Presenter Name – Presenter Title

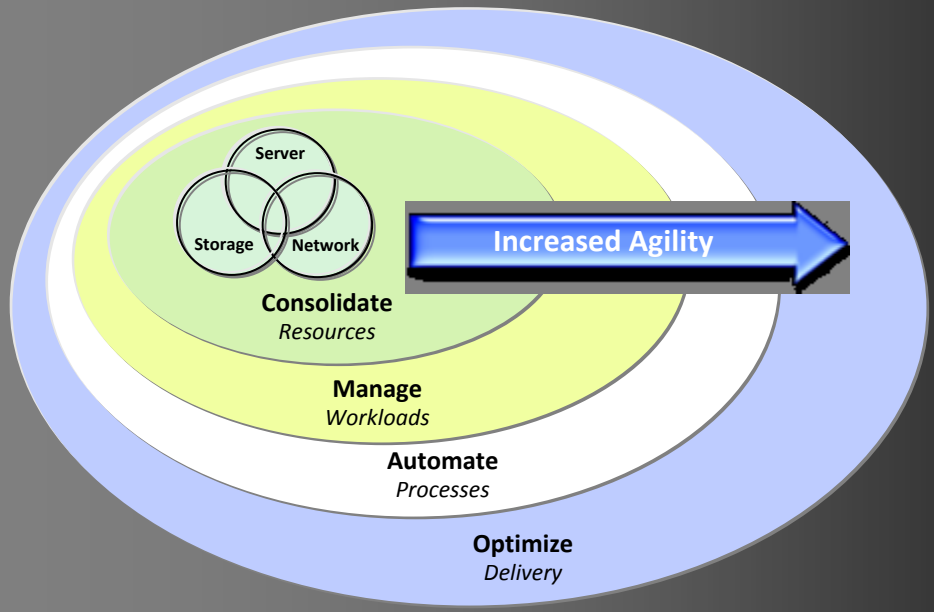
MM/DD/Year

Virtualization with Integrated Service Management:

Manage Workloads and Automate Processes

IBMSmarterSystemsTour2010

Virtualization with Integrated Service Management for improved business agility



Consolidate *Resources*
- Improved efficiency and utilization of IT resources

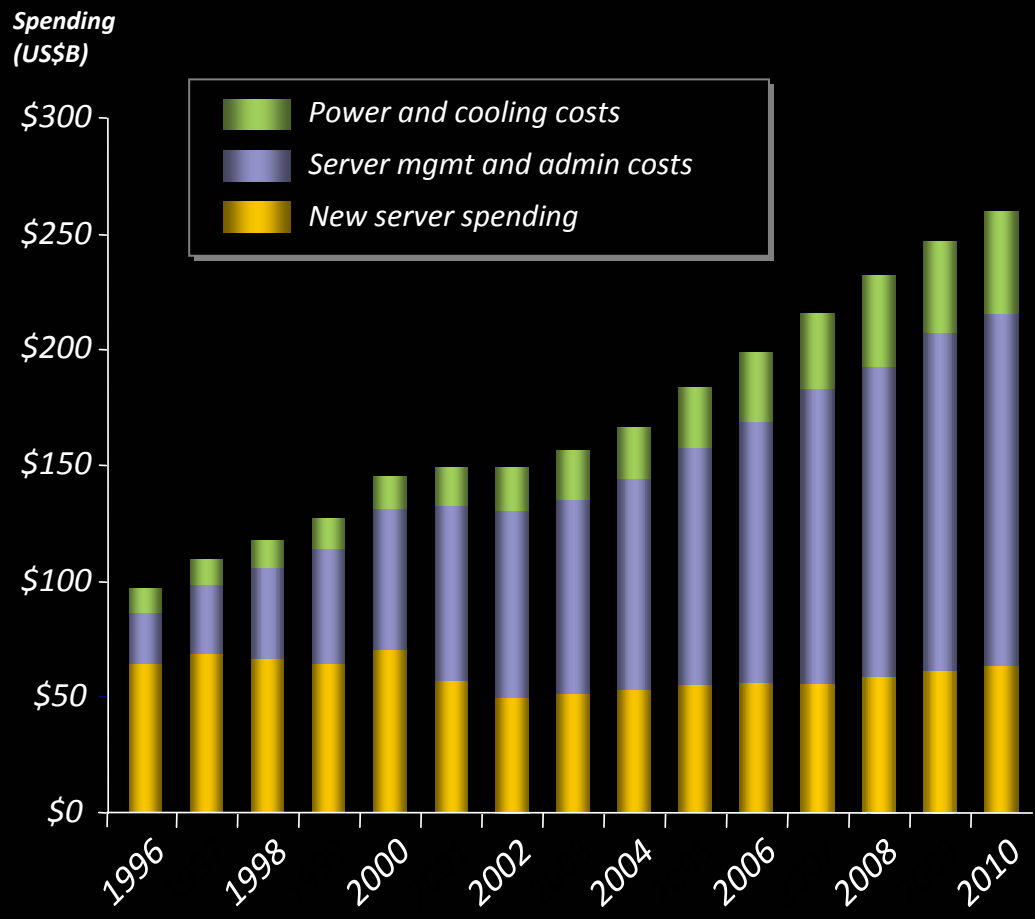
Manage *Workloads*
- Improved IT staff productivity with integrated systems management dashboard

Automate *Processes*
- Consistent and repeatable processes based on best practices, business priorities and service level agreements

Optimize *Delivery*
- Self provisioned by users based on business imperatives, unconstrained by physical barriers or location.

