Service Management World Tour

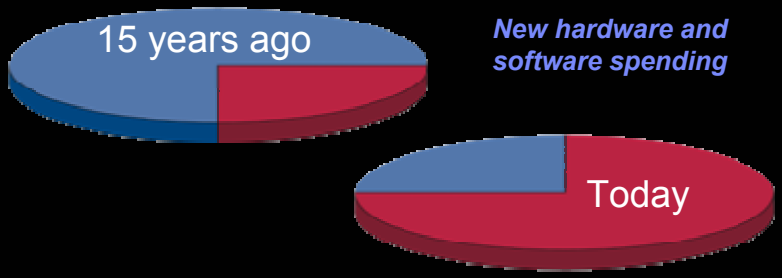
Improve ROI of Consolidating Workloads to Linux on System z -- with IBM Tivoli solutions

Agenda

- Linux on System z -- Ideal Platform for Consolidation
- Managing the New Workloads
- IBM Tivoli Service Management Center for System z
- Suggested Reference Architecture
- Why IBM Tivoli
- More Information Resources

Consolidation Drivers: Lower TCO, Better Resource Utilization of System z

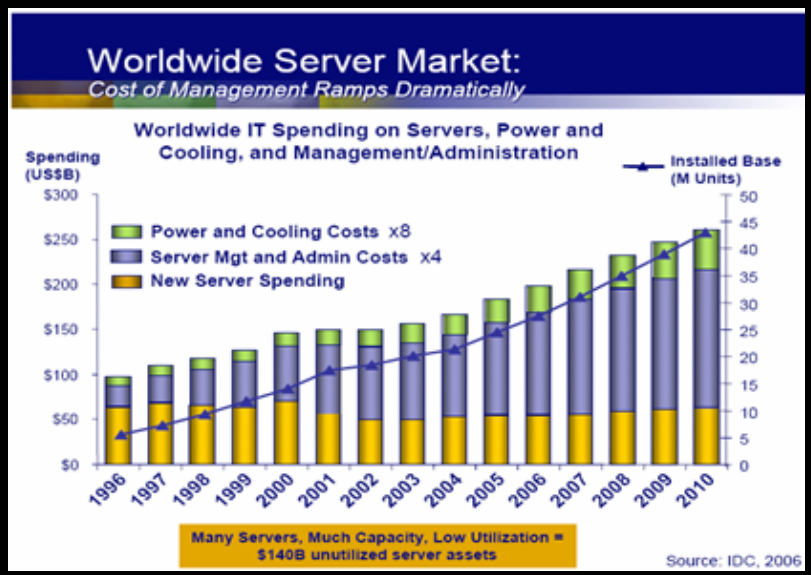
Rising Costs of Management and Administration



Source: Tony Picardi, IDC
Economist.com: Make it simple. Oct. 28, 2004
From The Economist print edition

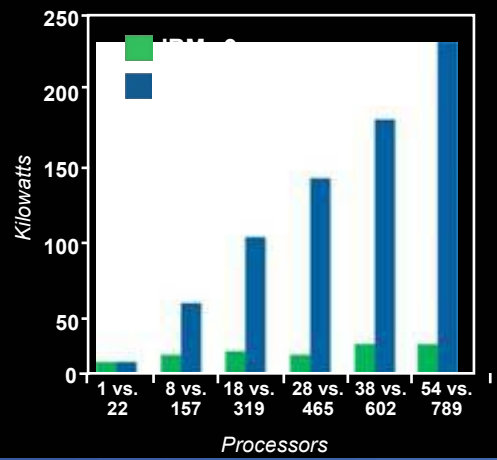
System z Effectively Manages Growth and Complexity

Gartner

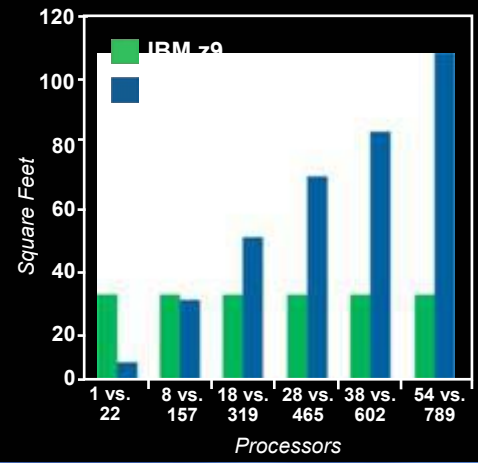


System z: More Performance and Capacity than Linux

POWER:
System z vs. Linux on Intel



SPACE:
System z vs. Linux on Intel



Linux on System z Provides an Ideal Platform for Key New Workloads – Data, Web / WebApp Servings

- **Data Serving challenge: Manage massive processing requirements and meet them quickly**
  - System z scalability supports consolidation of diverse workloads onto zSeries servers
  - "Vertical" scaling consolidates workloads of less powerful processors onto a more powerful processor
- **Web Serving/Web App challenge: Requires many server instances, resulting in complex server environments**
  - z/VM running on a zSeries processor enables "horizontal" server consolidation
  - Capacity is added by obtaining additional servers and integrating them into the network

"With z/VM, the mainframe can support hundreds to thousands of Linux virtual systems on a single mainframe, which can provide excellent total cost of ownership, especially based on software pricing per core."

-- Gartner "Open Source in IBM Mainframe"

IBM Internal Project to Consolidate Linux Servers Onto Mainframes With IFL's

- IBM expects substantial savings by consolidating 3,917 Linux servers to approximately 30 mainframes

- $82M operational savings per year
  - 86% savings in system admin cost
  - 85% savings in floor space
  - 81% savings in power
  - 57% savings in network
  - 41% savings in software support
  - 19% savings in disk storage maintenance

Organizations Move New Workloads to Linux on System z to Cut Costs … Then Think About How to Manage Them

When they decide to move their workloads ...

1. Scenario 1 - Their current solutions may not allow them to manage from System z -- they may not have a rich portfolio for security
2. Scenario 2 - They may be new to virtualization and consolidation and may not have tools to manage this environment
3. Scenario 3 - Apart from consolidation and lower TCO benefits, customers may want to implement a "New Enterprise Data Center" -- a flexible infrastructure that can help IT align closely with the business

Organizations must ensure they have the Visibility, Control and Automation to manage their entire enterprise centrally from System z

Scenario 1: IBM Tivoli brings integrated solutions and capabilities to manage workloads on Linux on System z … and the entire enterprise

End-to-end solutions for managing the enterprise

- End-to-end Operations Management
  - Integrated and automated solutions for service delivery process and processes such as deployment, fulfillment, and change and release management
  - *#1 in Worldwide IT Operations Management - Gartner (6th consecutive year)*
  - *#1 in System Management Software - IDC*
  - Dynamically allocate workloads to best available virtual resource, and resolve cross-workload and physical resource dependencies
- Highest Availability and disaster recovery
  - Reduce the number and duration of service disruptions
  - Help ensure high availability of critical applications with policy-based healing and automation capabilities

Highest level of Security with rich set of applications

- Provide integrated, end-to-end security management including identity protection, access control and regulatory compliance

Scenario 1:
Customer's management solutions may not allow them to manage from System z. They may not have a rich portfolio for security.

Scenario 2: IBM Tivoli provides the tools to manage virtualized environments and realize the benefits of moving workloads to Linux on System z

- Proactive Monitoring and visualization tools are vital for managing the new environment
  - Need a comprehensive and cohesive view of IT resources; rapidly isolate and analyze problems before service levels are threatened
  - Need advanced real-time visualization of services and processes to monitor, measure availability - performance
- Provide end-to-end automation of system and application availability across applications
- Dynamically manage workloads across the virtualized environments and provide best resource utilization
- ★ – Ranked "All Star First Team" by analyst EMA
- Track assets to understand how and where they are deployed, and reconcile actual assets
- Accurately assess which IT resources are being utilized, and provide chargeback

Scenario 2:
Customers are new to virtualization and consolidation, and may need a different set of solutions for this new environment

Scenario 3: Innovative, Best-of-Breed Tools Help Organizations Implement a "New Enterprise Data Center"

