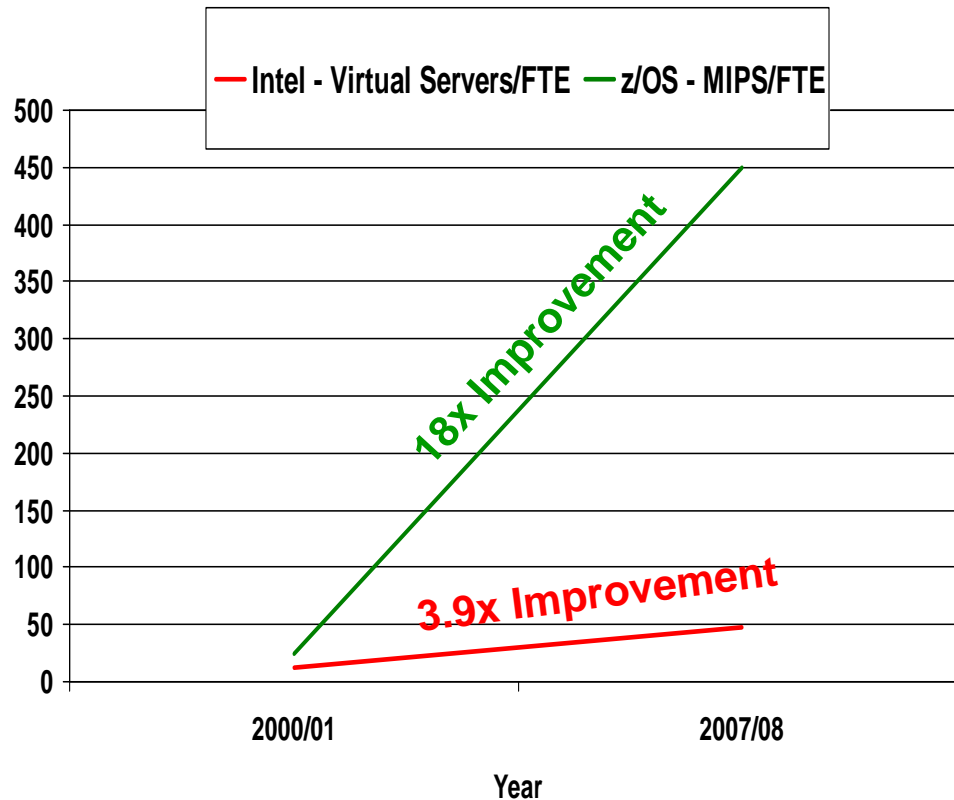




The New zEnterprise – A Smarter System For A Smarter Planet

Reduce Labor Costs With zEnterprise

System z Labor Cost Trends Favor A Centralized Approach To Management



Large scale consolidation and structured management practices drive increases in labor productivity

Small scale consolidation achieves lesser gains

**The more workloads you consolidate and manage with structured practices...
the lower the management labor cost**

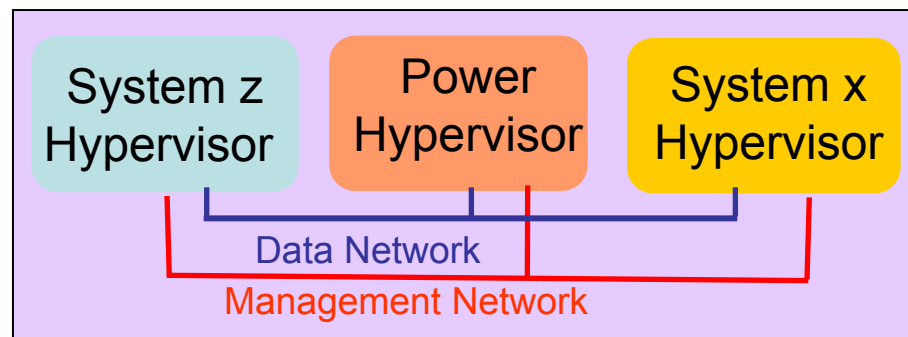
Examples Of Structured Management Practices

Process	Typical Distributed Management Practices	Structured Management Practices
Validation and Testing	<ul style="list-style-type: none"> Applications released into production may trigger errors or downtime 	<ul style="list-style-type: none"> Structured automated testing to ensure quality-driven software delivery
Deployment and Release Management	<ul style="list-style-type: none"> Manual, one at a time installation of software stacks 	<ul style="list-style-type: none"> Automated deployment process with self-service/request-driven provisioning
Availability and Capacity Management	<ul style="list-style-type: none"> Memorized procedures for manual starting, stopping and failover Manual scheduling of jobs 	<ul style="list-style-type: none"> Automated start, stop and failover of composite applications Automated job scheduling
Monitoring and Control	<ul style="list-style-type: none"> Passive monitoring 	<ul style="list-style-type: none"> Active and continuous monitoring to fix problems quickly
Incident and Problem Management	<ul style="list-style-type: none"> Manual routing of incidents by established convention 	<ul style="list-style-type: none"> Automated best practice problem resolution through integrated service desk and service catalog
Asset Management	<ul style="list-style-type: none"> Antiquated and inaccurate chargeback mechanisms 	<ul style="list-style-type: none"> Structured chargeback model based on license entitlements, usage and costs of shared resources