Managing virtualized environments requires new capabilities

- Management costs have doubled since 2000
- Virtualized required to
  - Increase resource utilization
  - Simplify management
  - Reduce power and cooling



Source: IDC, 2008

[1]WW TB Capacity Shipped on Enterprise Disk Storage Systems

[2]Server processing consumption doubles every 3 years

UPMC

Business Challenges:

- The organization struggled with multiple change control and incident tracking systems, making event management impossible
- Lacked centrally defined processes or guidelines for setting up monitoring
- Could not correlate events, resulting in duplicate events and false alerts being generated
- UPMC needed to implement a comprehensive event management and monitoring infrastructure, based on ITIL

Benefits:

- UPMC successfully created a unified event management and monitoring solution that includes:
  - a common repository for all active alerts and events, utilizing IBM Tivoli NetCool/Omnibus software
  - a single incident management system
  - events integrated from 20 different active sources

North Carolina State University

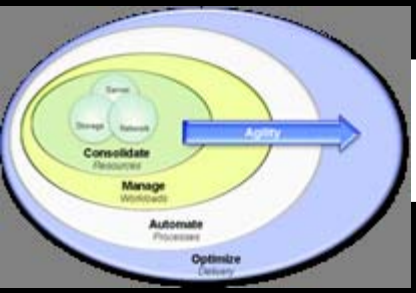
Business Challenges:

- NC State has more than 31,000 students and nearly 8,000 faculty and staff
- Growing demand for academic computing resources meant the school needed to fundamentally change the way it managed these resources in order to deliver the service levels that its key user populations required

Benefits:

- Improved access to academic computing resources
- Implemented new self-provisioning model based on real utilization
- Increased flexibility to shift computing capacity between instructional, research and administrative needs
- Reduced its future licensing costs by up to 75%, and 150% increase in students served per application license

The journey has well-defined steps



Consolidate → Manage → Automate → Optimize

- Plan Consolidation and Management
- Monitoring
- Server Consolidation and Workload Migration
- 1. Integrated Virtual/ Physical Management
- 2. Basic Workload Management
- 3. Rapidly Deploy Virtual Infrastructure
- 4. Basic Image Management
- 5. Business Continuity (HA/DR)
- 6. Security Management
- Advanced Workload Mgmt
- Self-Service Automation
- Advanced Image Management

Core Required Functionality

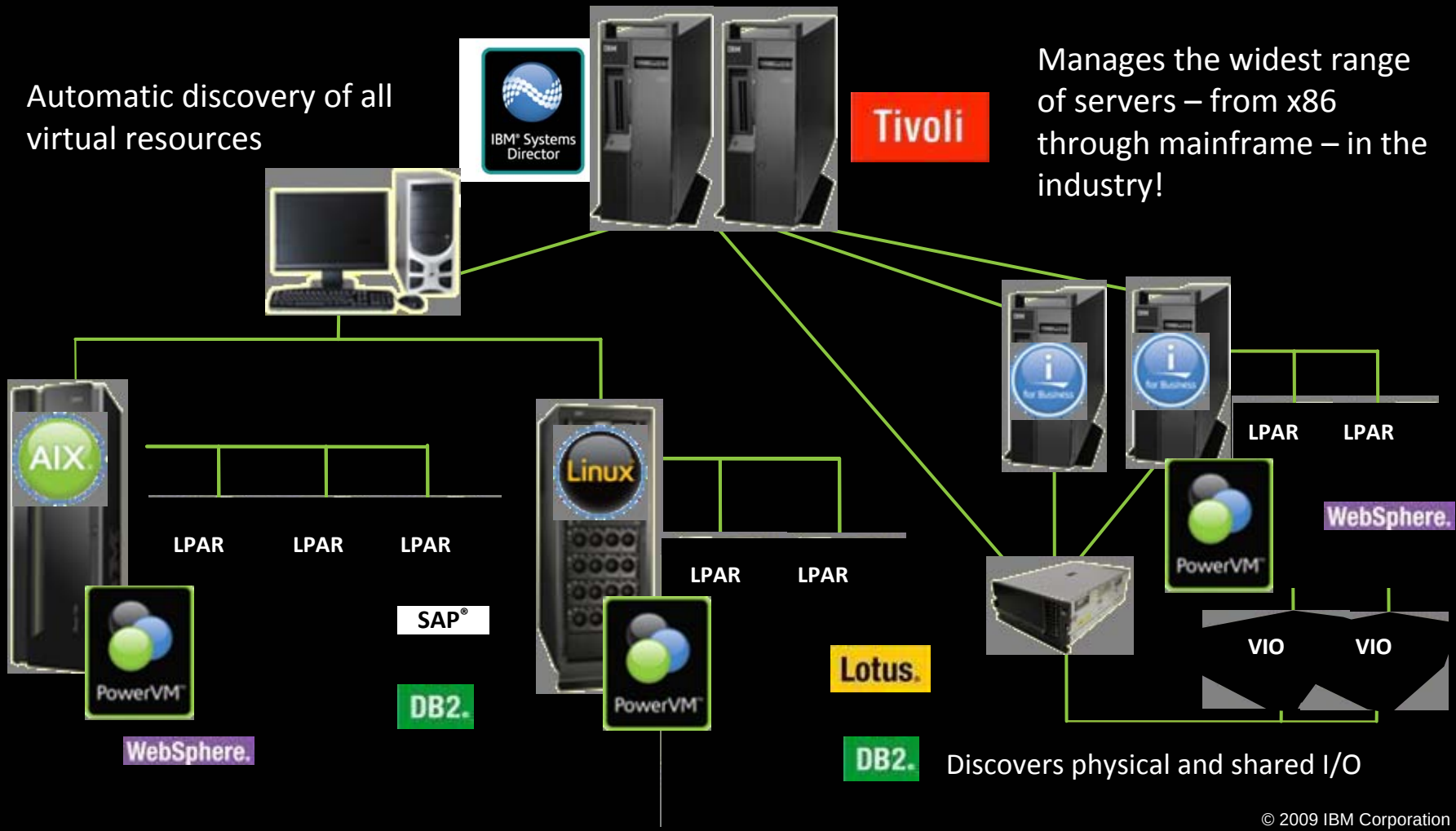
- Automatic/Real Time Discovery
- Central configuration management
- Provisioning
- Monitoring
- License management
- Usage and accounting
- Analytics

1. Integrated Virtual/Physical Management

Improves resource allocation and utilization; reducing cost, improving service, managing risk

Automatic discovery of all virtual resources

Manages the widest range of servers – from x86 through mainframe – in the industry!

