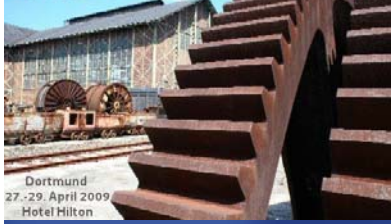


Frühjahrstagung 2009  
für zVSE, zVM und Linux on System z



Dortmund  
27.-29. April 2009  
Hotel Hilton



# V10 – Data Center Automation

## TPM und IBM Director auf Linux for System z

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IBM R&D Boeblingen – Technical Marketing Competence Center (TMCC)

28. April 2009



# Agenda

## **IBM Director**

- Positioning
- Overview about Product Family
- Product Topology
- Base Platform and Plug-In Managers
- How to Get The Product & System z Specifics
- Plug-In 'z/VM Center'
- Values

## **Tivoli and IBM Director**

- IBM Service Management
- Deployment with IBM Director and Tivoli
- Integrated Architecture
- z/VM Automation Package
- Tivoli Provisioning Manager (TPM) – Family, Overview, Capabilities, Topology

## **Data Center Automation – Client Implementation**

- Decision Points
- Strategy
- Implementation: Linux on System z running TPM Management + Database, Depot and TPMfOSD Server
- Previous – Server Farm for Satellite Server
- Cost Savings – Integration of Satellite Server
- Use Cases Implemented via TPM on Linux for System z
- Benchmark System z10 & TPM Set-Up
- Benchmark Results – Upcoming Whitepaper

## **Summary**



# What is IBM Systems Director?

**IBM Systems Director is a management solution for heterogeneous IT environments :**

- Operating Systems

- Linux running on System z / POWER / Intel
- AIX
- Windows
- ...

- Virtual & Physical Resources

- z/VM
- System p LPAR
- Xen, VMWare
- BladeCenter
- Storage Devices
- ...



**Basic platform management solution for IBM systems and non-IBM x86 systems**

- Centralized – single GUI – providing a consistent view of all platform resources (status, health, monitoring)
- Downloadable from [ibm.com](http://ibm.com) at no charge

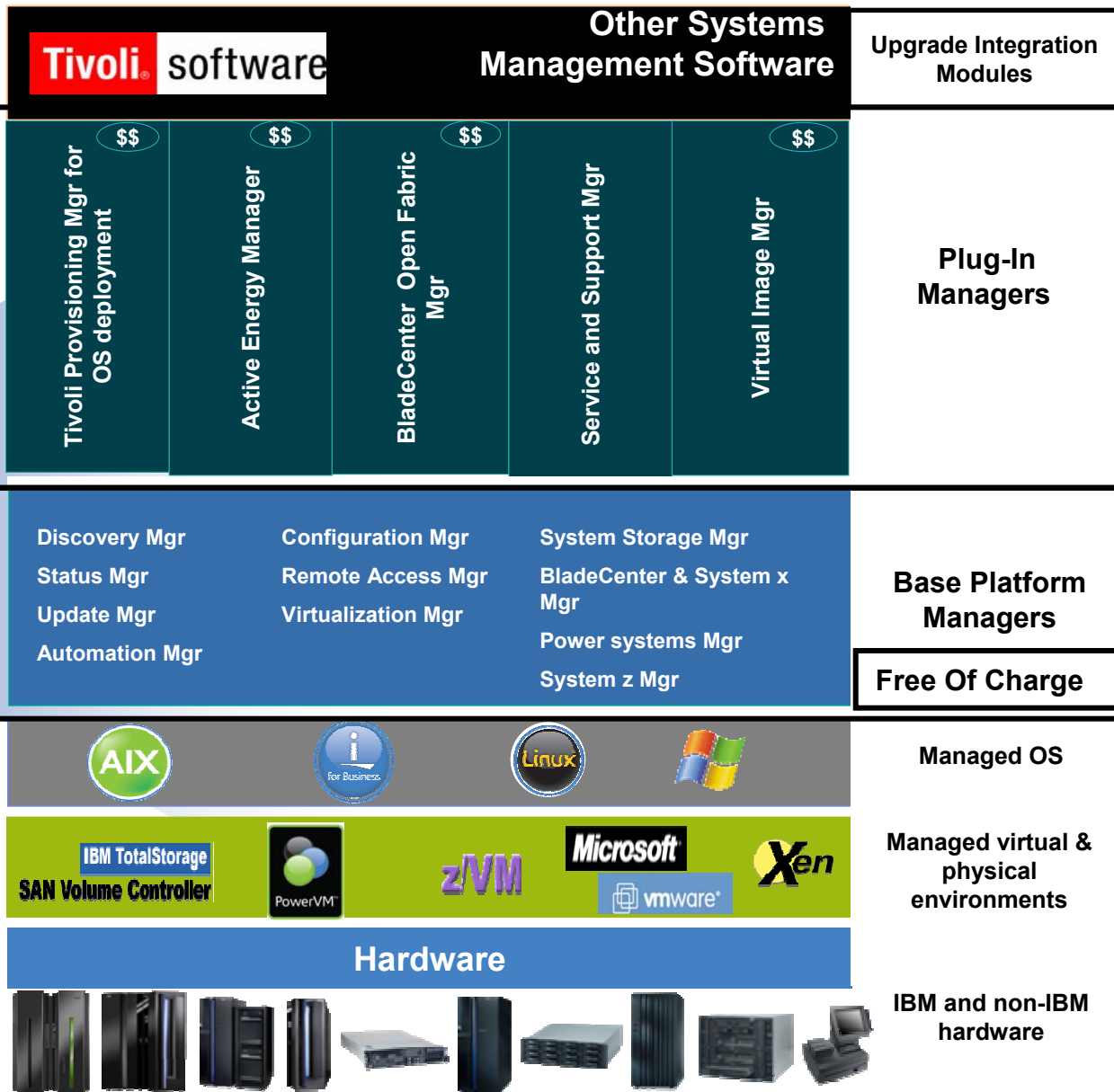


# Overview

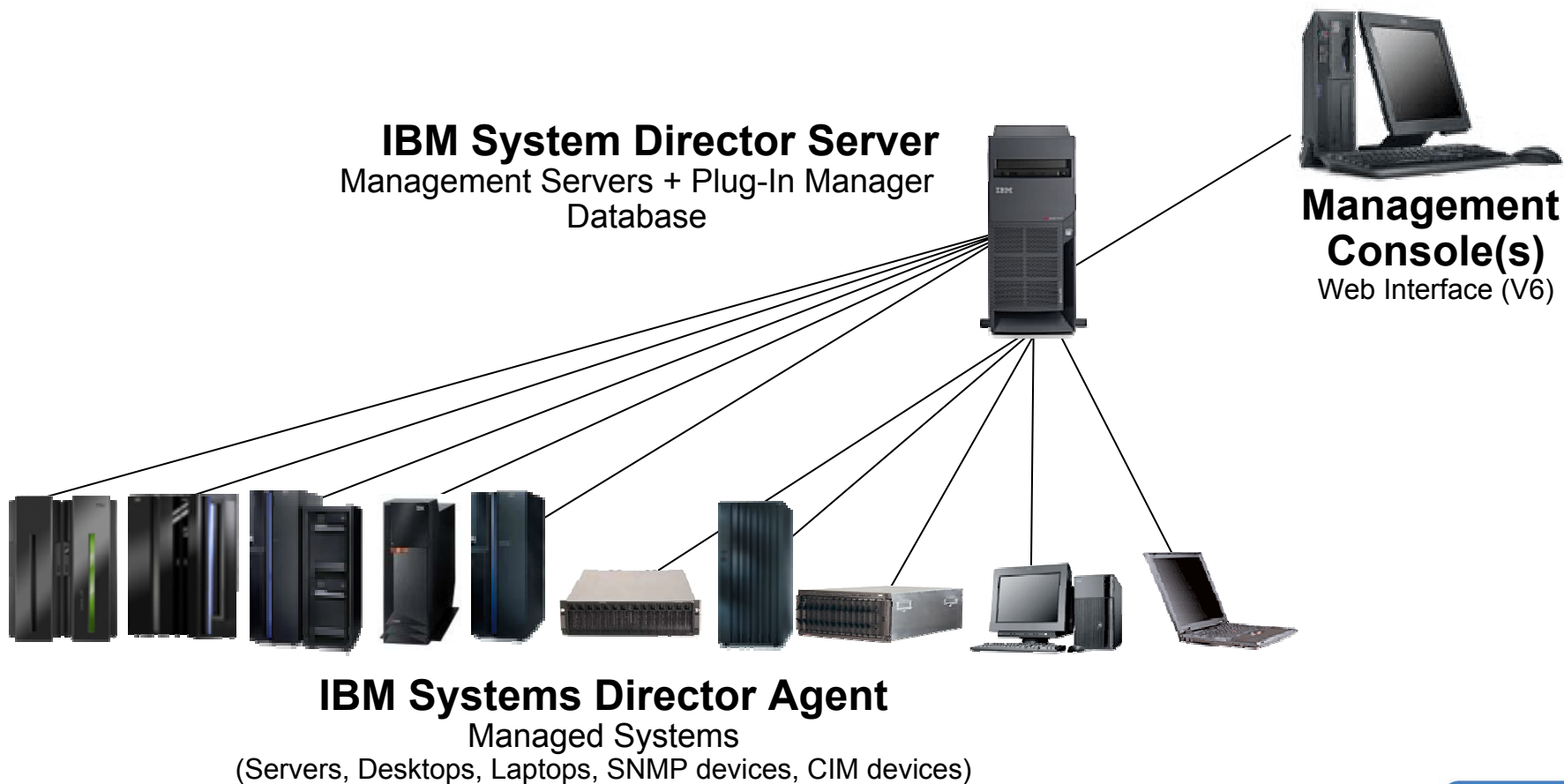
Single User GUI



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# IBM Systems Director Topology