zEnterprise And Tivoli Support Structured Management Practices For All Workloads

IBM Tivoli Service Management Center
for System z

Unified Resource Manager



**End-to-End
Service Management**

**Integrated
Platform Management**

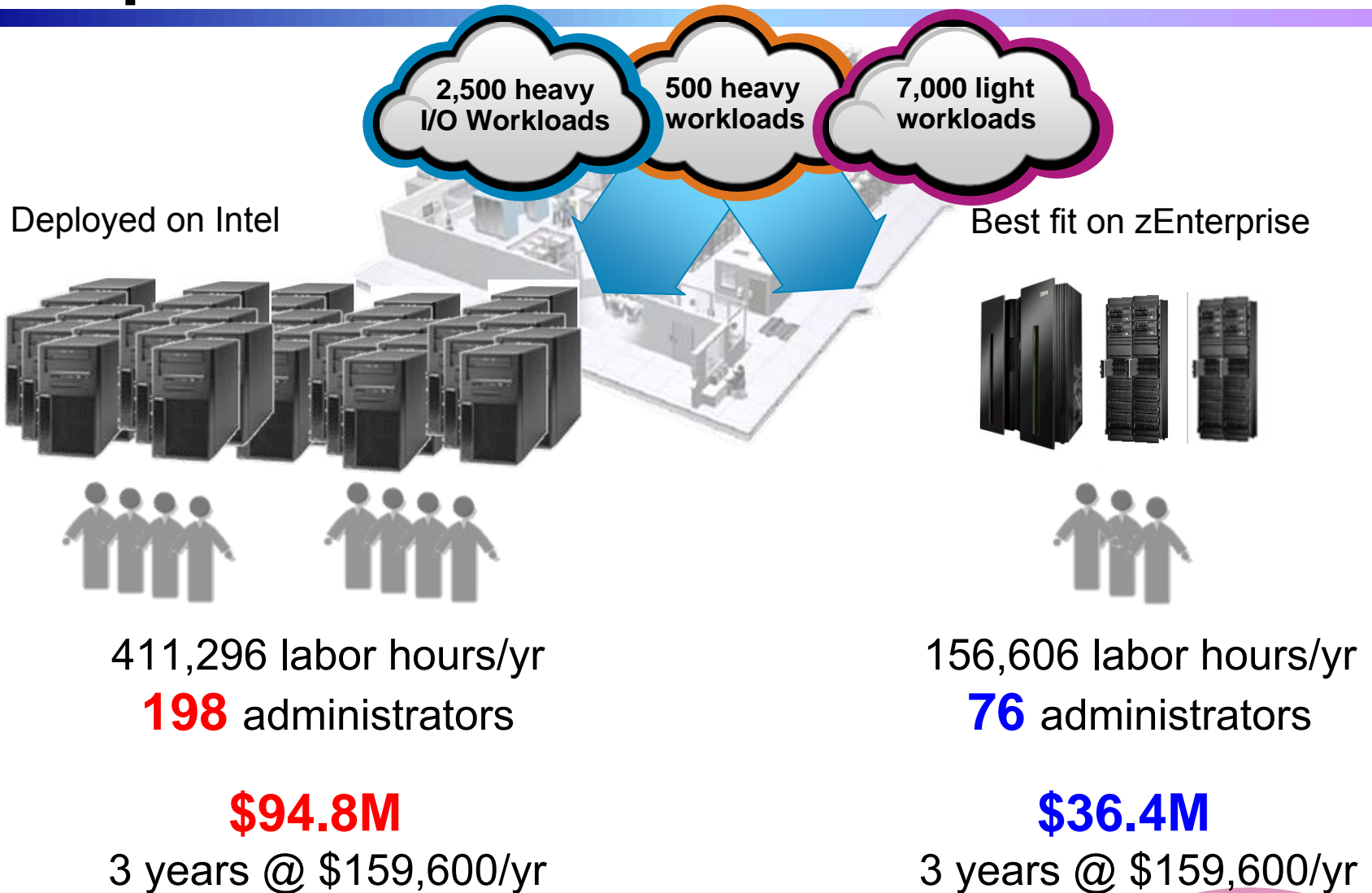
**Integrated
Fit-for-Purpose
Platform**

zEnterprise



**Extends System z
quality of service to
all environments**

Compare Server Infrastructure Labor Cost



Configuration based on IBM internal studies.
Labor model based on customer provided field data from IBM studies
Labor rates will vary by country

62% less

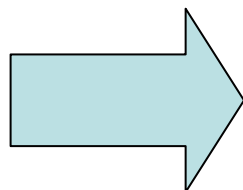
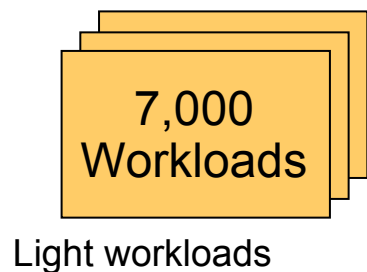
Labor Cost Model For Distributed Workloads

- Field data metrics typically stated in “servers per FTE”
- Allocate hours to
 - ▶ Tasks for each software image
 - ▶ Tasks for each physical server
- Further allocate hours to key ITIL processes
 - ▶ Hardware and software
- Assess how virtualization and standardization will reduce task hours required
- Use lab studies to estimate how automation will reduce task hours required

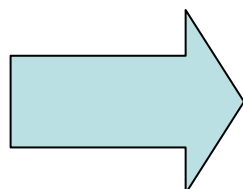
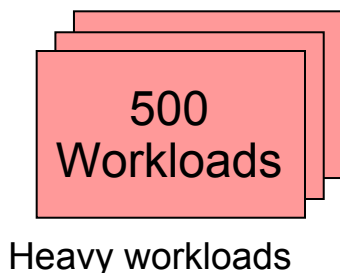
Accumulated Field Data For Labor Costs

- Average of quoted infrastructure labor costs
 - ▶ **30.7** servers per FTE (dedicated Intel servers)
 - **67.8** hours per year per server for hardware and software tasks
 - ▶ **52.5** Virtual Machines per FTE (virtualized Intel servers)
 - **39.6** hours per year per Virtual Machine for software tasks and amortized hardware tasks
 - Typical 8 Virtual Machines per physical server
- Best fit data indicates
 - ▶ Software tasks are **36** hours per software image per year
 - Assume this applies to all distributed and zLinux software images
 - ▶ Hardware tasks are **32** hours per physical server per year
 - Assume this applies to Intel or Power servers
 - Internal IBM studies estimate **320** hours per CPC for zLinux scenarios

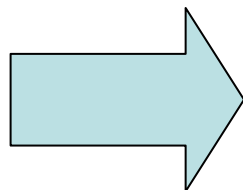
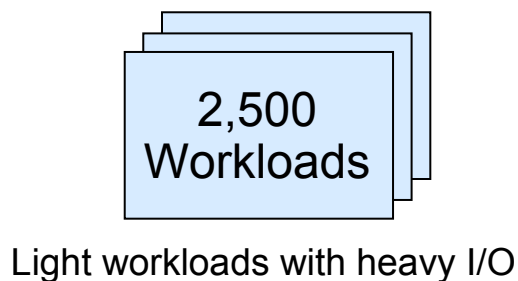
Distributed Infrastructure - Labor Costs Are Significant



280,000 labor hours
(135 administrators, or
\$21.5M per year)
52.5 Virtual Machines per
FTE



34,000 labor hours
(16 administrators, or
\$2.6M per year)
30.7 servers per FTE



97,296 labor hours
(47 administrators, or
\$7.5M per year)
52.5 Virtual Machines per
FTE

