is a data protection platform that gives enterprises a single point of control and administration for their storage management needs. It enables outstanding efficiency, simplicity and scalability for virtual, physical and cloud backup environments of all sizes. IBM z Systems Storage Management is an end-to-end solution to optimize your heterogeneous environment that includes capabilities to drive down costs and improve overall availability and performance of big data business requirements.



Resources

[Video: Value of improved Enterprise visibility for supporting new technologies like Mobile](#)

[Software Announcement: Tivoli OMEGAMON Performance Management Suite for z/OS \(January 7, 2014\)](#)

[Clabby Whitepaper: IBM OMEGAMON and System Automation - Proactive, Automated Problem Resolution \(April 2014\)](#)



Transform enterprise business with automation solutions on z Systems

Enterprises suffer huge consequences to the business if they are not automated, requiring more human labor. Manual solutions can represent a substantial penalty to the organization's bottom line. For many CIOs, much of the annual budget will be allocated to operational staff expense. Through automation, the focus of that investment can be redirected to directly support business innovation in the form of enhanced and new revenue-generating services.

Service Management solutions can play a key role in helping organizations achieve operational automation by leveraging and integrating existing tools, adding and adapting best-practice processes, such as ITIL, ITOM, COBIT, and Six Sigma, as well as assuring that closed-loop processes are in place across the full service lifecycle.



Specific solutions that help automate IT processes are available in key areas, including software provisioning, data backup and restoration. Both streamline service delivery and support processes, requiring as little direct supervision as is organizationally appropriate.

[IBM Tivoli Workload Scheduler for z/OS](#) enables you to automate, plan and control the processing of IBM z Systems workloads. When combined with IBM Workload Automation, it includes and integrates workloads, tasks and processes for both distributed environments and enterprise applications, along with the ability to provision cloud computing resources. With it, IT can model workflows in advance to detect any potential problems before they occur, as well as monitoring and managing unattended cloud-based workflows.

[IBM Automation Control for z/OS](#) offers a powerful and flexible set of functions to monitor, control and fully automate IBM z Systems Monoplex application environments. It is easy to install, policy-based and goal driven high availability tool for IBM z Systems installations, which reduces the risk for system outages and application downtime significantly.



Specific solutions that help automate IT processes are available in key areas, including software provisioning, data backup and restoration.

[IBM Service Management Suite for z/OS](#) is a comprehensive solution providing customers with a single point of control for a broad range of systems management functions on IBM z Systems. It is a single PID offering that contains the system and resource level automation, network, monitoring and discovery capabilities needed to manage z/OS and key subsystems.

Customers get the visibility, control and automation of a large range of system elements spanning both the hardware and software resources in a [Sysplex](#). This approach to automating system and application start-up, shut down, recovery, response to problems and disaster recovery helps improve availability and cost on IBM z/OS.

[IBM System Automation for z/OS](#) (included in IBM Service Management Suite for z/OS) helps clients automate a comprehensive zEnterprise applications and resources to keep their business up and running. System Automation minimizes a user's efforts to reduce the costs of IT operation, lower risks, and improve system and application availability. It is the foundation for Geographically Dispersed Parallel Sysplex (GDPS), IBM's premium disaster recovery solution on z Systems.

[IBM NetView for z/OS](#) (included in IBM Service Management Suite for z/OS) provides automation, network and systems management to address today's requirements for business agility on z Systems. System and Network Automation provided by NetView addresses customers continued drive for increased IT availability. As expanding network requirements, such as adding mobile devices, increase the need for complete network management solutions, it will be important to control the infrastructure.

[IBM UrbanCode Deploy and UrbanCode Release](#) provide continuous software release and deployment capability, a must for continuous delivery in a hybrid cloud environment. UrbanCode Deploy automates the deployment of application, database, and configuration changes across hybrid environments, enabling teams to standardize on one solution to coordinate the delivery of on-and off premise services, driving down costs and speeding time to market. Applications can be deployed in minutes versus days. Secure 'push-button' deployments improve productivity and reduce cycle time to develop and test applications. Teams can create intuitive, versioned processes with the drag-and-drop designer, replacing custom scripting and simplifying maintenance. End-to-end traceability for compliancy and auditability enables organization to accelerate delivery with confidence and control.

Resources

[Whitepaper: IBM OMEGAMON and System Automation - Proactive, Automated Problem Resolution \(April 2014\)](#)

[Video: Improving business agility requires increased mainframe automation](#)

[Video: From BlueMix to Mainframe with IBM UrbanCode Deploy](#)
[developerWorks article: Multi-platform application deployment with UrbanCode Deploy](#)



Explore, Learn, and Implement

IBM's Cloud and IT Service Management platform is designed to help companies optimize their IT delivery and accelerate their rate of innovation. It includes an array of different products and services centered on operations, performance management, automation and analytics.

IBM continues to deliver end-to-end enterprise wide ability to simplify operations with decreased cost and reduced risk. We are continuing to add more analytics and cloud capabilities to z Systems, and IBM monitoring, workload and system automation tools continue to be enhanced based on customer requirements to provide improved visibility, control and automation for z Systems clients.

For more information, please go to:

<http://www.ibm.com/software/os/systemz/itsm/>

Please feel free to contact with any questions:

Bill Reeder – WW Sales Leader for Cloud (breeder@us.ibm.com)

Kershaw Mehta – Chief Architect for Cloud on z Systems (kershaw@us.ibm.com)

Steven Dickens – Cloud Offering Manager (steven.Dickens@us.ibm.com)

Mark Figley – Cloud Offering Manager (figley@us.ibm.com)

Tom Follette – Cloud Marketing Manager (tfollet@us.ibm.com)



Resources

[Cloud-based trial: IBM Integrated Solution for System z Development - develop and test z/OS applications in a guided "tinker, test, and try" sandbox environment.](#)