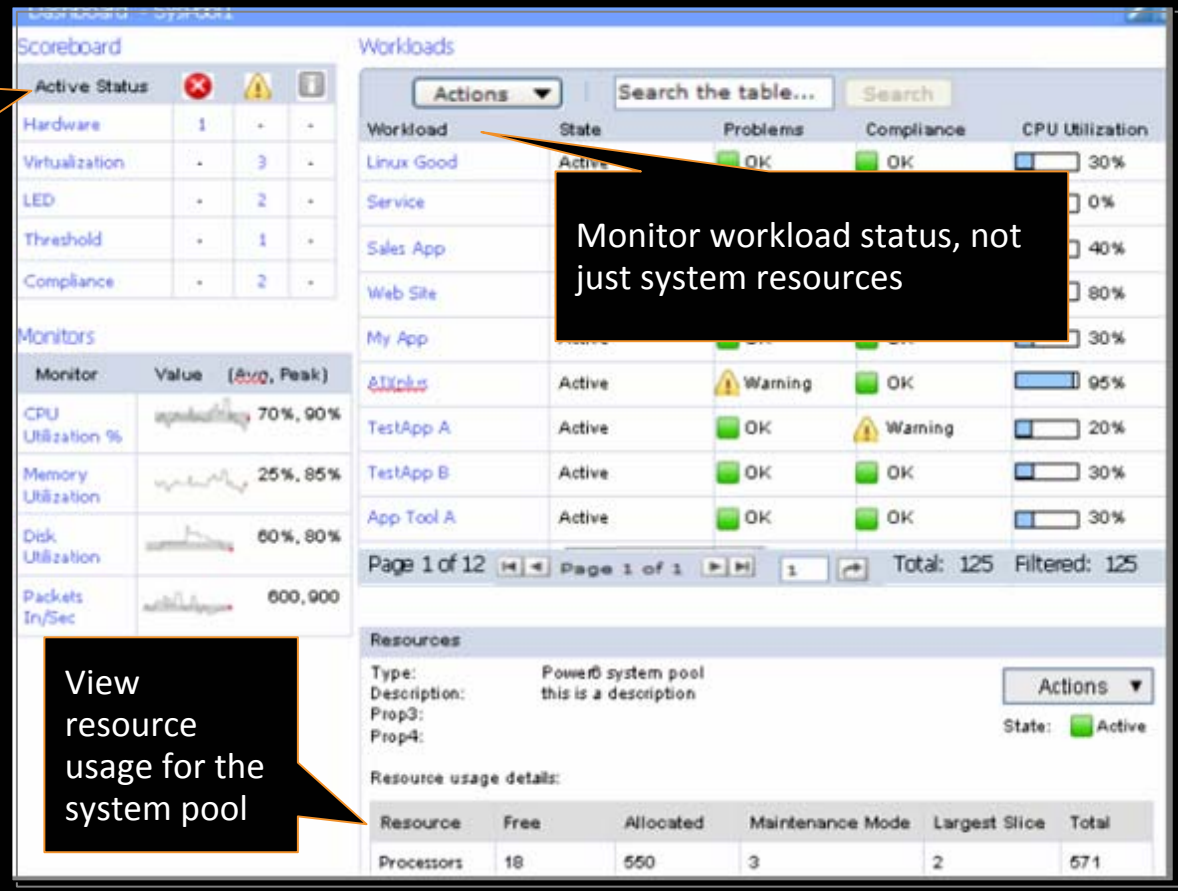


Discovers physical and shared I/O

1. *Integrated Virtual/Physical Management*

Single, comprehensive view enables improved responsiveness, service & reliability

Get an overall view of system pool status



Monitor workload status, not just system resources

View resource usage for the system pool

System Pool Dashboard

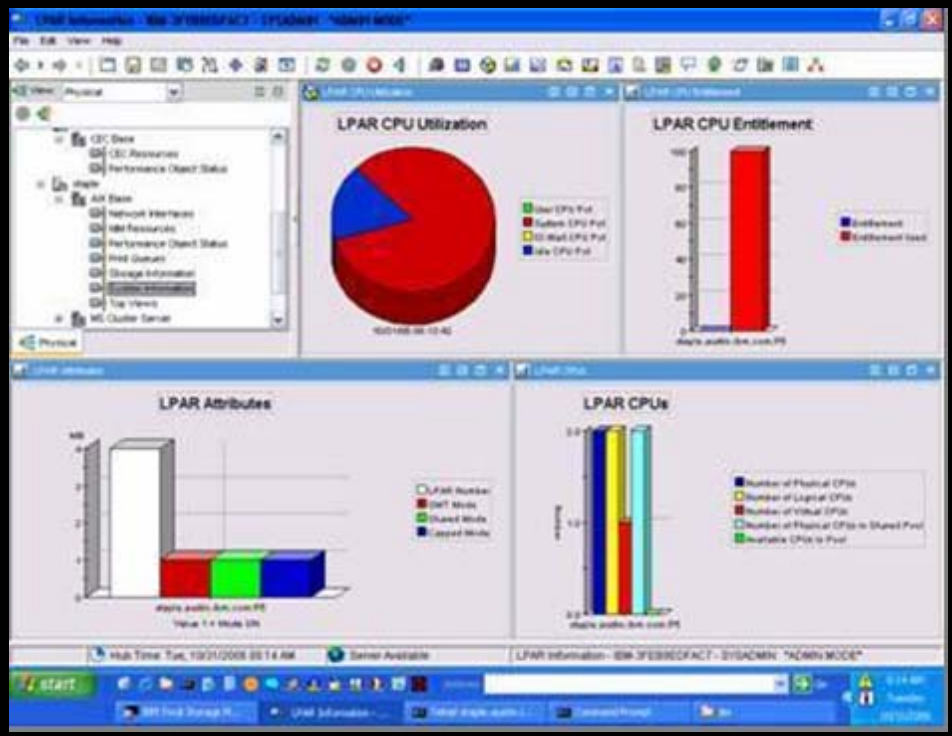
- Workloads running
- Resources used/available
- Aggregated monitoring
- Aggregated Status

IBM System Director VMControl

1. *Integrated Virtual/Physical Management*

Improves decision making, enabling greater performance, reliability; reducing cost, improving service and managing risk

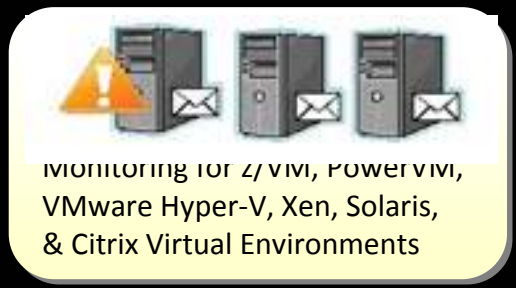
- Monitoring IBM and non-IBM virtualized environments, energy, OS, applications & transactions
- Visualize virtual server historical utilization
- Automate best practices in response to system events
- Visualize virtual performance problems
- Real-time and historical data analysis
- Executive level reports