**Three-tiered architecture**





# IBM Systems Director 6.1 - Base Platform Managers

- **Discovery Manager**
  - Discovers the both virtual and physical systems in your network
  - Collects inventory data about hardware and software
  - Visualizes relationships to other system in the network
- **Status Manager**
  - Monitors hardware status, power status, and update compliance status on discovered systems
  - Creates, views, and customizes the resource and processes to monitor and generate notifications when a custom threshold is reached
- **Update Manager**
  - Acquires, installs, and manages updates to Systems Director, its components, and the systems it manages.
  - Updates can include new functions as well as fixes to certain firmware, operating systems, and platform managers.
- **Automation Manager**
  - Automatically performs predefined actions in response to events that occur in your environment using even automation plans
- **Configuration Manager**
  - Configures system parameters and hardware settings on systems, including BladeCenter chassis and its installed components automatically



## Base Platform Managers cont.

- **Remote Access Manager**
  - Provides a set of integrated tools that support remote access, including remote control tools (such as Virtual Network Computing (VNC), Remote Desktop (RDP), and web-based remote control for IBM BladeCenter® and RSA), hardware command line, remote command line, and file transfer tools.
- **Virtualization Manager**
  - Manages the lifecycle of your virtual resources (such as virtual servers and virtual farms) from a single interface for many of the different virtualization technologies from a single console in the industry.
- **IBM System Storage™ management**
  - Provides core lifecycle management of your storage resources including discovery, status and configuration.
- **IBM BladeCenter and System x™ management**
  - Provides full lifecycle management of your modular System x, IBM BladeCenter Chassis, and related resources including discovery, status, configuration, updates, and virtualization.
- **IBM Power systems management**
  - Provides full lifecycle management of your Power systems and related resources including discovery, status, configuration, updates, and virtualization.
- **IBM System z™ management**
  - Provides management of z/VM and Linux. Provides discovery for z/VM and virtual servers and discovery, inventory, status and updates for Linux.

# Director Version 6.1 - Plug-in Manager

Migration Assist

Management servers Agents Plug-ins Upward integration

Director 5.20

You can add plug-ins to IBM® Systems Director that provide advanced function or function tailored to a particular environment.

- Tivoli Management Framework
- Tivoli NetView
- HP OpenView
- Microsoft
- CA Unicenter

Plug-in	Details	
<b>IBM Systems Director Active Energy Manager Version 4.1</b> Manages the power use and temperature of your IT environment. Controls the energy use of IBM servers and monitors other datacenter equipment.	Monitoring information is available for no charge. Additional management functions, such as setting power capping and power saving modes, are available for a fee.	Download
<b>IBM Systems Director Service and Support Manager Version 6.1 (IBM Electronic Service Agent™)</b> Monitors, tracks, and captures system hardware errors and service information and reports them directly to IBM support.	No-charge plug-in that supports Windows and Linux for x86 platforms.	Download
<b>IBM Systems Director Migration Tool Version 6.1</b> Enables you to migrate from a previous version of IBM Systems Director to Version 6.1.	No-charge tool that supports all platforms that IBM Systems Director supports.	Download
<b>IBM Systems Director Transition Manager for HP® Systems Insight Manager™ 6.1</b> Allows you to discover systems that are managed by HP Systems Insight Manager and manage them in IBM Systems Director. Includes a tutorial that helps HP Administrators to quickly become proficient at managing their systems using IBM Systems Director.	No-charge tool that supports all platforms that IBM Systems Director supports.	Download

<http://www-03.ibm.com/systems/management/director/downloads/>





## Plug-in Manager cont.

- **IBM Tivoli Provisioning Manager for Operating Systems Deployment**  
is a tool designed to provision an operating system via a library of disk images to any supported system on the network
- **BladeCenter Open Fabric Manager**  
advanced upgrade allows for the assignment and reassignment of Ethernet MAC and Fibre Channel WWN addresses used by the I/O ports on server blades in the IBM BladeCenter
- **Virtual Image Manager**  
Easily automate cloning, capturing, customizing and deployment of virtual system images radically simplifying the deployment of new systems

*Priced Plug-Ins Not Included in  
Base IBM Systems Director 6.1  
Require Separate Install*



# Internet Download -

<https://www14.software.ibm.com/webapp/iwm/web/preLogin.do?source=dmp>

## IBM Systems Director

### Downloads

To properly configure your download, please review the information below. Select the appropriate offering. When you are done, press the "Continue" button at the bottom.

### Offering

- IBM Systems Director 6.1 Agents for Manual Deployment**  
Version 6.1
- IBM Systems Director 6.1 Agents for Remote Deployment with Agent Installation Wizard**  
Version 6.1
- IBM Systems Director 6.1 DVD Images**  
Version 6.1
- IBM Systems Director 6.1 Management Servers**  
Version 6.1

- IBM Systems Director 6.1 Service and Support Manager**  
Version 6.1
- IBM Systems Director 6.1 Standalone Common Agent Managers**  
Version 6.1
- IBM Systems Director Migration Tool**  
Version 6.1
- IBM® Systems Director Transition Manager for HP® Systems Insight Manager**  
Version 6.1
- IBM Director for AIX**  
Version 5.20
- IBM Director for i5/OS**  
Version 5.20
- IBM Director for Linux on POWER**  
Version 5.20
- IBM Director for Linux on System z**  
Version 5.20
- IBM Director for Windows and Linux on x86**  
Version 5.20
- IBM Director Plug-ins & Extensions for Windows and Linux on x86**  
Version 5.20

Version 6.1 and Version 5.20 available



# Director Version 5.20 – Overview & System z Specifics

## IBM Director base functions for Linux on System z

- Discovery
- Group Management
- Inventory
- Basic Resource Monitor
- Event Action Plan
- Process Management
- Remote Session
- File Transfer
- Network Configuration
- Software Distribution
- SNMP Browser

## z/VM Center – System z Plug -In

- Utility Service Configuration Manager
- z/VM Virtual Server Deployment
- z/VM Server Complexes

## Software Distribution Premium Edition – System z Plug-In

- SW package distribution

IBM Director for Linux on System z, Version 5.20 PID: 5648-DR1	
<b>Base</b>	IBM Director
<b>Feature</b>	IBM Director z/VM Center
<b>Feature</b>	IBM Director Software Distribution Premium Edition

- Plug-Ins 'z/VM Center' and 'SW Distribution Premium Edition' are available with Version 5.20 only
- Similar functionality is/will be made available with Version 6.1 Virtualisation Manager and further Plug-In Managers
- Plug-In 'z/VM Center' continues to be marketed and serviced for a ,not-yet annouced' amount of time

# Internet Download -

<https://www14.software.ibm.com/webapp/iwm/web/preLogin.do?source=dmp>

Download IBM Director for  
Linux on System z Version 5.20

**z/VM Center**

- IBM Director 5.20.2 zSeries zvmmap Agent for Linux on System z**  
dir5.20.2\_zvmmap-agent-linux-s390.tar (31MB)  
[View license](#)
- IBM Director 5.20.2 assisted MAP installation package for Linux on System z**  
dir5.20.2\_setup-zvmmap.tar (1.19MB)  
[View license](#)
- IBM Director 5.20.2 z/VM Center Extension for Linux (full rpm noarch install packages for console and server)**  
dir5.20.2\_zVMCenterExt-Linux.tar (4.1MB)  
[View license](#)
- IBM Director 5.20.2 z/VM Center Extension for Windows (full IS install package for console and server)**  
dir5.20.2\_zVMCenterExt-Windows.zip (4.8MB)  
[View license](#)

To request a 90 day trial license for z/VM Center, send an email to [Evaluation Request](#)

**z/VM Center Plug-In**

- Provides access to z/VM Linux guest systems via IBM Director
- Requires z/VM Manageability API (zvmmap) Agent to enable access to z/VM system

