IBM System z Technology Summit

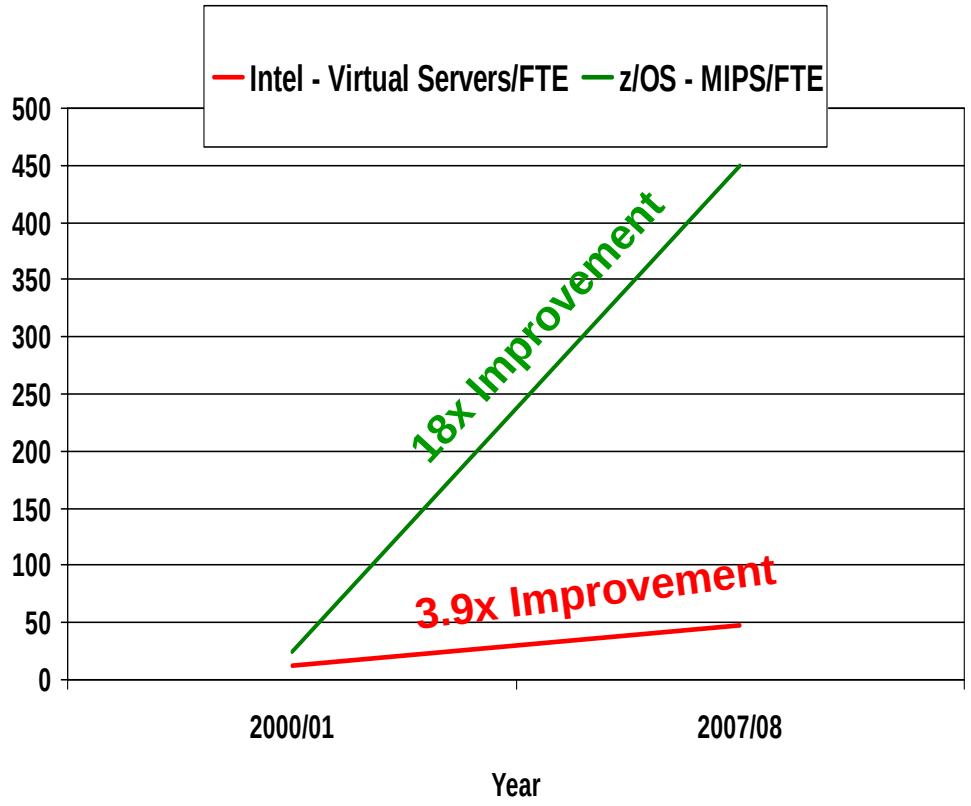
zEnterprise – The First System Of Systems

Reduce Labor Costs With zEnterprise

Roberto Calderon

27th Jan 2011

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

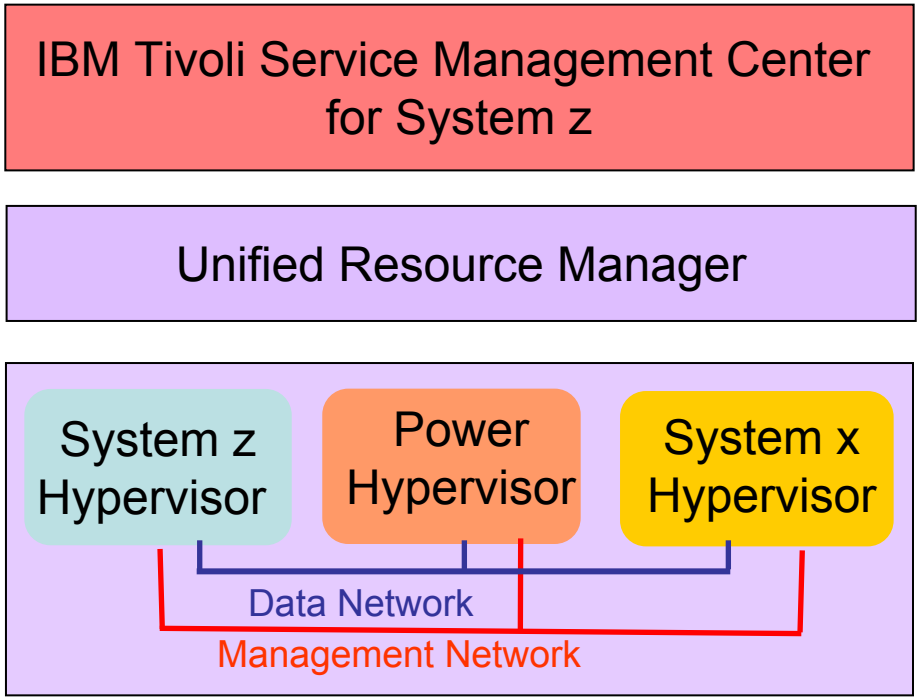
The more workloads you consolidate and manage with structured practices…
the lower the management labor cost

Source: IBM Scorpion Studies

Examples Of Structured Management Practices

Process	Typical Distributed Management Practices	Structured Management Practices
Validation and Testing	■ Applications released into production may trigger errors or downtime	■ Structured automated testing to ensure quality-driven software delivery
Deployment and Release Management	■ Manual, one at a time installation of software stacks	■ Automated deployment process with self-service/request-driven provisioning
Availability and Capacity Management	■ Memorized procedures for manual starting, stopping and failover ■ Manual scheduling of jobs	■ Automated start, stop and failover of composite applications ■ Automated job scheduling
Monitoring and Control	■ Passive monitoring	■ Active and continuous monitoring to fix problems quickly
Incident and Problem Management	■ Manual routing of incidents by established convention	■ Automated best practice problem resolution through integrated service desk and service catalog
Asset Management	■ Antiquated and inaccurate chargeback mechanisms	■ Structured chargeback model based on license entitlements, usage and costs of shared resources

zEnterprise And Tivoli Support Structured Management Practices For All Workloads



End-to-End Service Management

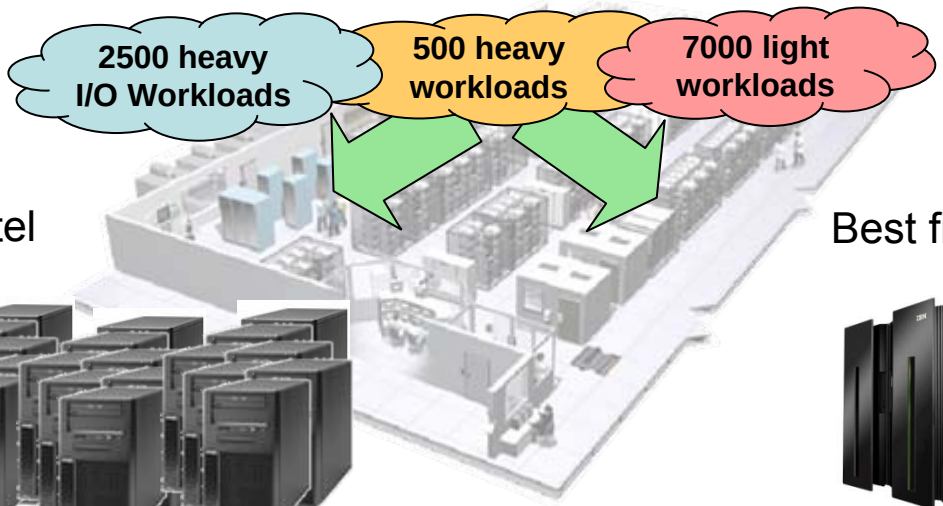
Integrated Platform Management

Integrated Fit-for-Purpose Platform

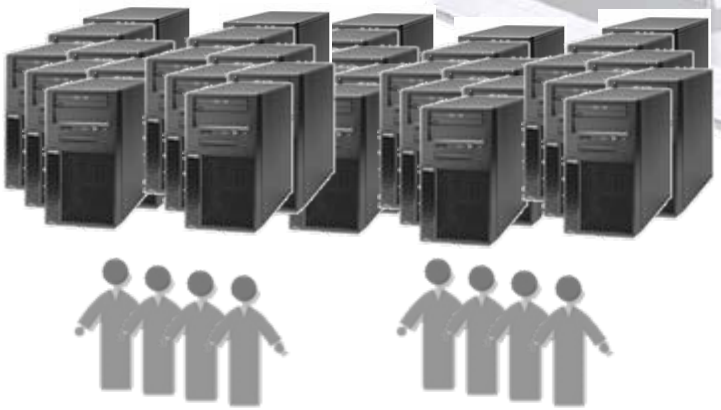
zEnterprise

Extends System z quality of service to all environments

Compare Server Infrastructure Labor Cost



As deployed on Intel



411,296 labor hours/yr

198 administrators

$94.8M

3 years @ $159,600/yr

Best fit on zEnterprise

151,204 labor hours/yr

73 administrators

$35.0M

3 years @ $159,600/yr

63% less

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

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

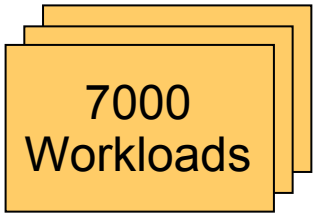
Accumulated Field Data For Labor Costs

- 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

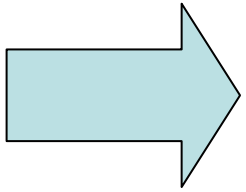
- Best fit data indicates
  - Software tasks are **36** hours per software image per year
    - Assume this applies to all distributed and zLinux software images
  - Hardware tasks are **32** hours per physical server per year
    - Assume this applies to Intel or Power servers
    - Internal IBM studies estimate 320 hours per CPC for zLinux scenarios