411,296 total labor hours, 198 administrators, or \$31.6M per year cost

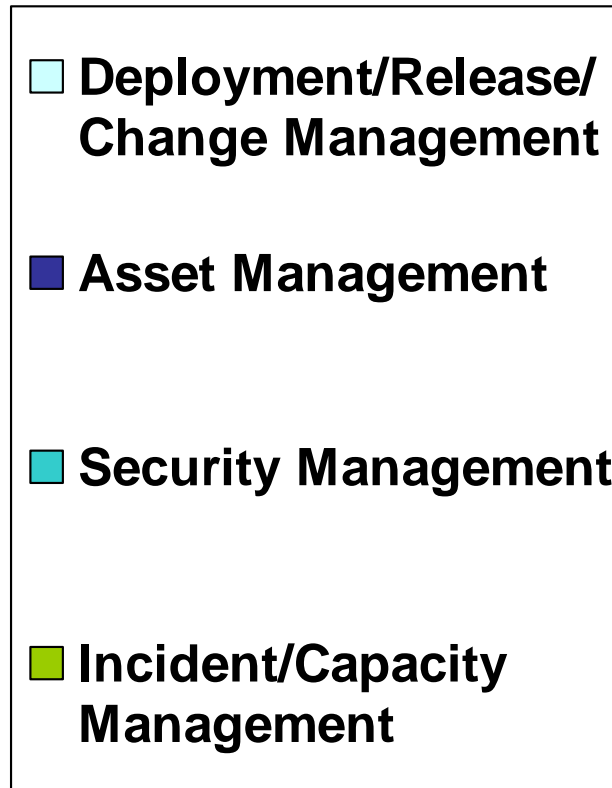
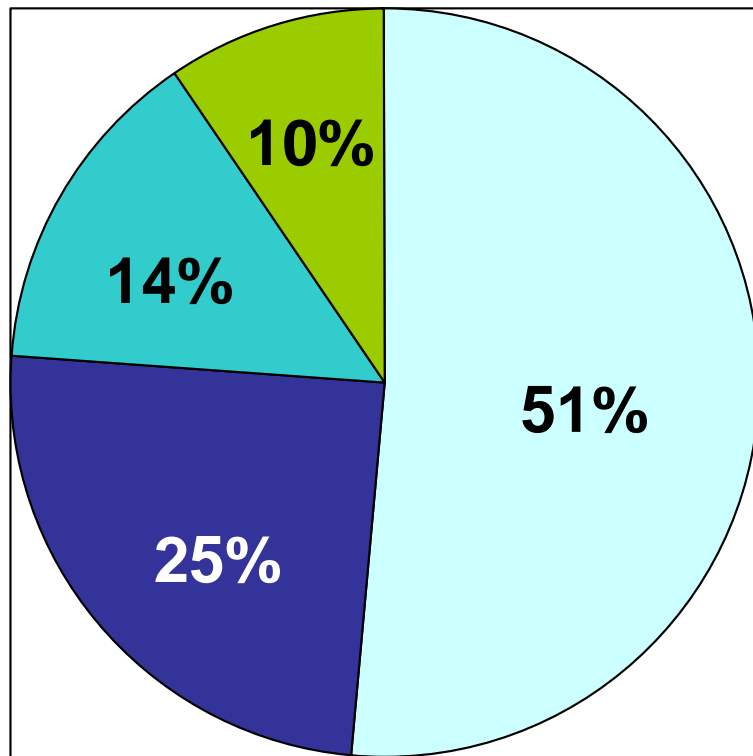
Based on fully-burdened rate of \$159,600 per year for each FTE (2080 hrs/yr)

Configuration based on IBM internal studies.

Labor model based on customer provided data from IBM studies

Labor rates will vary by country

Four Key IT Processes For Infrastructure Administration



Fractional allocation of labor based on an in depth Eagle TCO study with a typical large financial services customer

Distributed Infrastructure - Deployment Labor Costs

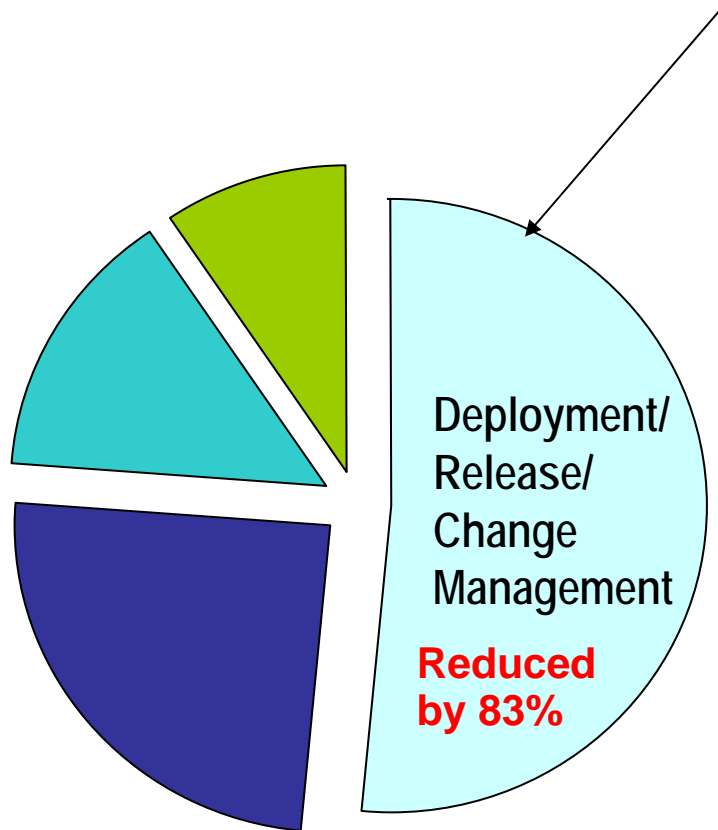
	Total HW labor hours	Deploy % of labor	Total # of servers		Total SW labor hours	Deploy % of labor	Total unique stacks		
7,000 Light Workloads	32 hr	0.51	875	+	36 hr	0.51	7,000	=	142,800
+									
500 Heavy Workloads	32 hr	0.51	500	+	36 hr	0.51	500	=	17,340
+									
2,500 Heavy I/O Workloads	32 hr	0.51	228	+	36 hr	0.51	2500	=	49,621

**Intel Server
TOTAL**

Based on IBM internal study.
Labor model based on customer
provided data from IBM studies

209,761 hrs

Example – zEnterprise Labor Cost Reduction Strategies

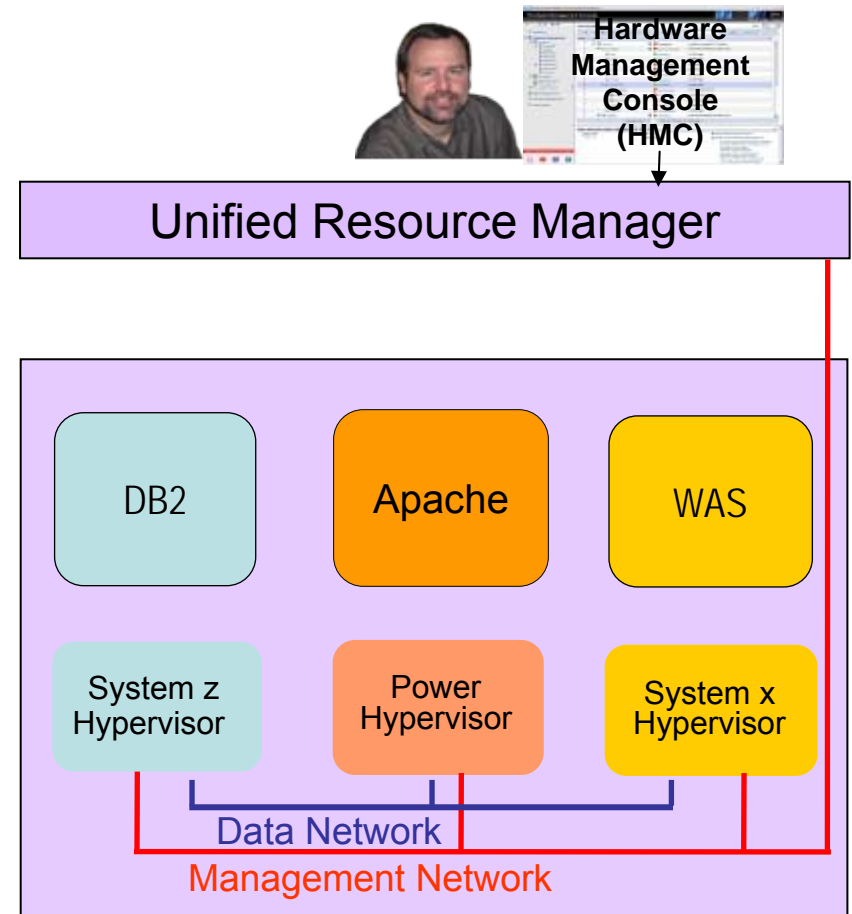


■ Reduce deployment costs

- ▶ Best fit virtualization and **consolidation** on zEnterprise
 - Consolidation minimizes hardware labor
 - Unified Resource Manage reduces labor for virtualization management and network setup
- ▶ **Standardization** of deployed images
 - TSAM standard offerings reduce software labor
- ▶ **Automation** of repetitive tasks
 - TSAM/TPM automated provisioning eliminates repetitive software labor