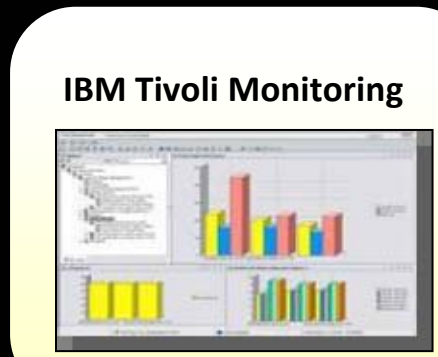


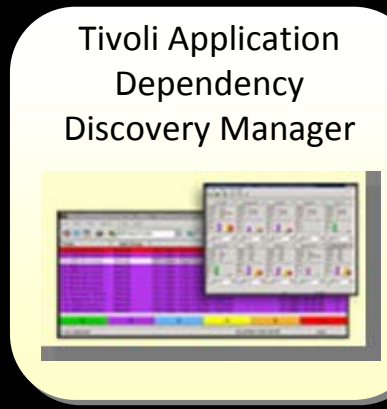
IBM Tivoli Monitoring

1. *Integrated Virtual/Physical Management*

Align Automated Problem Resolution Processes with Business Priorities
Reduces service interruptions – improving reliability and service







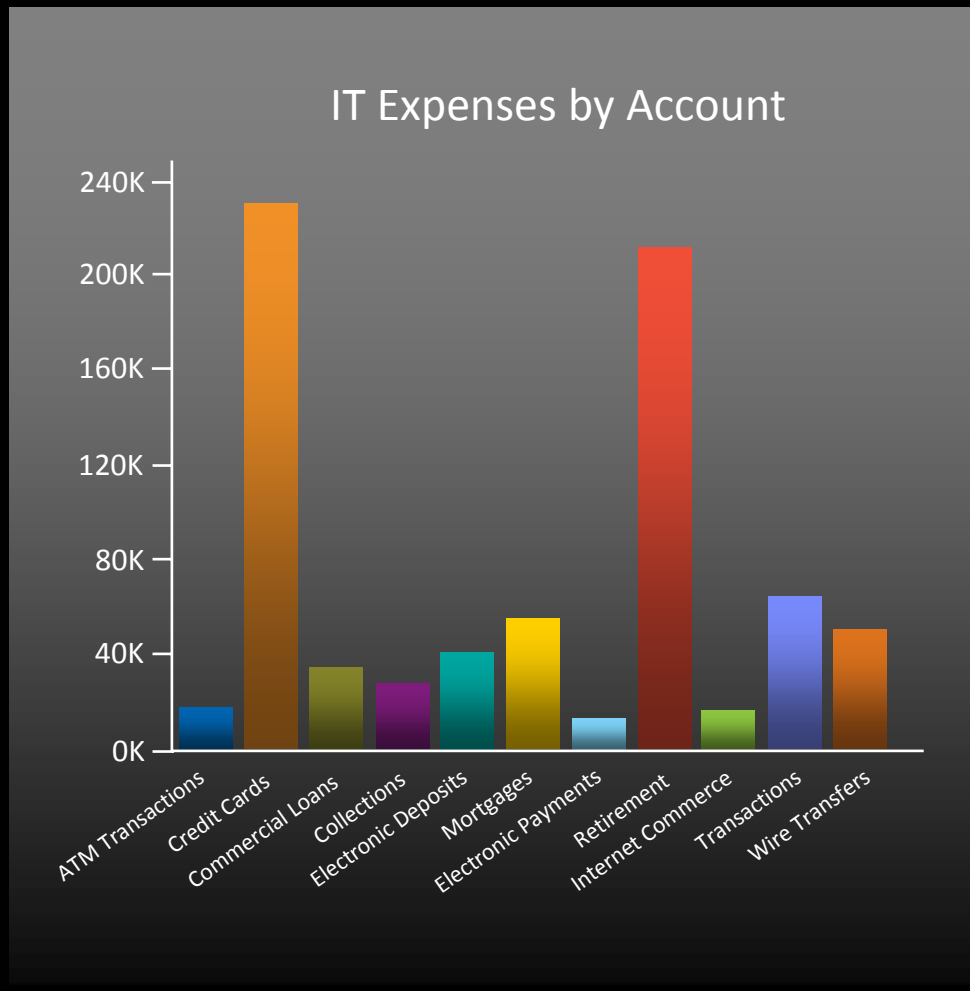
1. Error detected in Virtualized environment,
2. Errors consolidated, filtered, and correlated. Trouble ticket created.
3. TADDM used to identify affected applications and servers.
4. Priority assigned to the trouble ticket & corrective actions identified.
5. Error is recorded in Tivoli Data Warehouse and is tracked / reported to identify resource bottlenecks and plan for future capacity needs

1. *Integrated Virtual/Physical Management*

Improve resource utilization & allocation leading to reductions in cost

IBM Usage and Accounting Manager Virtualization Edition

- Understand costs and track, allocate and invoice by department, user and many additional criteria
- Easily forecast growth by department to justify year-to-year budget changes
- Consolidates a wide variety of usage data with Data Collectors
- Collects, analyzes and bills based on usage and costs of shared computing resources



