Tivoli Provisioning Manager Overview for Linux on System z

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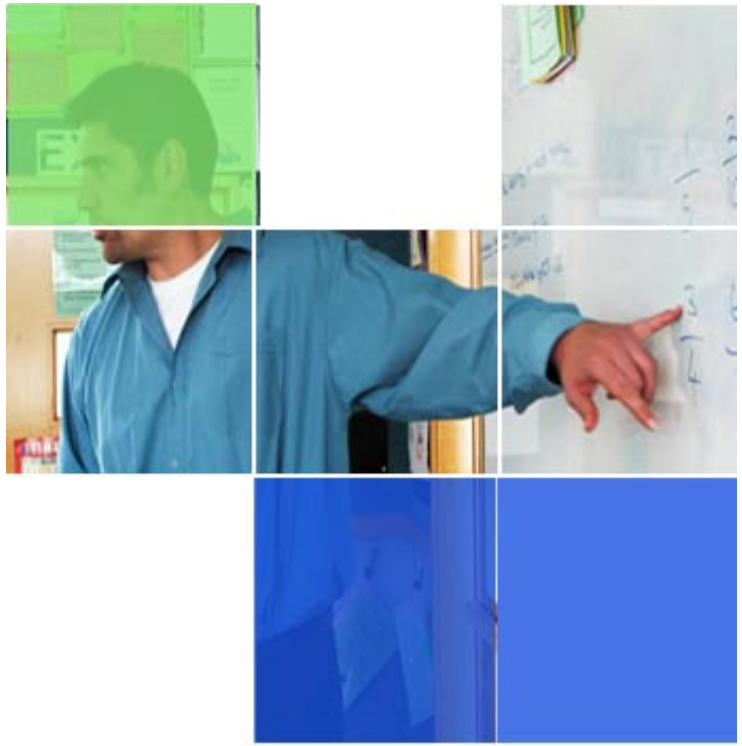
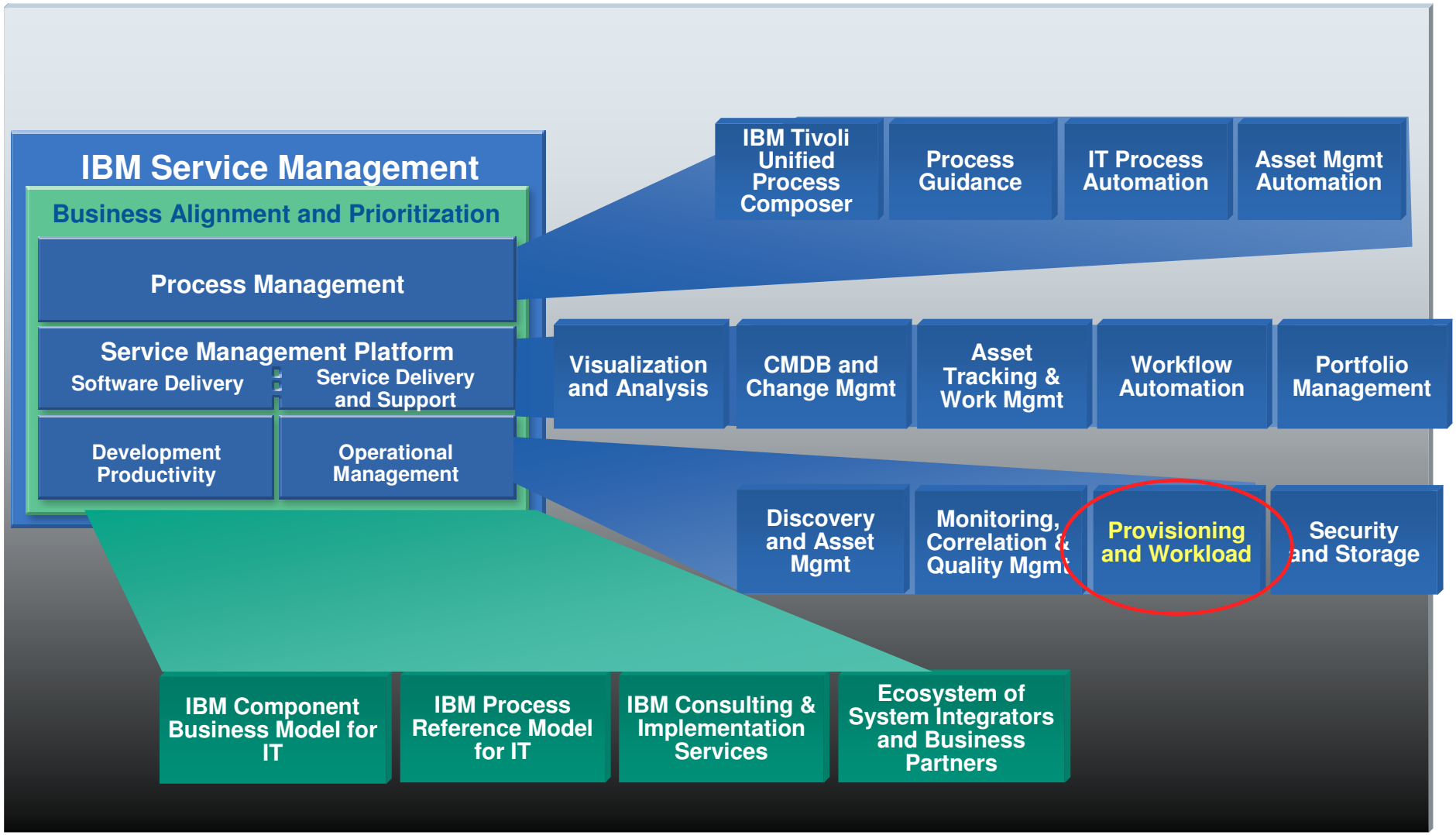
Agenda

- Provisioning Portfolio - Positioning
- Tivoli Provisioning Manager
  - Architecture Overview
  - Features and Functions
- TPM for Linux on System z – Proof Points



Provisioning within the Context of IBM Service Management



What is Provisioning?

– Uses Automation to Discover, Deploy, Configure, and/or Move Resources to Where Needed

- Discovery for Inventory Management
- Configuration for servers, software, network and storage devices
- Software Distribution, Patch Management, and Content Distribution

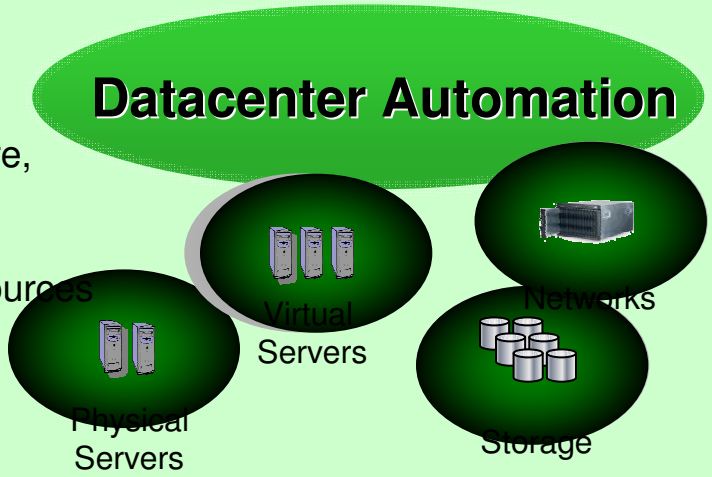
– Can Anticipate Demand for Resources - Sense and Respond

– Benefits: Higher IT asset utilization rates, Quality, Security, Efficiency, Cost Reduction (especially Labor)

TPM Portfolio Products Positioning

Resources

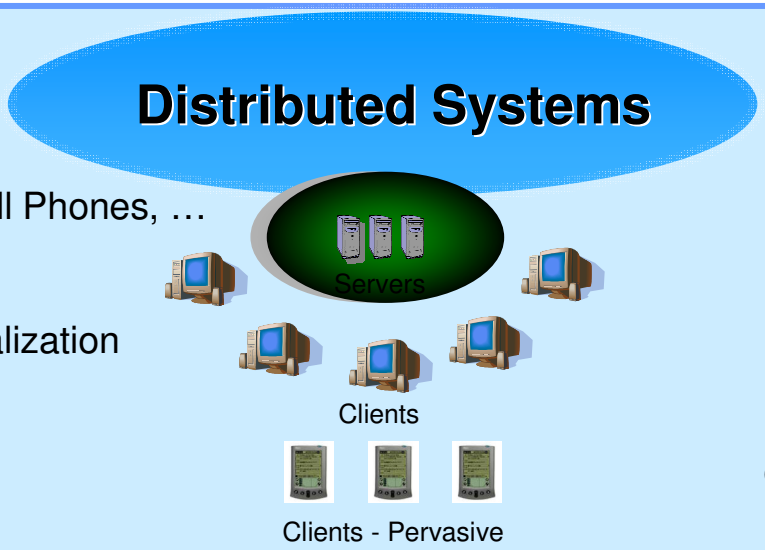
- Servers
- Networks
- Storage
- O/S, Middleware, Applications
- Databases
- Virtualized resources



Functions

- Resource provisioning
- Complex automation
- Back-up/recovery
- Broad O/S and resource coverage
- Resource security
- Integration w/other products
- Secure operation
- Auditing
- Customization

- Desktops
- Laptops
- Remote Servers
- ATMs, PDAs, Cell Phones, …
- O/S, Middleware, Applications
- Application Virtualization



- Resource inventory control
- Bare metal install
- Software distribution
- Remote Control
- Compliance
- Scalability
- Scheduled automation
- Ease of use