IBM Tivoli Service Management Center for System z provides …

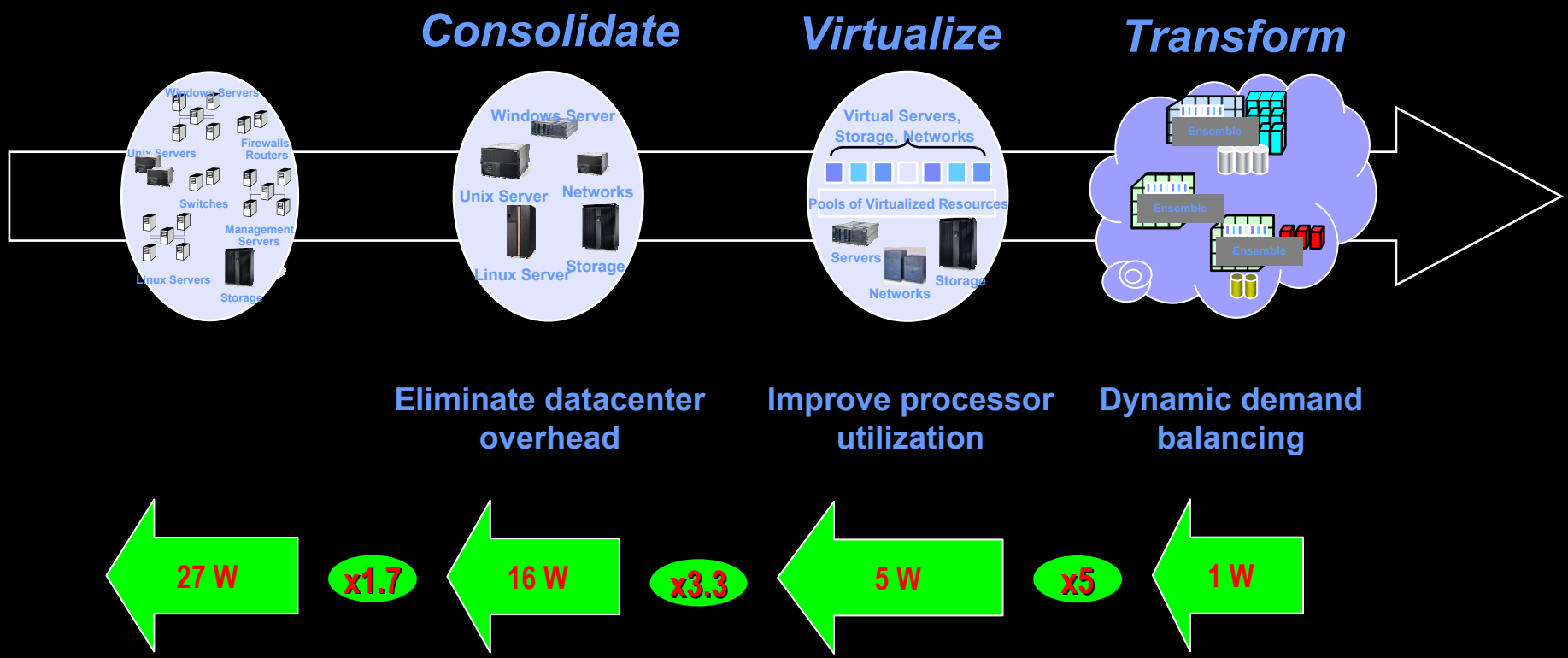
- Dynamically provision and de-provision servers on demand and ensure full utilization of resources
- Understand the impact of incidents or changes
- Real-time service visibility & intelligence; Plan, test and execute IT Service continuity
- Automate key process steps such as release targeting, testing and deployment
- *Highest Rated, OvumSummit ITSM Vendor Report Card*
- *Leader, Datamonitor Vendor Comparisons for ITSM and Desktop Management*
- Create a **Cloud Computing environment** – a highly efficient, trusted, energy efficient and virtualized environment for consolidation and high speed processing

… a compelling new way to deliver service

Scenario 3:

Apart from consolidation and lower TCO benefits, customers may want to implement a "Dynamic Data Center" -- a flexible infrastructure that can help IT align closely with the business.

Infrastructure: From Consolidation to the Cloud



IBM Tivoli Solutions Address Data Serving and Web Serving Management Needs Caused by Consolidation

Data Serving Challenge:

Manage massive processing requirements and meet them quickly

- Manage incidents, analyze and prioritize risks
- Get visibility into system health and quickly resolve issues
- Dynamically manage workloads across virtualized resources, resolve priorities and provide service assurance with critical path analysis
- Improve system availability and productivity

Web Serving Challenge:

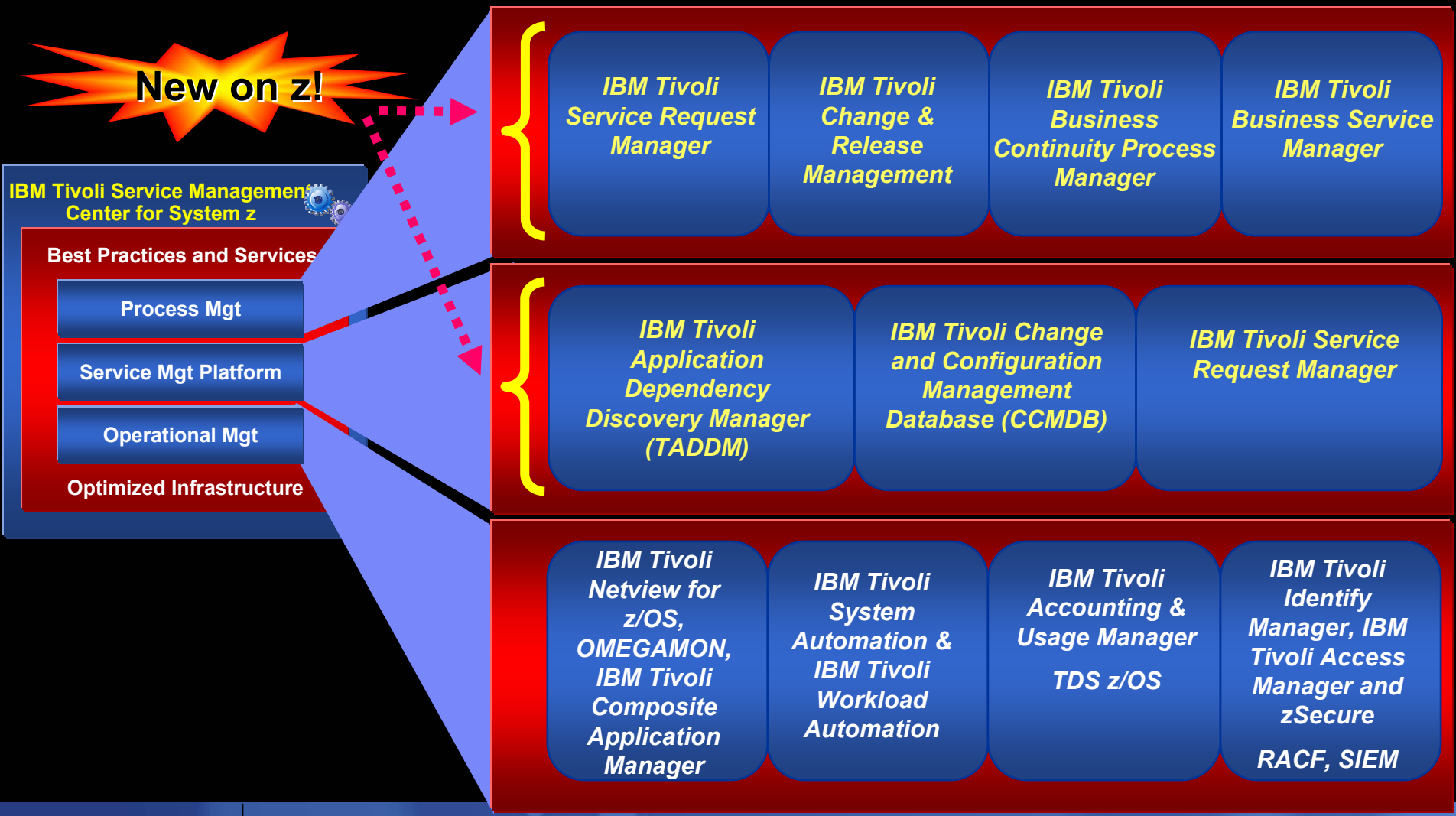
Requires many server instances, resulting in complex server environments

- Discover application dependencies, see the configuration details, store them in central place and manage changes to the environment
- Manage incidents and analyze and prioritize risk based on SLAs
- Manage your assets and provide chargeback based on their usage
- Maintain high availability with single point of control and HA/DR automation

IBM Tivoli's Service Management Center for System z:
Providing organizations with the Visibility, Control and Automation to use System z as the hub for managing their entire enterprise

