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Managing the Mainframe From an End-to-End Perspective

Session 12901
February 7, 2013

Mike Bonett (bonett@us.ibm.com)
IBM Advanced Technical Skills

SHARE in San Francisco 2013

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Abstract

There are probably no System z environments that do not co-exist with non-System z platforms.

When the components and applications on the non-z platforms connect to System z, issues – technical, process, and organizational – can arise without an end-to-end perspective for managing this environment. The movement to Cloud solutions will only exacerbate this situation.

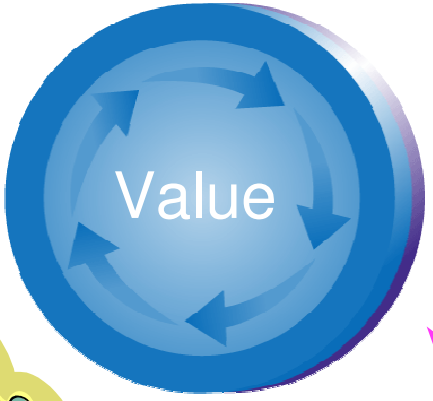
This session will provide key information and insights to help the Mainframe person better understand why an end-to-end perspective is required.

Agenda

- Understanding the current trends
- The Role of System z – actual vs. perceived
- Understanding “end-to-end” and its implications
- Viewing and applying System z within the end-to-end management context

Elements of a Complete Management Solutions

People



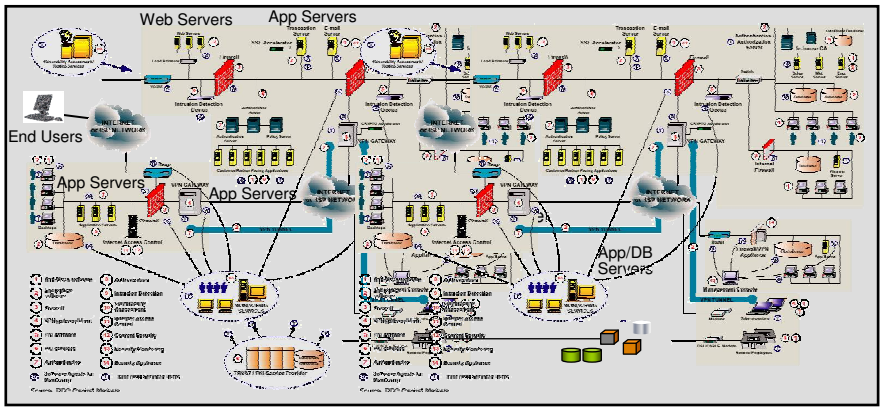
Technology

Process

- Technology
  - Managed environment
  - Management tools
- Process
  - Planning and Design
  - Implement and Operate
  - Feedback and Refinement
- Organization
  - Skills
  - Roles
  - Responsibilities
- They converge to provide value from information technology investments
- They must consider the status and trends inherent across IT infrastructure, workloads, and applications

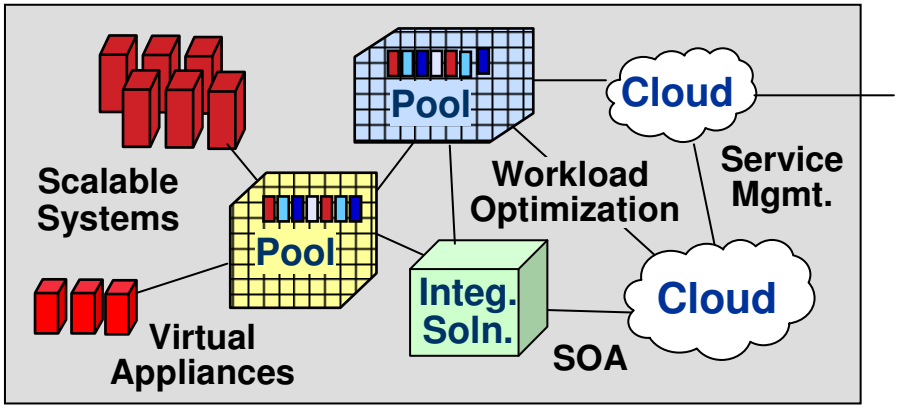
IT Infrastructure Trends

IT of the Past – Complex Sprawl



- Many servers managed individually
- Rigid configurations
- Server, storage, network silos
- HW changes impact SW assets
- Extensive do-it-yourself
- Services made-to-order per LOB
- Workloads bound to hardware
- Fragmented management
- Excessive "plumbing" management

IT of the Future



- Integrated scalable IT building blocks:
  - Systems, pools, solutions, clouds
  - Hardware + software + mgmt software
  - Workload optimized
  - Standardized, pre-built, ready to use
- Comprehensive virtualization
- Workloads and Resource mobility
- Unified management
- Application business value focus