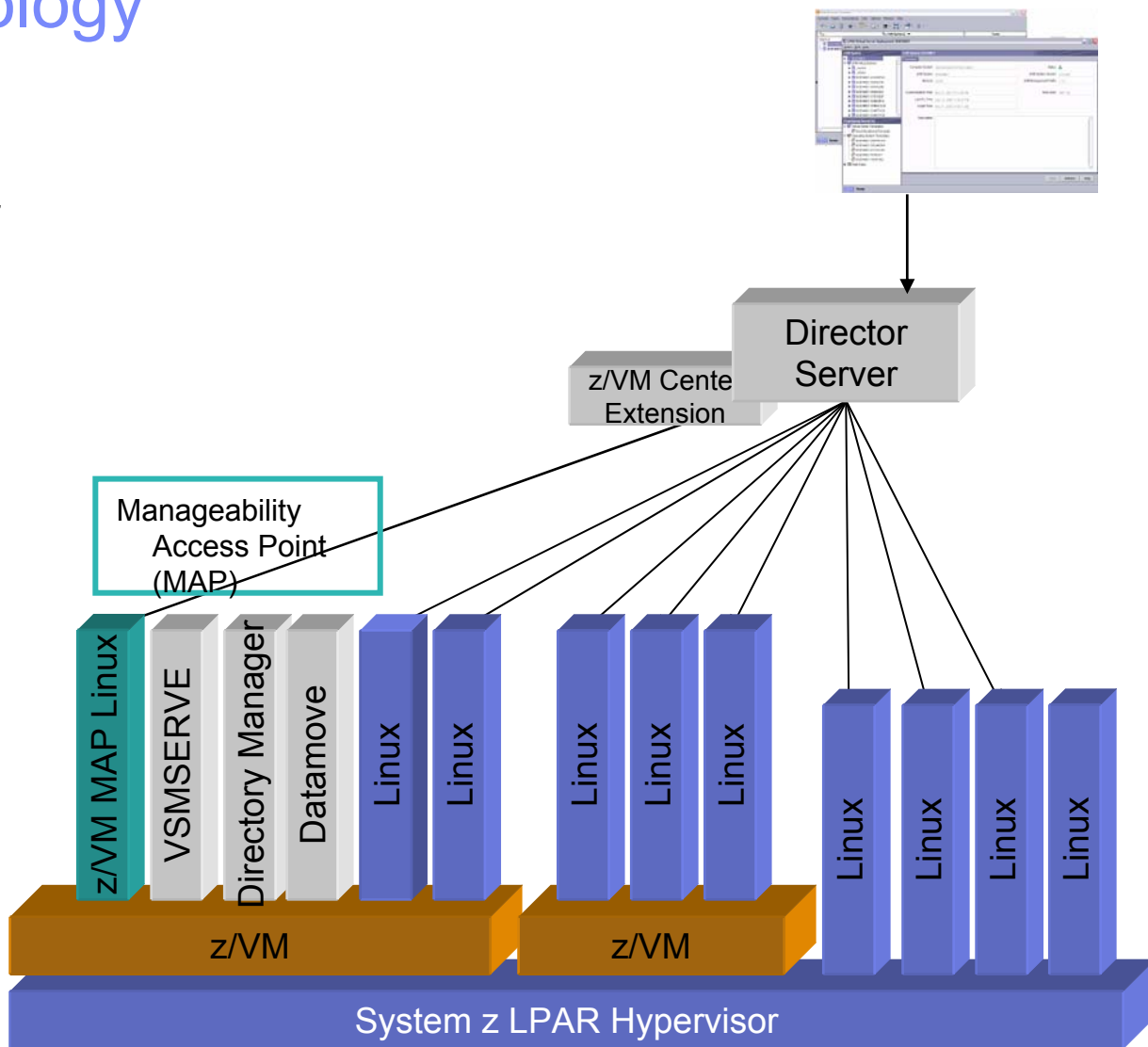
- Server 'Plug-In' = so-called 'Extension' with Director Version 5.20
- Can be applied to any IBM Director Server in the enterprise

- Trial version

# z/VM Center Topology

## z/VM Center tasks

- Virtual Server Deployment (VSD) - Easy deployment of Linux virtual servers under z/VM
  - Creation of templates for virtual server and Linux operating system provisioning
  - Creation of virtual server from template
  - Applying Linux into a virtual server from template
  
- Server Complexes – One-step provisioning of multiple Linux virtual servers
  
- Utility Service Configuration Manager – Easy install of Linux utilities





## IBM Director for Linux on System z - Values

### **Simplified administration of enterprise wide IT, incl. z/VM Linux systems**

- Central system management hub might run on Linux for System z
- No platform specific skill required - Consistent function set across IBM platforms

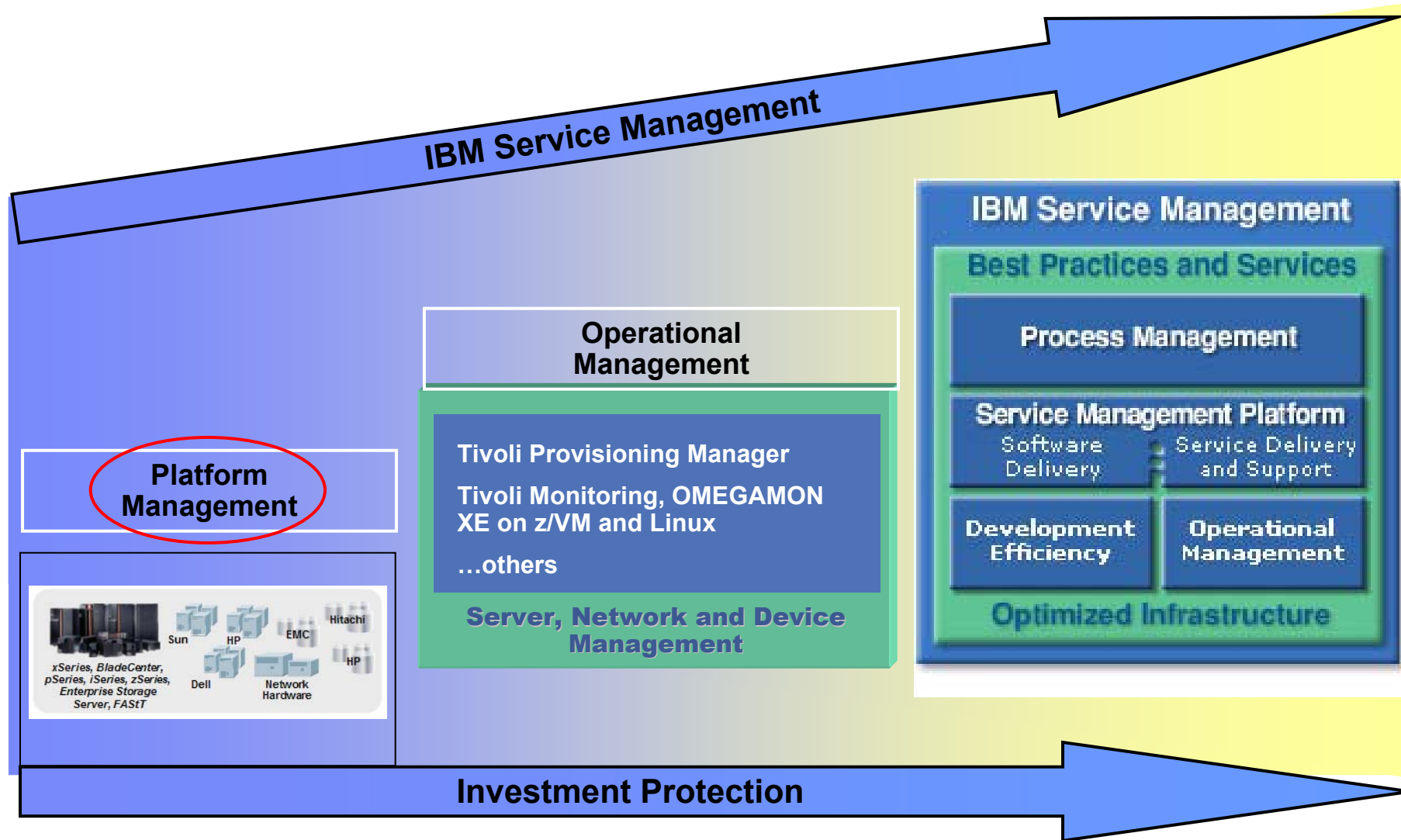
### **Automated z/VM Linux provisioning based on standards**

- Template-based deployment of test and development systems, managed via IBM Director console GUI
- Flexible management of z/VM virtual servers based on industry CIM (Common Information Model) standard

### **Upgrade path to IBM Tivoli solutions on System z**

- Easy start – start with one product only to get the basic systems management functions
- Grow into comprehensive IBM Service Management solutions like IBM Tivoli Provisioning Manager (TPM), IBM Tivoli Monitoring (ITM) and OMEGAMON®

# IBM Director and Tivoli - IBM Service Management





# Deployment – with IBM Director and Tivoli

## IBM Director for Linux on System z ‘z/VM Center’

### Rapid z/VM Linux provisioning

- Management via IBM Director GUI to reduce need for specific z/VM skill
- z/VM Linux cloning – dynamic z/VM environment with growing number of z/VM guests - frequent requests to provide z/VM guests for testing or development purpose