- Implements service management with System z as the core platform for managing services that often span diverse operating systems and platforms
  - Not a product, but a portfolio of integrated solutions, organized into management domains
- Provides unified means for z practitioners to have enhanced visibility, control and automation of the services delivered to their customers
- Manages a System z virtualized environment and the high utilizations of consolidated workloads to reduce your environment complexity and overall energy consumption
- Exploits the operational advantages of System z to deliver and expand enterprise services managed as a utility

Service Management Center for System z Provides a Rich Set of Solutions for Managing z Linux Environment



Management Considerations during a System z Consolidation Project

During analysis phase to determine what workload is appropriate to consolidate, also consider

I. What is needed to manage consolidated environment

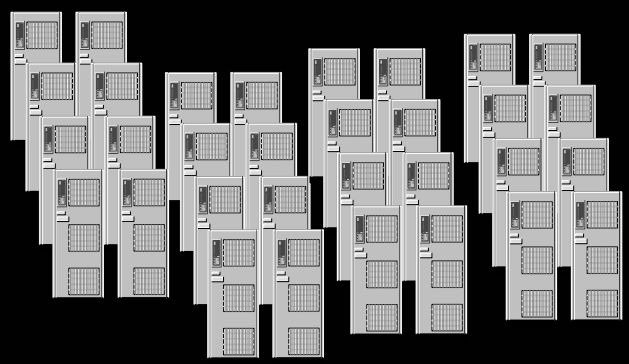
II. Where the management solution runs

III. Incremental approach leverages existing investments

IV. Common service management process automation infrastructure

Manage the new System z Consolidated Environment

- Visualize, control and automate the consolidated operating environment
- Improve availability with performance monitoring and automation
- Realize the total cost of ownership (TCO) advantages of consolidating
- Design for operational advantages up-front
- Leverage existing skills and centralized management
- Optimize the use of physical hardware with correlation to virtual resources



System z Consolidation
(10:1 - 20:1 reduction in physical servers) *

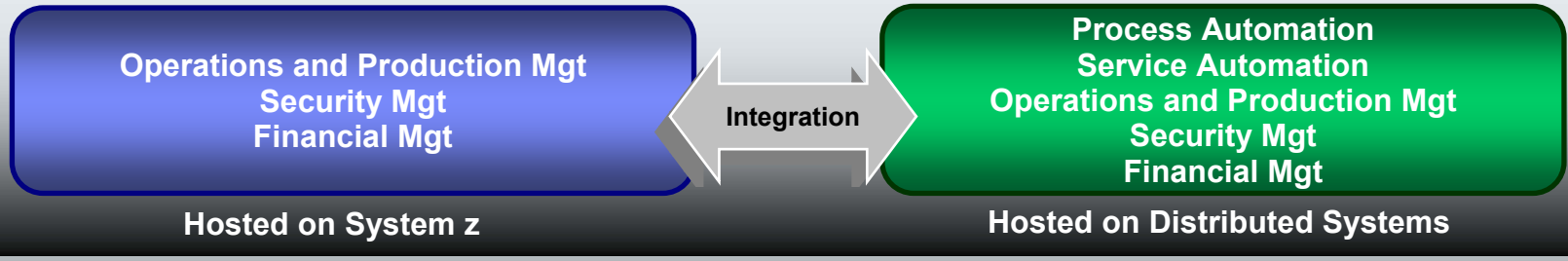
- ✓ **Simplifier**
- ✓ **Faster**
- ✓ **Cheaper**

New consolidated System z environment

*** Analysis required to determine workload appropriate for consolidation.**

Flexible Approach to Where to Run Management

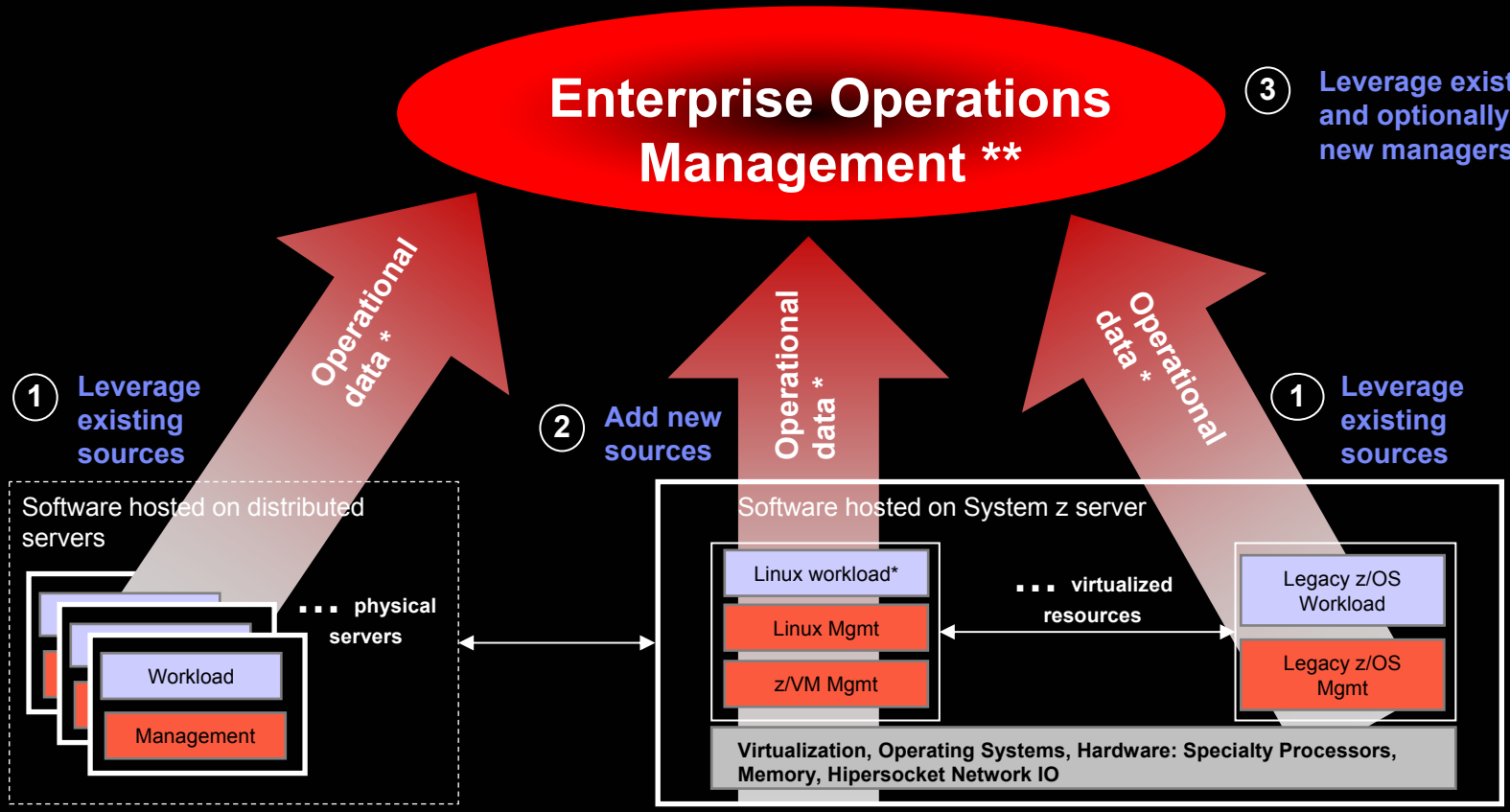
- **Traditional service management implementation:**



- **Consolidated IBM Service Management Enterprise Hub implementation:**

- ✓ Management solution can be consolidated to run on System z
  - Flexibility allows for same TCO benefits of consolidating applications
  - Management for Enterprise can be “managed from“ System z
- ✓ Legacy z/OS management provide basis for centralized management and common infrastructure