Labor model based on customer data from IBM studies

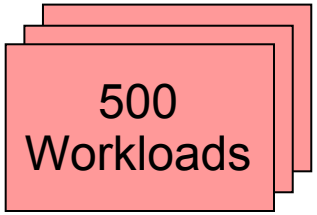
Distributed Infrastructure - Labor Costs Are Significant



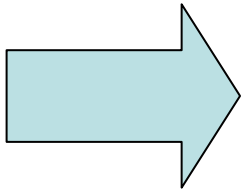
Light workloads



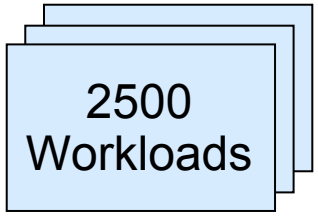
280,000 labor hours
(135 administrators, or $21.5M per year)
52.5 Virtual Machines per FTE



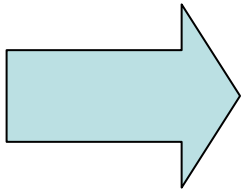
Heavy workloads



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



Light workloads with heavy I/O



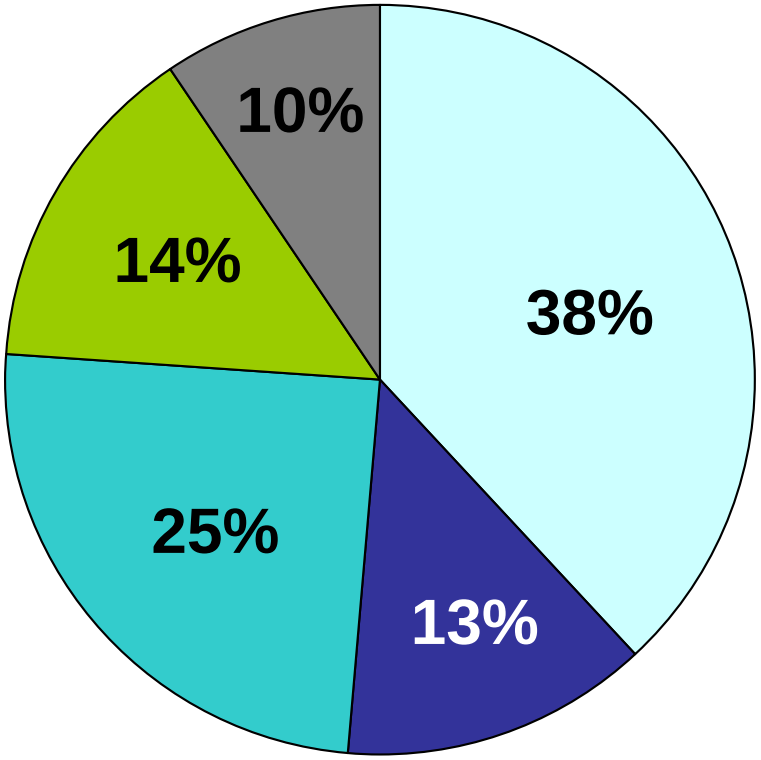
97,296 labor hours
(47 administrators, or $7.5M per year)
52.5 Virtual Machines per FTE

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

Five Key IT Processes For Infrastructure Administration

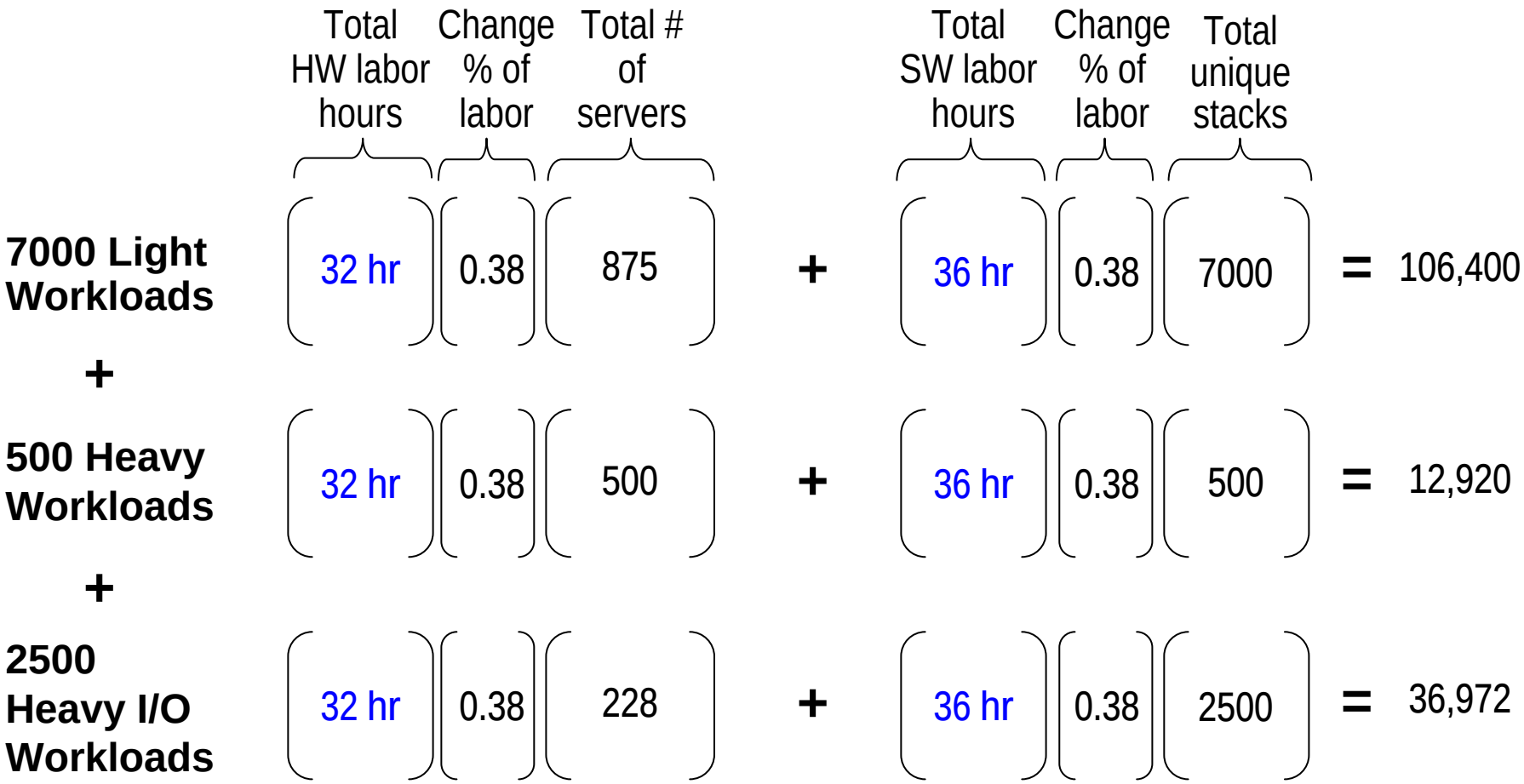


- **Change Management**
  - *Hardware and software changes*
- **Deploy/Release Management**
  - *Hardware set-up and software deployment*
- **Asset Management**
  - *Hardware and software asset tracking*
- **Security Management**
  - *Access control*
- **Incident/Capacity Management**
  - *Monitor and respond*