Automated Tasks By Unified Resource Manager Reduces Virtualization Management Labor

- Automatic inventory of all elements
- Update configuration and service
- Create virtual machines across all hypervisors from one console
- Manage performance of virtual machines as a group for a business workload



zEnterprise - Virtualization Impact on Deployment Labor Costs

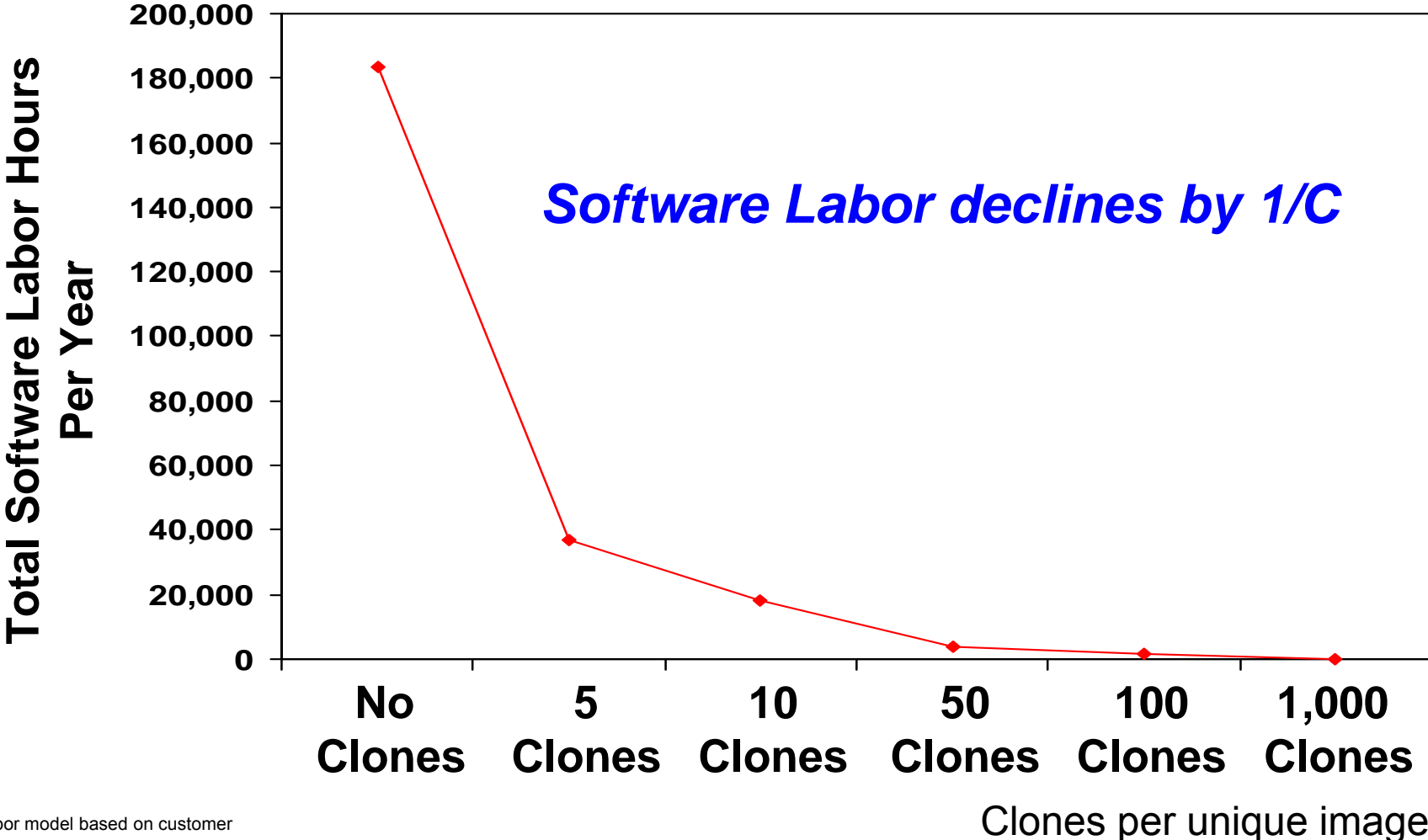
	Total HW labor hours	Deploy % of labor	Total # of servers	zBX/URM efficiency factor	+	Total SW labor hours	Deploy % of labor	Total unique stacks	=	
7,000 Light Workloads	32 hr	0.51	195 x-blade servers	0.20	+	36 hr	0.51	7,000	=	129,156 hrs
+										
500 Heavy Workloads	32 hr	0.51	250 p-blade servers	0.20	+	36 hr	0.51	500	=	9,996 hrs
+										
2,500 Heavy I/O Workloads	320 hr	0.51	5 z196 servers		+	36 hr	0.51	2,500	=	46,716 hrs

zEnterprise Server TOTAL

Based on IBM internal study.
Labor model based on customer provided data from IBM studies