## IBM Tivoli Provisioning Manager (TPM) Version 5.1, z/VM Automation Package (\*)

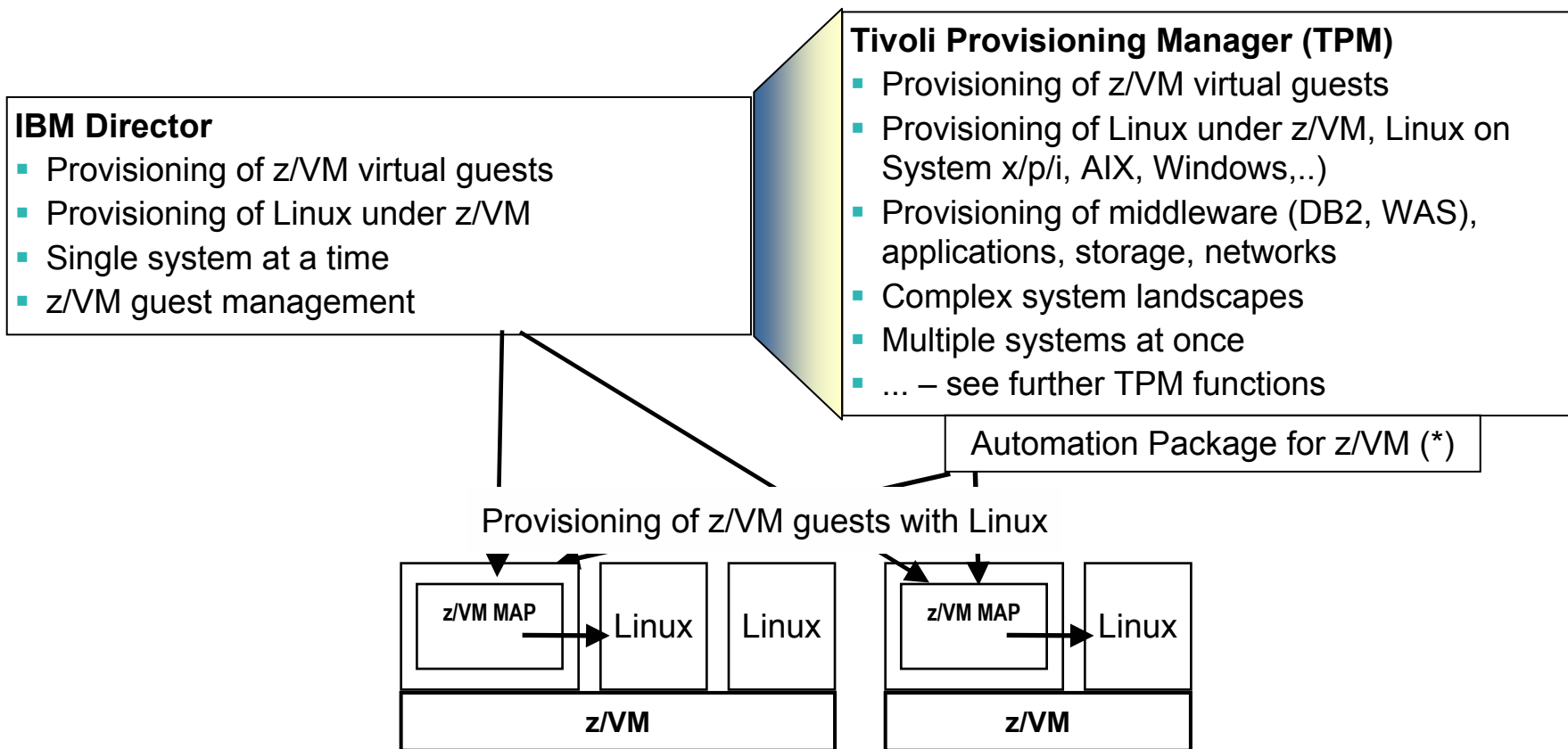
### Rapid enterprise-wide provisioning

- Cross enterprise operational environments incl. middleware + applications, or deployment of other operating systems like AIX®, i5/OS™, Microsoft® Windows®
  - Linux or Windows bare metal install or Microsoft Active Directory integration
  - Compliance/remediation support to help prepare for audits
  - Patch management
- **Re-use of IBM Director infrastructure by TPM**
    - IBM Director ‘z/VM MAP agent’ is leveraged by TPM to perform z/VM Linux system provisioning

(\*) available at OPAL  
[www.ibm.com/tivoli/opal](http://www.ibm.com/tivoli/opal)



# Integrated Architecture



z/VM Manageability Access Point (MAP) - Leveraged by IBM Director and Tivoli Provisioning Manager

- Set-up only once
- Comes as part of IBM Director using standard CIM interface



# z/VM Automation Package

## IBM Tivoli Open Process Automation Library Downloadable integrated modules for IBM service management applications

Tivoli software

1 - 4 of 4      Sort by: Top Matches      Go

Search in catalog:       Go

### IBM Automated Provisioning of z/VM Linux Guests with Tivoli Provisioning Manager Cookbook

Step by step guide to installing and using TPM to automate the provisioning of Linux hosts on a z/VM system.

Popularity: ★★★★★      Provider: IBM

[Info](#)      [Download site](#)

### IBM OMEGAMON XE on z/VM and Linux Reports for use with Tivoli Common Reporting

Customizable historical reports that use Tivoli Common Reporting (TCR) services for common look and feel, display and automation.

Popularity: ★★★★★      Provider: IBM

[Info](#)      [Download site](#)

### IBM z/VM (extended) driver for Tivoli Provisioning Manager

Extends the TPM zVM tcdriver by adding support for VLAN definitions, permanent zVM net-work connections, dynamic assignment of IP address, auto boot on z/VM start up and deletion of z/VM Software Resource Templates (SRTs).

Popularity: ★★★★★      Provider: IBM

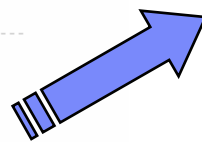
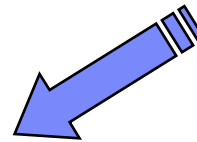
[Info](#)      [Download site](#)

### IBM IBM Automation Package for zVM

IBM Automation Package for zVM

Popularity: ★★★★★      Provider: IBM

[Info](#)      [Download site](#)



## IBM Automation Package for zVM

Rating: unrated

Popularity: ★★★★★

Accesses: 164

NavCode@: 1TW10100E

Creation date: 6/21/07

Updated date: 6/21/07

Provider: IBM

Overview      Review      Details      About provider

### Description:

IBM is adding IBM zVM Support on zSeries.

This driver is for use with Tivoli Provisioning Manager and Tivoli Intelligent Orchestrator.

The zVM\_Server automation package can be used together with IBM Director and z/VM Center extension to create and manage virtual servers on IBM System z Servers running z/VM V5.2. Support is provided for creation, deletion, activation and deactivation of z/VM virtual servers. Support is also provided for deployment of Linux images into the previously created virtual servers.



# z/VM Automation Package Content

- Work flow documentation
  - <ftp://ftp.software.ibm.com/software/tivoli/OPAL/1TW10100E/package.html>
- Work flows supplied in TPM Fix pack 2
  - zVM\_CreateVirtualServer
  - zVM\_CreateVirtualServerTemplate
  - zVM\_DeleteVirtualServerTemplate
  - zVM\_DestroyVirtualServer
  - zVM\_DevicePowerOff
  - zVM\_DevicePowerOn
  - zVM\_DeviceReboot
  - zVM\_GetServerState
  - zVM\_Initial
  - zVM\_InstallGoldenMasterImage
  - zVM\_ListDiskPools
  - zVM\_ListOSImages
  - zVM\_OpenConnection
  - zVM\_SoftwareInstallationUninstall
- XML files
  - zVM.xml
  - zVM\_LinuxImage.xml



# TPM Family - Overview

## TPM Family Key Capabilities and Business Value

<b>Policy Based Resource Allocation</b>	<b>Dynamic computing capability allocation based on business demands</b>
<b>Automation</b>	<b>End to end automation of multi-tier application components deployment across distributed environments</b>
<b>Compliance and Remediation</b>	<b>Periodic scan for compliance against policy and automatic remediation of non-compliant systems</b>
<b>Patch Automation</b>	<b>Heterogeneous patch management for servers and PCs, simplify the process for keeping distributed servers and clients up to date</b>
<b>Software Distribution</b>	<b>Flexible, scalable and secure software distribution to heterogeneous servers, PCs and mobile devices</b>
<b>Reporting</b>	<b>Turn data into consumable information about the current status of your resources</b>
<b>Discovery and Inventory</b>	<b>Up to date information of the environment, helps you understand what you are provisioning to, leading to more accurate deployments</b>
<b>Bare-Metal Installation</b>	<b>OS cloning and remote unattended installation and configuration, saves time and labor while reducing errors</b>



# What is IBM Tivoli Provisioning Manager?

## Automation and Enforcement of IT Processes

TPM is an end-to-end automation package. It captures a customer's existing procedures by linking together their systems management tools and executing those and new processes in a repetitive error-free manner either within or across organizational boundaries.

**TPM'S GREATEST STRENGTH IS EXPLOITATION OF A CUSTOMER'S EXISTING PROCESSES**

**End-to-End Automation** →

**Servers and Software**

**Networks**

**Storage**

**Security**

### Hardware and Operating Systems

pSeries (NIM/CSM) HP-UX (Ignite)  
 xSeries (RDM) HP (RDP)  
 Windows (ADS) SUN (Jumpstart)  
 Linux (Kickstart) Altiris DS

### Virtual Servers

i/pSeries – (HMC)  
 VMware – Virtual Center/ESX  
 Microsoft Virtual Server 2005

### Software Distribution

Tivoli Configuration Manager

### Application Software

WebSphere BEA  
 DB2 Microsoft SQL  
 Linux SAP  
 Citrix Apache

### Routers and Switches

Cisco  
 Brocade  
 Extreme  
 Foundry

### Load Balancers

Alteon  
 F5 Networks  
 Cisco  
 Nortel

### Power Distribution Units

APC

### IBM Storage

ESS  
 IBM DS4000

### EMC Storage

Symmetrix

### Switches

Brocade  
 McData  
 Cisco

### IBM Systems and Technology Group

TotalStorage Productivity Center

### Firewalls

Cisco  
 Nokia  
 Checkpoint

### IBM Tivoli Products

IBM Tivoli Security Compliance Manager



## TPM 5.1 Capabilities

- **Software distribution** - [see slide 24](#)
  - Single screen interface to pick packages and targets for a distribution (select software, select targets, schedule, pick notification, submit)
  - Dynamic Content Delivery, Build-in flexibility, leading-edge security, leading scalability
- **Extensive discovery** - [see slide 25](#)
  - Leverages more than 14 different discovery technologies for initial scanning of devices and subsequent configuration change management.
  - Common inventory technology scanner offers comprehensive hardware and software discovery (enhanced signature recognition and custom signatures)
- **Compliance and Remediation** - [see slide 26](#)
  - Security compliance – Workstation and server security, patch security
  - Software compliance – Required, prohibited and optional software
  - Out of compliance notification to individuals or distribution lists
  - Compliance reporting
- **Role-based views** - [see slide 27](#)
  - Clearer separation of operations and configuration activities based on access rights