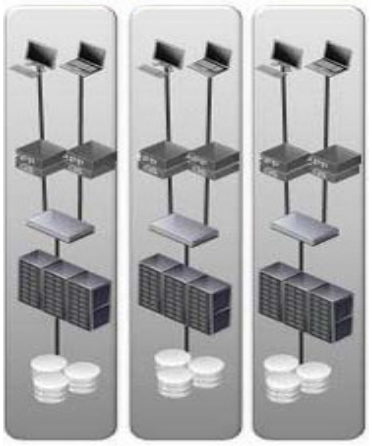
Lower Costs, Higher Qualities of Service, Increased Agility

Infrastructure Realities

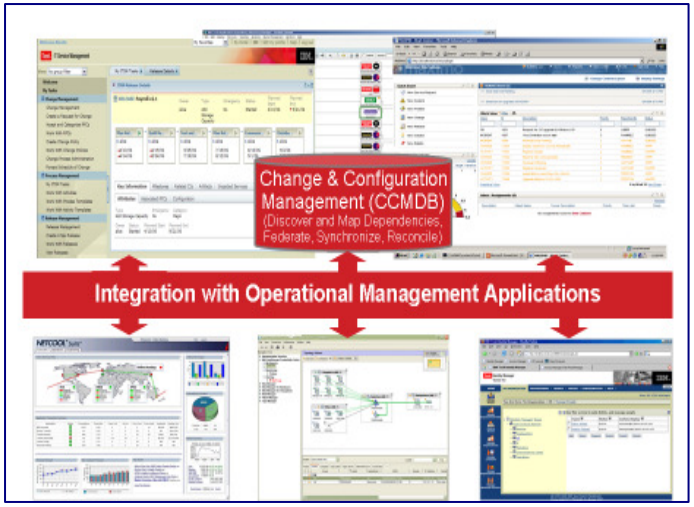
- IT is a heterogeneous world with mixed technology types and platforms
- One size does not fit all
- Elimination of one or more architecture types may be desirable for simplicity… but is rarely achievable in practice
- Even if some are eliminated, mergers/acquisitions will likely return things to a heterogeneous infrastructure

Management Technology Trends

- From
  - Islands of Management
  - Inconsistent information
  - Isolated Events
  - Functional Automation



- To
  - Management across platforms, applications and connectivity
  - Automated asset lifecycle management
    - Not just operations, but create, configure, deploy, and retire
  - Direct management information exchange
  - Wider event scope (component, application, and process)



Application Workload Trends

- **Consolidation** – Combining work onto fewer physical platforms
- **Virtualization** – Sharing resources to drive more efficient hardware utilization
- **Parallelization** – Partitioning resources to drive faster turn around
- **Clustering** – Hardware in support of parallelization and for redundancy for higher levels of availability
- **Operational Analytics** – dynamic optimization of business processes blending transactions, queries and analytics on operational data

Application Trends

- Applications consist of many components
- Components are both tightly and loosely coupled
- What is the best place to run the components?
  - "Fit for Purpose"
- What management capabilities are available where the components run?
- How do I manage these components from an application health perspective?

Transaction Processing and Database

Scale
High Quality of Service
Handle Peak Workloads
Resiliency and Security

Analytics and High Performance Computing

Compute intensive
High Memory Bandwidth
Floating point

Business Applications

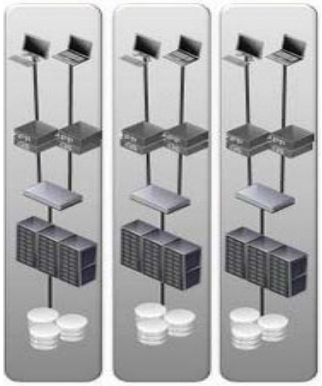
Scale
High Quality of Service
Large Memory Footprint
Responsive Infrastructure

Web, Collaboration and Infrastructure

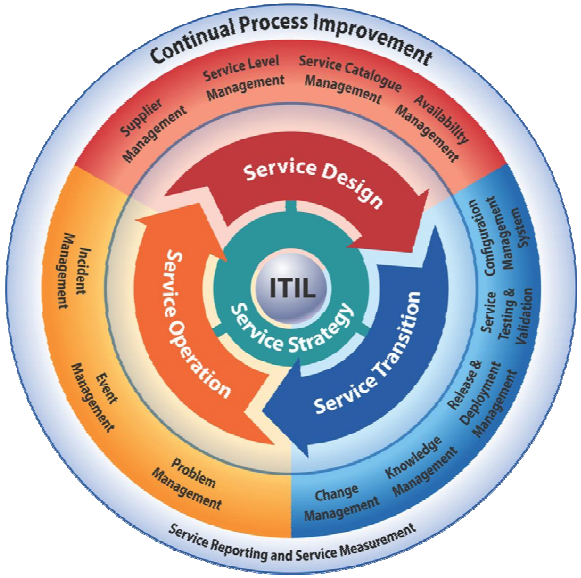
Highly Threaded
Throughput-oriented
Scale Out Capable
Lower Quality of Service