185,868 hrs

Reuse Of Standardized Software Images Reduces Software Labor Hours

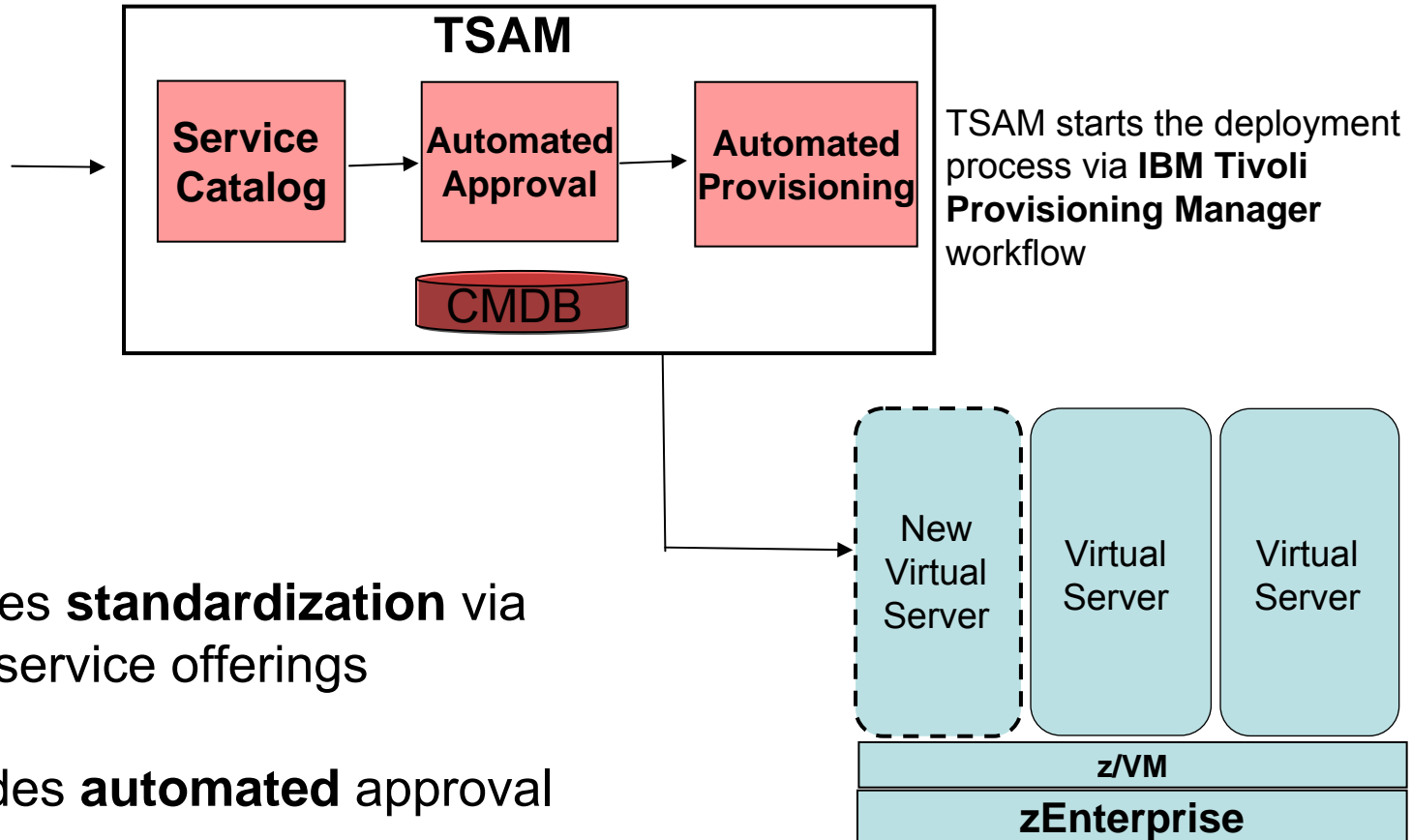


Labor model based on customer provided data from IBM studies

Automated Tasks By Tivoli Service Automation Manager (TSAM) Reduces Software Labor Hours



User browses service catalog
Adds service to shopping cart
Submits request



TSAM enables **standardization** via a catalog of service offerings

TSAM provides **automated** approval

TSAM uses Tivoli Provisioning Manager to provide **automated** provisioning

IBM Tivoli Provisioning Manager Automates Provisioning

- Repository to centralize and standardize on provisioning materials
 - ▶ Images, installation packages, configuration properties
- Automates the tasks of installing and configuring software environments on virtual machines
 - ▶ Pre-built customizable best practices workflows describe provisioning steps
 - ▶ Automatic workflow execution with verification at each step
- Automates creation of virtual machines via cloning for Linux on z/VM

DEMO: Self-Service Provisioning With IBM Tivoli Service Automation Manager (TSAM)

- Submit a request to add a new virtual machine (VM) under z/VM to an existing project
- VM created with a complete software stack (zLinux, WebSphere, customer application and Tivoli Monitoring agent) installed
- Requester is notified via email when the request is completed

Provision one or more z/VM Linux virtual servers containing a software image.

General

*Project Name:

*Team to Grant Access:

Project Description:

*Start Date:

*End Date:

Requested Image

Resource Group Used to Reserve Resources:

Monitoring Agent to be Installed

*Image to be Deployed:

Select	Name	Hypervisor	CPUs	Memory	Storage
<input checked="" type="radio"/>	SLES 10 with WAS 6	zVM	1	2 GB	7 GB
<input type="radio"/>	RHEL 5 with DB2 9	zVM	1	1 GB	1 GB
<input type="radio"/>	SLES 10 with DB2 9	zVM	1	1 GB	1 GB
<input type="radio"/>	RHEL 5 with WAS 7	zVM	1	1 GB	1 GB
<input type="radio"/>	SLES 10 with WAS 7 and D	zVM	1	1 GB	1 GB

Resources

To adjust the settings of the requested resources, press the setting button. After making the necessary adjustment, press the setting button to save the configuration.

Servers

*Number of Servers to be Provisioned:

7 available at above configuration and schedule

CPU

Virtual 1

Physical 1.0

Memory

Main 2.000 GB

Swap 0.000 GB

Disk

Local 7 GB

OK Cancel

zEnterprise - Automation Impact On Deployment Labor Costs

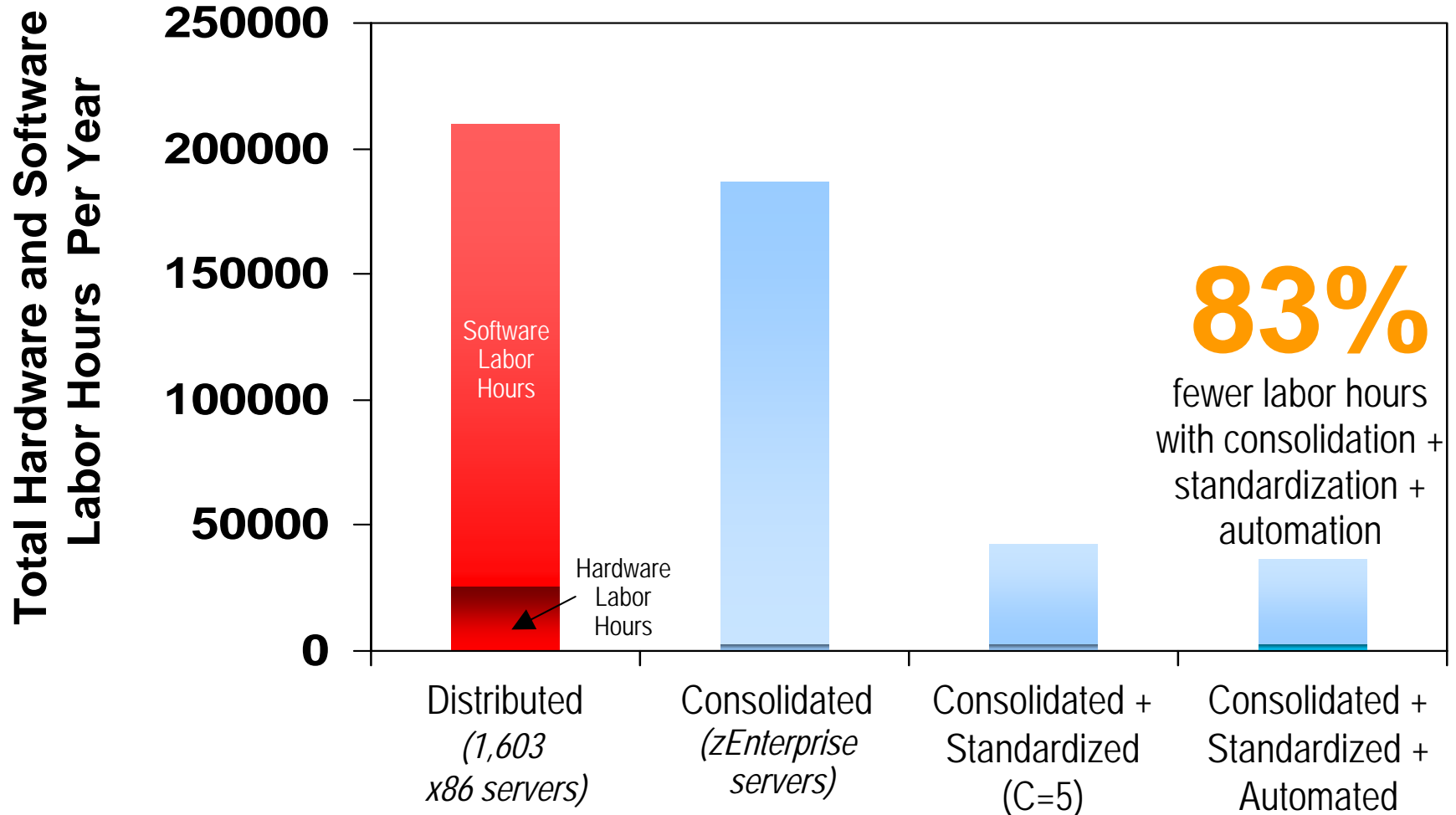
	Total HW Deploy Labor hours	Deploy % of labor	Total # of servers	zBX/URM efficiency factor	Total SW labor hours	Deploy/Release/Change % of labor	Total unique stacks	% Deploy labor unaffected by Auto.	Auto. factor	% Deploy labor impacted by Auto.	
7,000 Light Workloads	32 hr	0.51	195 x-blade servers	0.20	36 hr	0.51	$\frac{7,000}{5}$	0.74	0.70	0.26	= 24,335 hrs
+											
500 Heavy Workloads	32 hr	0.51	250 p-blade servers	0.20	36 hr	0.51	$\frac{500}{5}$	0.74	0.70	0.26	= 2,509 hrs
+											
2,500 Heavy I/O Workloads	320 hr	0.51	5 z196 servers		36 hr	0.51	$\frac{2,500}{5}$	0.74	0.60	0.26	= 9,280 hrs

zEnterprise Server TOTAL

Based on IBM internal study.
Labor model based on customer provided data from IBM studies

36,124 hrs

Consolidation + Standardization + Automation On zEnterprise Delivers Deployment Labor Savings

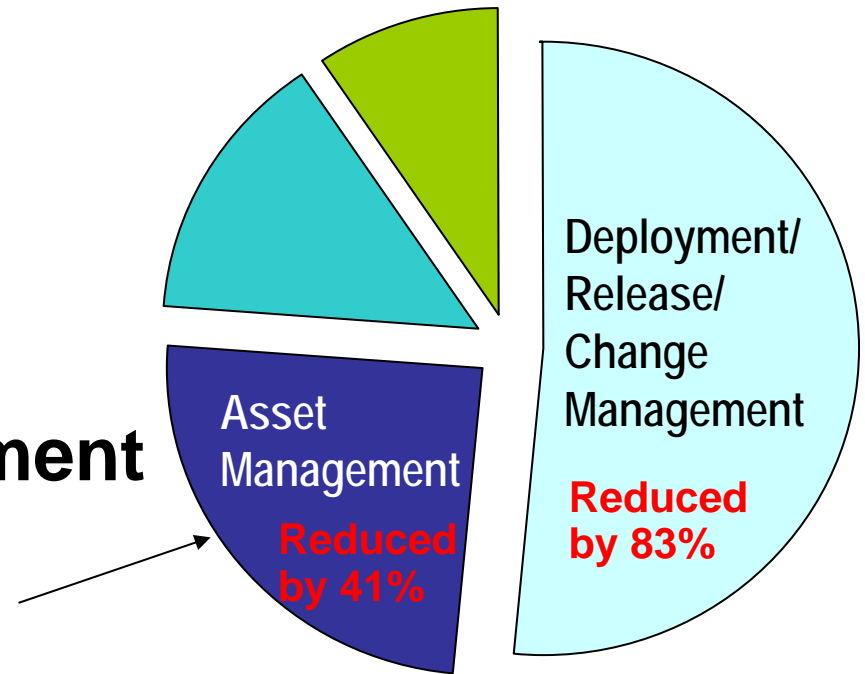


Based on IBM internal study.
Labor model based on customer
provided data from IBM studies

Example – Labor Cost Reduction Strategies

■ Reduce asset management costs

- ▶ Consolidation on zEnterprise reduces the number of assets
- ▶ Automation of asset management
 - IBM Tivoli Asset And Financial Management For zEnterprise

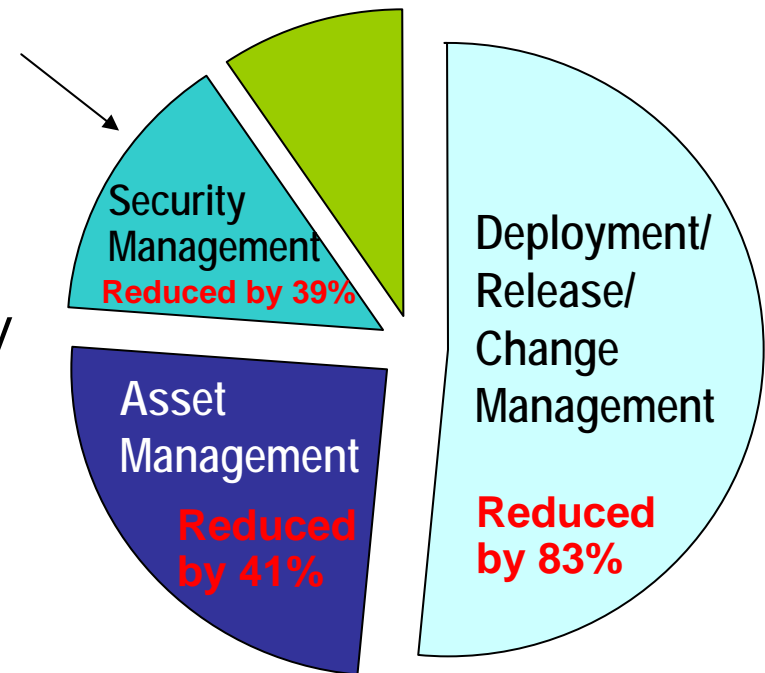


Based on IBM internal study.
Labor model based on customer
provided data from IBM studies