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

Allocation based on customer data from IBM study

Distributed Infrastructure – Change Management Labor Costs

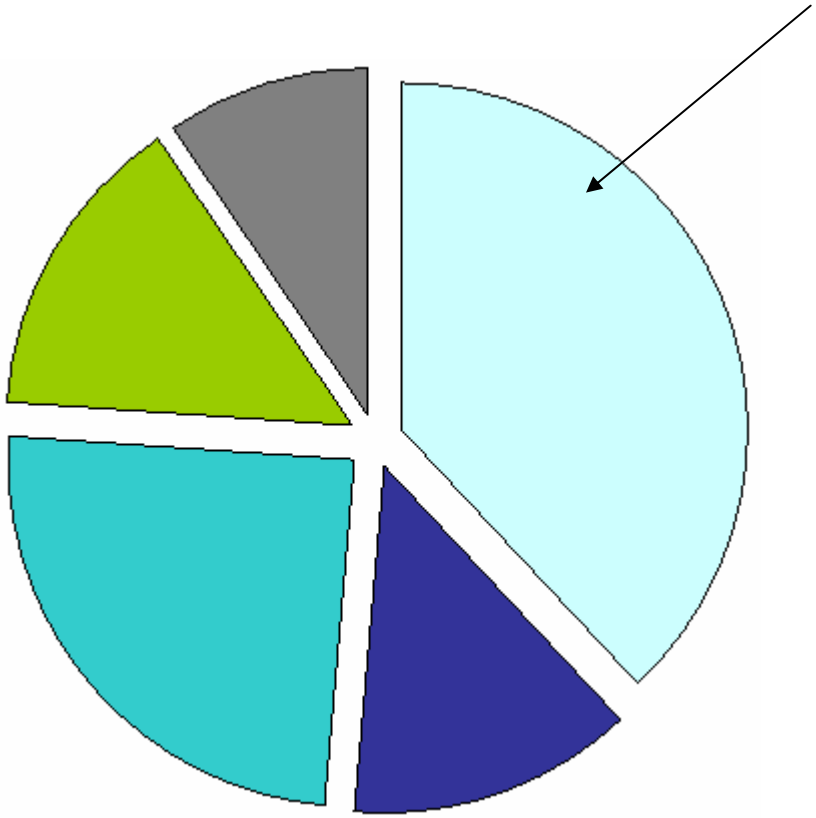


Distributed Server TOTAL

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

156,292 hrs

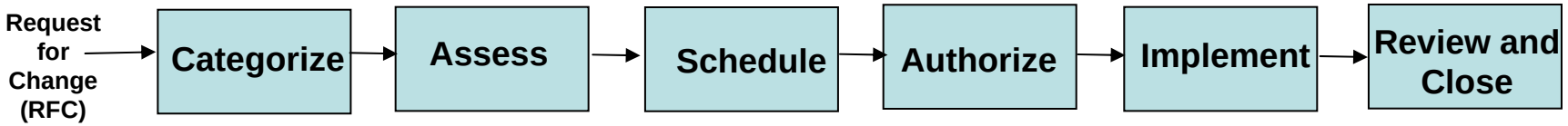
Example – zEnterprise Labor Cost Reduction Strategies



- **Reduce change management costs**
  - **Consolidation** on zEnterprise reduces the number of hardware assets to manage
  - **Automation** reduces the amount of time required to process change requests
  - **Standardization** of deployed images reduces number of unique changes that need to be made

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

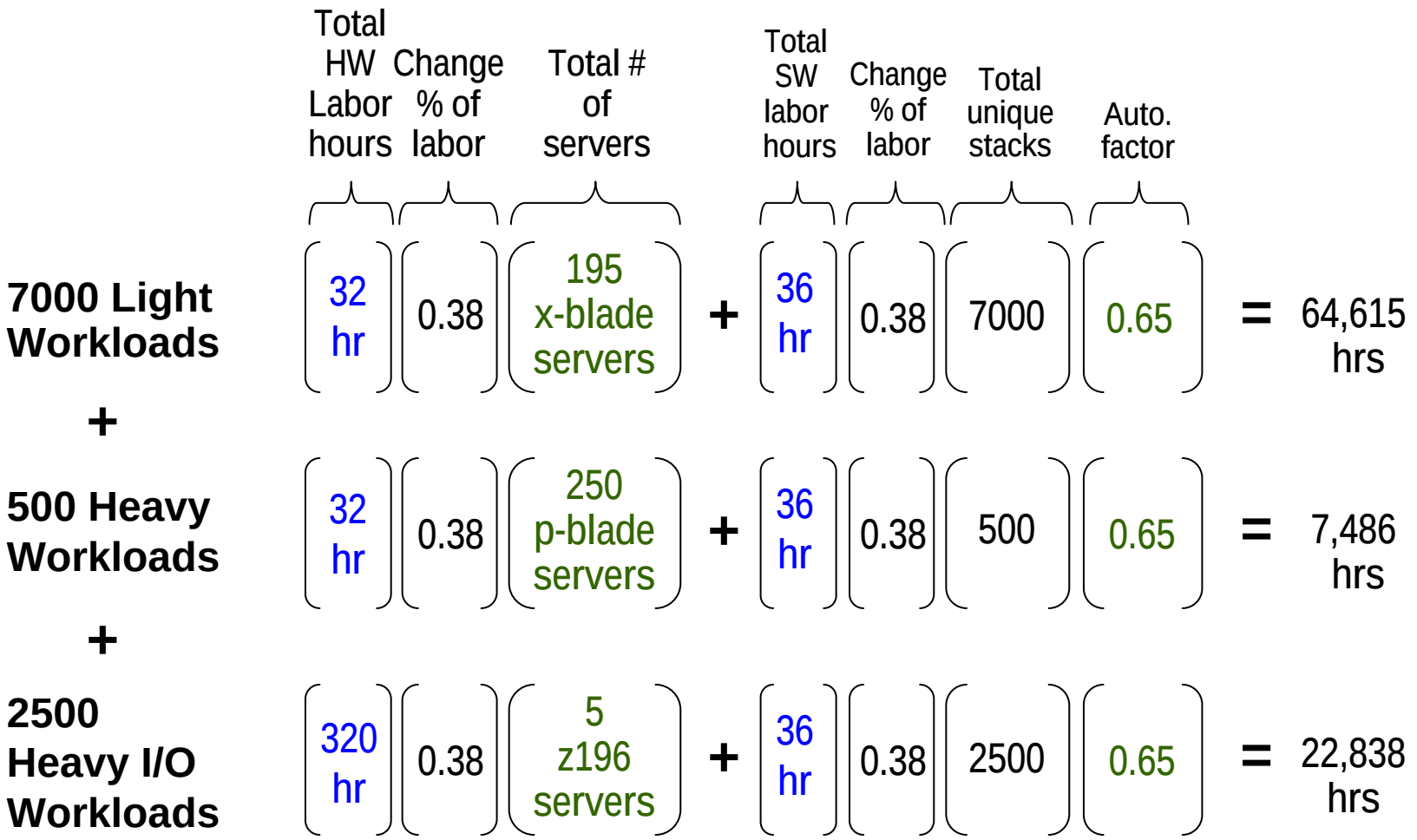
Tivoli Change and Configuration Management Database (CCMDB) Reduces Software Labor Hours



- Out-of-the-box best practices and customizable change management process
- Discover assets and manage change
  - Automated dependency mapping via application descriptors
- Categorize change based on impact, priority and risk and automatically determine a job plan for a change
- Assess the impact of implementing a change
  - Identify and record impacted configuration items using discovered relationship data
  - Subject Matter Experts can document assessment results
- Schedule by associating change window with configuration items (managed assets)
  - Check for schedule conflicts
  - Prevent changes from occurring outside defined window
- Authorize automatically or route to appropriate approvers
- Implement with routing tasks to task owners in the correct order

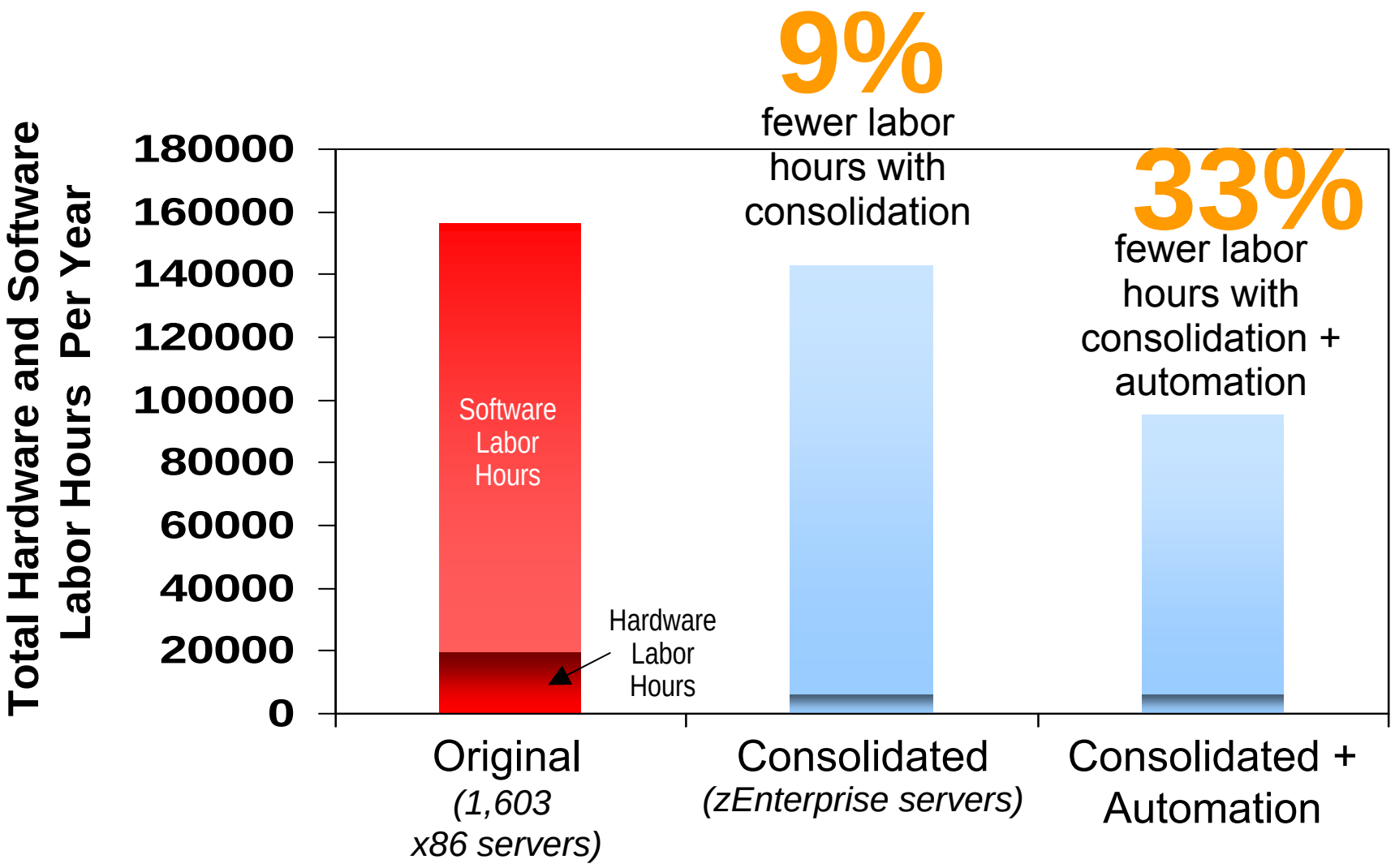
Change Management Labor Costs

(Detailed Calculations)