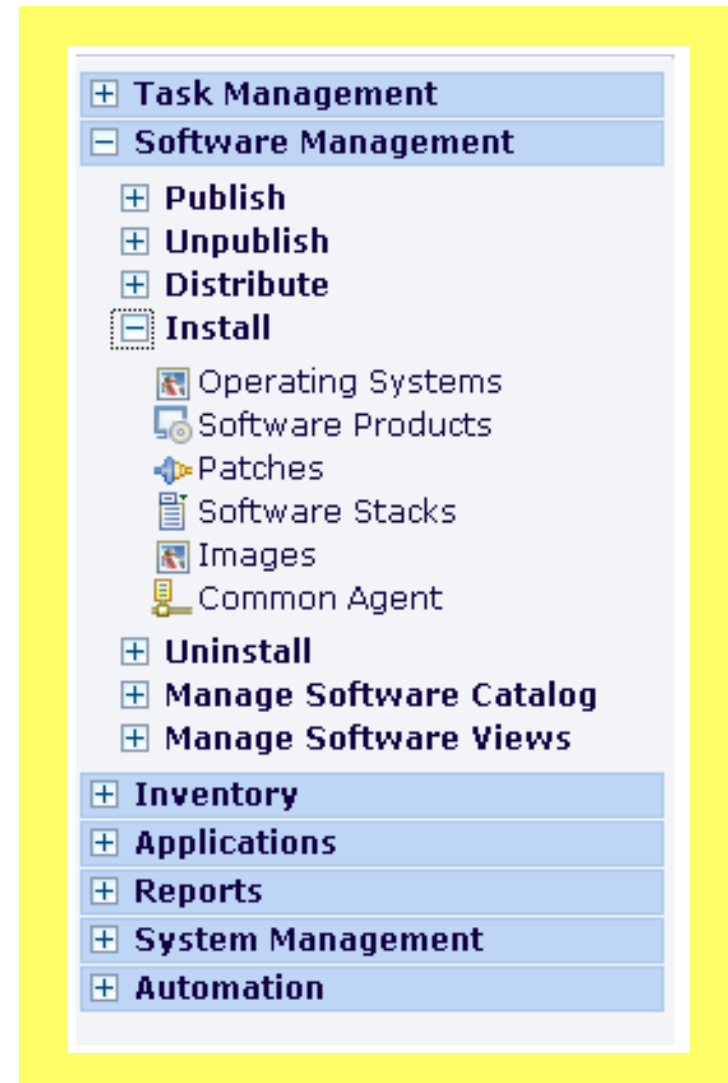
## Further TPM 5.1 Capabilities (cont.)

- **Reporting** - [see slide 28](#)
  - Predefined reports – Audit, inventory, compliance, deployment, discovery and custom
  - HTML, PDF and Microsoft Excel® output
  - Scheduled reports and e-mail distribution
  - Customized report creation from simplified table views
  - External views for 3rd party reporting integration
- **Patch Management**
  - Support for multiple OS patching through consistent operational UI (Linux, UNIX, Windows)
  - Patch compliance (missing patches) – generated automatically for review
  - One step remediation for groups of computers
  - Ability to put patches into an ignore list if decided to not install
  - Approval support on a per group basis
  - Separation of roles for person approving the patch install to a computer group (ex: LOB or branch) versus the installer role



# Mission-Critical Software Distribution

- **Dynamic Content Delivery**
  - Grid-like technology supports dynamic addition and removal of depots/peers
  - Management server performs load balancing
  - Checkpoint/restart and failover capability
- **Built in flexibility**
  - Adaptive Bandwidth Control
  - Roaming users get files from closest depots and peers
- **Leading edge security**
  - Advanced Encryption Standard AES 128-bit
- **Market Leading scalability**
  - Clients simultaneously pull different portions of a file from associated peers/servers
  - Pulls from closest depots and peers to reduce network impact







# Extensive Discovery Capabilities

- Embedded discovery to get up and running fast
  - Heterogeneous discovery and inventory
    - Common inventory technology discovery
    - Microsoft Active Directory discovery
  - Network Discovery
    - Native network discovery
    - IBM Tivoli NetView discovery
    - Cisco Network discovery
  - Miscellaneous Discovery
    - pSeries LPAR information
    - Network Installation Manager (NIM) discovery
    - IBM Remote Deployment Manager (RDM)
    - IBM Network Installation Manager (NIM)
- Exploitative discovery to interoperate with other discovery engines
  - IBM Director
  - ITIL CI discovery with IBM CCMDB
  - Support for other technologies through Discovery Library

Name
Cisco Switch Discovery
Discovery Library Reader for Tivoli Application Dependency Discovery Manager
IBM Blade Discovery
IBM DB2 UDB Discovery
IBM WebSphere Discovery
Microsoft Active Directory Discovery
Microsoft MBSA Scan
Microsoft WUA Scan
RXA Platform Discovery
Redline LB Discovery
SCMCollectorAgent
Security Compliance Scan
Symantec AntiVirus Discovery
Tivoli Provisioning Manager Inventory Discovery
Windows Configuration Discovery
Windows Local Groups Discovery
Windows Local Services Discovery
Windows Local Users Discovery

# Compliance and Remediation

- Security compliance
  - Workstation and server security
  - Patch security
- Software compliance
  - Required, prohibited and optional software
  - Concept of software groups
- Notify Action to each Group Administrator
- Compliance reporting

The screenshot displays the 'Compliance Reports' interface. At the top, there is a gear icon and the title 'Compliance Reports'. Below the title is an 'Edit' dropdown menu. Underneath are buttons for 'Delete', 'Import', 'Export', a search input field, and a 'Search' button. The main content is a table with the following data:

Select	Name	Description	Type
<input type="radio"/>	Groups without checks	What groups don't have compliance checks?	Group
<input type="radio"/>	Computer Compliance	What policies are on my computers and are they compliant?	Computer
<input type="radio"/>	Computers without checks	What computers don't have compliance checks?	Computer
<input type="radio"/>	Compliance Notifications	Who is supposed to receive compliance notifications and why?	Notifications
<input type="radio"/>	Patch Compliance	Are my computers compliant with their patch compliance policies?	Patch
<input type="radio"/>	Software Compliance	Are my computers compliant with their software compliance policies?	Software

# Security - Flexible Operations Roles

## Unique roles with unique views to improve usability and productivity

- System Administrator
- Network Administrator
- Storage Administrator
- Software Operator
- Change Approver
- Workflow Developer
- Inventory Specialist

**Tivoli. Provisioning Manager**

Change Log off Home W

Collapse All

Find:

- + Software Management
- + Reports
- + System Management

**Change Management View**

**Tivoli. Provisioning Manager**

Software Log off Home W

Collapse All

Find:

- + Task Management
- + Software Management
- + Inventory
- + Reports
- + System Management

**Software Specialist View**

**Tivoli. Provisioning Manager**

Inventory Log off Home W

Collapse All

Find:

- + Task Management
- + Software Management
- + Inventory
- + Applications
- + Reports
- + System Management

**Inventory Specialist View**

**Tivoli. Provisioning Manager**

tioadmin Log off Home W

Collapse All

Find:

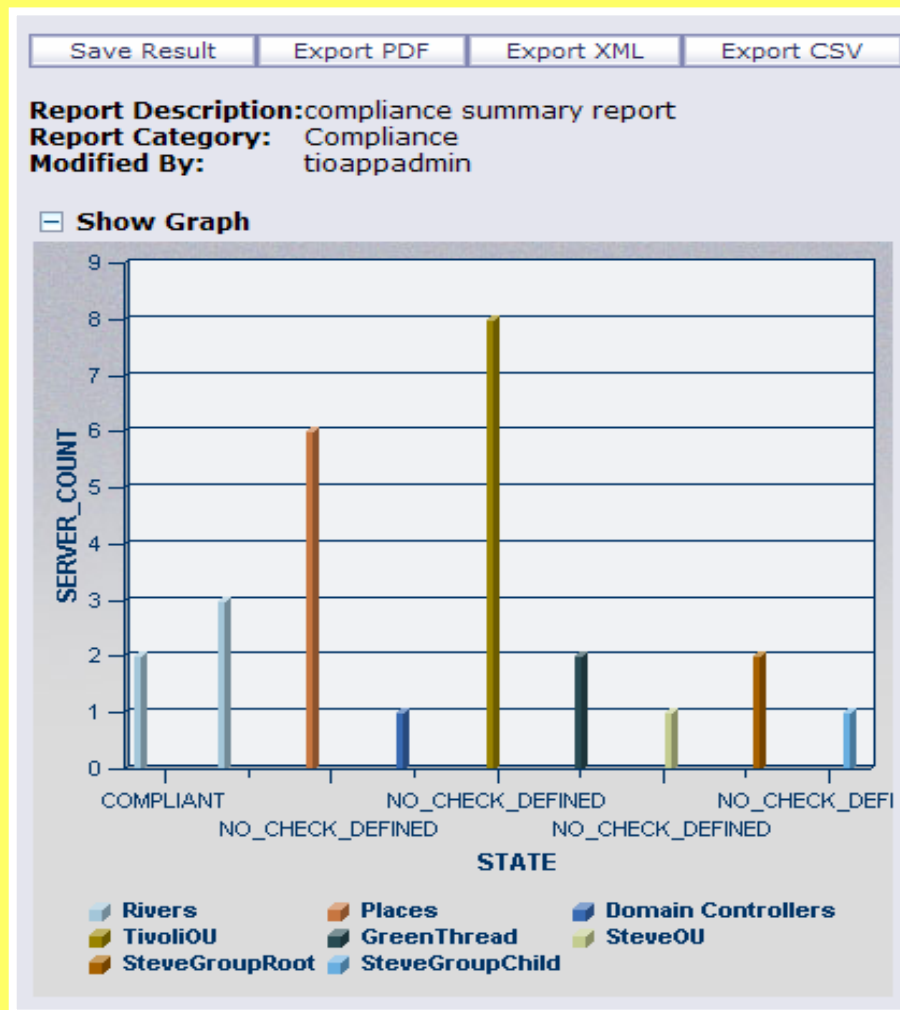
- + Task Management
- + Software Management
- + Inventory
- + Applications
- + Reports
- + System Management
- + Automation