Process Trends

- From:
  - Component management
  - Platform centric processes and management
  - Process duplication
  - Limited automation



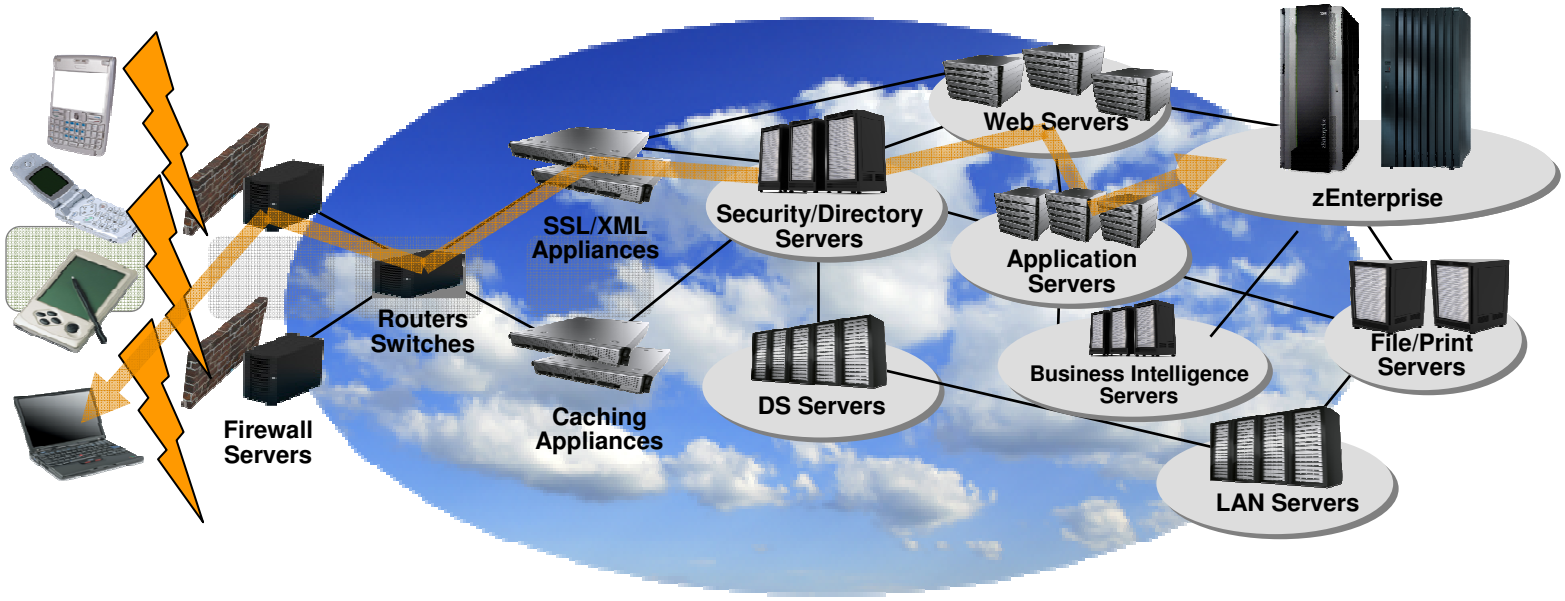
- To:
  - Managing “provided services” instead of “systems” or “components”
  - Lifecycle emphasis
  - Use of standards within processes
  - Process centric management
  - Process automation beyond operations



People/Organization Issues

- IT organizations tend to be isolated due to the skill depth necessary to manage the individual pieces of service delivery
- Different organizations may not really understand what the other has to do, and have difficultly finding common metrics for capacity, cost, efficiency and performance
- Associated risks
  - Cultural mismatch… creates friction, 'THEM & US' increases governance overheads
  - Requirements mismatch… result is availability and service level risk
  - Commercial mismatch… separate cultures may compete rather than cooperate
  - Technical Strategy mismatch … management products are contentious and may be a blockage on the critical path
  - "Multi-customer syndrome" - caused by internal customer divisions or business units being unable / unwilling to integrate

End-to-End



- Cuts across People, Technology, and Process for all computing platforms
  - Focus on the application and workload flows as primary
  - Increasing number of virtualized components
  - Traditional “static” processes become more dynamic due to cloud lifecycle management requirements
  - Monitoring one component no longer provides an accurate picture of application and workload health

End-to-End Outlook

- **Future IT strategies, technologies, and designs will mandate an end to end design approach**
  - Infrastructure integration and consolidation
  - Network convergence (including emerging SDN)
  - Scalability
  - Cloud Computing level(s) of service being provided (IAAS,PAAS,SAAS)
  - Hybrid computing

- **Lack of an end to end design approach will result in risks in the solution**
  - typically in the areas of performance and resilience
- **It can be unclear regarding the roles and responsibilities in end-to-end:**
  - Who understands the end to end requirements?
  - Who is responsible for the end to end design?
  - Who is responsible to resolve end to end connectivity issues?
  - To what extent does this really include System z?