zEnterprise Server TOTAL **94,939 hrs**

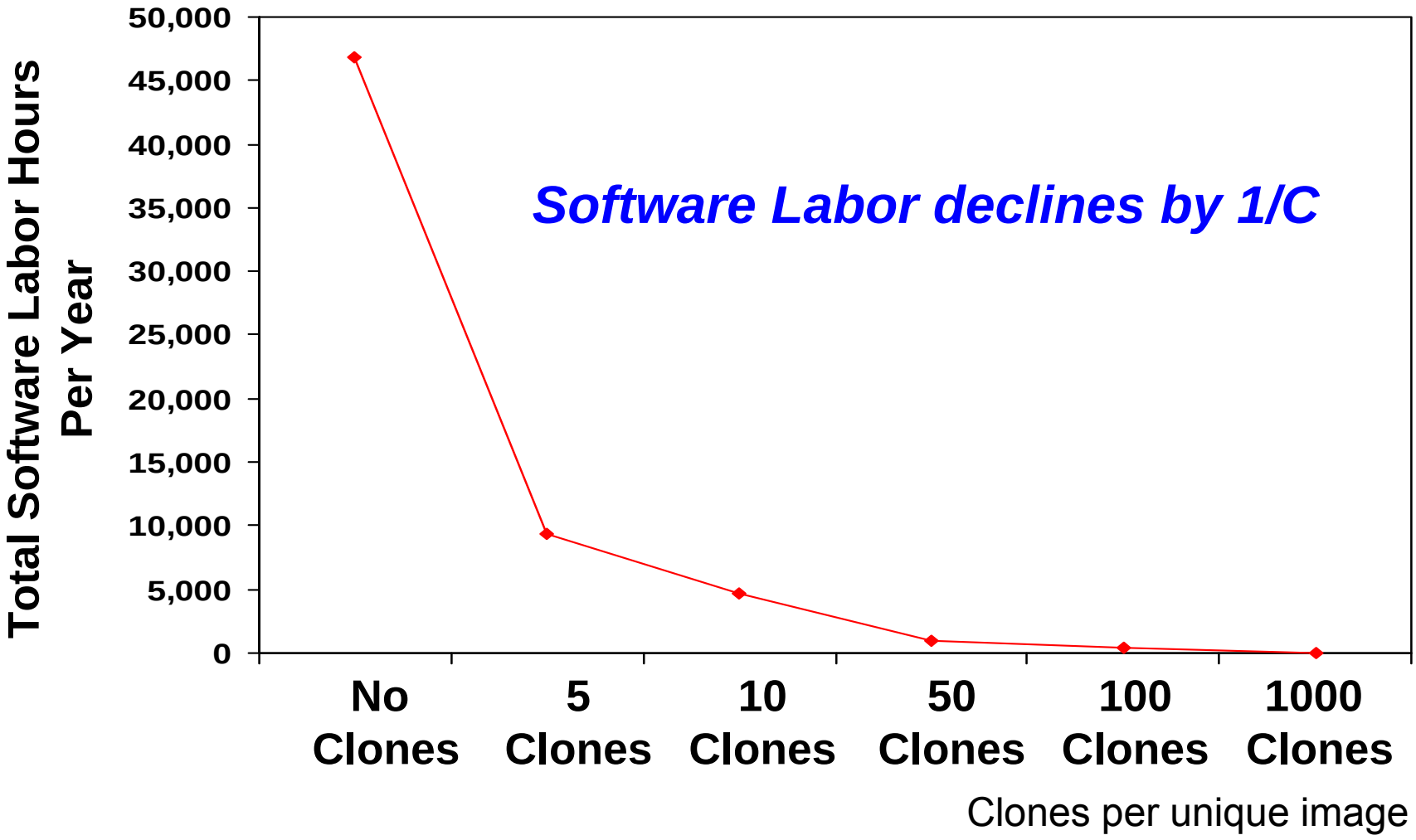
Consolidation and Productivity Improvements Through Automation Drive Down Change Management Labor Costs



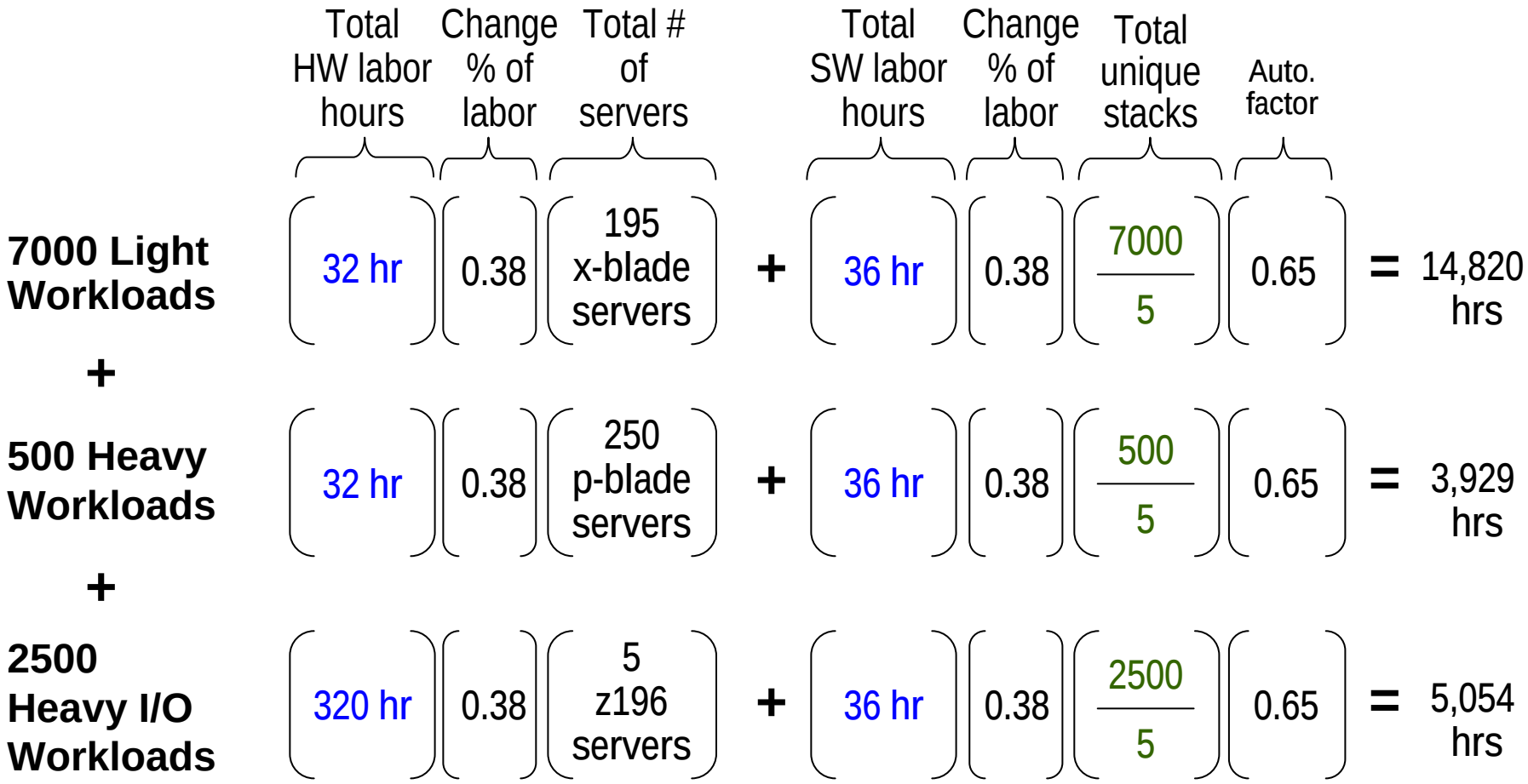
Standardization

- **A server needs a full set of software to run a workload**
  - Operating System, Middleware, Applications
  - Patches, configuration specifications
- **The combination of all this software is called a “software stack”**
- **Without controls, the variety of software stacks tends to proliferate, driving up labor costs**
  - Different levels, patches, product selections, etc
- **Standardization of software stacks can reduce labor costs**
  - Uniformity reduces the number of unique stacks to manage
  - Re-using a standard software stack is called “cloning”