Incremental Approach Leverages Existing Investments



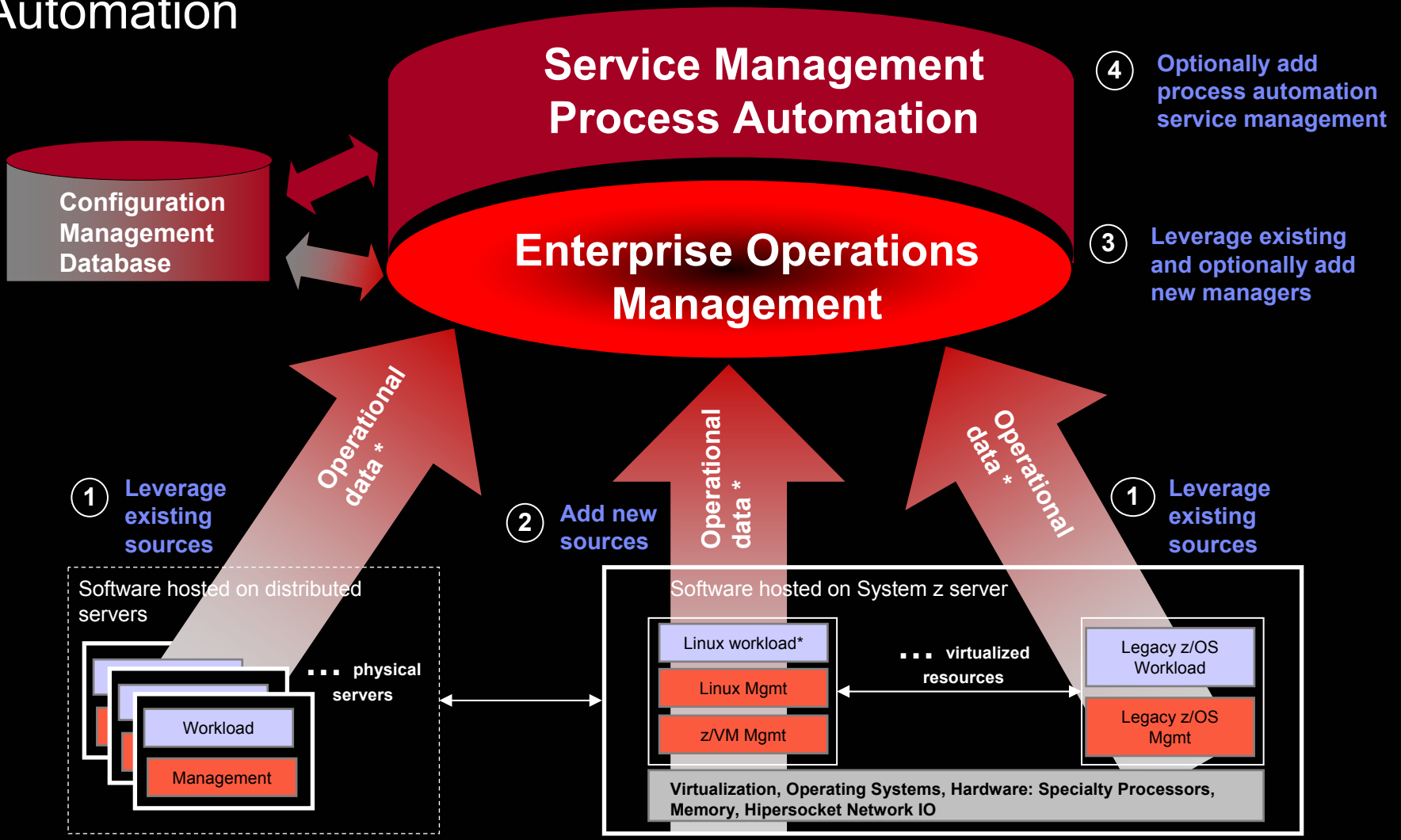
Flexible approach to incrementally adding management

- ✓ Multiple starting points
- ✓ Leverage both IBM and 3rd party management tooling

* Operational data includes events, discovery, key performance indicators, availability, compliance, usage accounting, etc.

** Centralized Operations Enterprise Managers perform remote analysis across many resources for reporting, event viewing, topology, inventory, dashboards etc.

Common Infrastructure Enables Service Management Process Automation



* Operational data includes events, discovery, key performance indicators, availability, compliance, usage accounting, etc.

** Centralized Operations Enterprise Managers perform remote analysis across many resources for reporting, event viewing, topology, inventory, dashboards etc.

Why IBM Tivoli ?

We offer the most comprehensive solutions for Linux on System z to help organizations realize lower TCO while providing superior levels of service

Service Management Center for System z delivers:

- The best end-to-end event-management solutions
- A very broad and rich set of process-management tools
- A reliable, repeatable, resilient incident-management tools
- The capacity and flexibility to dynamically address business process change and increase efficiency
  - Example: Provision/de-provision servers on-demand while ensuring maximum asset utilization
- Ability to map the application and resource dependencies, monitor the resource usage, and provide chargeback
- The option to take incremental steps when managing new workloads by leveraging existing mainframe solutions
- Significant time and resource savings to manage the consolidated mainframe environment versus a distributed one
- The highest level of end-to-end security, access control, identity protection and compliance.

Casas Bahia: Maximizing Marketing *and* Cutting IT Costs

Client Needs:

- Implement a sales reporting system to analyze trends and gauge success of specific marketing campaigns
- Consolidate application development on an enterprisewide platform to handle rapid growth while reducing IT costs

Solution:

- Centralize operations on two IBM zSeries 990 mainframes
- Establish a unified change management process using IBM Rational ClearCase and ClearQuest software
- Optimize system performance with Tivoli OMEGAMON XE family of products, Tivoli NetView, Tivoli Business Systems Manager, Tivoli Monitoring, Tivoli Enterprise Console

Client Benefits:

- Improved reporting and development capabilities, while simplifying systems management and reducing IT costs
- Increased Infrastructure availability
- Lowered total cost of ownership for IT environment

Industry: *Retail*

Profile: *One of the largest household goods retailers in Brazil, Casas Bahia operates 500 stores targeting consumers in lower-income brackets. The retailer came to IBM for help in achieving its goal of increasing its customer base from 10 million to 14 million.*

First National Bank of Omaha: z Linux Leads to Consolidation, Virtualization and Major Improvements

Client Needs:

- Simplify large, complex IT infrastructure with more than 600 servers
- Control maintenance costs and 30% annual staff growth
- Improve average 12% server and 14% storage utilization rates
- Manage continual capacity growth to handle peak transaction volumes

Solution:

- Implemented IBM WebSphere products for banking running on IBM System z with z/VM and Linux virtual servers

Client Benefits:

- **Realized ratio of 18:1 on physical server consolidation by using virtualization, decreasing maintenance costs**
  - Consolidated 560 Intel-based servers to 70 BladeCenter servers
  - Decreased systems staff from 30 to 8 to manage entire infrastructure
- **Capacity Upgrade On Demand provides more mainframe computing resources when extra capacity required**

Industry: *Banking*

Profile: *First National Bank of Omaha is a multi-state holding company founded more than 130 years ago. It serves more than 6.6 million customers throughout the U.S. and has more than 50 location throughout the West and Midwest.*

Olio Carli: Standardizing on z Linux Solves Address Dilemma, Cuts Costs and Increases Efficiency

Client Needs:

- Standardize addresses in growing customer database populated by Web, telephone and written materials
- Correct and update existing records, ensure standardization of new addresses
- Reduce costs from incorrect international shipments

Solution:

- Implement Java-based address standardization product, added to customer's mainframe by installing Linux on System z.

Client Benefits:

- Sub-second address standardization transactions
- Disparate functions consolidated on enhanced mainframe environment, reducing floor space, power and cooling costs
- Enhanced mainframe environment provides capacity for transaction loads, assures reliable network connections, reduces software licensing costs, and more.