End-to-End is About Integration…

What are the key business issues driving demand	*What is IT being asked to do to support these goals?*	*What must the end-to end efforts support?*	*What are the key technologies that will enable these goals?*	*What obstacles must be faced with these technologies?*
• Risk Mitigation • Cost Reduction • Improved Productivity • Regulatory Compliance	• Improve BC/DR Processes • Distribute and Protect Data • Reduce IT Spending • Deploy New Applications • Swift implementations	•Connect Geographically Dispersed Data Centers •Improve Infrastructure Availability & Recovery •Improve Application Availability & Recovery •Data Center Consolidation •Coordinated Deployment of Platforms, Middleware, and Applications •Move Infrastructure Resources To Support New Applications	• Data mirroring and replication • Server and Mainframe Clustering • Server, storage, and network virtualization • SANs • Storage networking technologies • Faster transports (channel extensions, optical technologies, etc.	▪ Lack of Skills/Resources ▪ Solution Complexity (Multiple Technologies & Vendors) ▪ Vendor and application inter-operability ▪ Poor Application Performance ▪ Limited Management Capabilities ▪ Jumbled solutions and siloed components

…And System z is about Integration – the Perfect Fit

- The mainframe fits well within the “integration” niche
  - System z has presence in almost every workload category
  - In most instances System z is runs several “workload types” in an integrated fashion, often sharing data with other applications
  - Virtualization is driving this on all platforms
  - The only global rule that eliminates mainstream work from running on somebody’s z CEC is lack of software support from an ISV or IBM
  - Given software that will run, System z must still be evaluated for the best fit
    - It takes consideration of local factors to sort it out
    - Things like SLA, Usage Pattern, and scale govern the viability of z more than things like “typical adoption” under a dedicated deployment model, industry “wisdom”, or benchmarked performance.
    - One size does not fit all

System z – Are These The Perceptions?

- Crazy Relative in the Corner
  - Tolerated or ignored, and possibly sneered at
  - The sinkhole for unexplained/unaccountable costs
  - Platform and middleware currency lagging
  - No workload growth
  - Potential replacement by other platforms

- Dragon's Lair
  - A foreboding presence
  - Users fear to enter, for fear of not returning
  - Little knowledge of what happens once the application/workflow leaves their control

GOAL: Become the Trusted Partner with the rest of the Enterprise

The Mainframe Reality

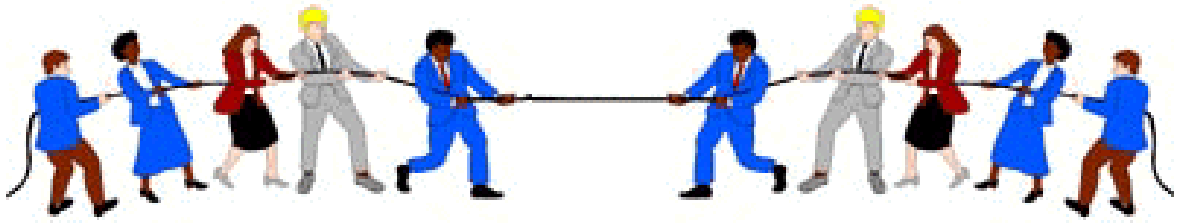
1. System z can run new workloads such as Java, Web services and XML
2. System z can have a lower TCO than distributed environments
3. System z has many automated tools that do not require sophisticated skills to operate.
4. System z has Eclipse-based application development tools that can be used for both COBOL and Java applications
5. System z has proven to have a lower TCO when consolidating multiple servers onto a System z platform
6. System z has a job board with 1000s of jobs posted requesting System z skills
7. System z has a large ecosystem with 100s of ISVs developing new applications every year
8. System z is the most secure platform in the world

Time to Have a Discussion

Converge

Reduce Costs

Improve Productivity



Mainframe Centric View

Distributed can't do my work

Mainframe saves money

Complete Business Case

Distributed Centric View

Mainframe can't do my work

Distributed saves Money

Reality: It cannot be all or nothing…

So embrace the mixed environment via an end-to-end perspective

Relating System z to End-to-End

- Technology
  - System z is a strong fit for end-to-end support of technology for both platform optimization and platform management functions
- Process
  - System z can both support and participate within integrated processes for improved end-to-end service management
- People/Organization
  - System z should lead the way for communication among and broader skills within the end-to-end environment