2. Workload and Utilization Management

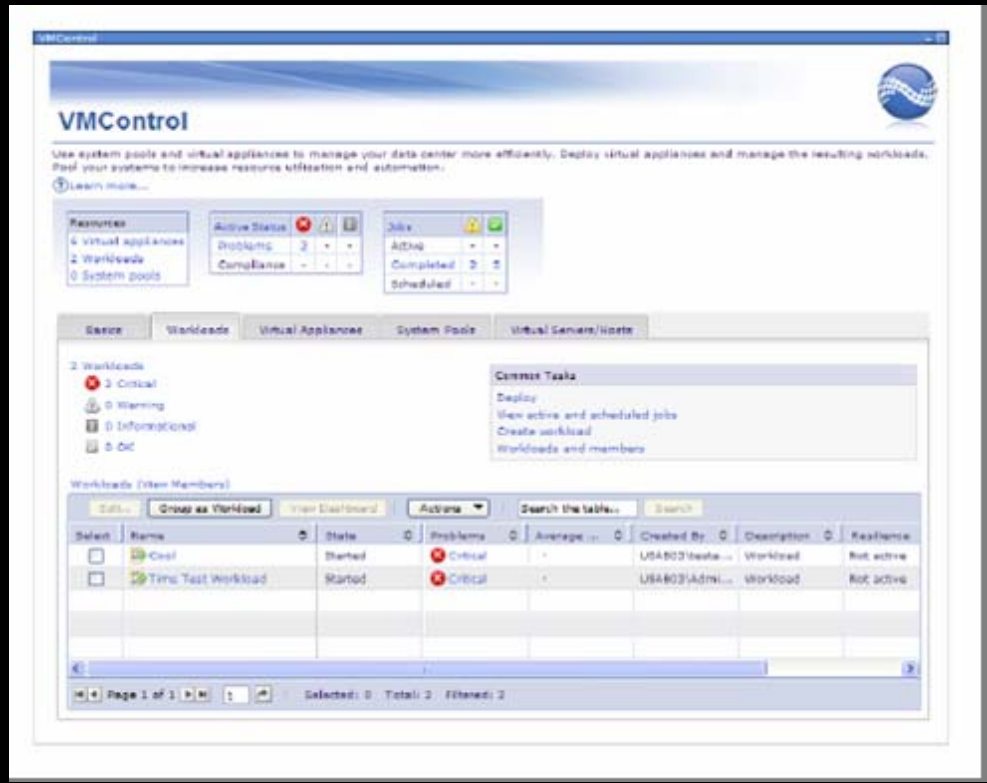
Reduced complexity & increased visibility improves responsiveness and service; reducing cost and risk

System Pool capabilities

- Create System Pool
- Add/Remove Hosts
- Monitors Resilient Workloads
- Automatic Placement

Resilience

- Relocate Virtual Servers
- Move virtual servers
- Restart virtual servers
- Resilience workload policies

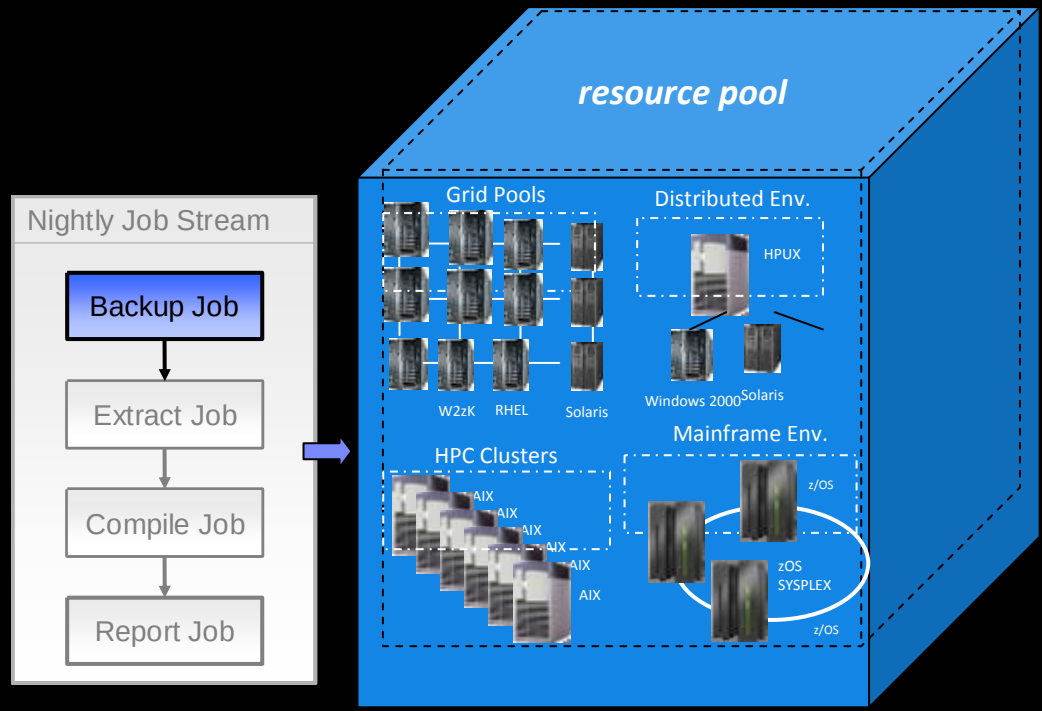


IBM Systems Director – VM Control

2. Workload and Utilization Management

Improve resource allocation and utilization to meet SLAs and reduce cost

- Define tasks in a workflow
- Specify dependencies and schedule
- Distribute work to available resources
  - Run jobs on any computer with the right resources
  - Limit how many jobs of a certain type execute at once, to follow software licenses
- Display results - did the job complete without errors and on time?



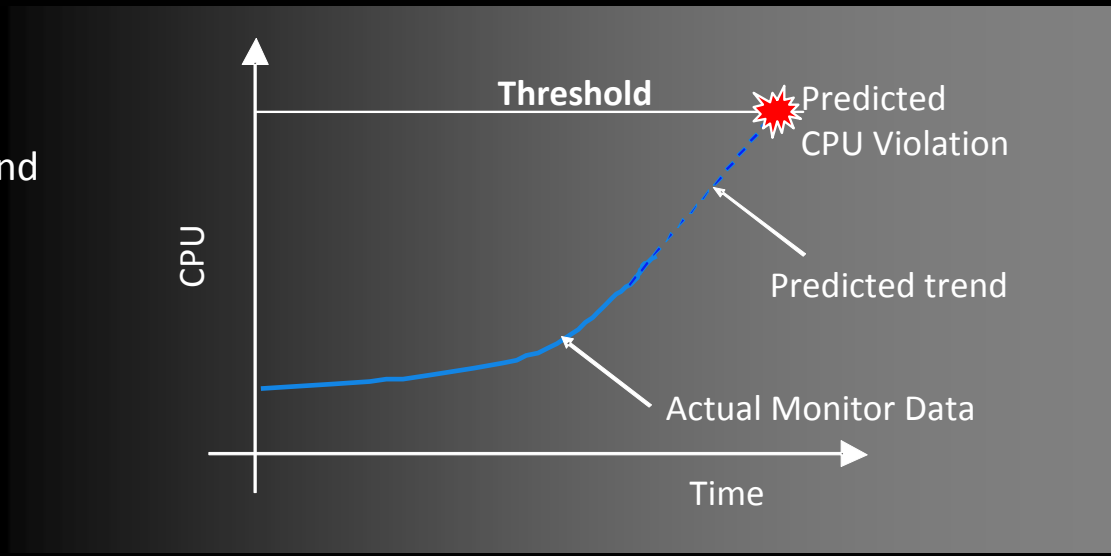
From Wikipedia - The concept of Workload Automation is an evolution of traditional job schedulers which needed to react to the dynamic demands of IT.