Benefit of Cloning Factor On Software Labor Costs In A Virtualized Environment



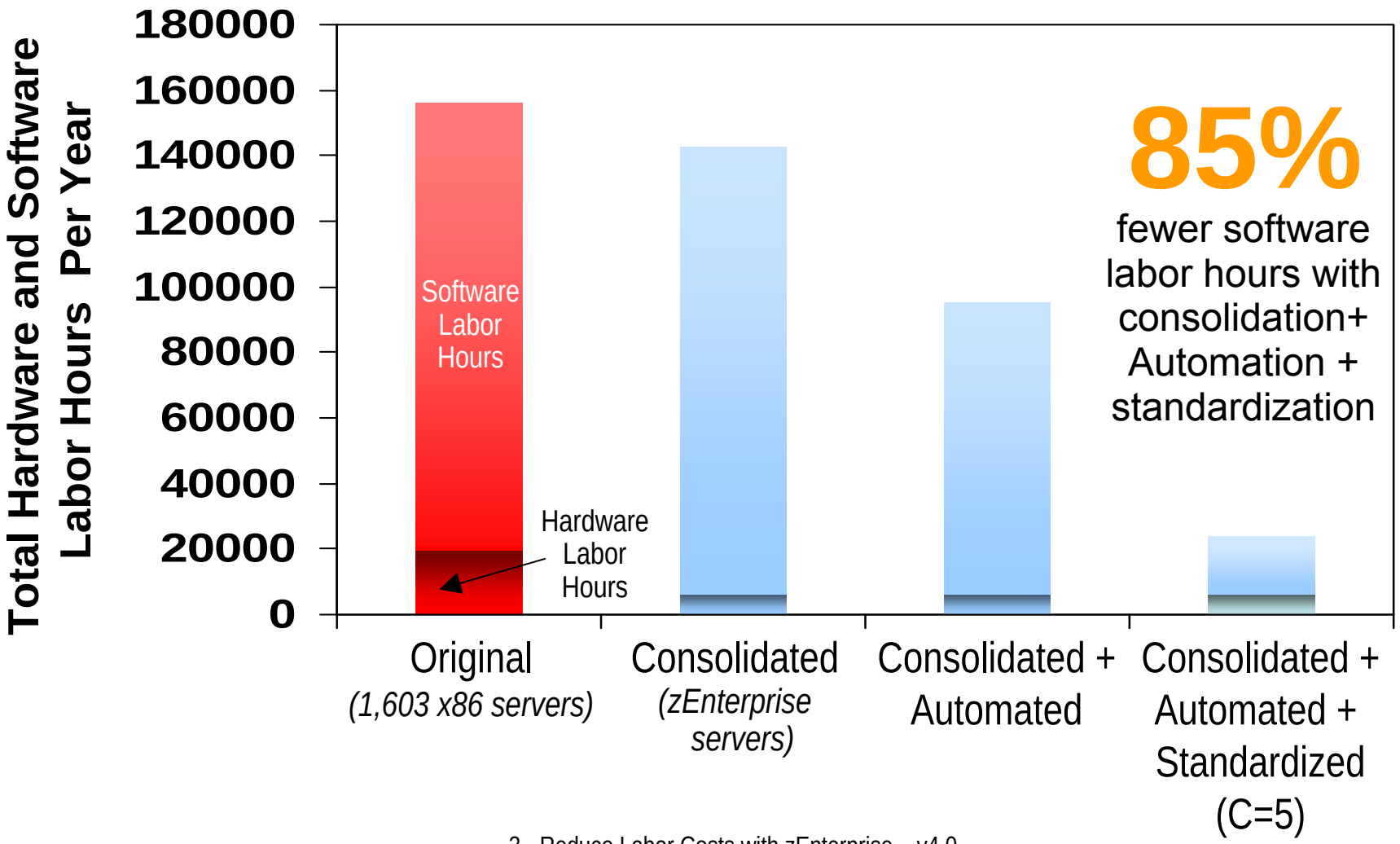
zEnterprise - Standardization Impact on Change Management Labor Costs with C=5



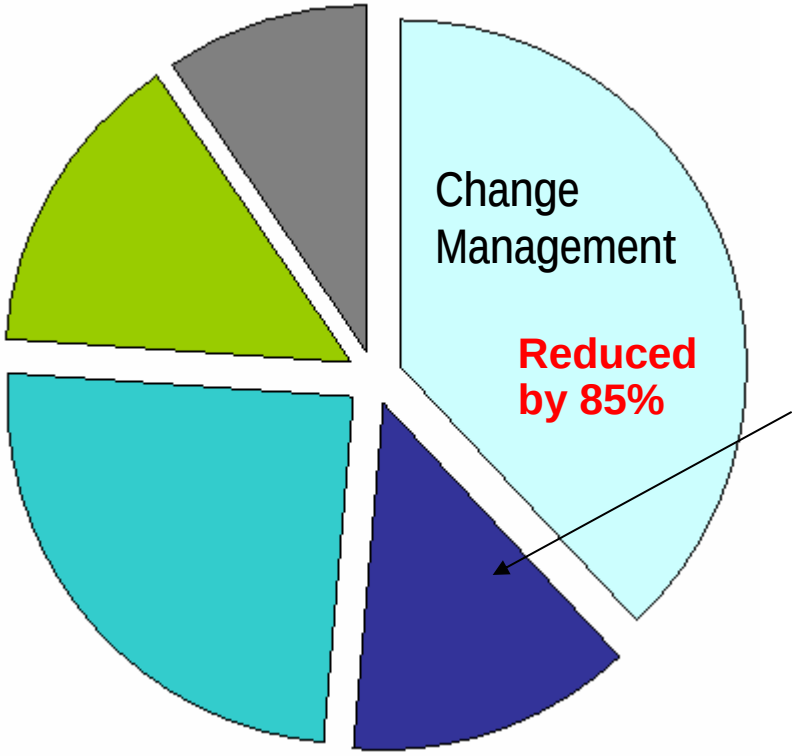
zEnterprise Server TOTAL **23,803 hrs**

Labor model based on customer provided data from IBM studies

Standardization On zEnterprise Provides Significant Labor Savings



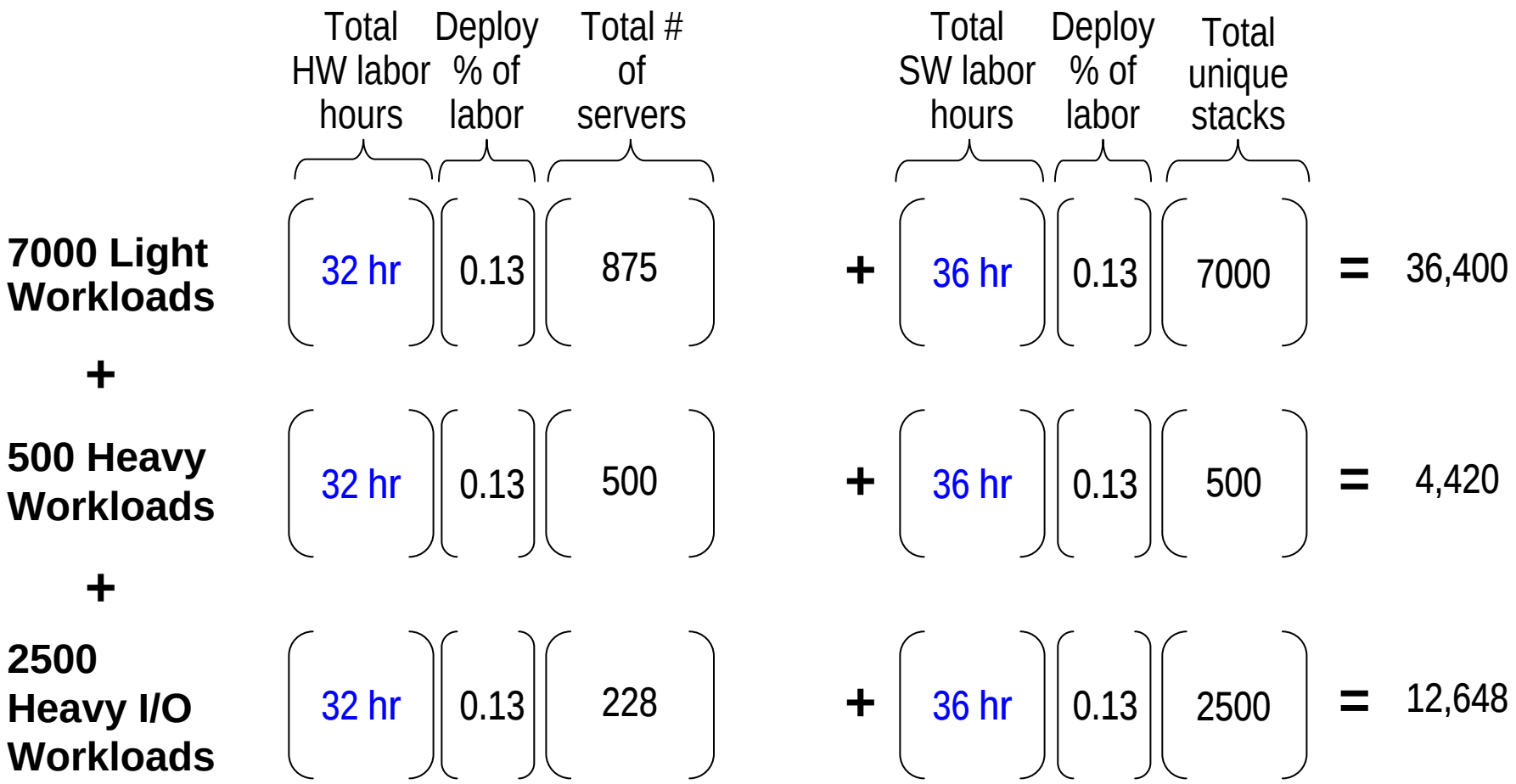
Example – zEnterprise Labor Cost Reduction Strategies