zEnterprise and Effective IT Optimization

IT Infrastructure on System z

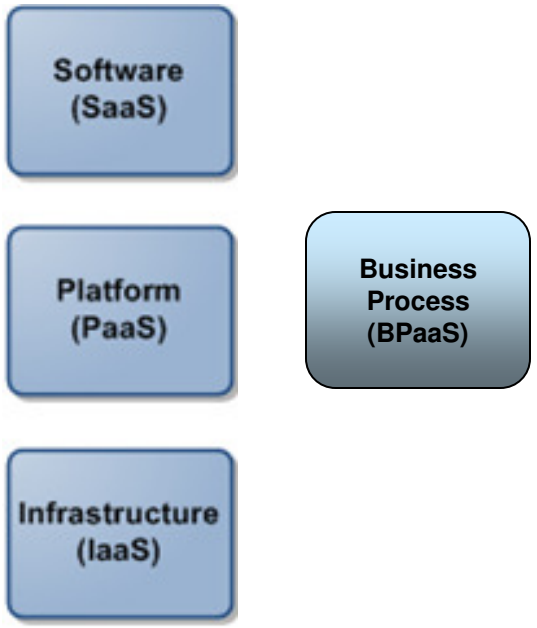
- Workloads with close System z affinities
  - Storage
  - Network
  - Management
- Remains flexible to work with distinct platforms
- Goal: Determine the best fit
  - Consolidation on System z
  - Cooperation with z

zEnterprise and Cloud

NIST * (Technical Definition)

Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g. servers, storage, network, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

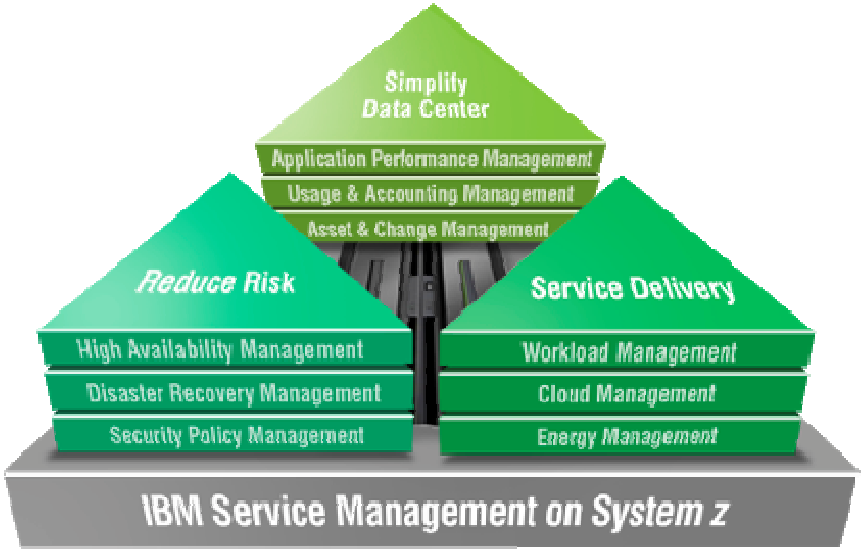
- **Shared resource pools**
- **Rapid elasticity (handle real-time changes in demand)**
- **Broad Network access**
- **On demand self-service (Portal & API)**
- **Measured Service**



zEnterprise platform capabilities can support cloud environments and allow integrated cloud environments across zEnterprise and distributed

End-to-End Technology - Management

- **System z platform flexibility makes it a strong candidate to be the end-to-end "Manage-from" platform**
  - Support of Windows/AIX/Linux based management servers
  - Virtual networking to isolate and protect management network
  - Apply System z security and availability features to support critical management functions



zEnterprise platform capabilities enabled with Service Management Products can support cloud environments and management across zEnterprise and distributed