Industry: *Retail*

Profile: *Established in 1911, Olio Carli is a leading manufacturer of olive oil in Italy and recently expanded distribution to France, Germany, Austria and the U.K. It's website is accessible in four languages and is a benchmark for e-commerce in Italy*

For More on Service Management Center for System z

Service Management Center for System z Press Release
http://www-03.ibm.com/press/us/en/pressrelease/23596.wss

- Learn more about IBM Service Management Center for System z
http://www.ibm.com/software/tivoli/features/zsmc/

Tivoli User Community
An active and lively community for Clients, Business Partners, and IT professionals. **Free membership** provides you with valuable resources, tools and networking capability. Log on to www.tivoli-ug.org or visit the ped in the IBM Pulse Expo

Tivoli Training
IBM offers technical training and education services to help you acquire, maintain and optimize your IT skills. For a complete Tivoli Course Catalog and Certification Exams visit www.ibm.com/software/tivoli/education

Tivoli Services
With IBM Software Services for Tivoli, you get the most knowledgeable experts on Tivoli technology to accelerate your implementation. For a complete list of Services Offerings visit www.ibm.com/software/tivoli/services

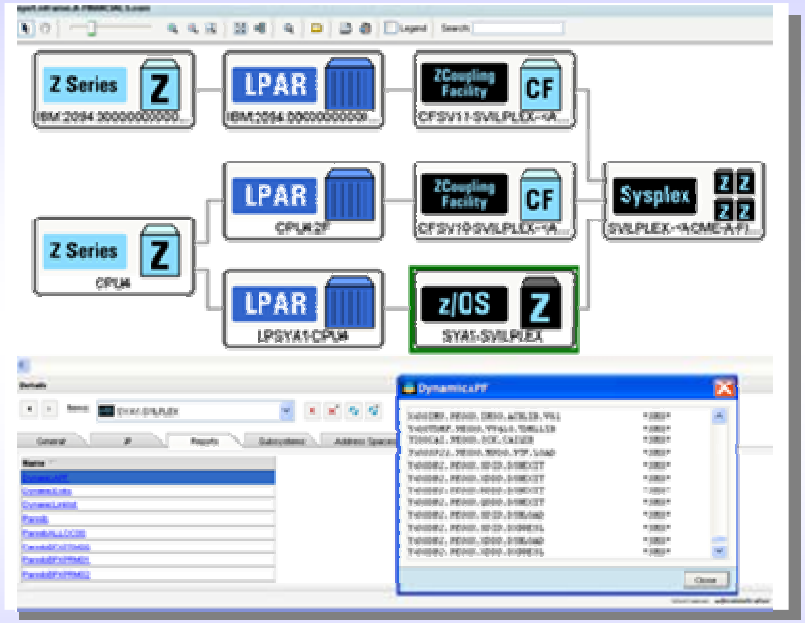
Tivoli Support
IBM Software Premium Support provides an extra layer of proactive support, skills sharing and problem management, personalized to your environment. Visit www.ibm.com/software/support/premium/ps_enterprise.html

THANK YOU

BACK UP

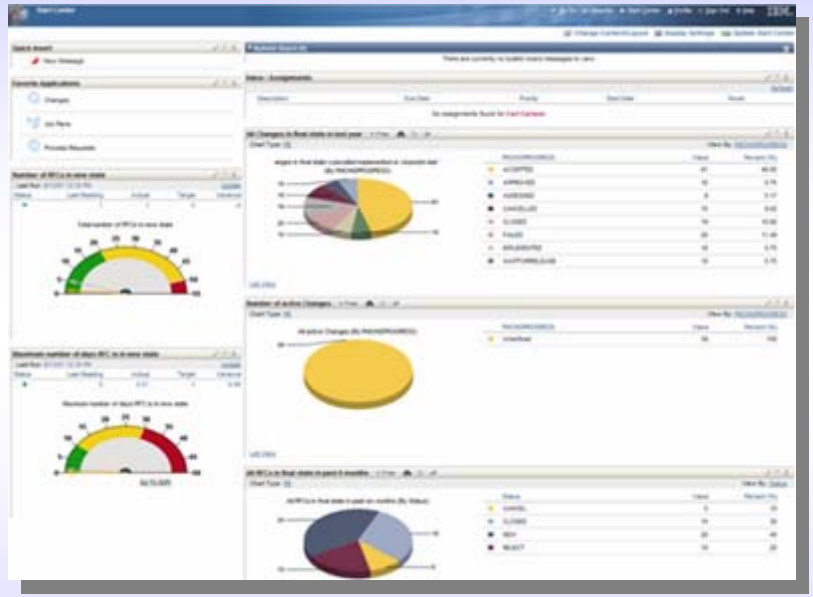
Discover Application Dependencies and Topology with Tivoli Application Dependency Discovery Manager 7.1 for Linux on System z

- **Topology – Enhanced Visualization**
  - Sysplex perspective graph - topology of components that make up a Sysplex, including multiple ZSeries computer systems.
  - HW perspective - topology of components that run on a ZSeries computer system, including multiple Sysplexes.
- **Configuration Data - Greater depth of discovery and handling of large amounts of configuration data**
  - System z report files
- **Discovery - Improved dependency mapping across the distributed and z worlds**
  - IMS Connect and CICS Transaction Gateway discovery
  - Added: distributed apps that access IMS and CICS via the IMS and CICS Gateways



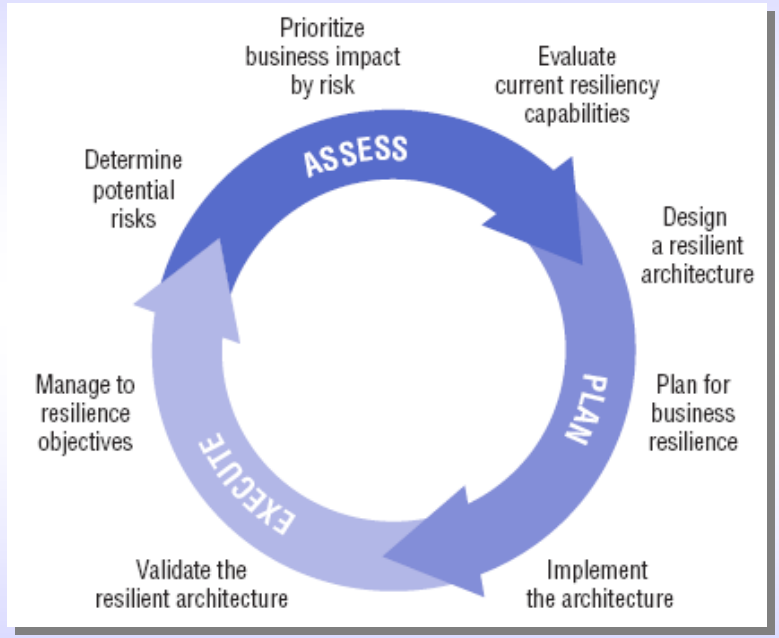
Manage Configuration Details and changes with Change and Configuration Management Database 7.1.1 for Linux on System z

- **ITIL-based processes included with base product**
  - Configuration Management
  - Change Management
- **Discovery engine that loads and maintains a reliable and trusted CMDB**
  - Based on TADDM
  - Robust reconciliation engine
  - Synchronization
  - Federation
- **Release Process Manager delivers the ability to effectively manage and automate deployment of multiple related changes**
- **Role identification and role-based access can easily be defined**



Manage Incidents, and Analyze and Prioritize Risk with Business Continuity Process Manager 7.1 for Linux on System z

- **Assess IT environment in Business Continuity context, in spite of ever-changing IT environment**
  - Integrate into CMDB, change and release management
  - Determine and prioritize risk and business impact
- **Define your Disaster Recovery plan**
  - Recovery Scope
  - Recovery Time and Recovery Point Objectives
- **Manage incidents cross-platform and execute appropriate plan**
- **Test plan and simulate incidents**
- **Assess reports from testing or real incidents to determine if SLAs and objects are met**