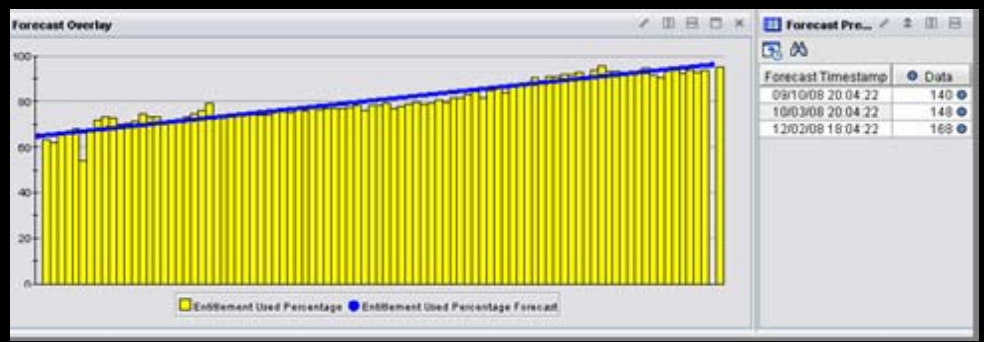
…to reduce transaction processing times by 80%

2. Workload and Utilization Management

Analyze capacity and performance trends to increase reliability, eliminate service interruptions to improve service and manage risk

- Future predictions based off historical warehoused data.
- Predict when CPU, Memory, Storage and Network will meet limitations
- Proactively respond to near-term & long term performance problems
- Warehouse future trends for capacity analysis reports



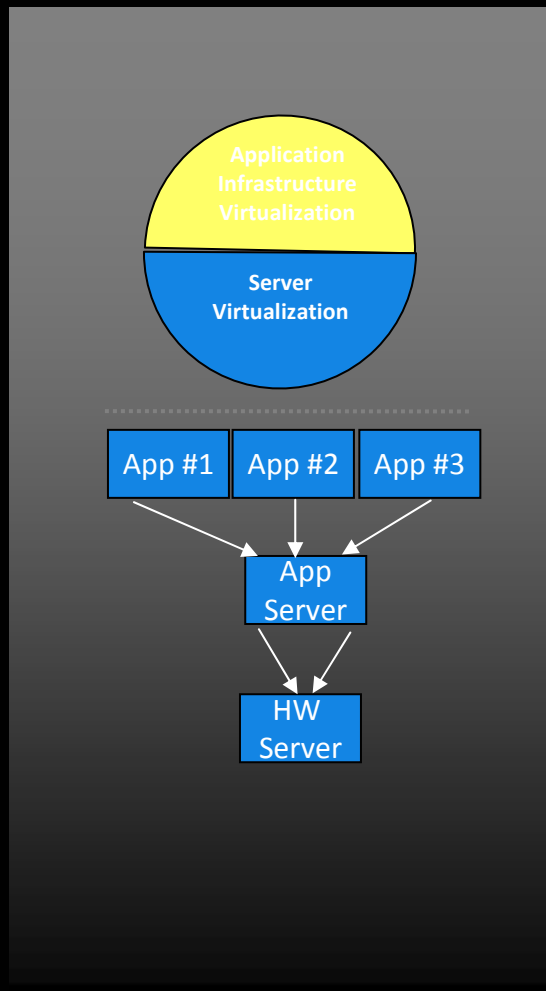


2. Workload and Utilization Management

Optimize throughput and responsiveness

Extend the economic benefits of server virtualization with **DB2 & WebSphere Virtual Enterprise**

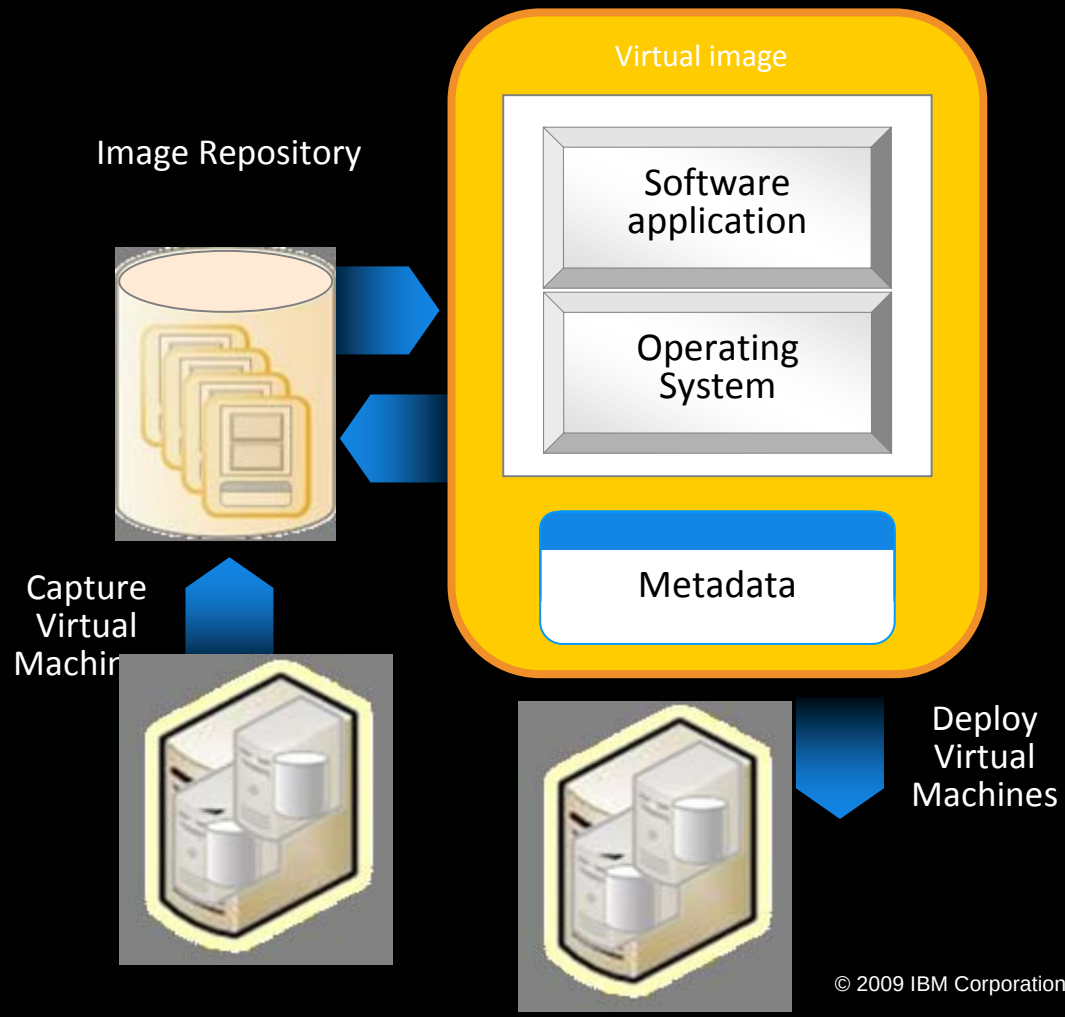
- Manage in-bound transaction (workload) requests in real time
- Route work to the application server that can do it best
- Streamline processing for higher priority requests
- Ensure in-bound requests do not overwhelm backend application resources
- DB2 optimized to support Dynamic Logical Partitioning so workload performance scales without intervention
- Dynamic-resource awareness ensures H/W can be maintained, firmware upgraded, and partitions consolidated without application outage
- DB2 exploits PowerHA pureScale and PowerHA SystemMirror for scalability and high availability
- Self-tuning memory and I/O management optimizes DB2 and AIX workloads seamlessly