- **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
  - **Automation** of repetitive tasks
    - TSAM/TPM automated provisioning eliminates repetitive software labor

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

Distributed Infrastructure - Deployment Labor Costs



Distributed Server TOTAL

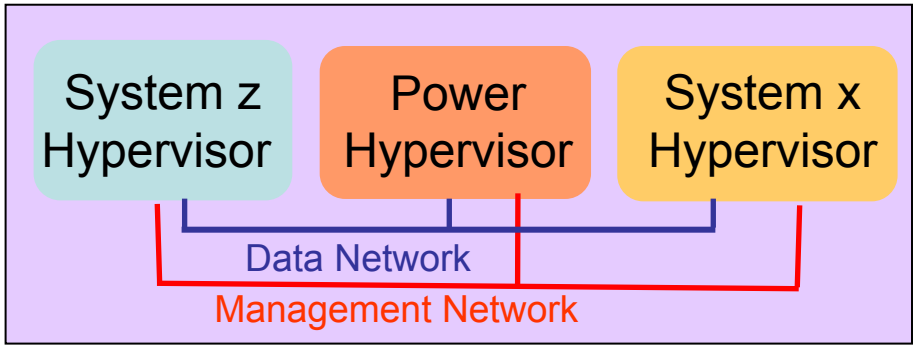
Based on IBM internal study.
Labor model based on customer provided data from IBM studies

53,468 hrs

zEnterprise Minimizes Labor Associated With Virtualization Hypervisor And Network Set-up

- Hypervisors are shipped, serviced, and deployed as System z Licensed Internal Code
  - Booted automatically at power on reset
- Pre-configured private and physically isolated internal management network
  - 1 Gbps that connects all resources for management purposes
- Private and secure data network
  - 10 Gbps that connects all resources
  - Access-controlled using integrated virtual LAN (VLAN) provisioning that requires no external switches or routers
  - Full redundancy for high availability

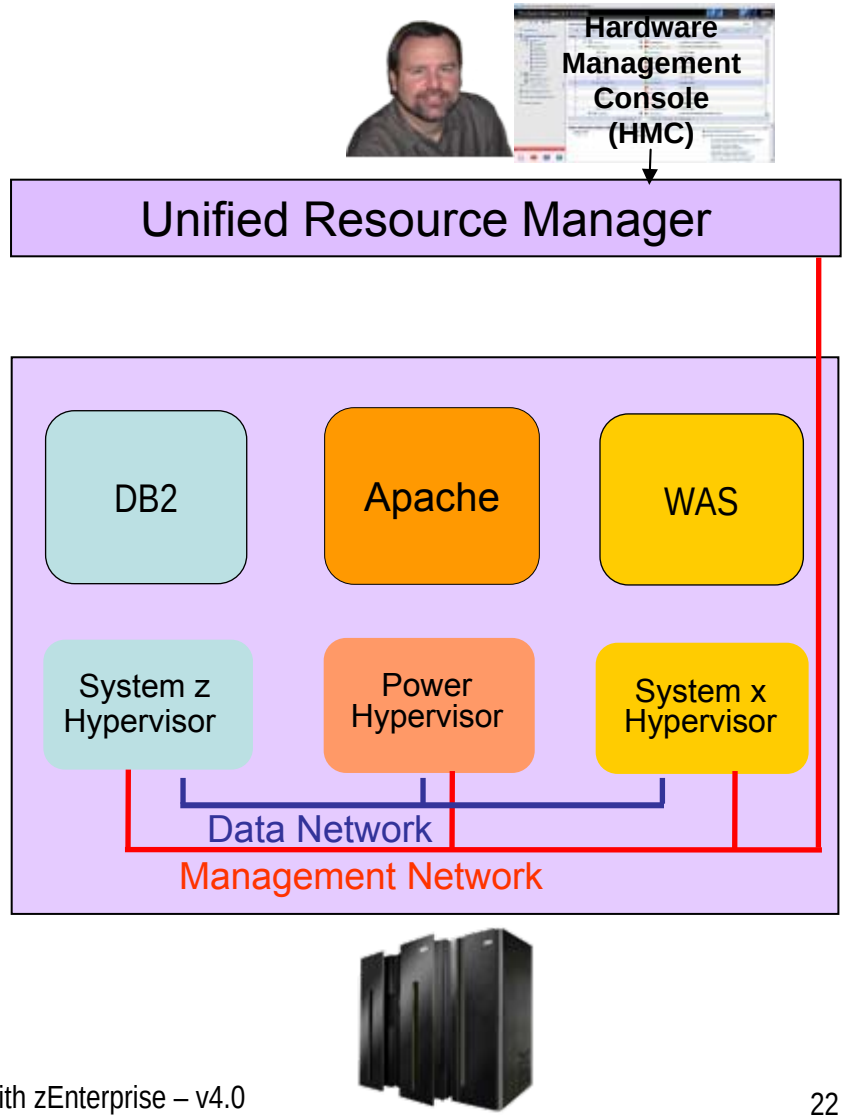
Centralized and Secure Virtualization Platform



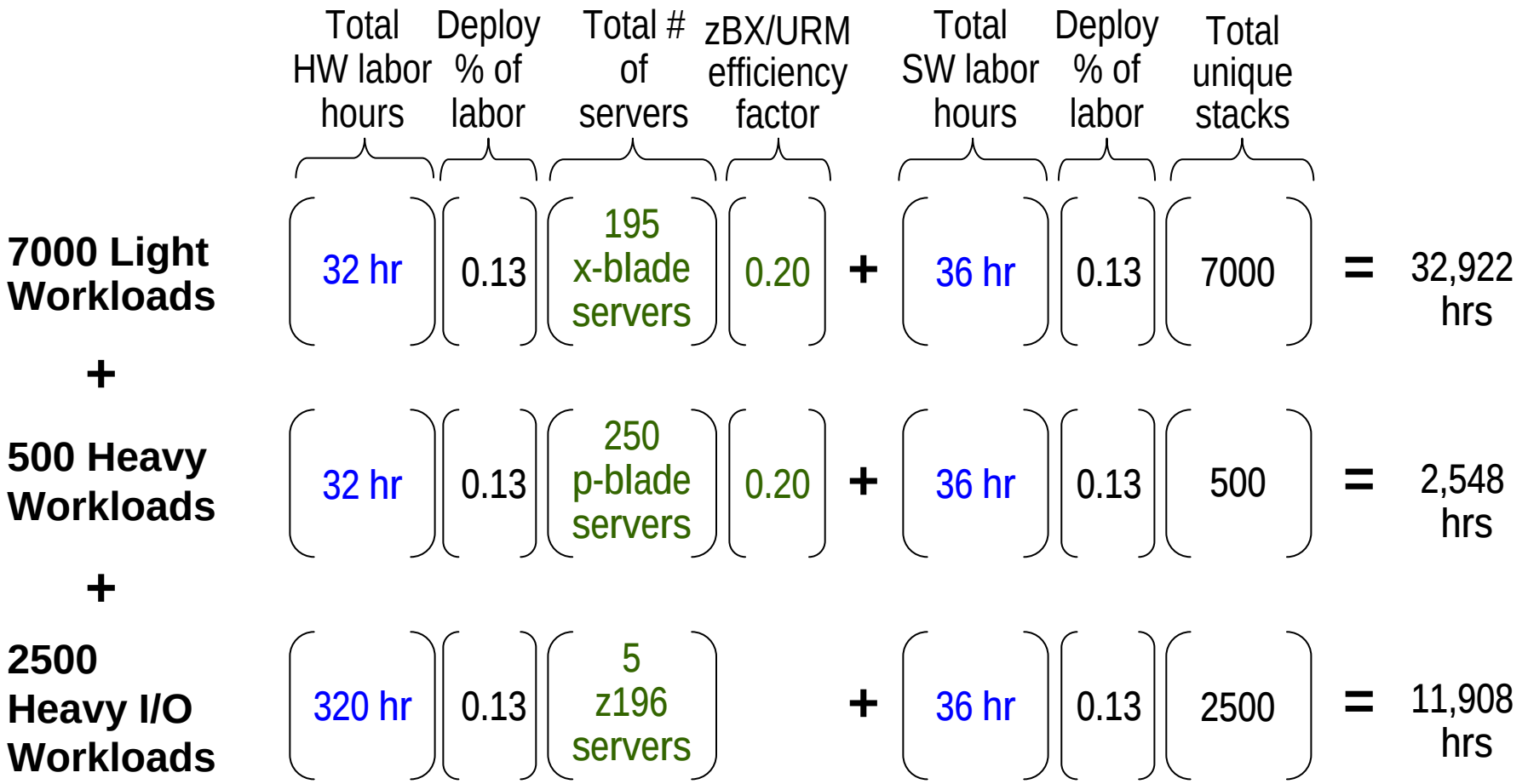
zEnterprise

Unified Resource Manager Reduces Virtualization Management Labor For Fit-for-Purpose Workloads