TPM Portfolio Products Positioning

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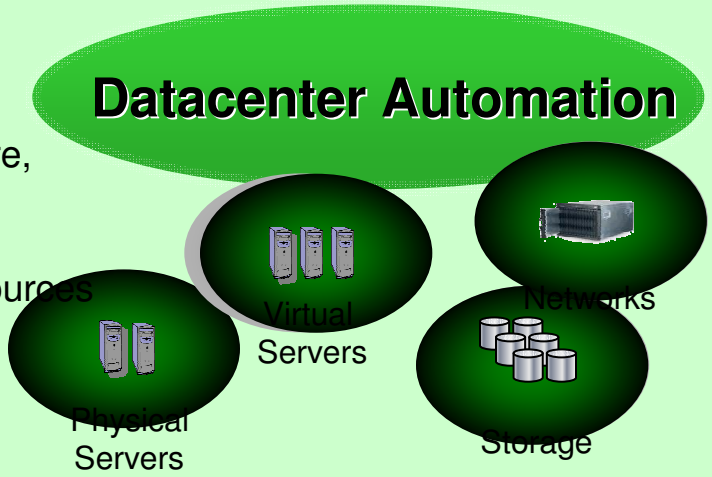

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- Customization

TPMfOSD

- **Tivoli Provisioning Manager**
- **Tivoli Provisioning Manager for OS Deployment**
- **Tivoli Provisioning Manager for Software**
- **Tivoli Remote Control**

- Desktops
- Laptops
- Remote Servers
- ATMs, PDAs, Cell Phones, …
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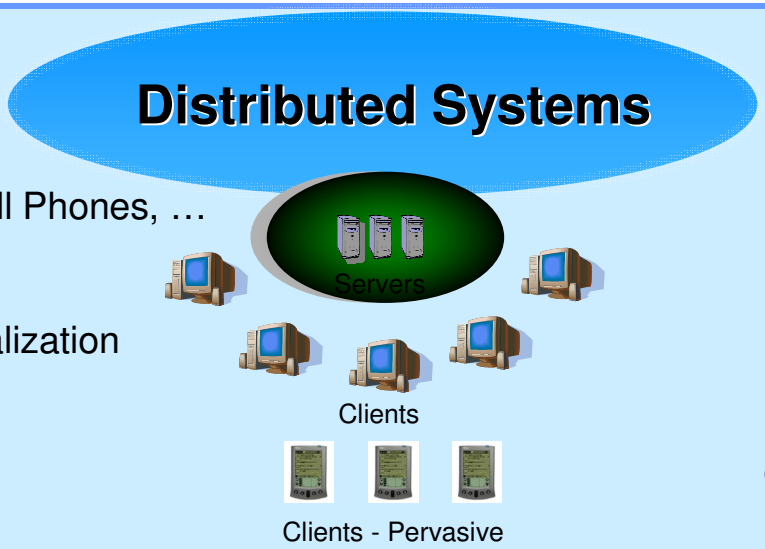

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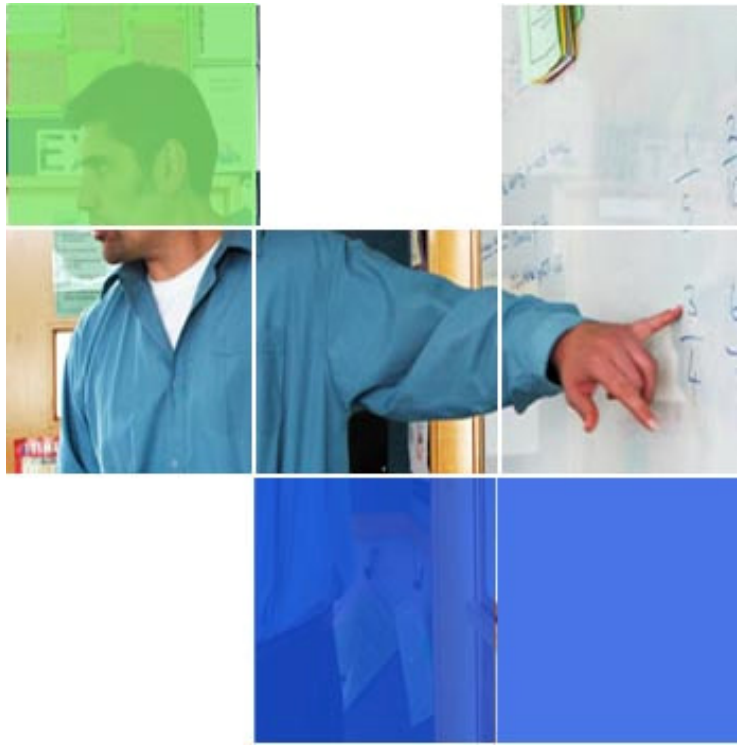
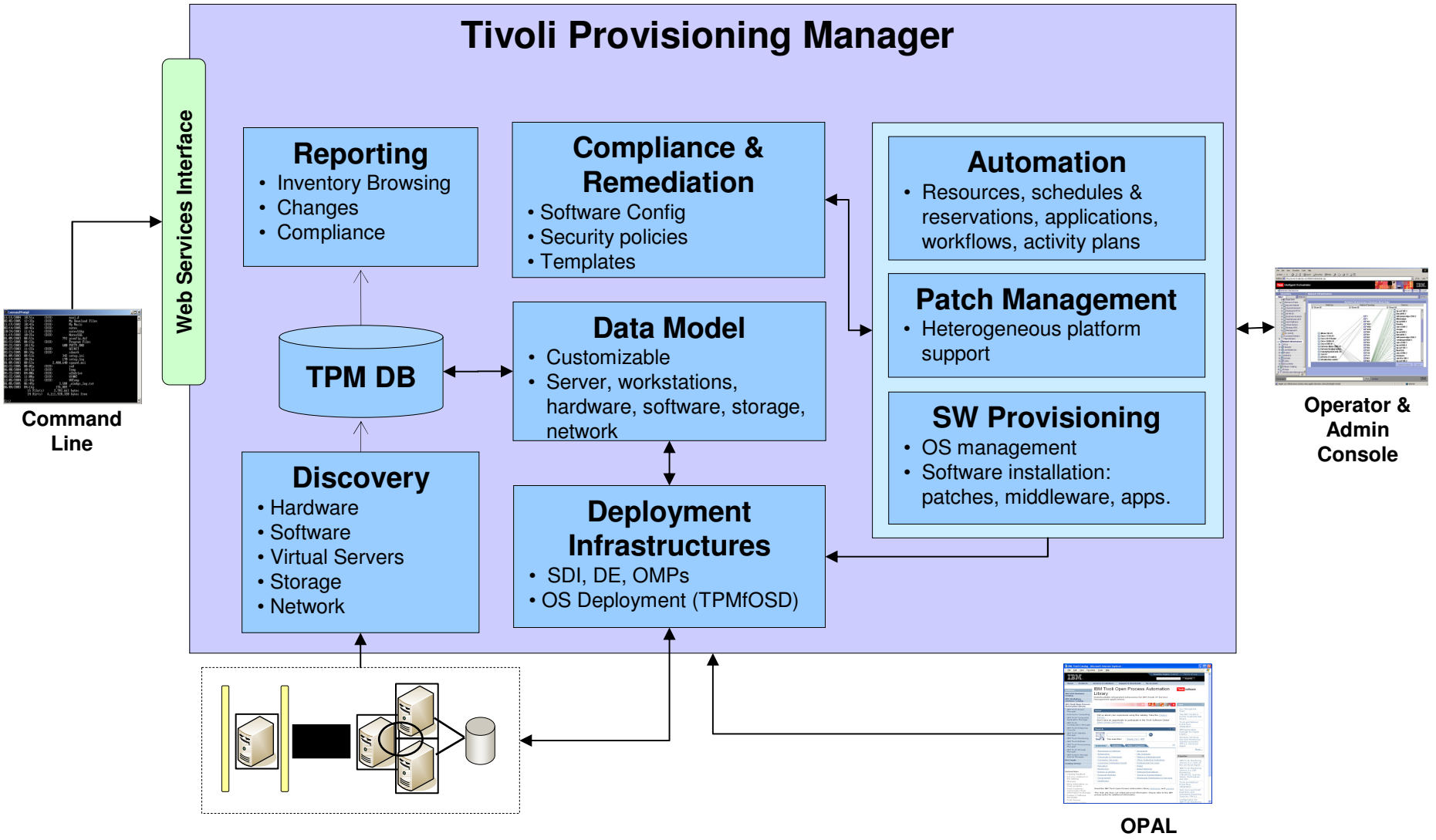
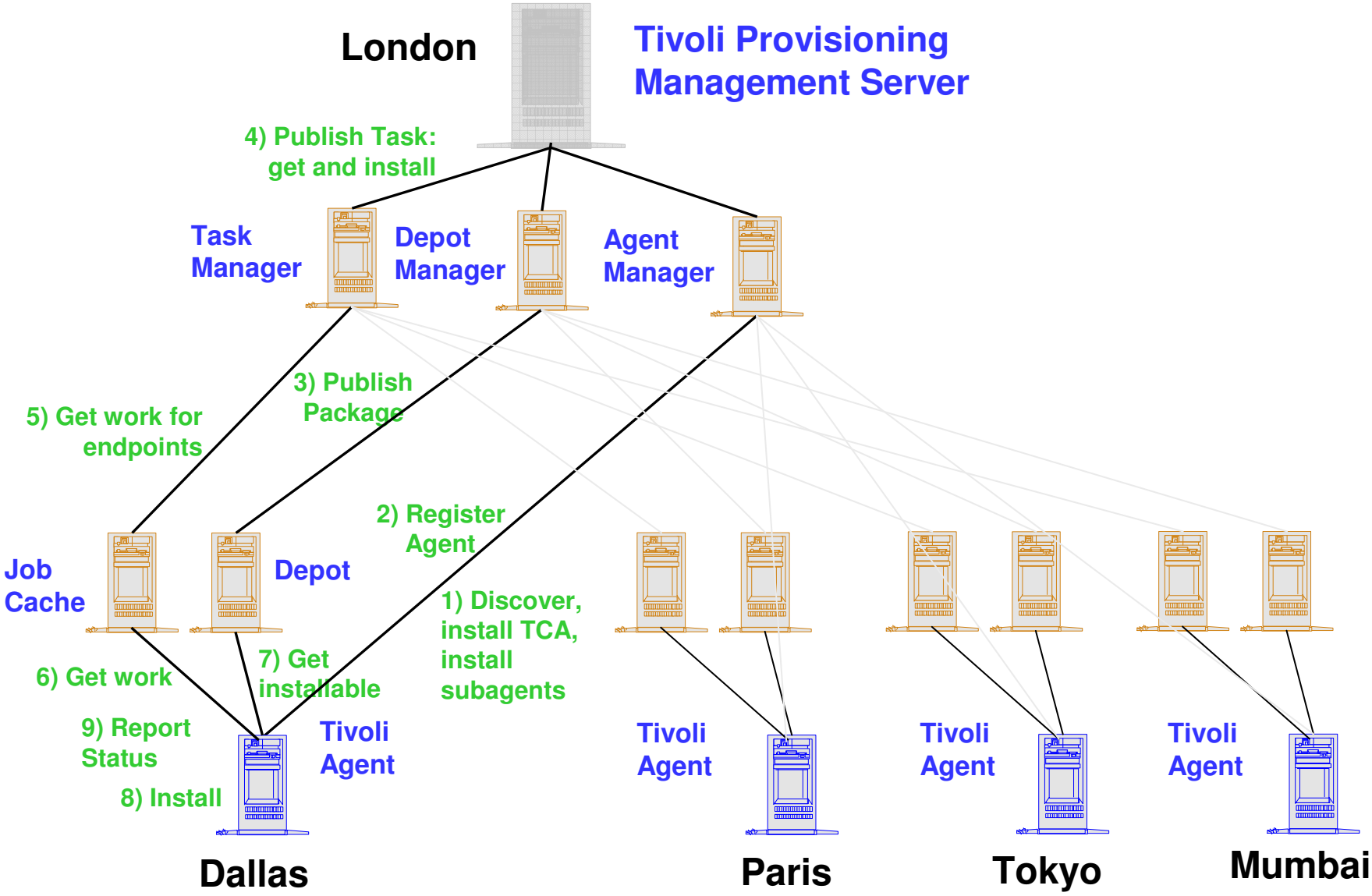