**Administrator View**

# Flexible Reporting

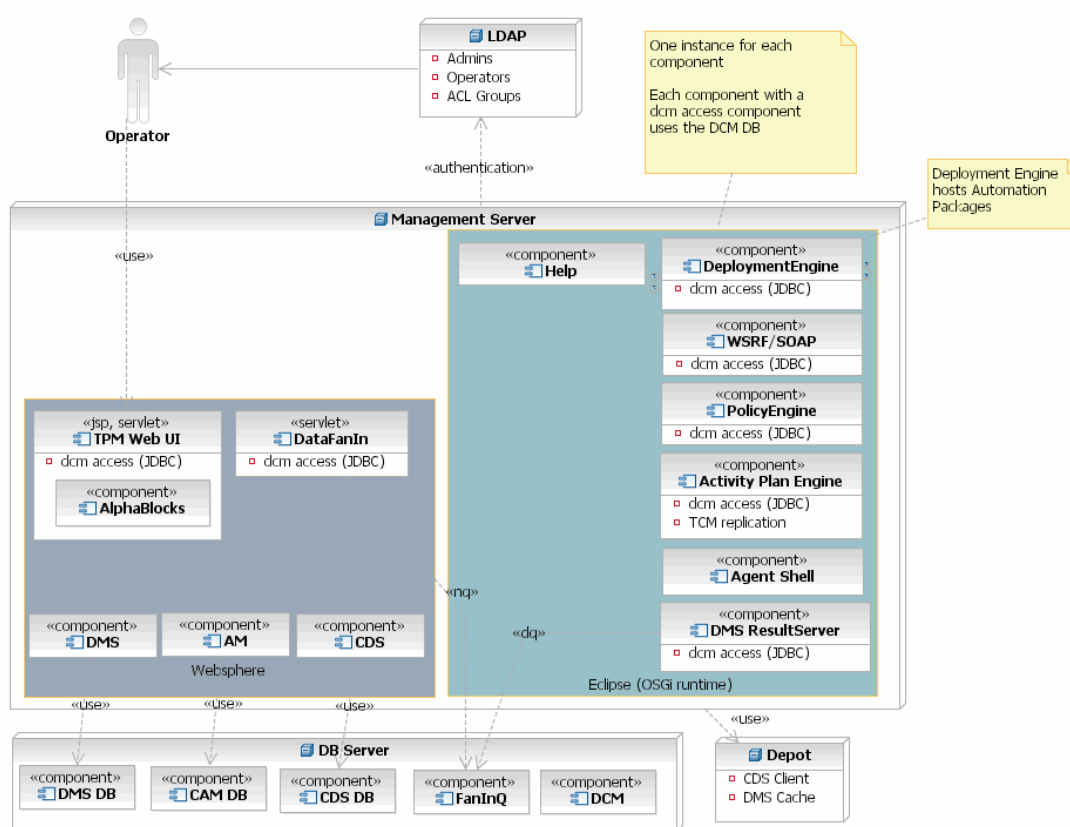
- Reporting installed by default
  - No further set up required
- New categories with predefined reports
  - Discovery, Inventory, Software Deployment, Compliance, Audit
  - “Other” category for individualized reports
- Variety of output formats
  - Highly flexible graphical capability
  - PDF, HTML, CSV (comma-separated values)
  - XML for easy data interchange with other applications
- Reporting import and exporting
  - Easily share custom reports
  - Easy way to save and restore reports

## Graphical Display of “Server Compliance by Group”



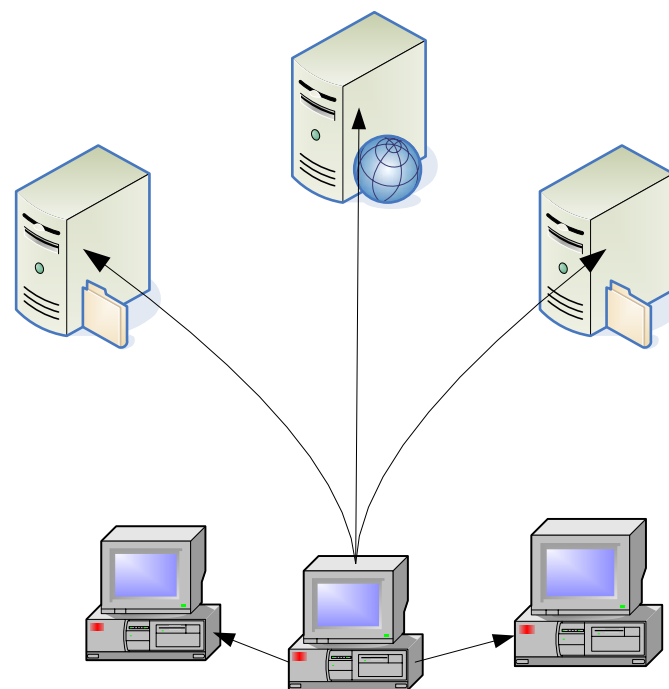
# TPM Topology

- WAS and Eclipse runtimes
- Clustering supported for:
  - [CDS](#) – slide 30 (Content Delivery Services)
  - DMS (job service)
  - IUS (endpoint results service)
- Non-clustered components
  - TPM user interface
  - TPM engines
  - CAS (Common Agent Services)
- Other components run outside the data center
  - Distribution depots
  - Endpoint support agents
- External LDAP solutions supported
  - MSAD, ITDS
- External DBMS solutions supported
  - DB2, Oracle, Cloudscape



## Content Delivery Services

- Grid-like infrastructure designed to bring the data close to the clients that will download it.
- Files are replicated to depot servers spread around the network.
- Once a machine has downloaded a file it can serve as a peer to other nearby clients.
- Parallel downloads from multiple servers and peers
- Load balancing / Failover
- Adaptive Bandwidth Control
- Files may be encrypted for their entire life within the grid.
- Resume-able downloads.





# Data Center Automation – Client Implementation



# Decision Points

## Customer Pains Points

Complex, people-intensive, error-prone IT management

- Homegrown, manual IT operations/administration – expensive maintenance, can't support rapid growth
- Contrasting IT set-ups in various data centers
  - high cost for maintaining specialized skill sets
  - different methods and reports make it hard to have an enterprise-wide picture

High efforts for IT asset management, compliance and security related IT activities

- **Reactive** to new and updated regulations or security requests - time consuming, people intensive and involves **detective work** with limited accuracy

## Value/Benefits

Improved work-life balance for IT operations staff through

- One management hub controlling all IT assets across all company-wide data centers – reduces need for system/platform specific management skill, enables consolidation of dispersed management sites from a single central site
- Keep IT assets under Control – consistent system management across all data centers means that you can be **proactive** towards requests and changes
- **Precise inventory data** enables thorough analysis, planning and accounting
- Trustworthy service delivery partner – automation of IT operations which enables rapid reaction to requests, and allows consistent repetitions to save time and people





## Decision Points (cont.)

### Why on Linux on System z

**Re-use expertise** - Mainframe Best Practices system management know-how means better control/management of distributed sites

**Flexible and scalable** - TPM set-up makes use of z/VM virtualization strengths – TPM components spread across different Linux instances will optimize workload + enable growth (e.g. easily increase number of depot servers as needed)

Processing and potential **performance advantages** - TPM encryption processing via System z crypto card can free up processing time for TPM server