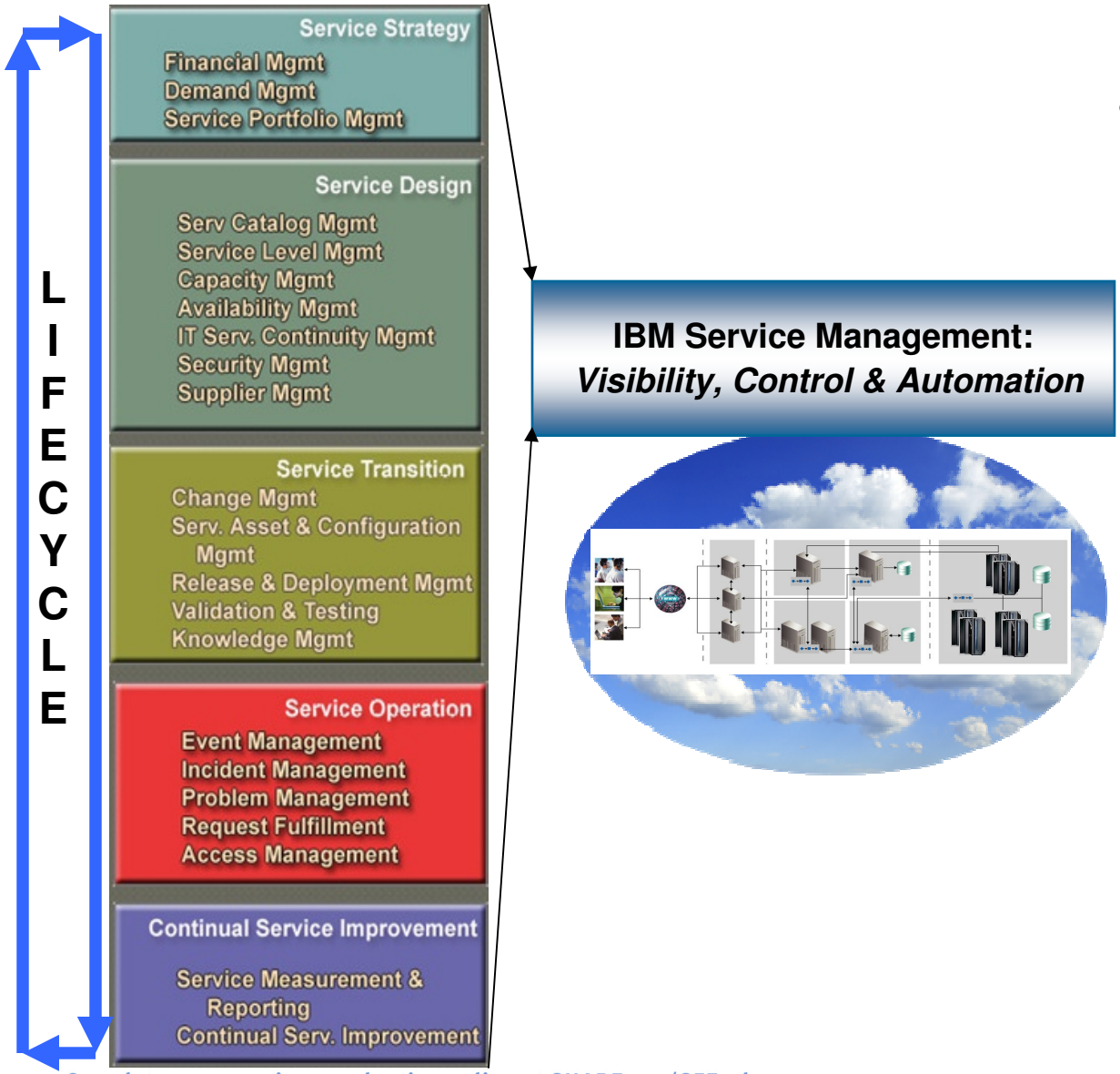
End-to-End Measurement

- End to end focuses on key metrics, with drill down to details as needed
  - Application volume/throughput measurements
  - Impact of events on services
  - Static and current connectivity relationships
  - Changes and impact
- Ensure zEnterprise functions and related management tools contribute to these metrics

End-to-End Processes

- The foundation for improved processes focuses on
  - Visibility (what do I have and how is it enabled)
  - Control (do I need to change it and when)
  - Automation (how can I change things efficiently)
- As processes span the end-to-end infrastructure, experiences gained from System z can be very applicable, particularly when supporting virtualized platforms
- System z must participate in those processes to standardize them
  - A single process that includes all platforms