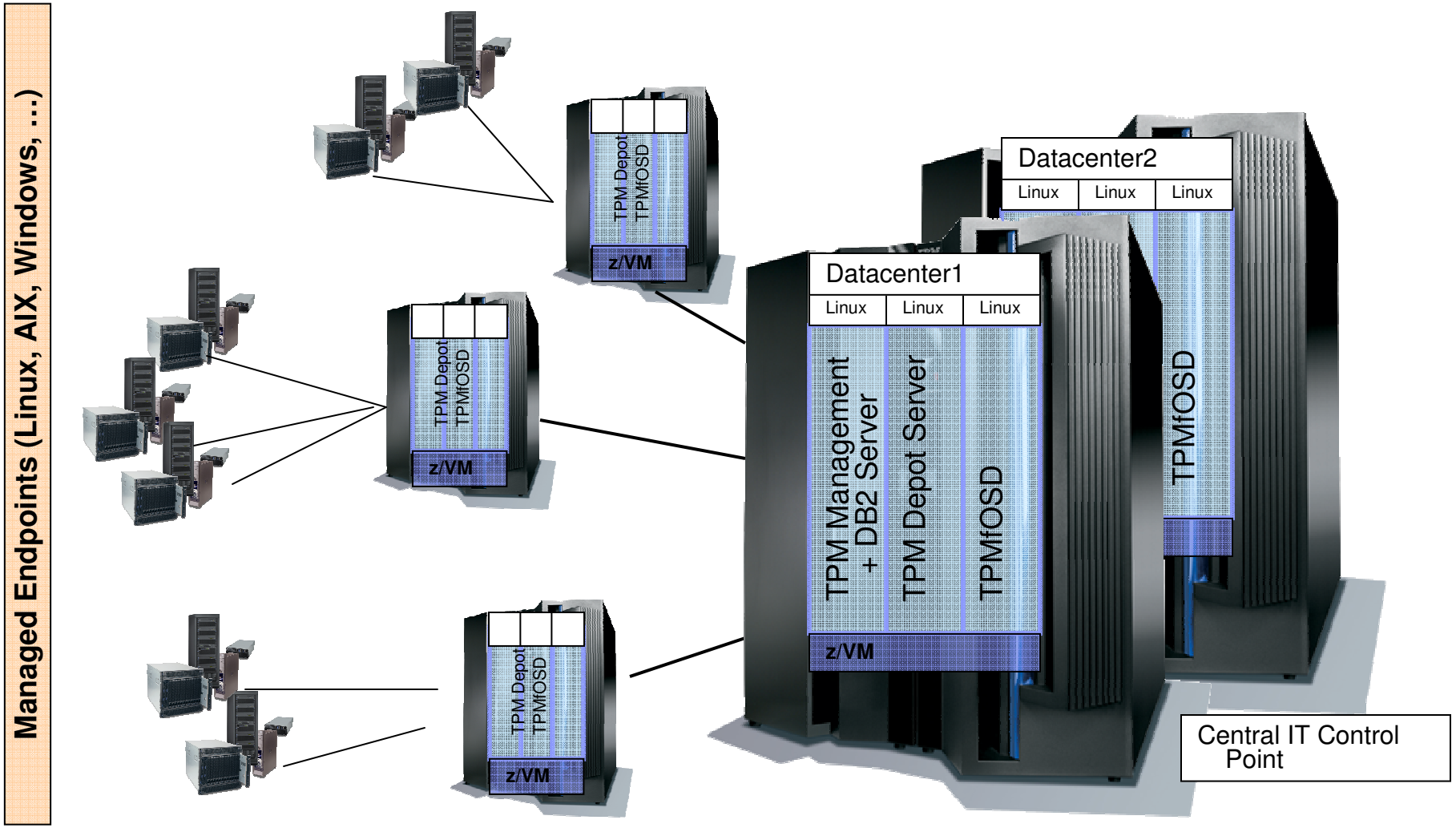
Tivoli Provisioning Manager Core Functionality



Tivoli Scalable Deployment Infrastructure (SDI)



Client Implementation – TPM for Linux on System z as Central IT Control Point



What OS's Are Supported?

Linux RHEL 5 (x86 32-bit, 64-bit)
Linux RHEL 5 on (System z 64-bit)
Linux RHEL 4 (x86 32-bit, 64-bit)
Linux RHEL 4 AS (iSeries)
Linux RHEL 4 AS (pSeries)
Linux RHEL 4 AS (AMD 64-bit)
Linux SLES 10 Enterprise Edition (System z 64-bit)
Linux SLES 10 Enterprise Edition (x86 32-bit, 64-bit))
Linux SLES 9 Enterprise Edition SP3 (x86 32-bit, 64-bit)
Linux SLES 9 Enterprise Edition (iSeries)
Linux SLES 9 Enterprise Edition (pSeries)
Linux SLES 9 Enterprise Edition (System z 64-bit)
AIX 6.1 any TL (pSeries)
AIX 6.1 any TL (iSeries)
AIX 5.3 any TL (pSeries)
AIX 5.3 any TL (iSeries)

Windows 2008 Server Enterprise Edition (32-bit, 64-bit)
Windows 2008 Server Standard Edition (32-bit, 64-bit)
Windows 2003 Server Standard Edition (32-bit, 64-bit) any SP
Windows 2003 Server Enterprise Edition (32-bit, 64-bit) any SP
Windows 2003 Server Datacenter Edition (32-bit)
Windows Vista Enterprise (64-bit)
Windows Vista Ultimate (64-bit)
Windows Vista (32-bit)
Windows XP Professional (32-bit, 64-bit) any SP
Solaris 10 (AMD 64-bit)
Solaris 10 (x86 64-bit)
Solaris 8,9,10 (Sparc)
HP-UX 11i v3 (PA-RISC, IA64, Itanium)
HP-UX 11i v2 (PA-RISC)

Tables indicate "Managed To" or client support provided by TPM 7.1.1 planned for 8/09.

Functional support may vary – great majority supported for inventory, SW deployment, OS patching