3. *Rapidly Deploy Virtual Infrastructure*

Reduce risk, increase productivity and responsiveness; improve service

- Dynamically capture composite images
- Deploy composite images and change configuration
- Support and extend Open Virtualization Format (OVF)

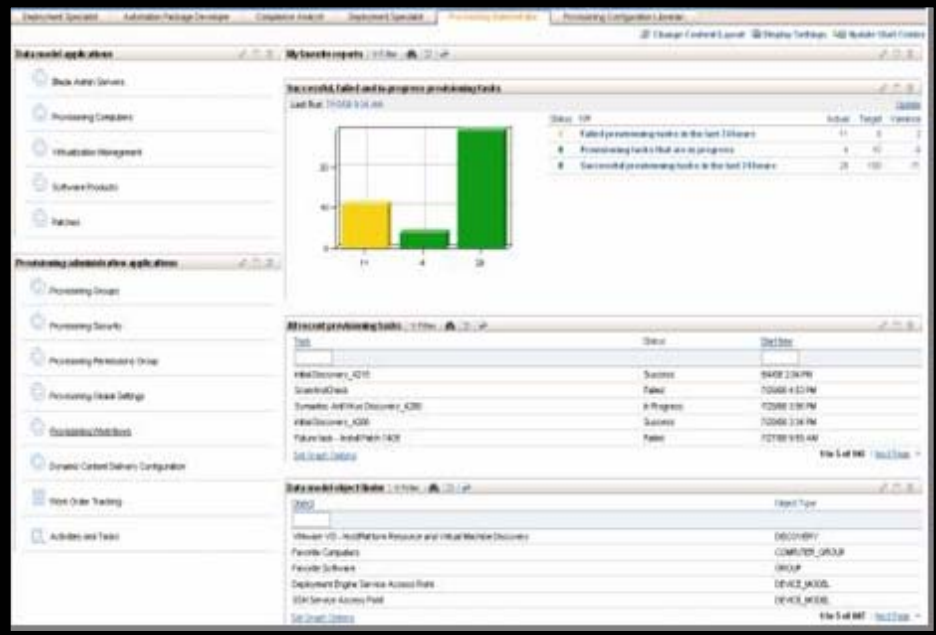


3. *Rapidly Deploy Virtual Infrastructure*

Automatic deployment of workloads in a virtual environment improves responsiveness and service while minimizing risk

Tivoli Provisioning Manager

- Process Integration
- Compliance Management
- Resources
- Discovery
- OS Provisioning Inventory
- Software Deployment
- Desired State Management



… reduces labor costs by 40-80% by increasing server image/administrator ratio

3. *Rapidly Deploy Virtual Infrastructure*

Standardized deployment of middleware applications into a virtualized environment

WebSphere CloudBurst Appliance Process

1. User selects a pre-built middleware pattern depending on their needs
2. WebSphere CloudBurst dispenses that pattern to a pool of Hypervisors
3. In just minutes, user is ready to deploy applications on the middleware

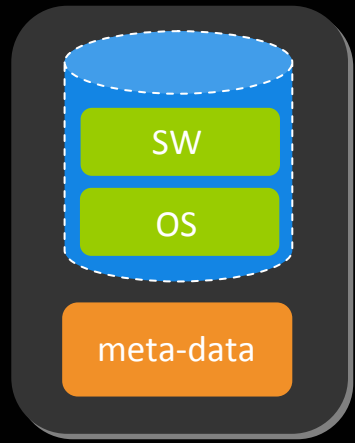
What takes **hours** to deploy today, takes **minutes** with WebSphere CloudBurst Appliance

- Manage standard patterns of middleware services,
- No longer deal with the details of middleware installation & configuration
- Quicker time-to-value, improved consumability, and lower costs

4. *Basic Image Management – Virtual Images*

Faster deployment, increased responsiveness and service

- Discover image repositories
- Import virtual appliance packages
- Image conversion (P-V, V-V)
- Image Library with Federation
- Image Versioning & Change Management, ownership
- Policy based zoning



Virtual Appliance

From Wikipedia - A virtual appliance is a virtual machine image designed to run on a virtualization platform. A virtual appliance is not a virtual machine, but rather a software image containing a software stack designed to run inside a virtual machine.