Exploit System z **RAS** capabilities for a highly available management hub



# Strategy

Position **Tivoli Provisioning Manager (TPM)** for

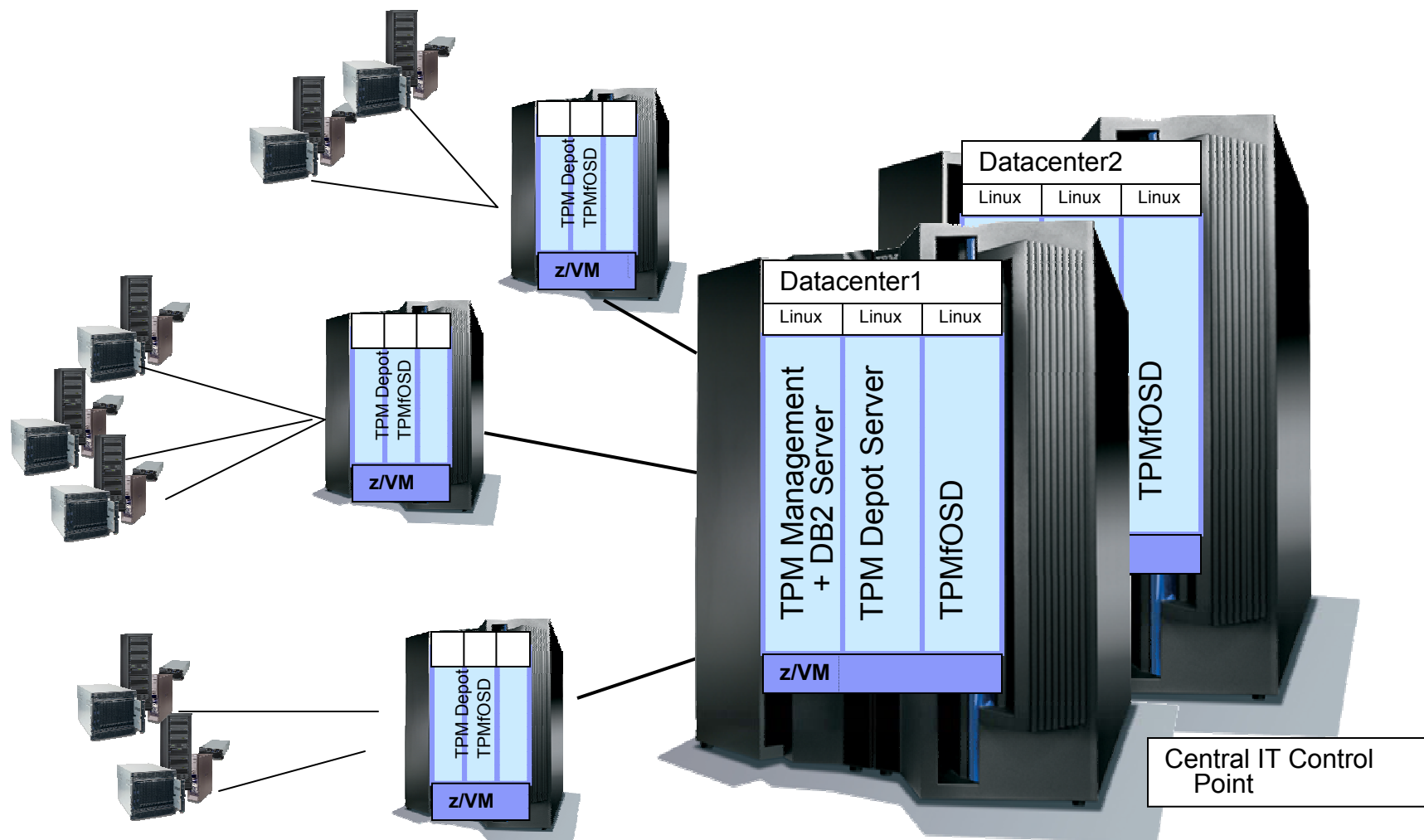
- server, network, storage provisioning – operating system and patches
- in a consistent manner across all company areas
- covering spread of different operating systems (AIX, Windows, Linux, Solaris, HP-UX) followed by Linux on System z via IBM Director

**Objectives:**

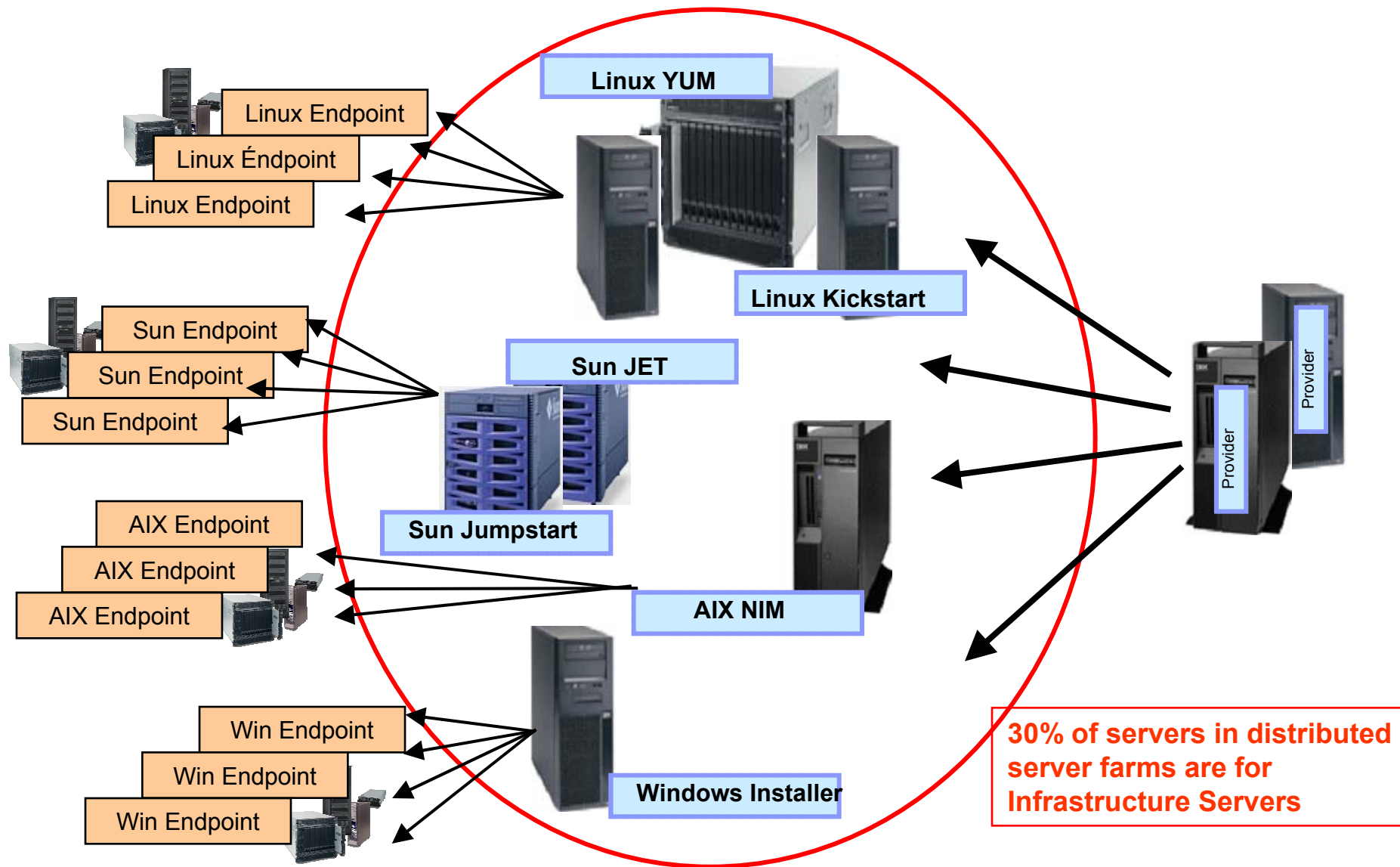
- Save cost by sun-setting old systems, reduce administration staff, consolidate support servers
- Reduce risks and exposures in compliances and unsupported infrastructure
- Enhance responsiveness of Business Unit – reduce todays cycle time of up to 57 days
- Improve manageability and control

# Linux on System z: TPM Management + Database, Depot and TPMfOSD Server

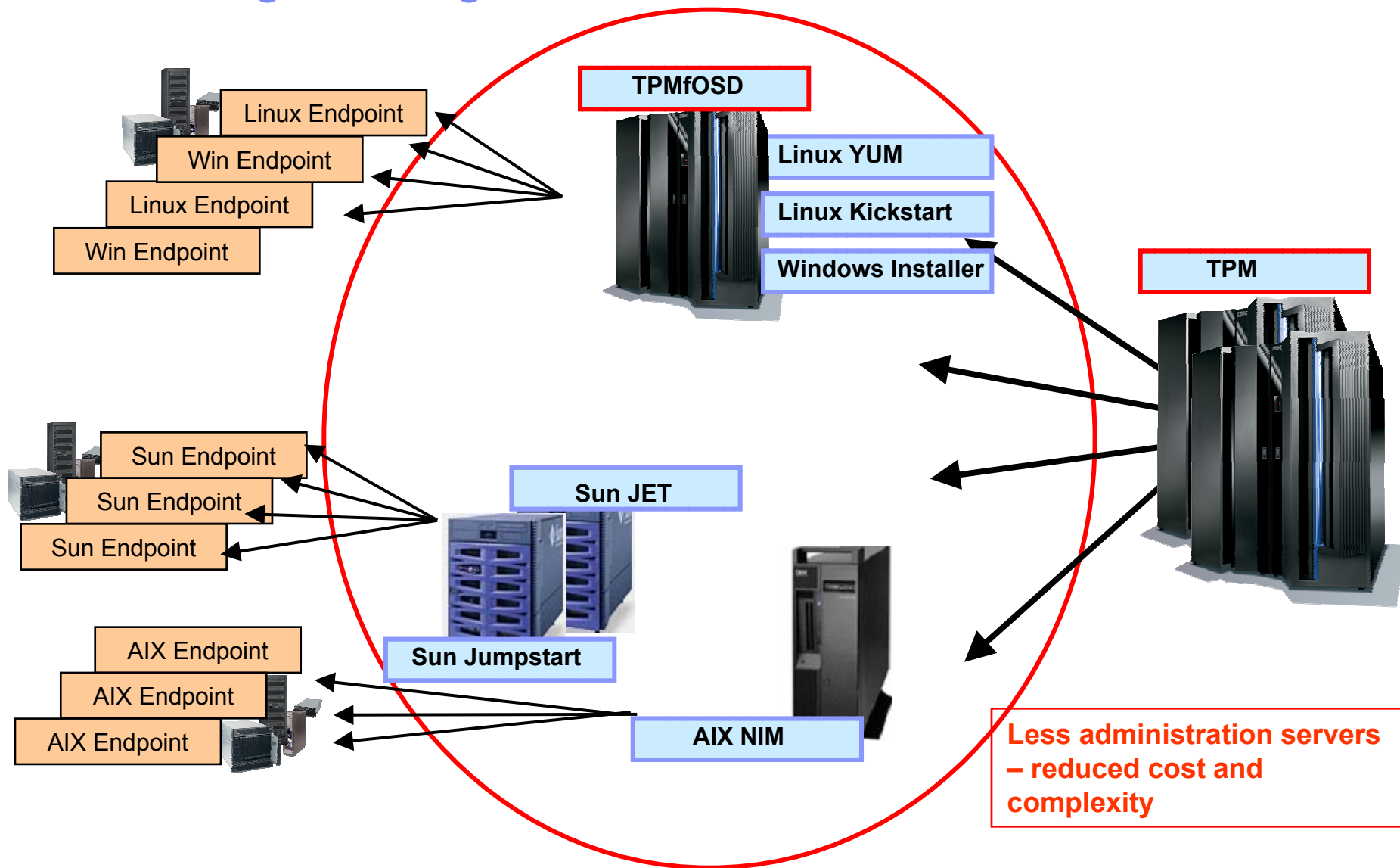
Managed Endpoints (Linux, AIX, Windows, ...)