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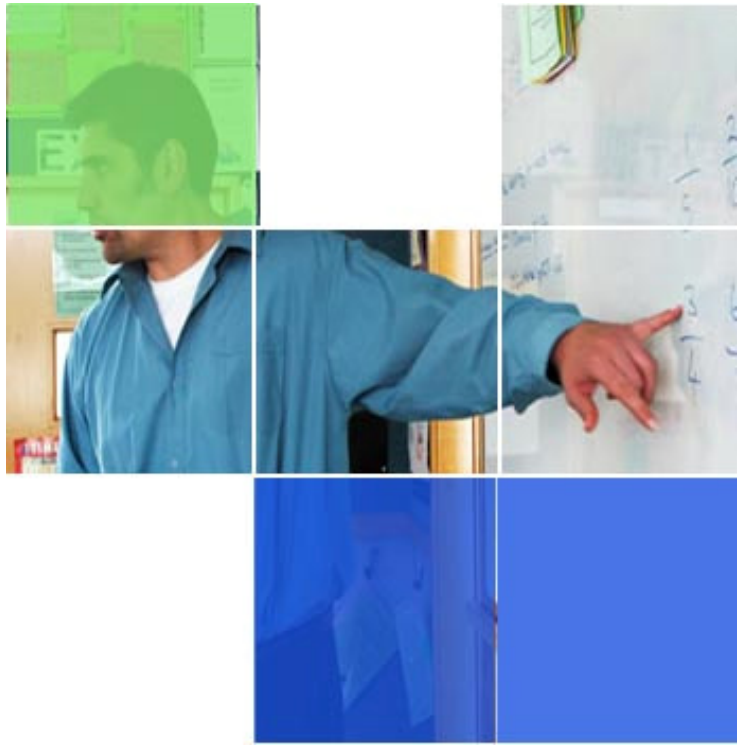
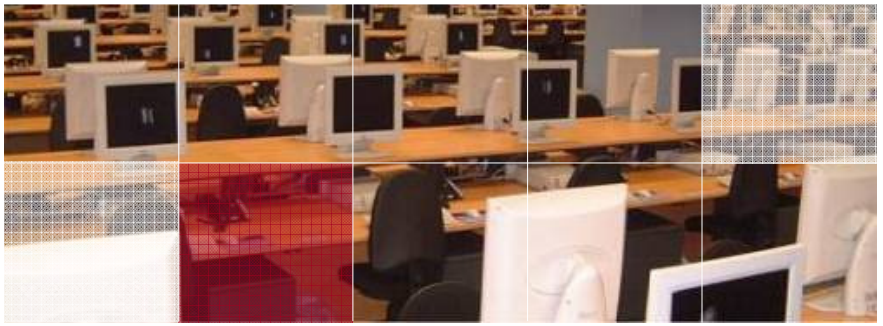
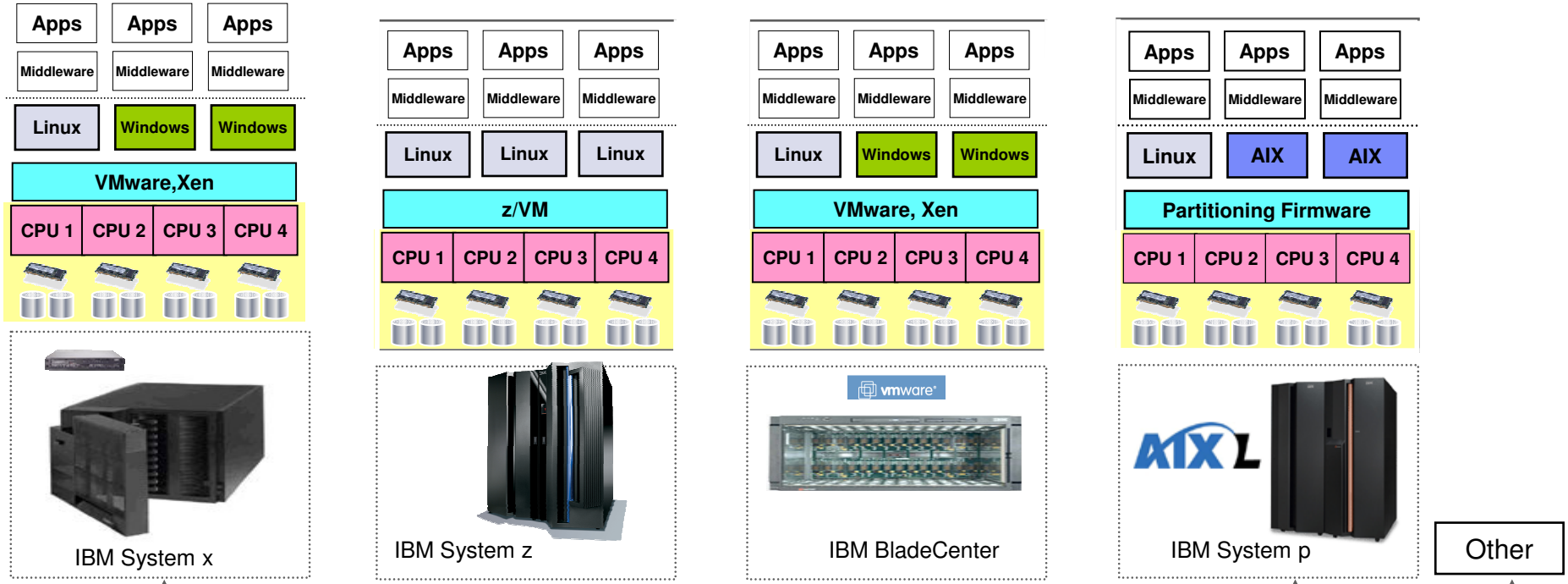


Multiple Discovery Capabilities

- **Embedded Discovery to get up and running fast**
  - Initial discovery initiated from welcome screen
- **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
- **Exploitative Discovery to Interoperate with other discovery engines**
  - TADDM
  - IBM Director
  - ITIL CI discovery with IBM CCMDB
  - Support for other technologies through Discovery Library



Physical and Virtual Support



SERVER/SOFTWARE PROVISIONING

- Data Center Model (DCM)
- Create virtual server from template
- Install operating system
- Install application software

NETWORK PROVISIONING

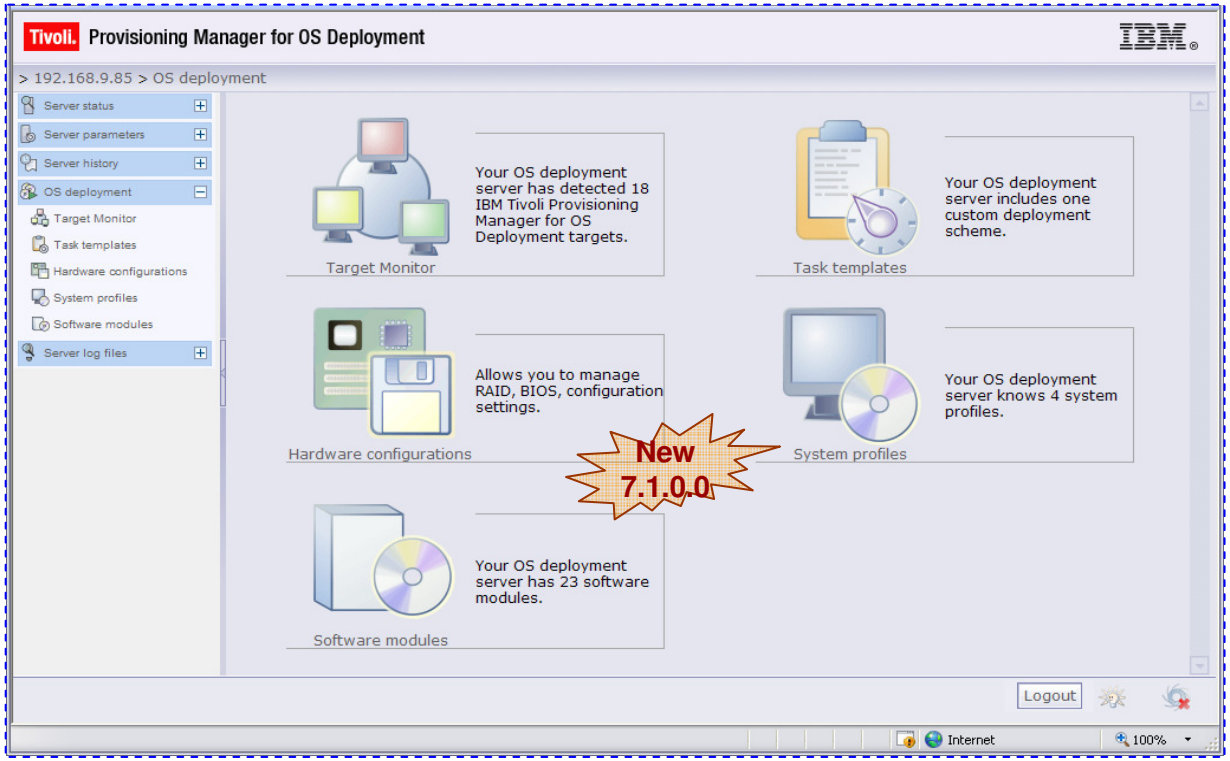
- Set appropriate server OS IP settings
- Set appropriate network IP settings
  - Firewall, switch, router
- Configure load balancer
- Place virtual servers in production

Tivoli Provisioning Manager "One Button Automation"

Tivoli Provisioning Manager for OS Deployment (TPMfOSD)

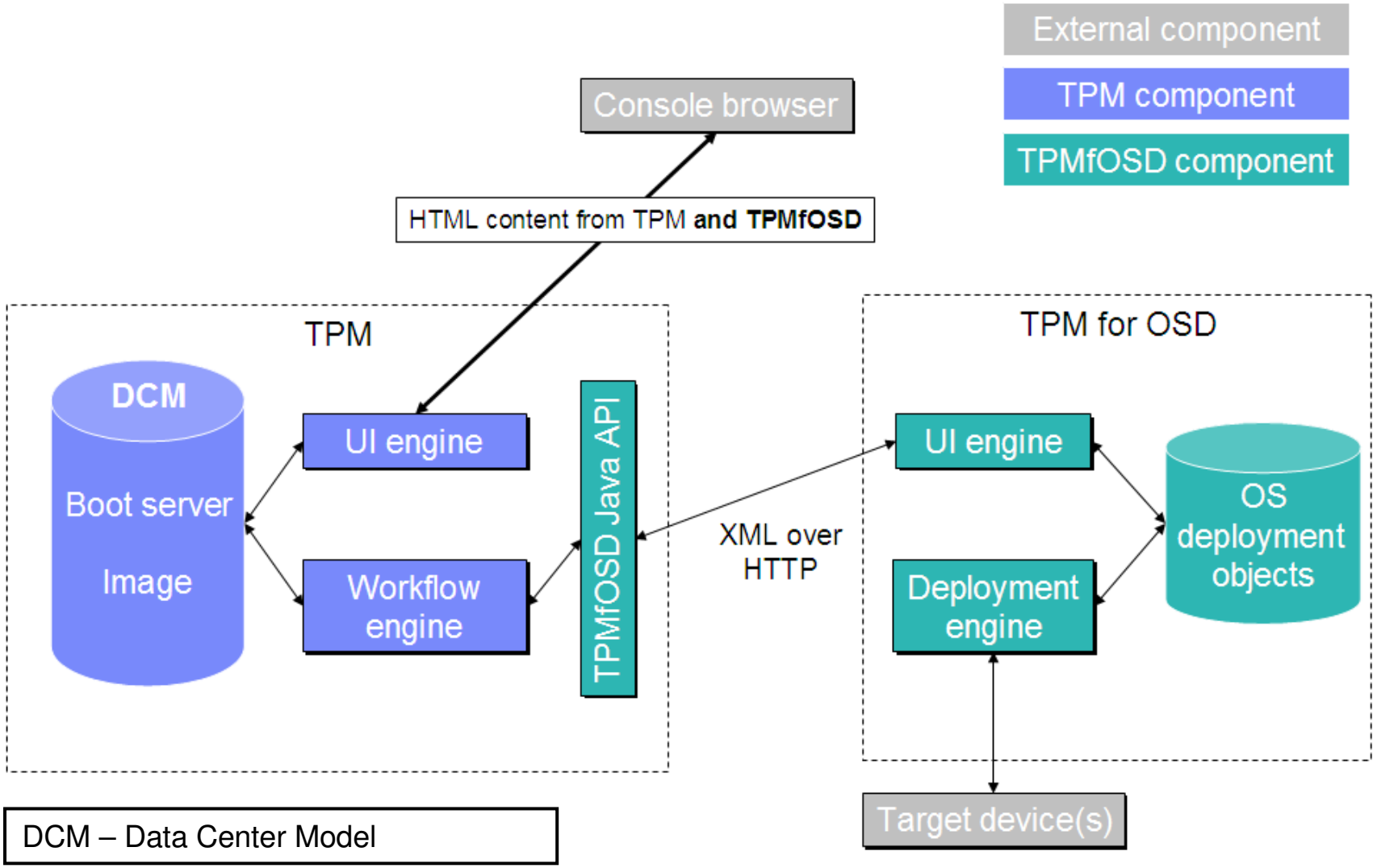
Manages computers booting through the PXE protocol