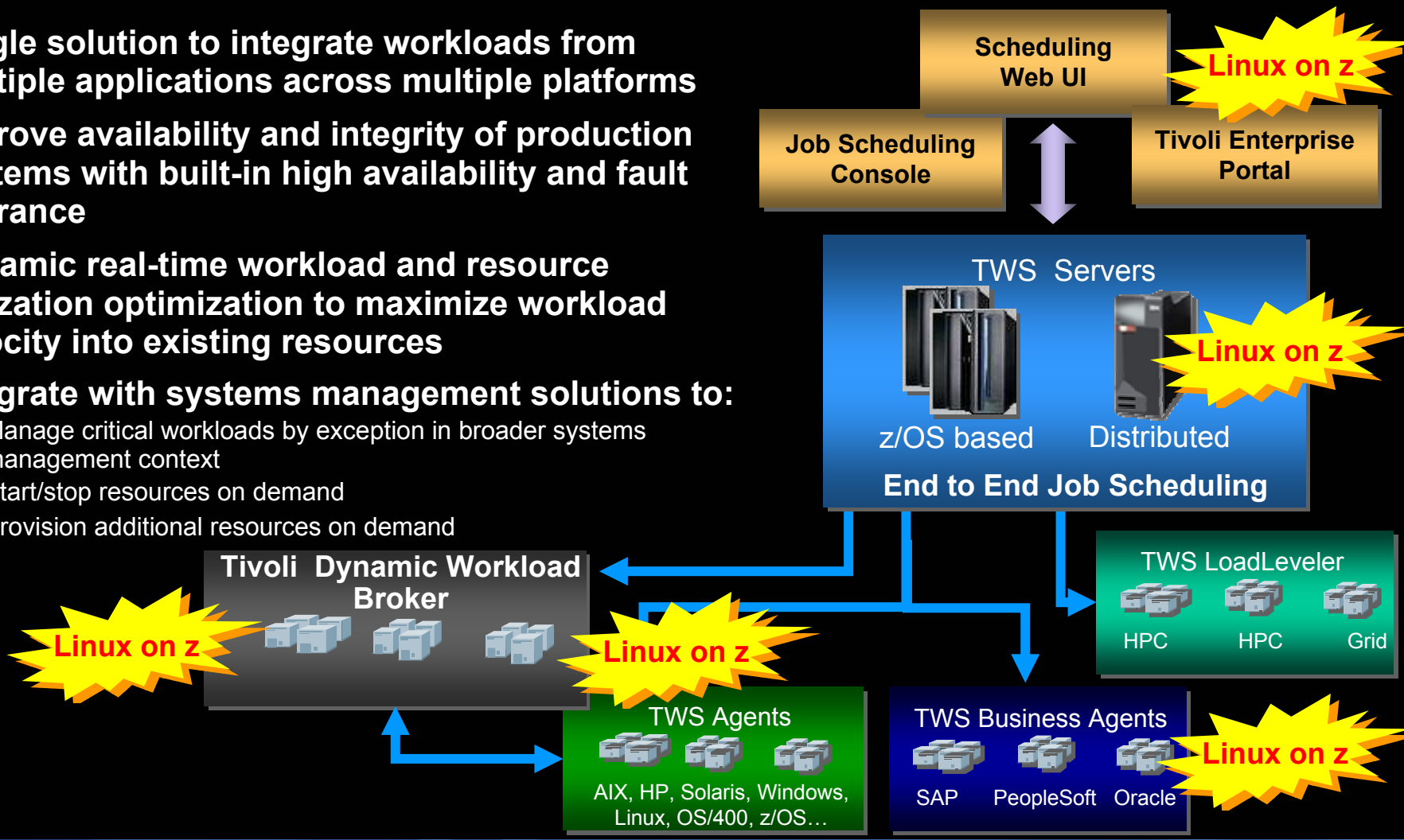


Gain Visibility into System Health and Resolve Issues Quickly with IBM Tivoli OMEGAMON XE on z/VM and Linux

- **Combined product offering that monitors z/VM and Linux for System z**
- **Provides work spaces that display:**
  - Overall system health
  - Workload metrics for logged-in users
  - Individual device metrics
  - LPAR Data
- **Provides composite views of Linux running on z/VM**

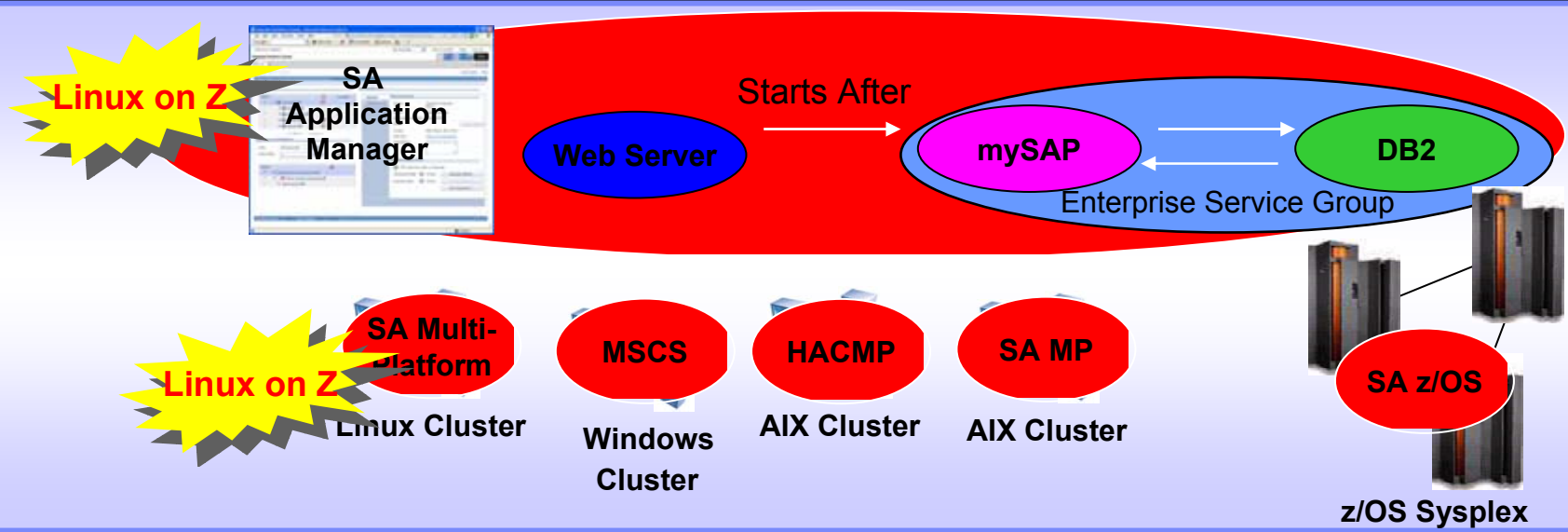
Dynamically Manage Workloads across Virtualized Resources with Tivoli Workload Automation Portfolio

- **Single solution to integrate workloads from multiple applications across multiple platforms**
- **Improve availability and integrity of production systems with built-in high availability and fault tolerance**
- **Dynamic real-time workload and resource utilization optimization to maximize workload velocity into existing resources**
- **Integrate with systems management solutions to:**
  - Manage critical workloads by exception in broader systems management context
  - Start/stop resources on demand
  - Provision additional resources on demand



Maintain a Single Point of Control for HA/DR Automation with the IBM Tivoli System Automation Portfolio

- **Provides single point of control for HA/DR automation across heterogeneous, distributed applications**
- **Extends goal-based automation to the entire application topology**
  - Automatically maintains cross-cluster resources and dependencies when driving observed resource states to desired states
  - Manages HA/DR operations so resources start, stop or move in right sequence in right system
  - Initiate start, stop and move operations with a single click
- **Includes a Business Continuity Process Manager for Enterprise Class HA/DR driven by ITIL-based processes**



Manage Assets and Measure Usage and Chargeback with Tivoli Financial Management Portfolio

IBM Tivoli Asset Management for IT

Enables customers to efficiently and effectively track and manage the lifecycle of IT assets by combining the inventory, financial, maintenance and – optionally with the Contract and Procurement Manager - contract and procurement management of IT hardware and software assets.

MRO Software acquisition
Formerly known as Maximo ITAM

IBM Tivoli License Compliance Manager

Identifies software inventory, measures use activity, and automatically links complex license entitlements to installed inventory and use activity to help manage software costs and license compliance in the distributed environment.

IBM Designed
Formerly known as IBM Tivoli License Manager

Linux on z

IBM Tivoli License Compliance Manager for z/OS

Identifies software inventory, measures use activity, and automatically links complex license entitlements to installed inventory and use activity to help manage software costs and license compliance in the mainframe environment.

Isogon acquisition
Formerly known as SoftAudit

IBM Tivoli Usage and Accounting Manager

Collects existing data about the use of IT resources like OS, database applications and storage devices and allocates those costs to the services that IT provides to the business.