# Previous – Server Farm for Satellite Server



# Cost Savings – Integration of Satellite Server



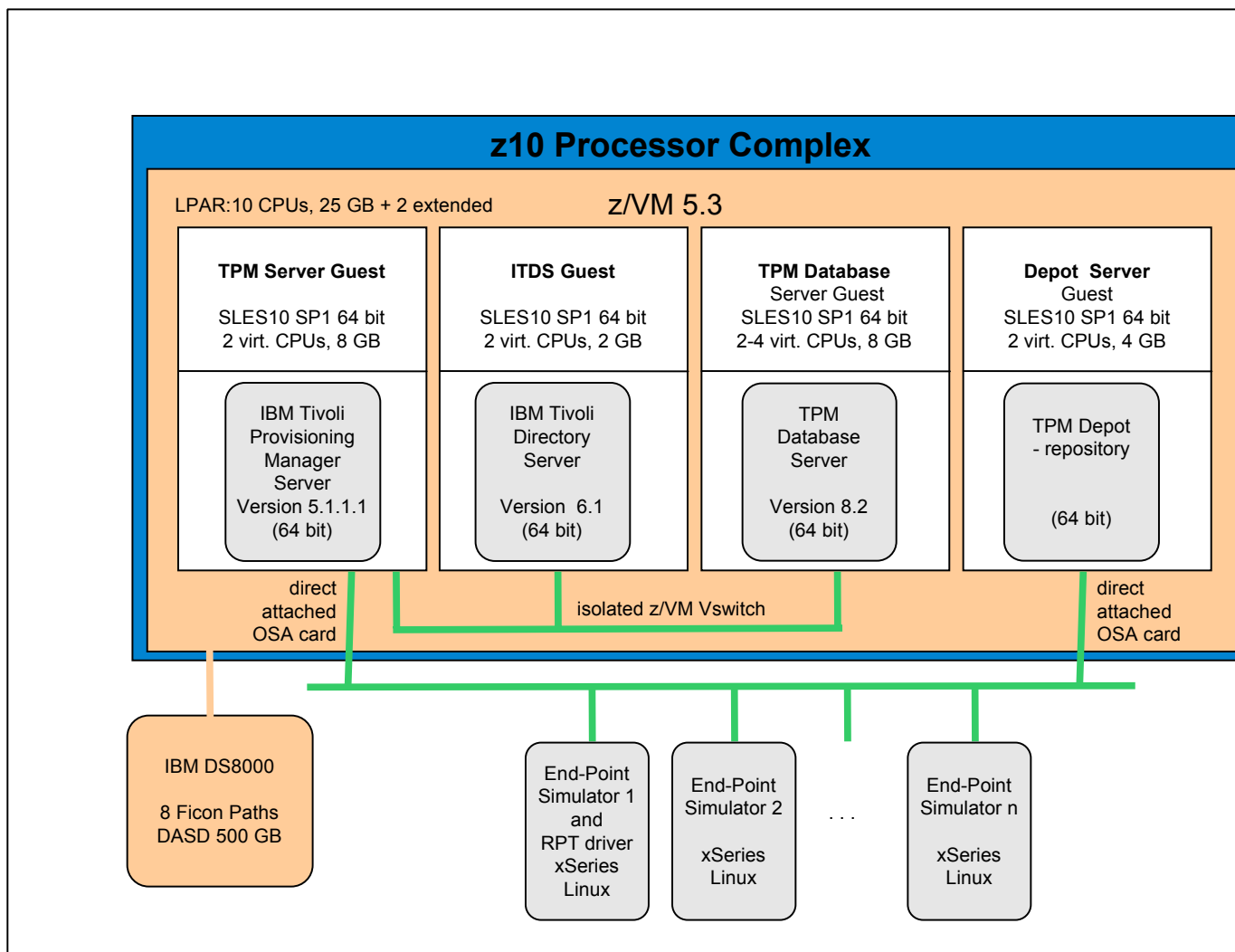


## Use Cases Implemented via TPM on Linux for System z

- **Requisition:** CMDB consolidation
- **Operating System Provisioning**
  - Windows
  - Solaris
  - AIX
  - Linux (RHEL x86)
- **System/Infrastructure Software Deployment**
  - Windows
  - Solaris
  - AIX
  - Linux (RHEL x86)
- **Patch Management**
  - Windows
  - Solaris
  - AIX
  - Linux (RHEL x86)
- **Platform Support:** Firmware, etc.
- **Virtualization Automation:** Guest machine/LPAR/LDOM/Domain automated provisioning, containers, guests

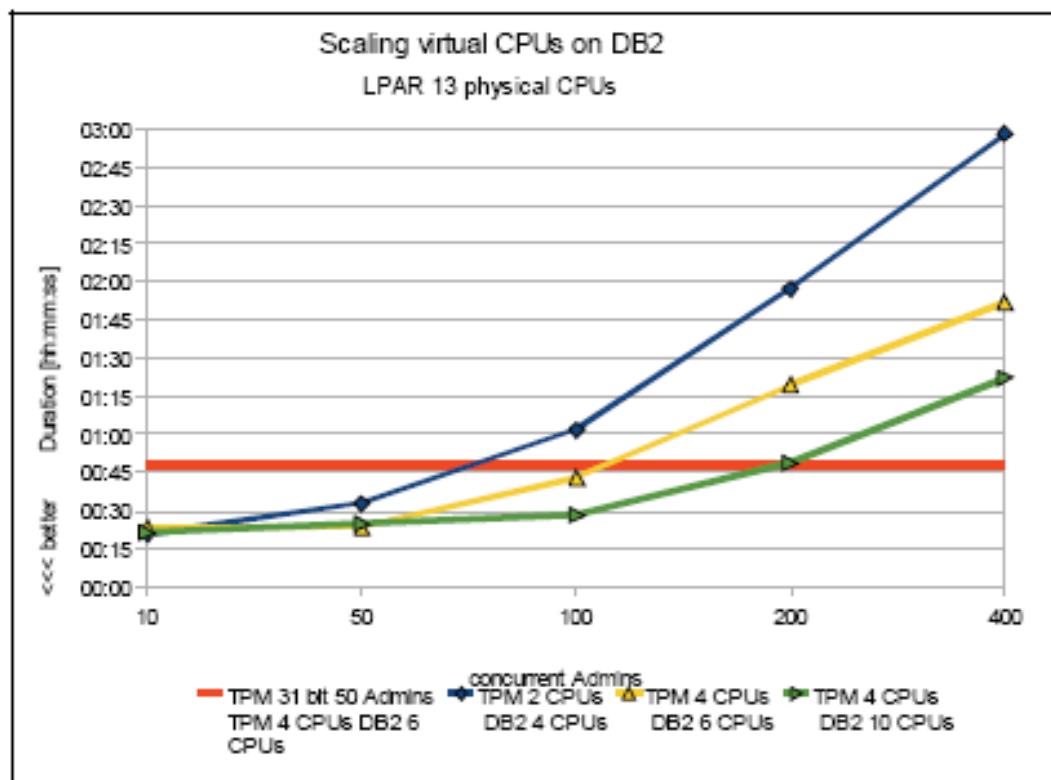
- **Application Provisioning:** Includes Citrix
- **Audit Compliance:** Compliance dashboard, reporting visibility, self assessment
- **Business Software Deployment:** shrink wrap in-house developed business applications; could include Oracle, WebLogic, WebSphere, Tuxedo, DB2
- **OS Upgrades**
- **OS Rebuild:** Reconfiguration of current state in case of system outage
- **Repurposing:** Re-use of environment; quick re-deployment
- **Server Decommission:** Retirement of a host, mostly workflow related (notify the systems)
- **Single User Mode / Maintenance Mode / Booting OS over Network**

# Benchmark System z10 & TPM Set-Up



## Benchmark Results – Upcoming Whitepaper

- Extensive TPM on System z Benchmark Tests performed with **31bit as well as 64bit** TPM version
- **TPM for Linux on System z** – Version 5.1.1 is the first 64bit IBM TPM product
  - 64bit porting has been result of benchmark identified limitation in support of more than 50 concurrent administrators
- Excellent performance and scalability reached with System z10 and TPM 64bit







# Summary

## Standardized Server Provisioning, Data Center Automation is Market Trend - see IDC

- IBM Director and Tivoli Service Management deliver into that trend
  - IBM Director might be the starter implementation
  - Integration with Tivoli enables growth into enterprise-wide implementation with Tivoli Service Management suite of products

### IDC OPINION

According to IDC market data based on detailed company-level revenue analysis as of August 17, the server provisioning software market grew to \$337 million in 2006, an increase of 24.6% from 2005. The leading vendor is IBM Tivoli, with \$88 million in revenue and a 26% market share. Other key findings include the following:

- ☒ The server provisioning market is expected to increase to \$900 million in 2011 at a five-year compound annual growth rate (CAGR) of 21.7%.
- ☒ The fastest-growing vendor in this market in 2006 was BladeLogic, with \$37 million in server provisioning revenue, an 11% market share, and 2005–2006 growth of 105.6%.
- ☒ Key market drivers include compliance reporting, change and configuration management, datacenter consolidation, and the ability to lower IT operations costs through process standardization.



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