- Allows to create and customize:
  - Clone profiles of a "prepared" computer
  - Unattended profiles of any MSDN or Unix CD/DVD
  - Software packages from the most common installers
  - Software packages from "driver" files
- Deploys and installs computers
- Delivers a "working" computer fully installed



TPMfOSD server runs on Linux for System z

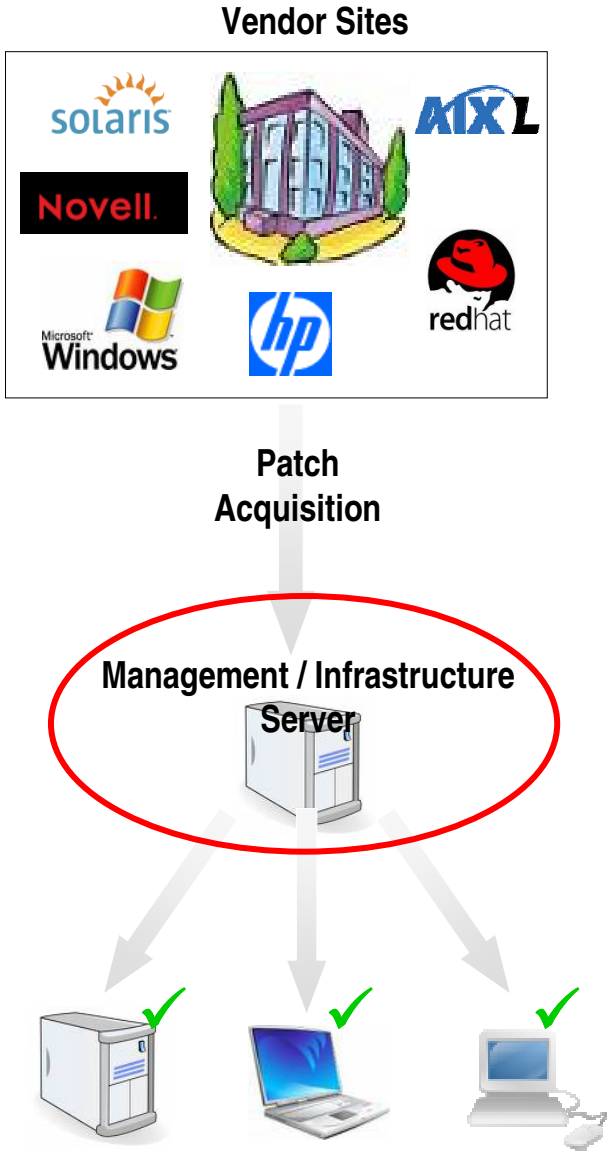
TPM and TPMfOSD Integration



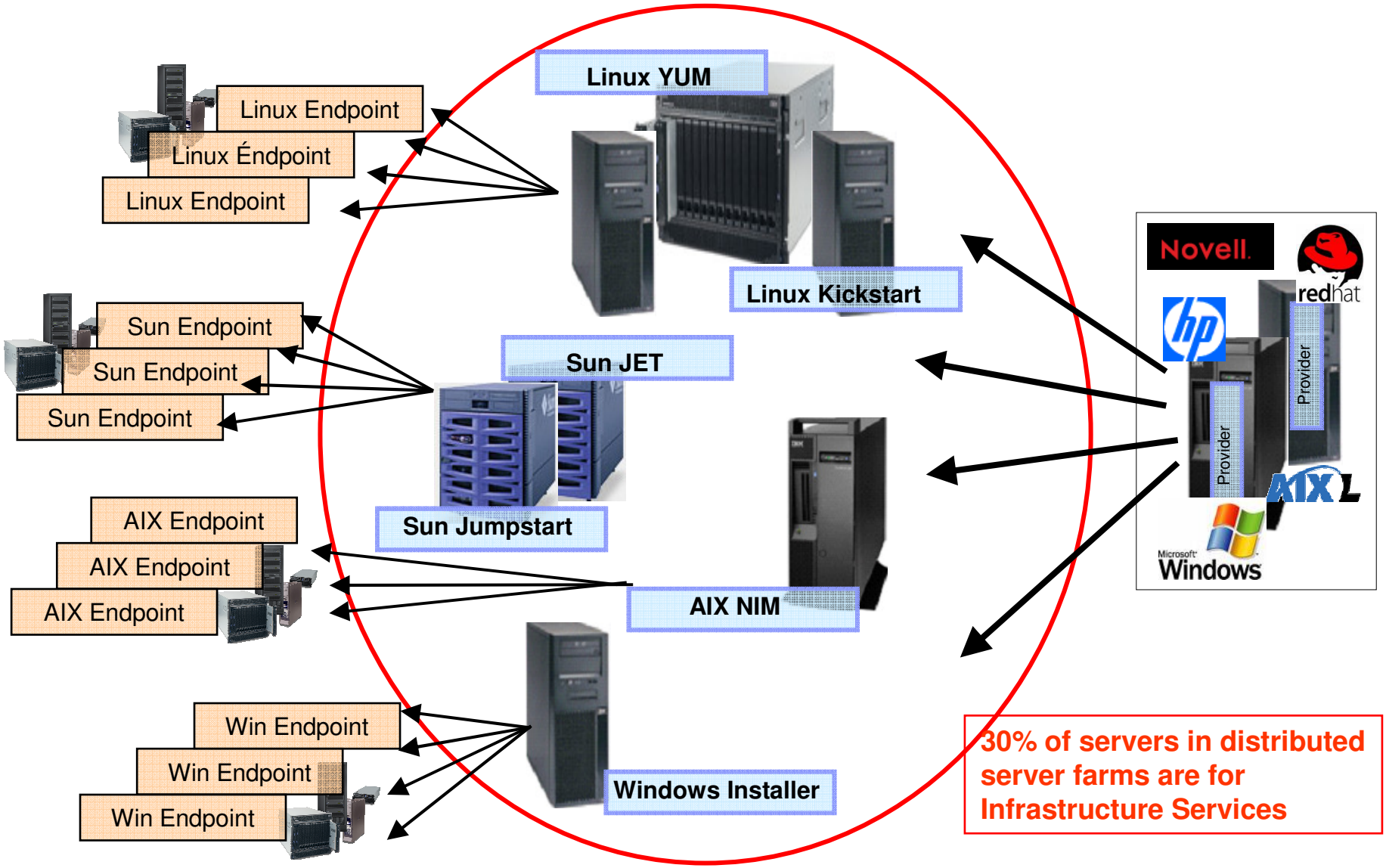
DCM – Data Center Model

Patch Management

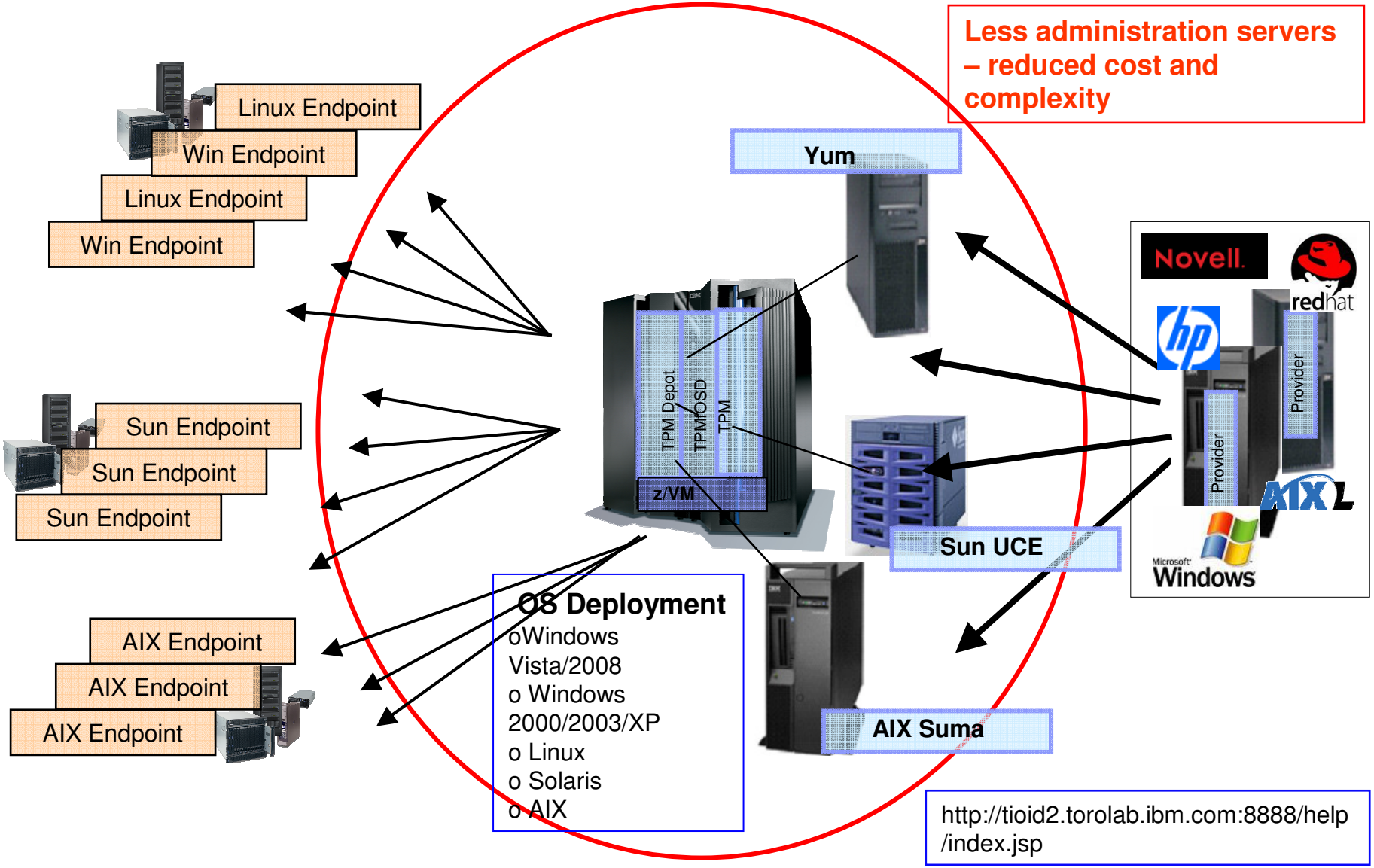
- Out of the box support for:
  - Red Hat and Novell SUSE Linux, AIX, Solaris, HP-UX, Microsoft Windows
- Integrated with higher-level compliance & remediation functions
- Same UI for multiple distribution frameworks
- Accurate patch recommendations for each system based on vendor scan technology