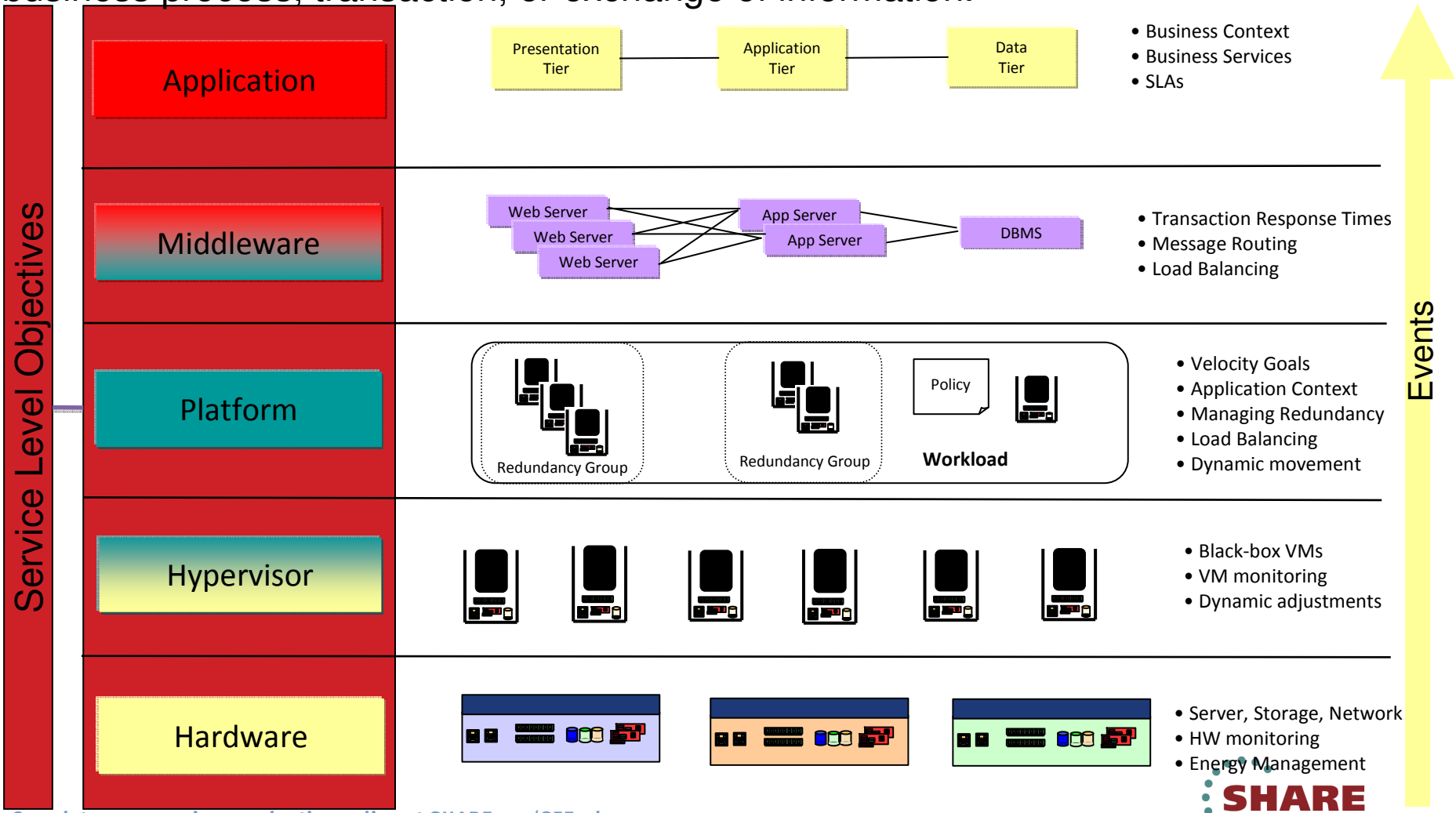
Process Standardization



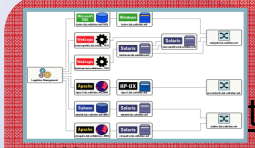
- Apply common or integrated processes across both System z and Distributed
  - Don't leave out System z because some see it as "different"
  - Duplicate processes are not efficient
  - System z process maturity can be beneficial to other platforms
  - Seek management tools that support common or integrated processes

Service Management Workload Perspective

A business service is any customer, partner or user facing *group of applications, middleware, security, storage, networks and other supporting infrastructure* that come together to enable a comprehensive, end-to-end business process, transaction, or exchange of information.



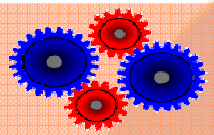
End-to-End Service Management Lifecycle



Map Service Dependencies to Infrastructure

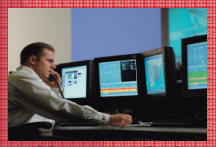
How are resources connected to provide business services?

Automate Service Operations



Are activities efficiently executed when delivering business services?

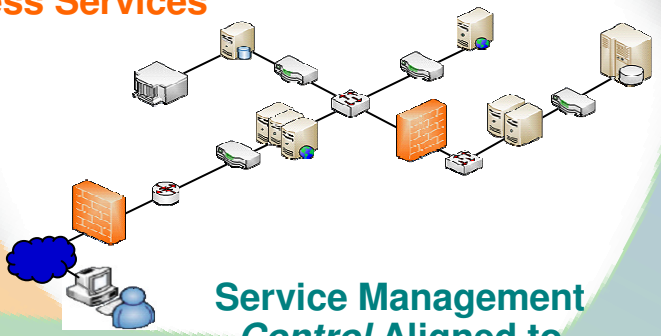
***Visibility* across Applications, Data and Underlying Infrastructure**



Monitor Infrastructure Resources

How are infrastructure events affecting services?

Process and Technology *Automation* across Business Services



Align Assets and Resources to Business Priorities

How are resources being deployed to meet business demand?

Understand User Service Experience

How are services meeting business user needs?

Service Management *Control* Aligned to Business Priorities

Fulfill Service Requests

How effectively are requests for services being managed?

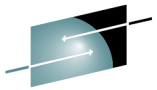
Provide Business Aligned Dashboards

What is the health of my business and the services that support it?