Example – Labor Cost Reduction Strategies

■ Reduce security management costs

- ▶ Consolidation on zEnterprise reduces the number security mechanisms
- ▶ Self service and automation improve productivity
 - Tivoli zSecure, Tivoli Identity Manager, Tivoli Access Manager

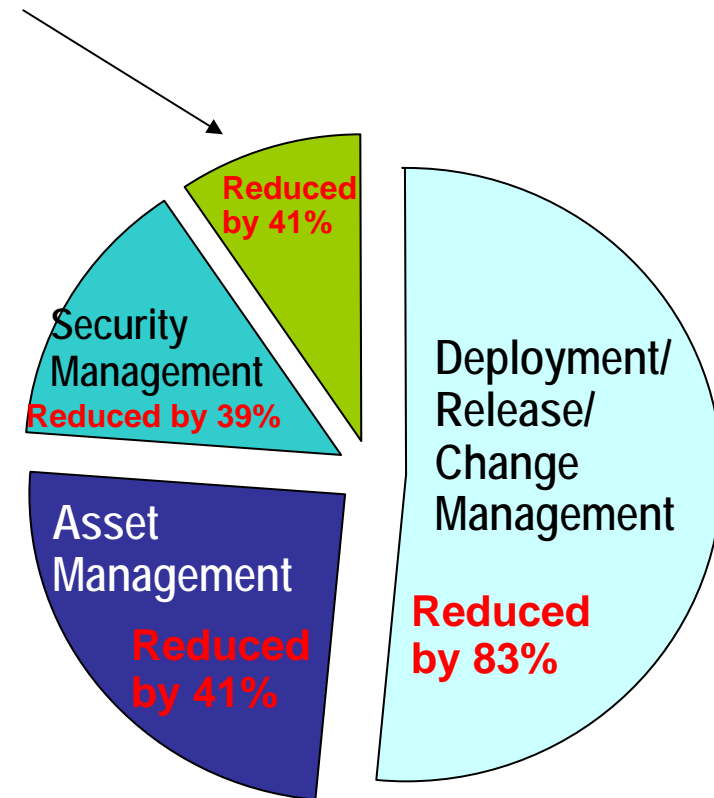


Based on IBM internal study.
Labor model based on customer
provided data from IBM studies

Example – Labor Cost Reduction Strategies

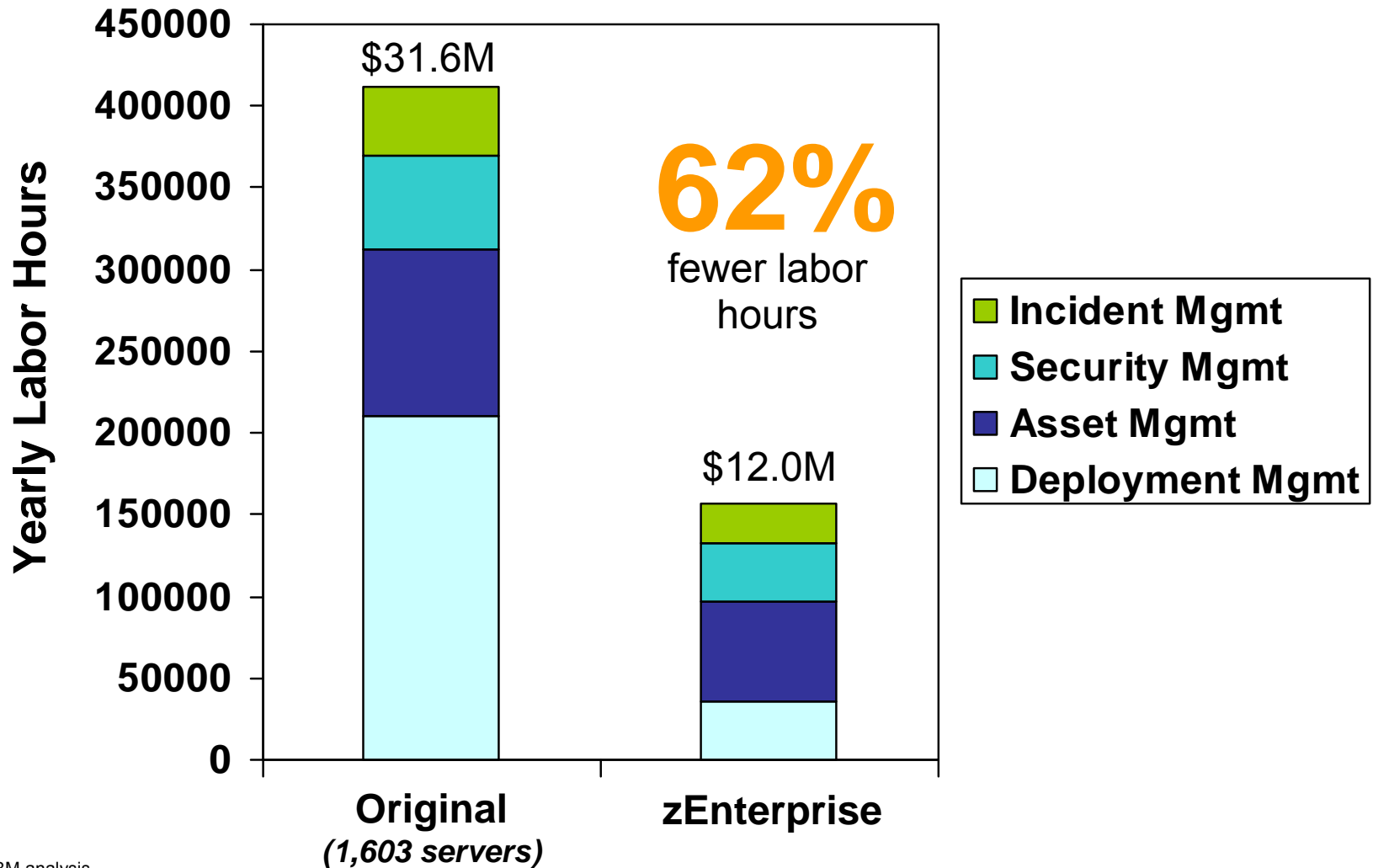
■ Reduce incident and capacity management costs

- ▶ Consolidation on zEnterprise reduces the number of platforms for incident management and capacity planning
- ▶ Automation improves productivity
 - IBM Tivoli Service Request Manager
 - IBM Tivoli Application Management for zEnterprise
 - IBM Tivoli Application Resilience for zEnterprise



Based on IBM internal study.
Labor model based on customer
provided data from IBM studies

Centralized, Structured Management With zEnterprise And Tivoli Cuts Infrastructure Labor Hours Dramatically