Client Implementation without TPM and TPMfOSD

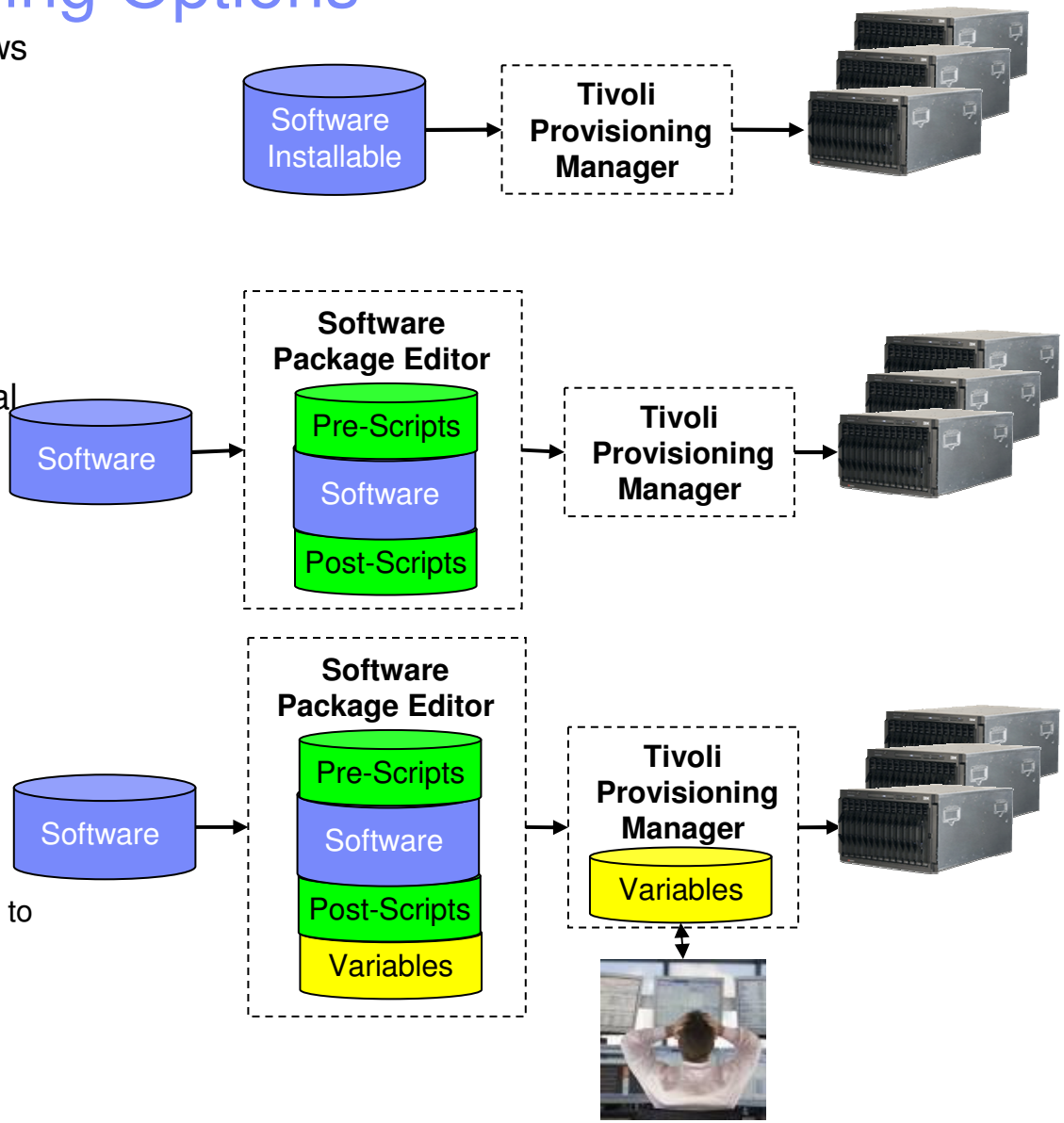


Cost Savings – Consolidate towards TPM and TPMfOSD



TPM Software Packaging Options

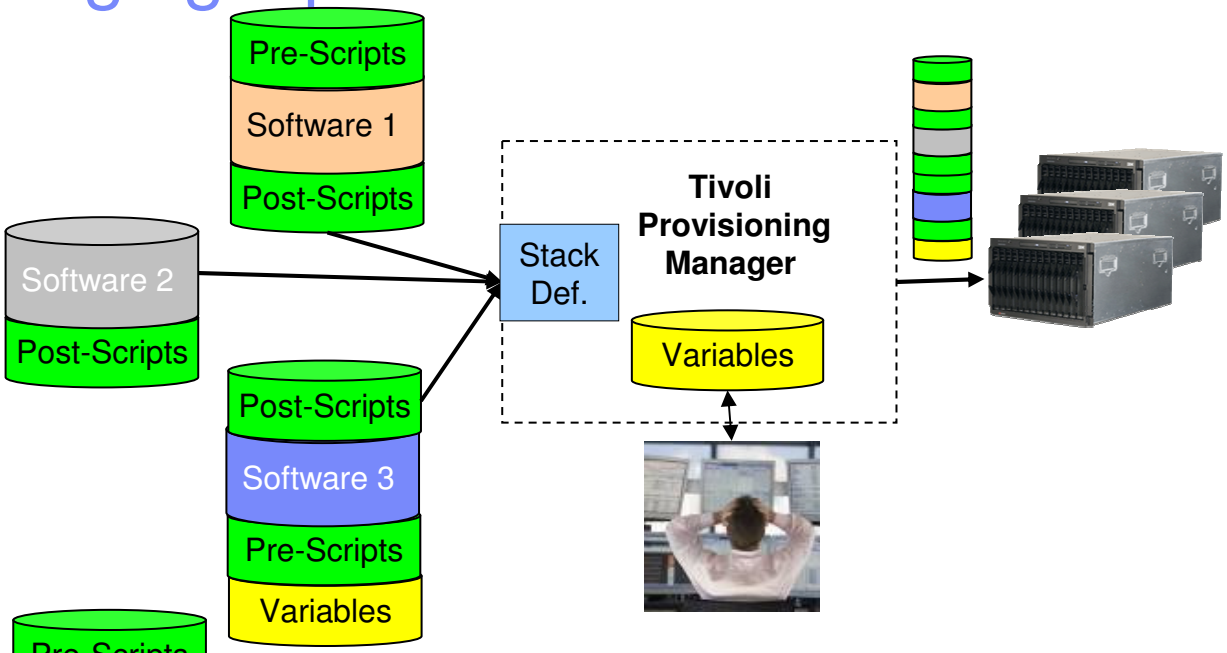
1. **Native installation technologies**; Windows (MSI, Installshield,…), AIX, Solaris, HP, Linux
   - Provide pointer to file
   - Provide installation command
   - Define targets
   - Install
2. **Software Package Block (SPB)** – physical package
   - Deployment of a single or multiple files
   - Can include before/after scripts
   - Resource dependency checks
   - User defined variables
   - Supports nested SPBs
   - Can be used to remove software
3. **Software Templates**
   - Ability to insert variables into deployment prior to execution



TPM Software Packaging Options cont.