6. Security Management

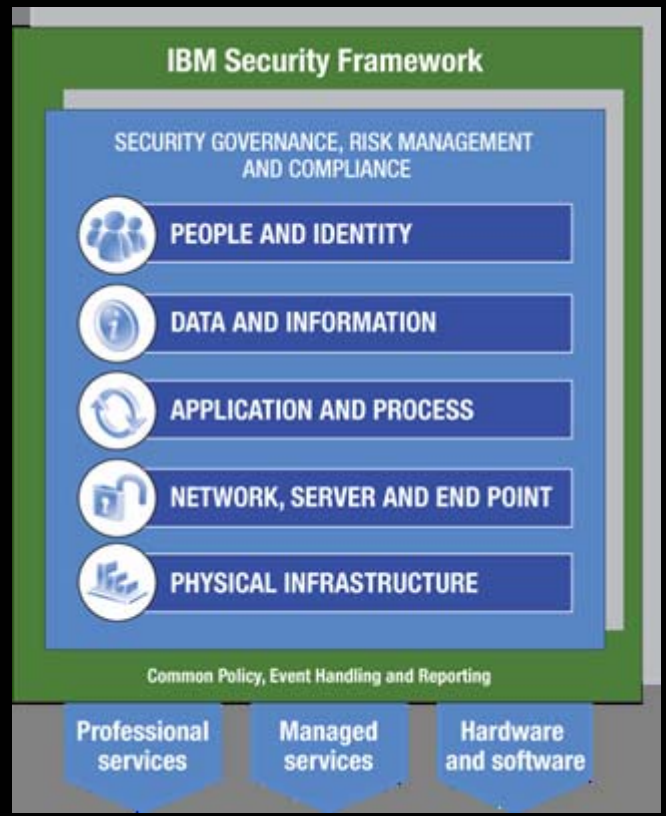
Security framework reduces complexity and minimizes risk

New complexities

- Dynamic relocation of VMs
- Increased infrastructure layers to manage and protect
- Multiple operating systems and applications per server
- Elimination of physical boundaries between systems
- Manually tracking software and configurations of VMs

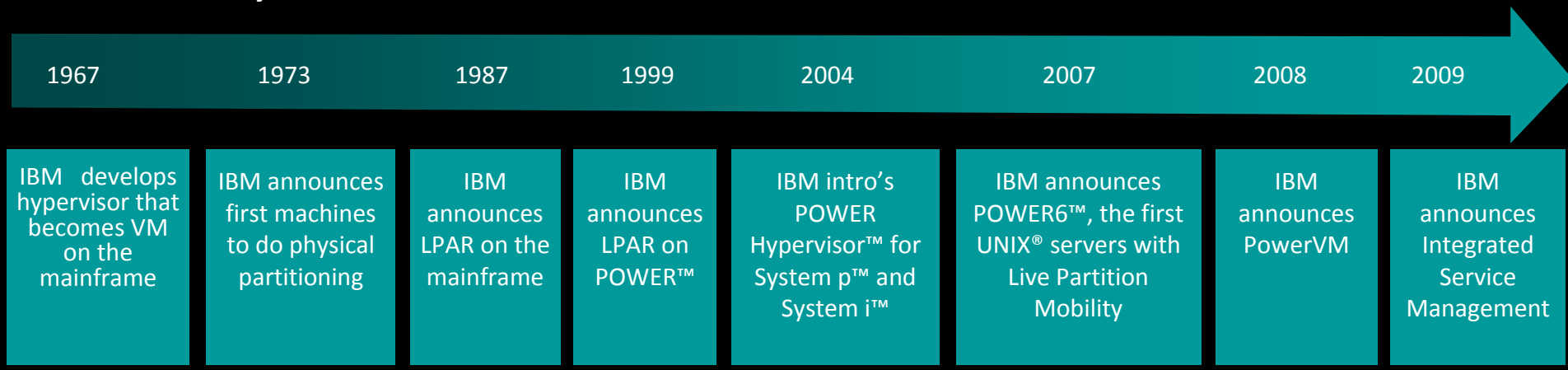
Require a comprehensive approach

- Authentication and role-based access control
- Isolation Management
- Integrity management
- Risk and Compliance
- Threat / Malware Management



IBM has an unmatched history of virtualization leadership

A 40-year track record in virtualization innovation



IBM's Undisputed Virtualization Leadership

- 70% of all System Workload is running on IBM Virtualization platforms
- Common platform scalable from x86, p, z
- Unlimited Scalability - allows any VM to utilize All CPU cores & All physical memory
- Loss Protection - backup and recovery of both physical and virtual servers
- Usage and Accounting - captures virtual machine usage for internal chargeback billing
- License management - 3rd party application software on a per VM basis
- Broad Hypervisor support, Self service provisioning

Summary

Leverage IBM Virtualization for added business value

IT benefits:

Reduce Cost

- Reduce complexity
- Enhance resource utilization
- Recapture floor space
- More efficient power & cooling

Improve Service

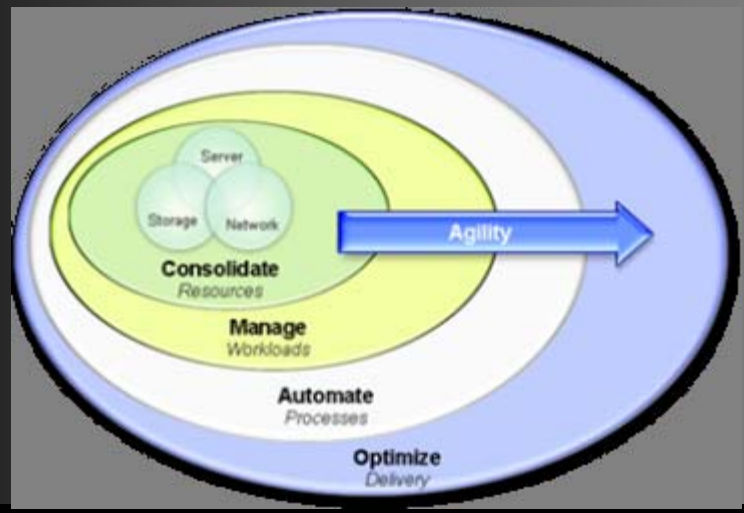
- Performance scalability
- Improve service levels
- New services online quickly

Manage Risk

- Phased adoption approach
- Investment protection
- Improve uptime / availability

Business benefits:

- Respond to new business opportunities quickly
- Process more information in real-time to make better business decisions.
- Consolidate operations
- Reduce infrastructure redundancy
- Improve employee productivity



Take action now!

- Visit the IBM Virtualization web site at **ibm.com**/systems/virtualization
- Schedule an in-depth briefing and demo on IBM Virtualization Solutions that map to your needs
- Join the IBM Virtualization Community at **ibm.com**/community/cloud

Thank You!

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Simply put, IBM is making systems smarter.