Based on IBM analysis

Labor model based on customer provided data from IBM studies

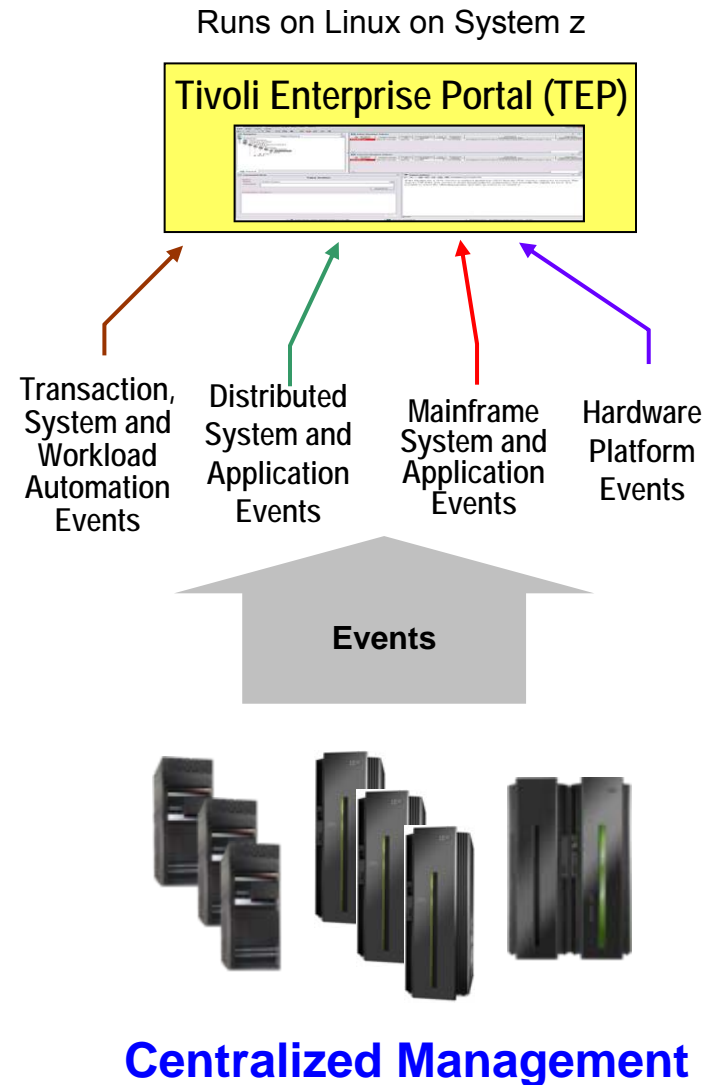
Labor rates will vary by country

Streamline Monitoring, Capacity And Availability Management With IBM Tivoli

- Tivoli Application Management for zEnterprise
 - ▶ Monitor composite applications and resolve issues with automated best practices scripts
- Tivoli Application Resilience for zEnterprise
 - ▶ Best practices to automate start, stop and failover of composite applications
 - ▶ Automate job scheduling of batch and event-based workloads while maintaining dependencies
- Tivoli Enterprise Portal provides a common user dashboard

Tivoli Enterprise Portal (TEP) – A Centralized Management Dashboard On System z

- Resource status/health from various event sources
- Detect incidents with standardized *situations*
 - ▶ Out-of-the-box supplied *situations* include combination of metrics and thresholds
 - ▶ Built-in situation editor allows to customize
- *Expert advice* helps obtain detailed explanation and recommendation for resolution
- *Take action* to automatically resolve recurring problems with existing or customized best practices scripts



DEMO: Tivoli Enterprise Portal (TEP)

- Monitor resources end-to-end with workspaces
- *Situations* triggered by problems, for example:
 - ▶ WAS application not responding
 - ▶ DB2 application has issues

The screenshot displays the Tivoli Enterprise Portal (TEP) interface. The top window is titled "Enterprise Status - 192.169.1.54 - SYSADMIN *ADMIN MODE*". The interface is divided into several panes:

- Navigator:** A tree view on the left showing the hierarchy of resources, including Linux Systems, z10Items, z9ccmdb, DB2, Linux OS, Web Server Agent - Primary, WebSphere Agent - Primary, zlxrdir, zlxrmaps, Windows Systems, and MS Systems. A red arrow points from the "Enterprise" root node to the "Situation Event Console" pane.
- Situation Event Console:** A table displaying active situations. The table has columns for Severity, Status, Owner, Situation Name, Display Item, and Source. Three rows are highlighted in red, indicating critical situations:

Severity	Status	Owner	Situation Name	Display Item	Source
Critical	Open		WebServicePipeline_Critical		ADCD.CICSA
Critical	Open		WASNotConnected	MXServer	Primary:z9ccmdb:KYNA
Critical	Open		UDB_Status_Warning		db2inst1:z9ccmdb:UD
- Open Situation Counts - La...:** A bar chart showing the count of various situations. The Y-axis lists situation names, and the X-axis represents the count. The bars are colored yellow. The situations listed are: WebServicePipeline_Critical, WASNotConnected, WASError, UDB_Status_Warning, MS_Offline, Linux_Process_High_Cpu, Linux_Low_percent_space, Linux_High_CPU_Overload, KSY_TEPS_Connectivity_Fail, and CICSplex_RTAGroup_Warning.
- My Acknowledged Events:** A table displaying a list of events. The table has columns for Severity, Status, Owner, Situation Name, Display Item, Source, Impact, Opened, Local Timestamp, Type, and Reference ID. The table is currently empty.
- Message Log:** A table displaying a log of messages. The table has columns for Status, Name, Display Item, Origin Node, and Global Timestamp. The log contains several entries, including "Open WebServicePipeline_Critical" and "Open WASNotConnected".

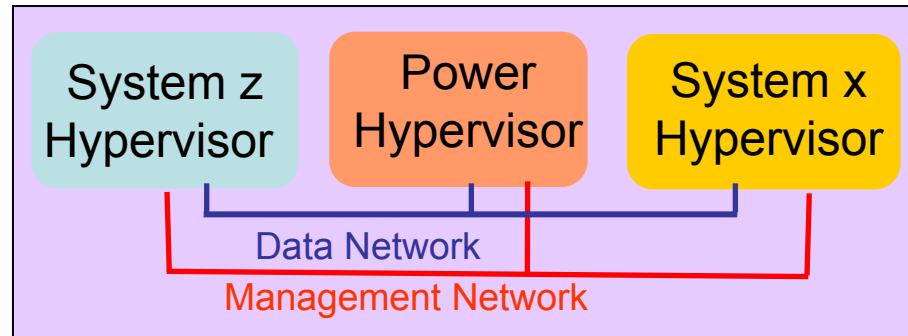
The bottom status bar shows the Hub Time: Mon, 09/08/2008 10:21 PM, Server Available, and Enterprise Status - 192.169.1.54 - SYSADMIN *ADMIN MODE*. The taskbar at the bottom shows the Start button and several open applications, including IBM Tivoli Net..., MAXIMO - Start..., Netcool/OMNIB..., Netcool/OMNIB..., Mozilla Firefox, and Enterprise St...

A Dynamic Role-based Portal for Centralized Management!

zEnterprise And Tivoli Support Structured Management Practices For All Workloads

IBM Tivoli Service Management Center
for System z

Unified Resource Manager



**End-to-End
Service Management**

**Integrated
Platform Management**

**Integrated
Fit-for-Purpose
Platform**

zEnterprise



**Extends System z
quality of service to
all environments**

A Side Benefit

Implementing these labor saving strategies also positions you to offer a private cloud service



IBM