CIMS Lab acquisition
Formerly known as CIMS server

Linux on z collectors

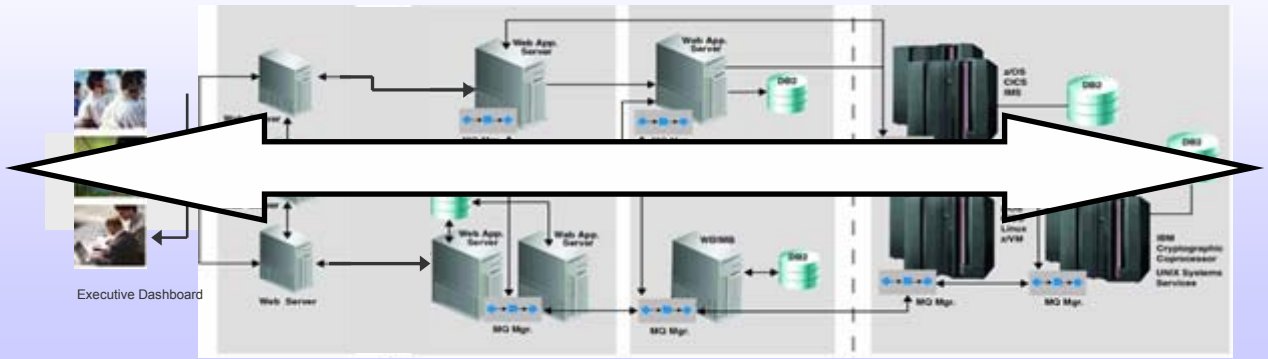
Storage Management for Linux on System z

Backup, restore, protect information

IBM Tivoli Storage Manager:
The leading data protection, retention, archive and recovery management platform for Linux on System z

Supporting z Linux:

- IBM Tivoli Storage Manager
  - Server & Client
- IBM Tivoli Storage Manager Extend Edition
  - Server & Client



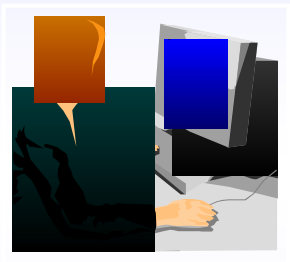
Improve system availability and increase productivity with Operations Manager for z/VM

Increase productivity

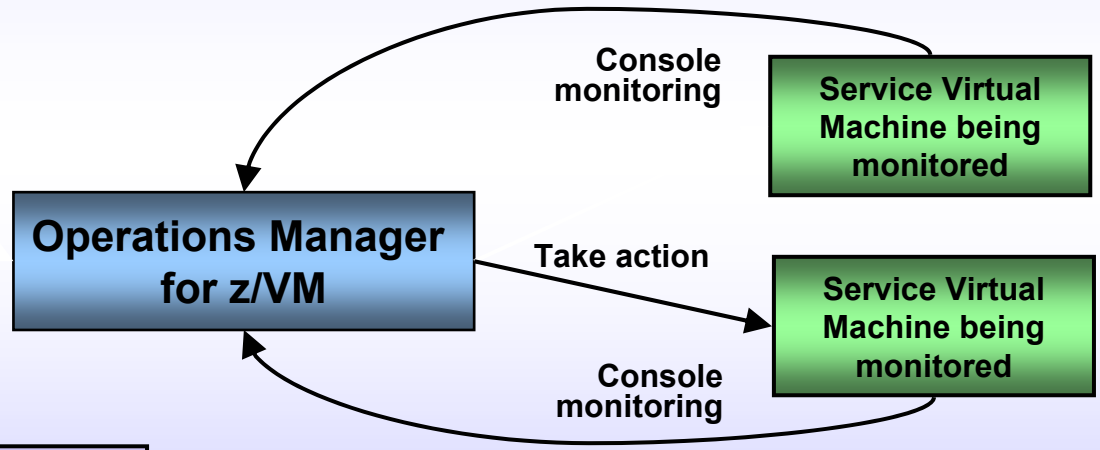
- Authorized users view and interact with monitored virtual machines without logging onto them
- Multiple users view/interact with a virtual machine simultaneously

Improve system availability

- Monitor virtual machines and processes
- Take automated actions based on console messages
- Reduce problems due to operator error



View & interact with consoles



Automation

Perform routine activities more effectively with minimal operations staff

Integration

Fulfill take-action requests from OMEGAMON XE on z/VM and Linux

Manage Backup and Recovery with IBM Tivoli Backup and Restore Manager for z/VM

- **Backup**
  - Requested by administrators
  - Full or incremental
  - Flexible selection of disks and files to back up
  - Review job before submitting for backup
  - Catalog housed in Shared File System
- **Restore**
  - Performed by users for their own data
  - Extending to other users available via exit
  - Performed by administrators for any data
  - Selection of data to restore
    - Full screen interface or commands

- **Integration with Tape Manager for z/VM**
- **Optional compression of data during backup**
  - **Call your own compression algorithm**
  - **Use IBM provided routine**
- **Encryption exits available**
  - **Call your own routine**
  - **Use vendor-written routine, such as V/Soft Software's Encrypt/Backup for z/VM**

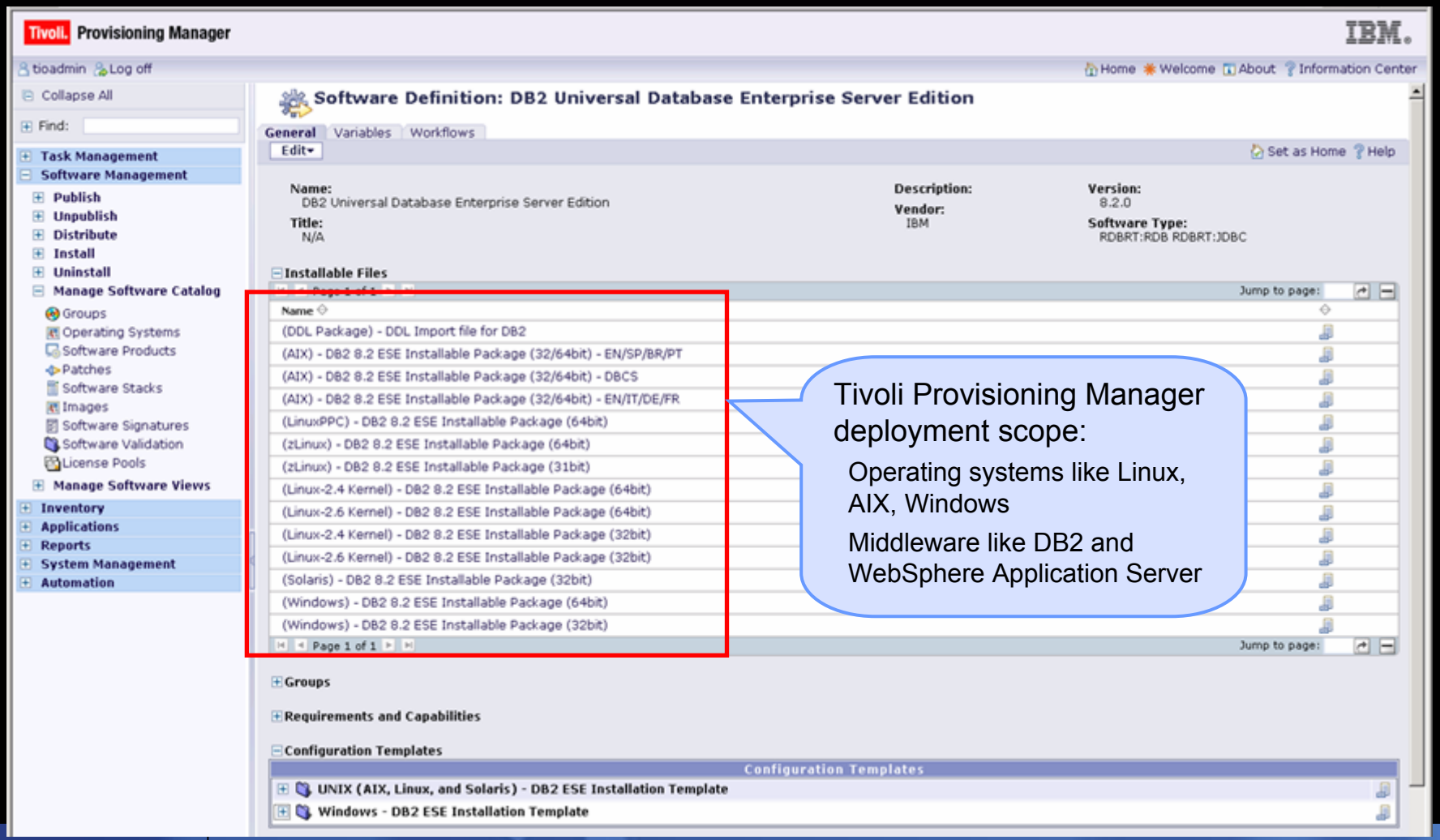
Manage Your Tape Devices with Tape Manager for z/VM

- **Manage tapes**
  - Define tapes in a catalog, including:
    - Free or used
    - Retention/expiration information
    - ATL/VTS or manual mount
    - Data Security Erase
  - Group tapes together into pools
    - Ownership and access control
    - Media type