Relating System z to End-to-End

- People/Organization
  - A virtualized mindset is required
    - Skills
    - zEnterprise
    - End-to-end Relationships
  - Participation required where there is potential for mainframe integration
    - Proactive, not reactive
  - Champion cross-platform responsibilities for end-to-end functions – areas where the Mainframe has lead
    - Automation
    - Security
    - Cloud Management

Where to Start? Potential Focus Areas



IBM Service Management: *Visibility, Control & Automation* – Does System z participate with other platforms, and how?

Discover	Monitor	Protect	Industrialize	Integrate
Understand infrastructure and business dependencies	Track infrastructure health and compliance	Ensure security and resiliency against threats and disasters	Streamline workflows and processes for repeatable, scalable and consistent results	Align and integrate operations and business for optimal impact
Infrastructure Discovery & Mapping	Event & Performance Management	Vulnerability & Threat Management	Virtualization and Cloud Management	Business Service Management
Assessing Security Controls Effectiveness	Applications Performance	Data Backup, Restore & Retention	Energy Management for Green Savings	Service Deployment & Lifecycle Management
Business Resilience Planning	Policy & Regulatory Controls Monitoring	Business Continuity / Disaster Recovery	Single Sign On	Service Desk
	User Activity Monitoring / Log Mgmt		IT Asset Management	Integrated Service Management Planning
	User Access Rights /User Lifecycle Mgmt		Usage Accounting	

Conclusion

- **Mainframe and System z are in the best position to promote and support the end-to-end perspective**
  - "Been there, done that" in regards to the management processes
  - Hardware and software architecture already encompasses the trends in overall IT infrastructure
    - Consolidation
    - Virtualization
    - Cloud environment
  - End-to-End skills can be easier to acquire when coming from a mainframe background
    - A point of reference has been established
  - Avoid being kept out of the loop
    - Help others with awareness of System z capabilities
    - Promote a cooperative rather than adversarial relationship
    - Move the focus from "control" to "service"

Conclusion…

- **IT will undergo a major required transformation in the next few years**
- **For greater business value and reduce costs, IT continues to move to modular and hierarchical architectures that includes:**
  - **Comprehensive virtualization** of all resource types
  - **Integrated workload-optimized IT building blocks** (systems, pools, clouds) driven by a diversity of needs and innovations
  - **Service management** that spans distributed data centers and supports the dynamic business processes of the future
- **These require a complete end-to-end perspective for efficient management solutions (technology, process, people)**
- **System z is very well suited to participate and lead these efforts**

For More Information (Examples)

- Maximizing Information Systems Efficiency: How to Build a Workload Optimized, Highly-Automated, Heterogeneous Hybrid Cloud
  - ftp://public.dhe.ibm.com/software/ecm/pdf/Clabby_System_Automation.pdf
- The Mainframe and End-to-End Energy Management
  - http://enterprisesystemsmedia.com/article/the-mainframe-and-end-to-end-energy-management
- Strategic requirements for optimizing enterprise capacity management
  - http://www.bmc.com/solutions/proactive-operations/offer/optimizing-enterprise-capacity-management.html
- Integrated Service Management for System z
  - http://www-01.ibm.com/software/tivoli/solutions/zsmc/
- Mainframes in Perspective
  - http://atos.net/NR/rdonlyres/028824DA-4E6E-4022-8881-4C29AD203061/0/AtosOriginMainframesinPerspectiveWhitePaper2.pdf
- The mainframe as a cloud
  - http://www.clabbyanalytics.com/uploads/CloudandISMFinal.pdf
- The Value of IBM zEnterprise for Deploying Heterogeneous Private Clouds
  - http://www.theedison.com/pdf/2012_Samples_IBM_zEnterprise_Cloud_Value_Proposition.pdf
- IBM Service Management Connect
  - https://www.ibm.com/developerworks/servicemanagement/

System z Social Media Channels

- Top Facebook pages related to System z:
  - IBM System z
  - IBM Academic Initiative System z
  - IBM Master the Mainframe Contest
  - IBM Destination z
  - Millennial Mainframer
  - IBM Smarter Computing
- Top LinkedIn groups related to System z:
  - System z Advocates
  - SAP on System z
  - IBM Mainframe- Unofficial Group
  - IBM System z Events
  - Mainframe Experts Network
  - System z Linux
  - Enterprise Systems
  - Mainframe Security Gurus
- Twitter profiles related to System z:
  - IBM System z
  - IBM System z Events
  - IBM DB2 on System z
  - Millennial Mainframer
  - Destination z
  - IBM Smarter Computing
- YouTube accounts related to System z:
  - IBM System z
  - Destination z
  - IBM Smarter Computing
- Top System z blogs to check out:
  - Mainframe Insights
  - Smarter Computing
  - Millennial Mainframer
  - Mainframe & Hybrid Computing
  - The Mainframe Blog
  - Mainframe Watch Belgium
  - Mainframe Update
  - Enterprise Systems Media Blog
  - Dancing Dinosaur
  - DB2 for z/OS
  - IBM Destination z
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Any Questions?