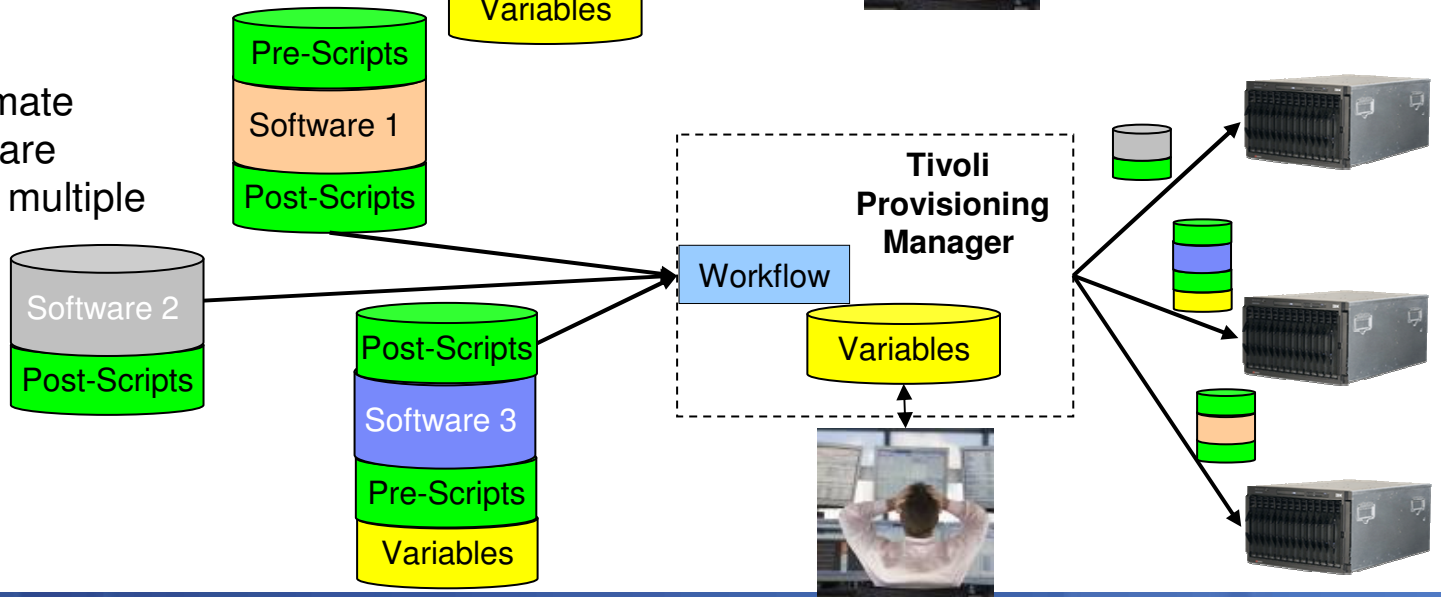
4. Software Stacks

– Groups of SPB's and/or templates to be deployed together in a specific sequence



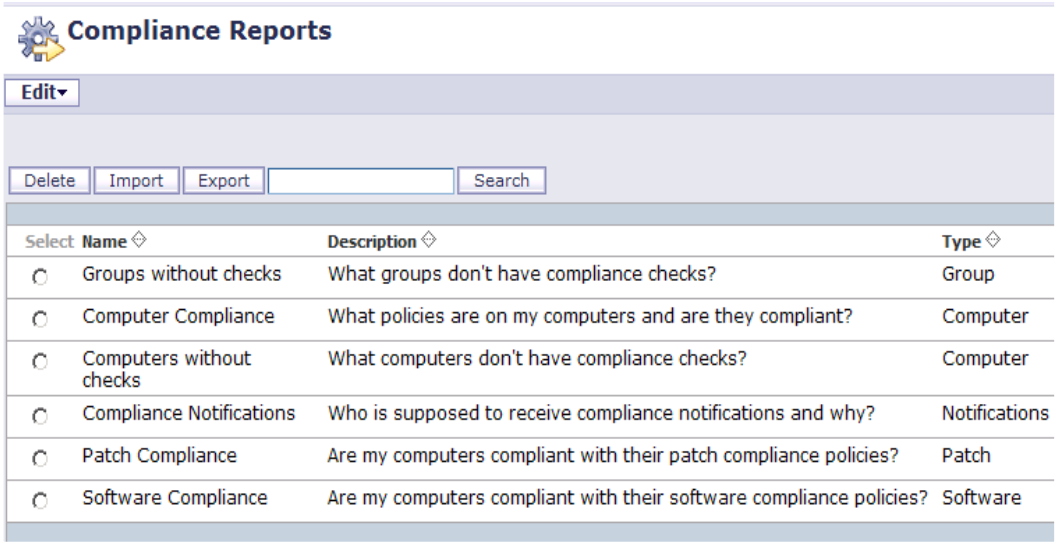
5. Complex Applications

– Ability to automate complex software installs across multiple systems



Compliance and Remediation

- **SECURITY Compliance**
  - Workstation and server security
  - Patch security
- **SOFTWARE Compliance**
  - Required, prohibited and optional software
  - Concept of software groups - one member of the group is required
- **Notify Action to each Group Administrator**
- **Compliance Reporting**



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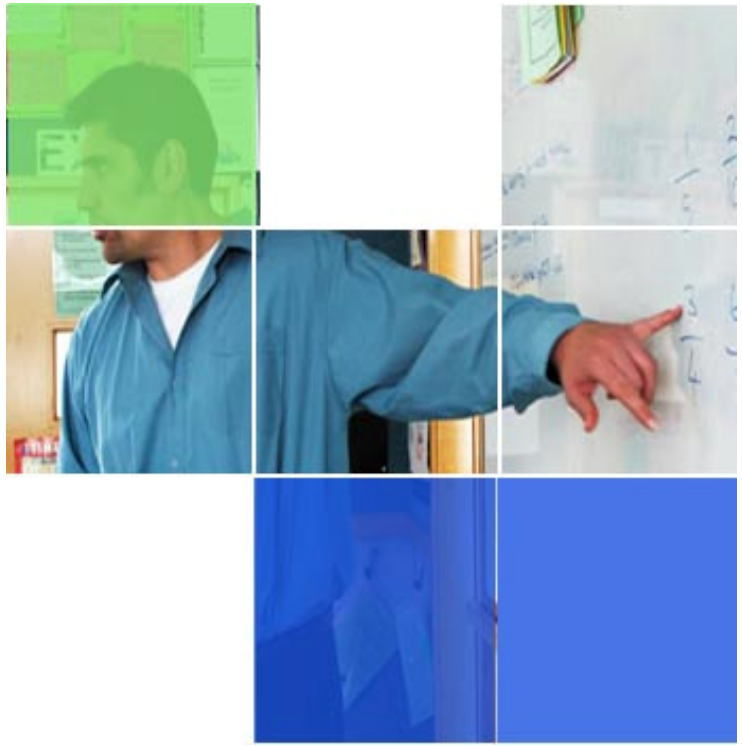


Decision Points for Data Center Automation

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

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

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

Data Center Automation - Benefits

Improved work-life balance for IT operations staff through

- One management hub controlling all IT assets across all company-wide data centers
- Keep IT assets under Control – consistent system management that you can be **proactive** towards requests and changes
- **Precise inventory data** enables thorough analysis, planning and accounting

Decision Points cont. + Objectives

Why on Linux on System z

- **Re-use expertise** - Mainframe Best Practices system management for distributed sites like SMPE
- **Flexible and scalable** using z/VM virtualization strengths – TPM components spread across different Linux instances to optimize workload + enable growth (e.g. easily increase number of depot servers as needed)
- **Performance advantages** - TPM 64 bit benchmark on System z10 shows excellent results

TPM Objectives

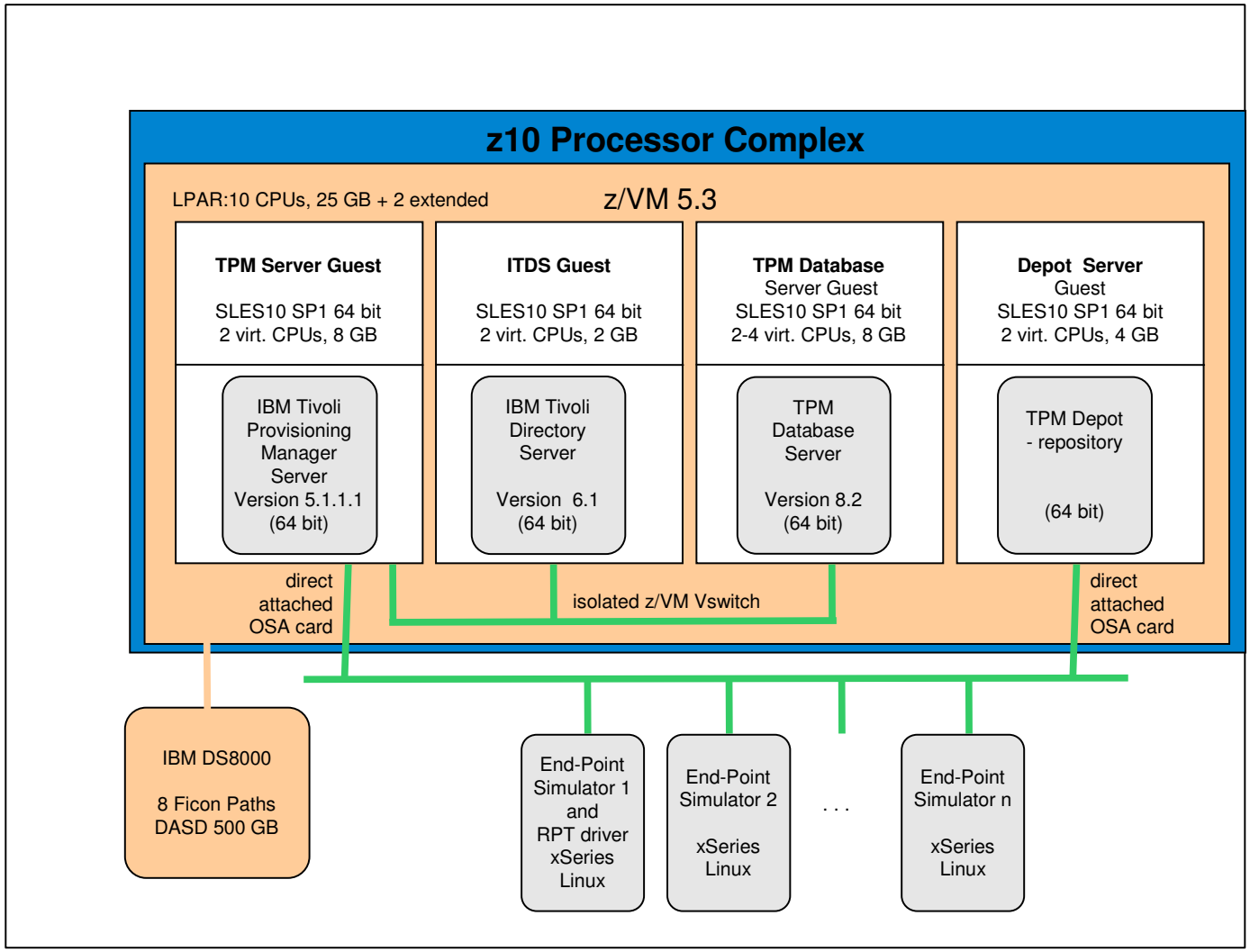
Server, network, storage provisioning

- Operating system and patches
- Consistent manner across all company areas
- Covering operating systems AIX, Windows, Linux, Solaris, HP-UX.