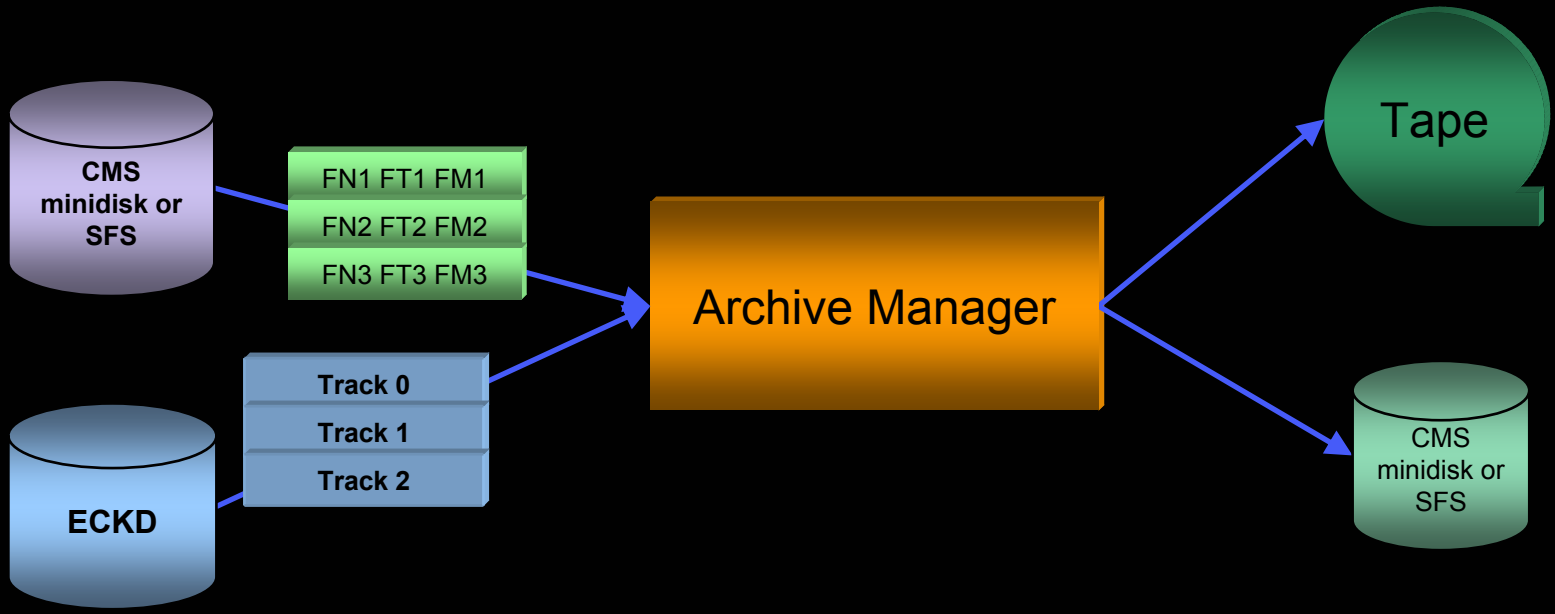
- **Manage devices**
  - Define available devices
    - Dedicated or assignable
  - Group devices together into device pools
    - ATL/VTS or manual mount
    - Any other grouping you choose
      - (read only vs. write, location, etc.)
  - Share devices with other systems

- **Manage mount requests**
  - Volume specific and scratch requests
  - Standard label
  - Non-label
  - Bypass label processing

Provision Software in System z Virtual Linux Servers with IBM Tivoli Provisioning Manager

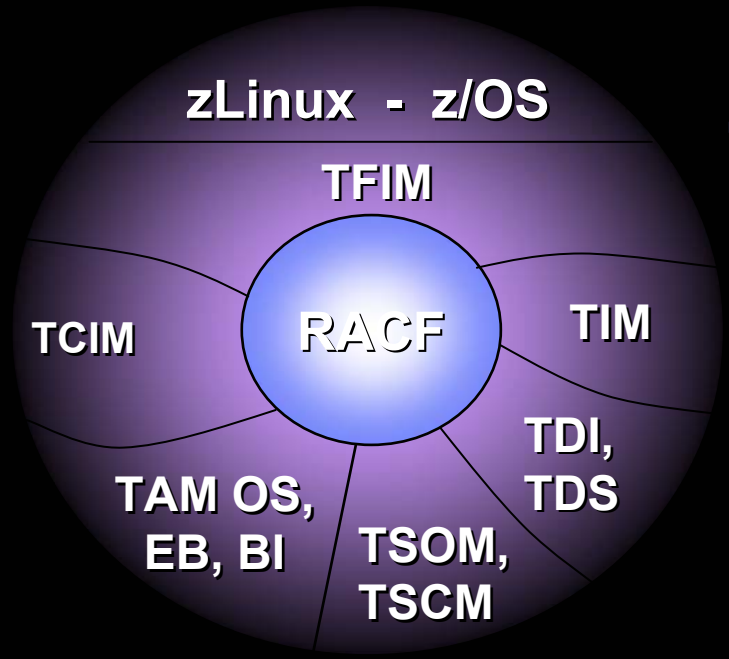


Manage Your Archives with Archive Manager for z/VM



- **Improve end user satisfaction and productivity**
  - **Users manage their own disk space**
  - **Move infrequently used files to tape or other disk**
  - **Archive and recall functions are controlled by the user**
    - **No administrator intervention required**
  - **Archived data staged to DASD, then tape if applicable**
    - **Users don't wait for a tape mount for archive request to complete**
- **Reduce DASD space requirements**
  - **Archive older files to less expensive storage media**
  - **Continue to provide users access to the archived data/files**
- **Control location, retention, and access to archived data**
- **Integration with Tape Manager for z/VM**

Tivoli Security Product Portfolio for Linux on System z



Tivoli Compliance Insight Manager*
- *Distributed log management, access monitoring and compliance reporting*

Tivoli Access Manager
- *Authentication, authorization, web and enterprise SSO*
- *TAM OS on Linux for System z*
- *TAM EB on Linux for System z*
- *TAM BI for WebSphere MQ for z/OS*

Tivoli Federated Identity Manager
- *Cross-domain security for web services and credential transform*

Tivoli Identity Manager
- *Enterprise user provisioning and user management*

Tivoli Directory Integrator
- *Data synchronization*

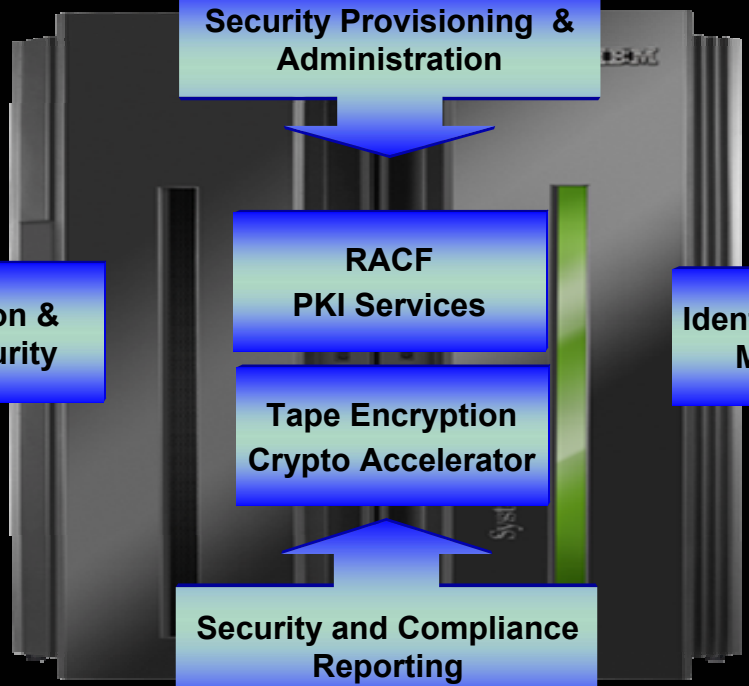
Tivoli Directory Server
- *LDAP infrastructure*

Tivoli Security Operations Manager*
- *Consolidate / correlate security alerts / events*

Tivoli Security Compliance Manager*
- *Vulnerability and compliance assessment*

* Runs on distributed and supports zLinux events

Tivoli System z Security Hub Overview for Linux on System z



Tivoli Identity Manager

Tivoli zSecure Family

Security Provisioning & Administration

Encryption Facility for z/OS

Tivoli Key Lifecycle Manager

Information & Data Security

RACF

PKI Services

Tape Encryption

Crypto Accelerator

Identity and Access Management

Tivoli Federated Identity Manager

Tivoli Identity Manager

Tivoli Access Manager Family

Tivoli Directory Integrator

Tivoli Directory Server

Security and Compliance Reporting

Tivoli zSecure Family

Tivoli Security Information and Event Manager (TCIM and TSOM)

z/OS Comm Server and NetView for z/OS