- 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

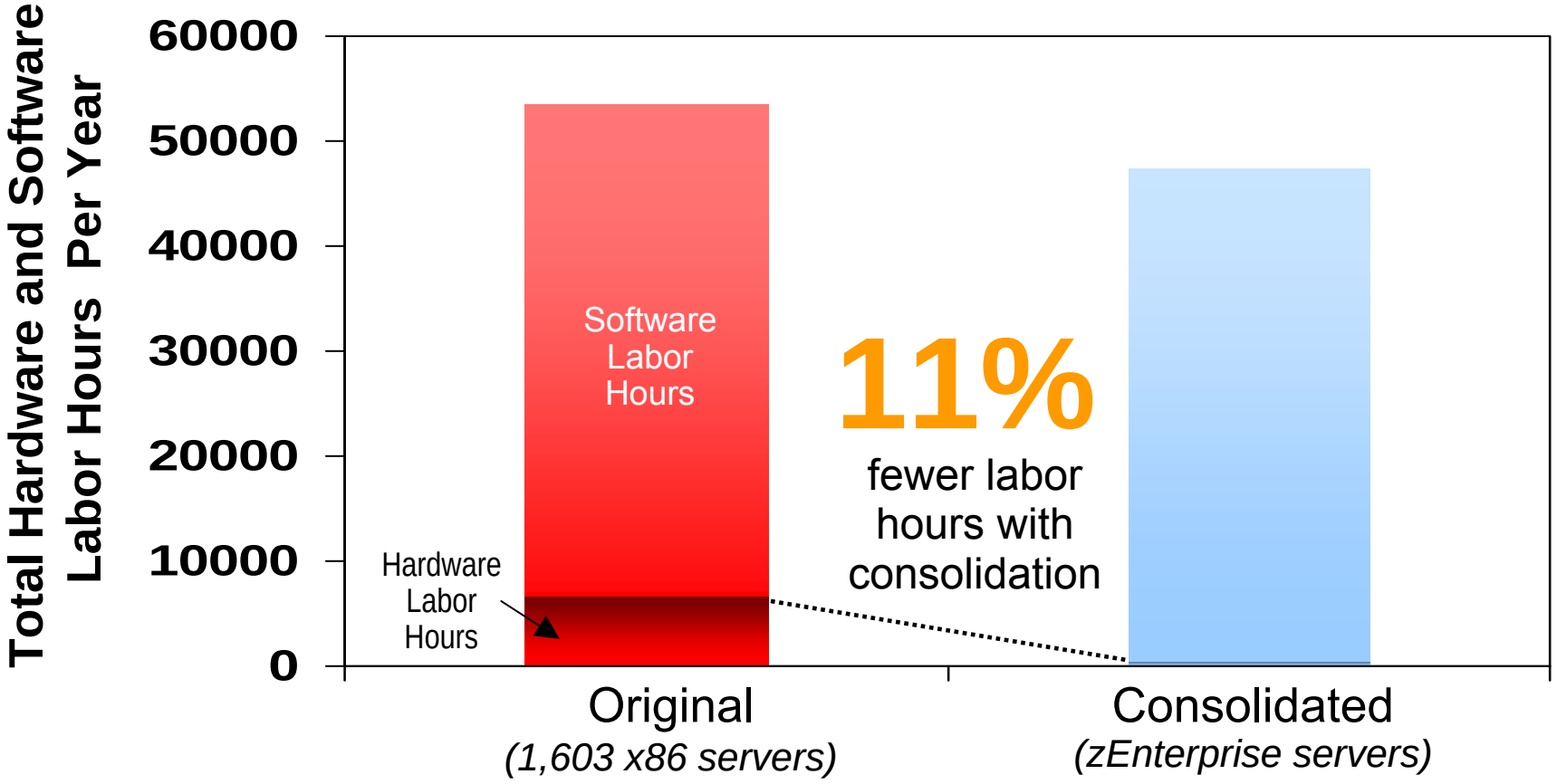


zEnterprise Server TOTAL

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

47,378 hrs

Consolidation On zEnterprise Provides Incremental Labor Savings

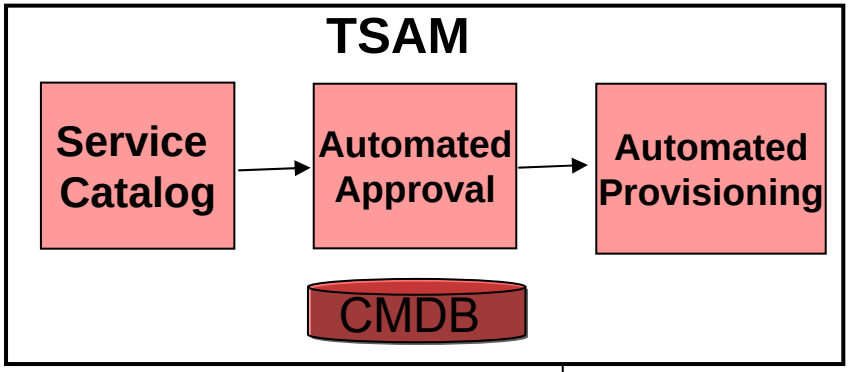


Automated Tasks By Tivoli Service Automation Manager (TSAM) Reduces Software Labor Hours

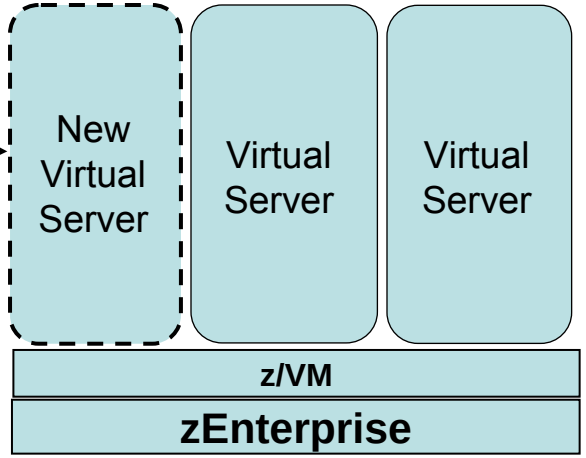
User browses service catalog

Adds service to shopping cart

Submits request



TSAM starts the deployment process via **IBM Tivoli Provisioning Manager** workflow



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

TSAM provides **automated** approval

TSAM provides **automated** provisioning*

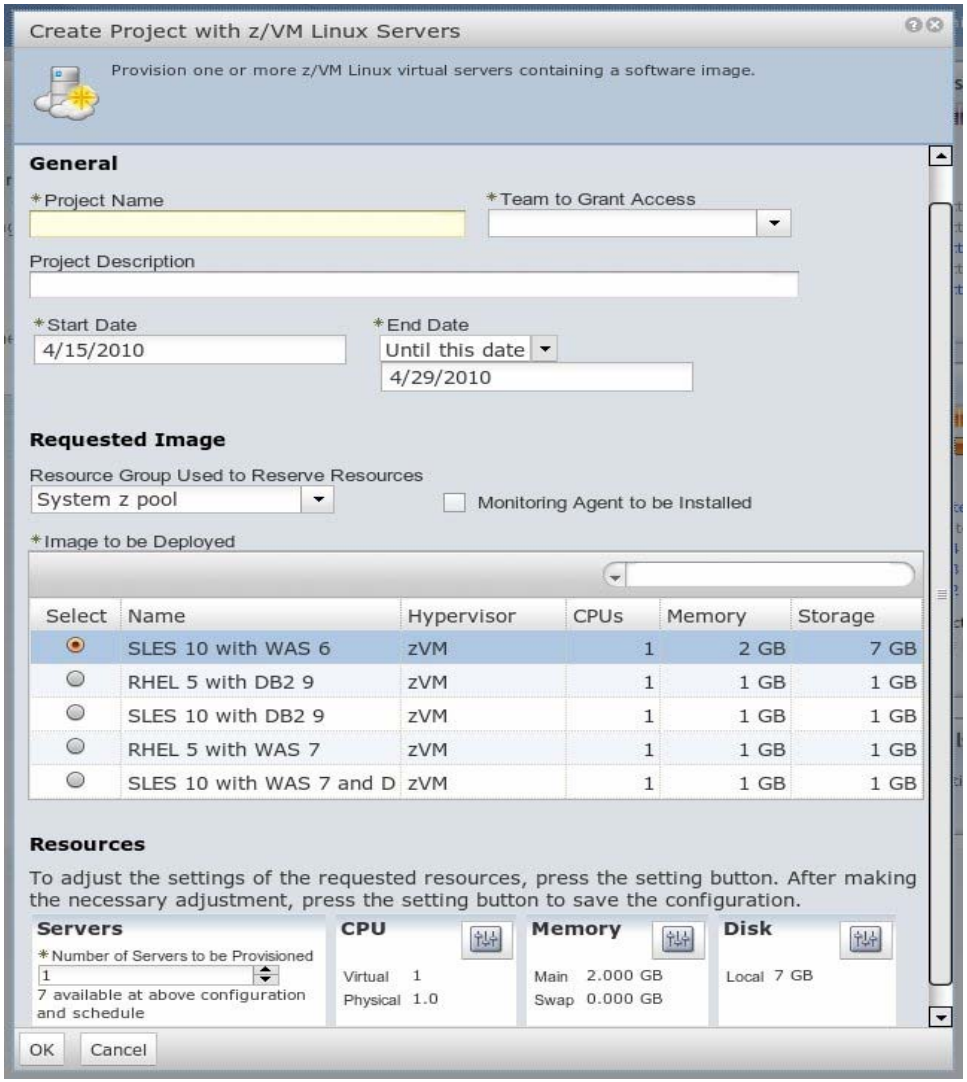
*Use TPM alone to provision software stack on p, x for zEnterprise