Cost savings

- Sun-setting old systems +consolidate infrastructure servers
- Reduce risks and exposures in compliances
- Enhance responsiveness – reduce today's cycle time of up to 57 days
- Reduce administration staff

Extensive TPM on System z10 Benchmark



Benchmark Scenarios & Methodology

Software Distribution to 20,000 endpoints

- Endpoint registration
- Endpoint discovery
- File distribution - 100MB to 20k endpoints
- Inventory scan result processing

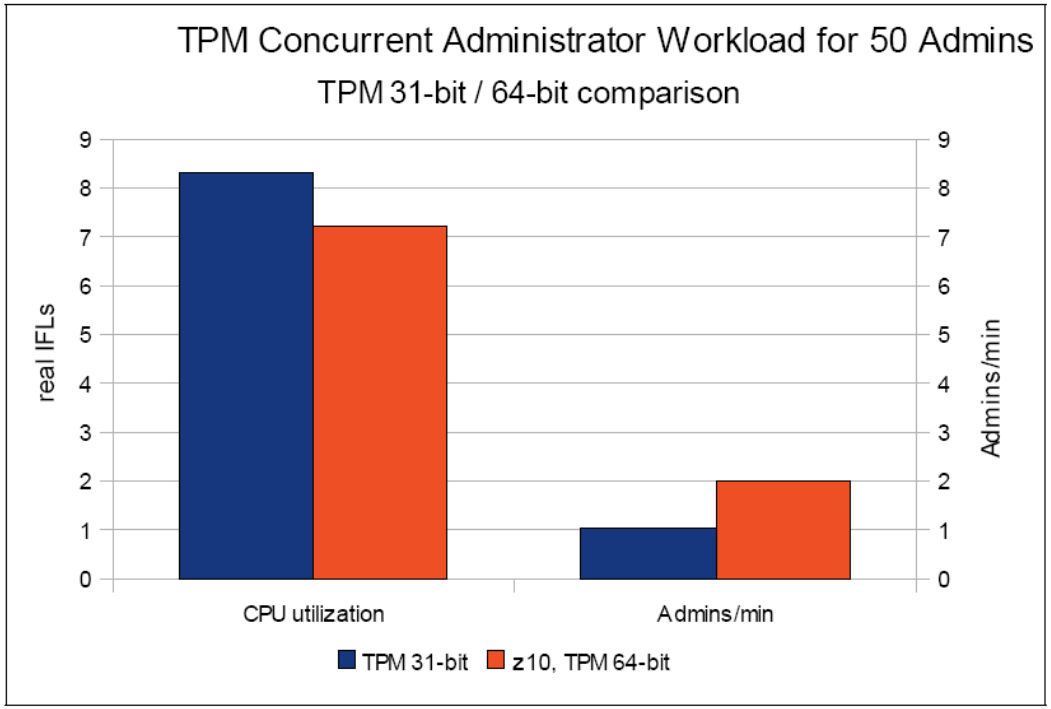
Concurrent administration up to 400 administrators

- Number of endpoints managed per administrator: 100
- Administrator workload mix “quick find” and “file distribution”

- Iterate over software distribution and concurrent administration scenarios while altering configuration
- **Tune up** TPM, WAS, DB2, hardware environment
  - CPU scaling (TPM + WAS: 1, 2, 4 IFLs; DB2: 2, 4, 6 IFLs)
  - Memory scaling
  - Network settings (OSA adapter/ports, VSWITCH)

Benchmark Results – Documented in Whitepaper

- Benchmark Tests performed with **31bit + 64bit** TPM on System z990, z9 and z10
- **TPM for Linux on System z** – Version 5.1.1 is the first 64bit IBM TPM product
- **Excellent performance** and scalability reached with System z10 and TPM 64bit:
  - With 13% less CPU utilization the number of served admins increases by 100%



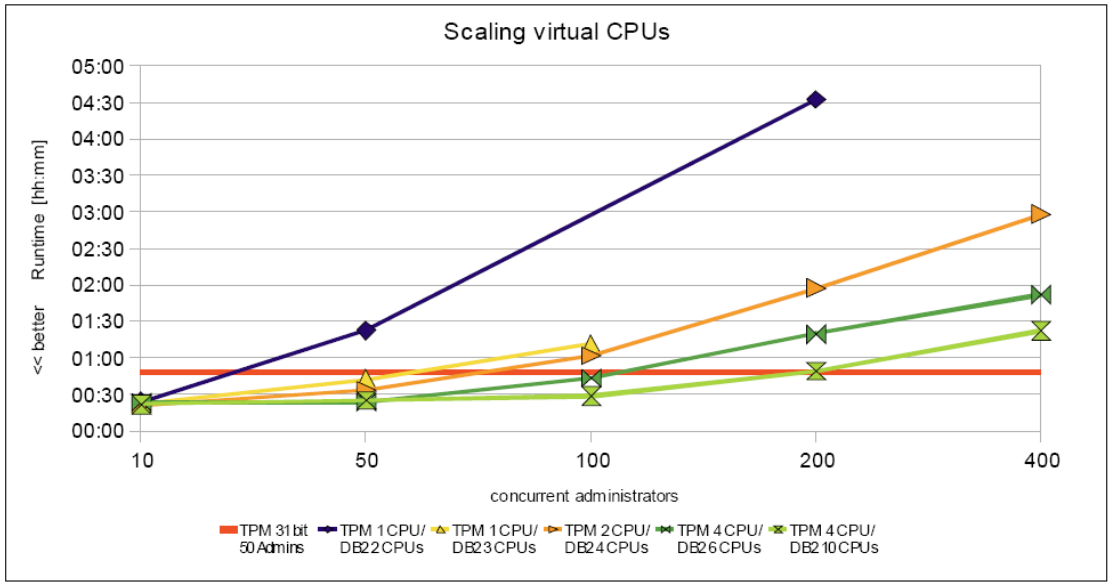
Whitepaper

http://www-01.ibm.com/software/brandcatalog/portal/opal/details?catalog.label=1TW10107R

Benchmark Results – Documented in Whitepaper cont.

Dramatic benefits for TPM 64bit compared to 31bit:

- For 50 concurrent administrators, 40% fewer CPUs can be allocated to System z10 and achieve over 31% improved transaction times
- Only about 45% of the IFLs for either 10 or 50 concurrent administrators are needed on System z10 compared to TPM 31bit on z990



		TPM 31-bit z990		TPM 64-bit z10	
#administrators		10	50	10	50
Duration [h:mm]		0:22	0:48	0:24	0:42
guest CPUs (virtual)	TPM server	0.98	3.07	0.40	0.82
	LDAP server	0.02	0.02	0.01	0.01
	DB server	2.39	5.05	1.19	2.82
	CDS	0.16	0.34	0.12	0.05
	sum guests	3.54	8.47	1.71	3.7
LPAR CPU utilization	**z/VM**	3.73	8.36	1.72	3.72

References

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- *TPM 7.1: Capacity Planning Cookbook(Leitch, Kaye-Cheveldayoff), - http://www-1.ibm.com/software/brandcatalog/portal/opal/details?catalog.label=1TW10107O*
- *TPM 5.1.1.1: 64 Bit System z10 Benchmark Results(Leitch, Doelle, Kaye-Cheveldayoff, Yuan, Sadler, - http://www-01.ibm.com/software/brandcatalog/portal/opal/details?catalog.label=1TW10107R*
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- *TPM 5.1: A High Availability Customer Solution* (Leitch, Postea, Kaye-Cheveldayoff), http://www.ibm.com/software/tivoli/opal/?NavCode=1TW10105N
- *TPM 5.1: A Disaster Recovery Customer Solution* (Leitch, Kaye-Cheveldayoff, Postea), http://www.ibm.com/software/tivoli/opal/?NavCode=1TW10105O
- *Large Scale Deployment Using Tivoli Provisioning Manager* (Iszlai, Fedorenko, Leitch), http://www.ibm.com/software/tivoli/opal/?NavCode=1TW10106H
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- *TPM 5.1.1: A Server Configuration Cookbook for Performance and High Availability* (Leitch, Kaye-Cheveldayoff), http://www.ibm.com/software/tivoli/opal/?NavCode=1TW101072
- *TPM 5.1.1: A DB2 Schema Movement Solution* (Leitch), http://www.ibm.com/software/tivoli/opal/?NavCode=1TW101073
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धन्यवाद

Hindi

多謝

Traditional Chinese

ขอบคุณ

Thai

Спасибо

Russian

Gracias

Spanish

Thank You

English

شكرا

Arabic

Obrigado

Brazilian Portuguese

多谢

Simplified Chinese

Danke

German

Grazie

Italian

Merci

French

நன்றி

Tamil

ありがとうございました

Japanese

감사합니다

Korean