IBM Tivoli Provisioning Manager Automates Provisioning

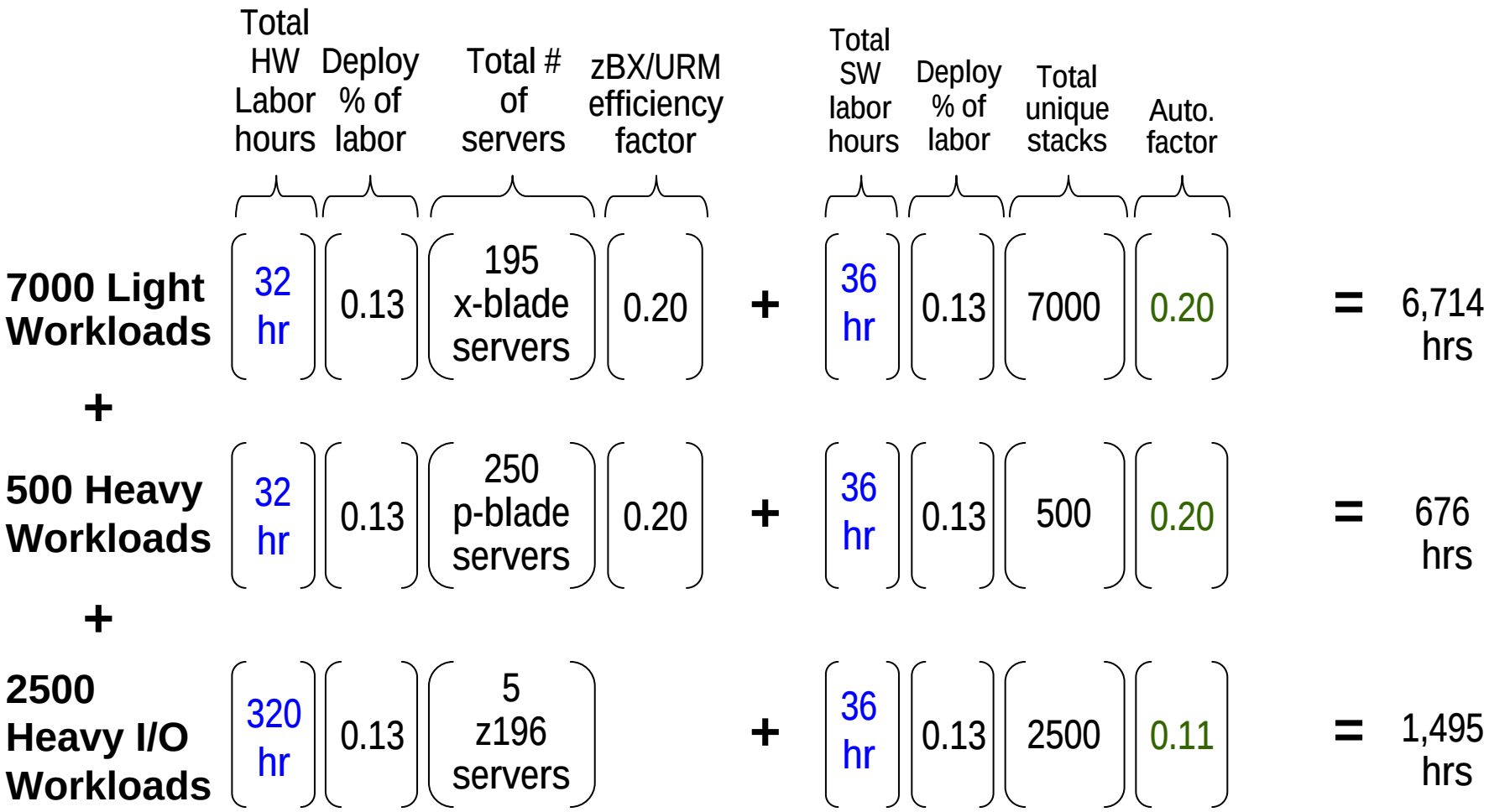
- Repository to centralize and standardize on provisioning materials
  - Images, installation packages, configuration properties
- Automates the tasks of installing and configuring software environments on virtual machines
  - Pre-built customizable best practices workflows describe provisioning steps
  - 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

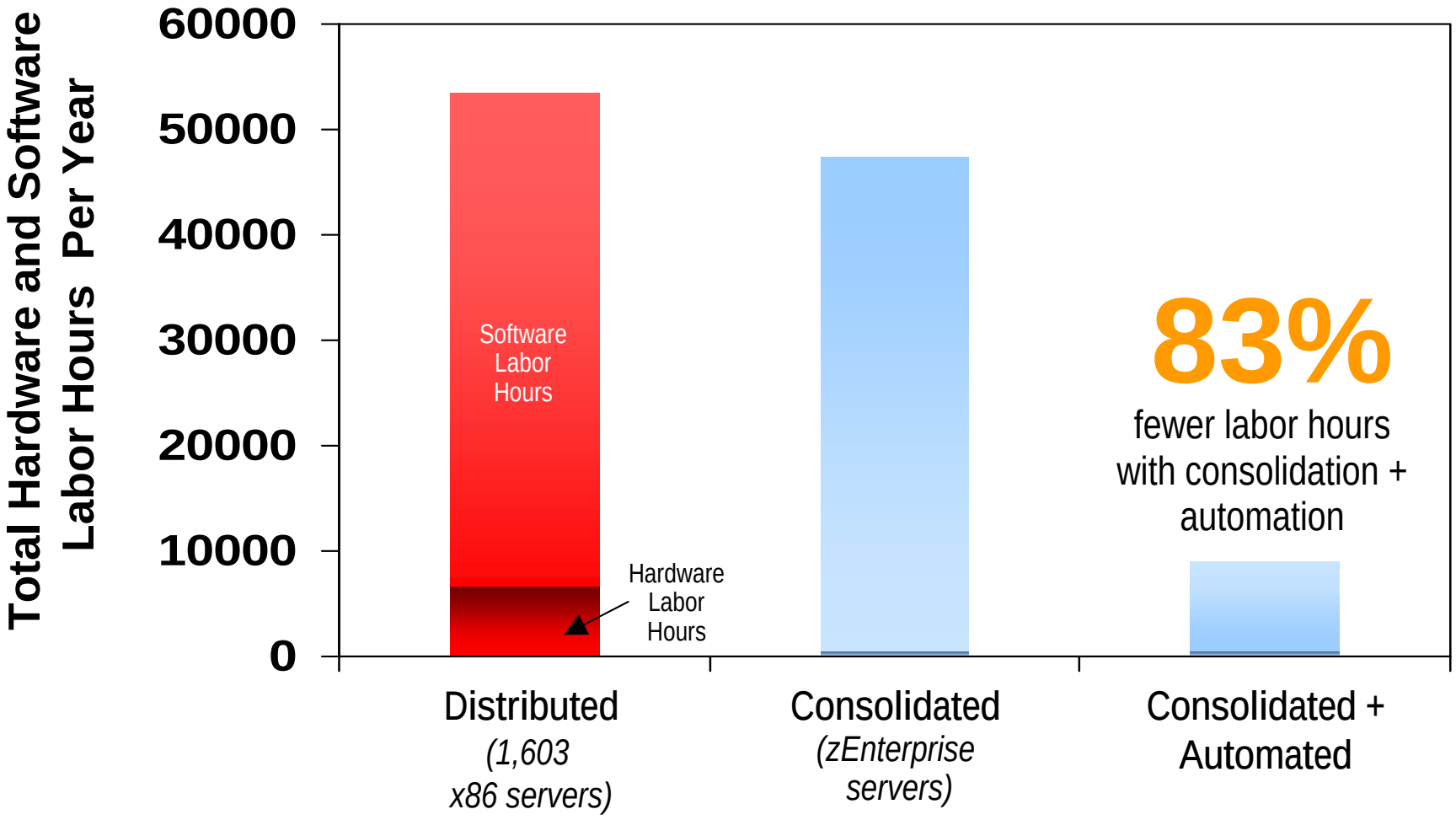


zEnterprise - Automation Impact On Deployment Management Labor Costs



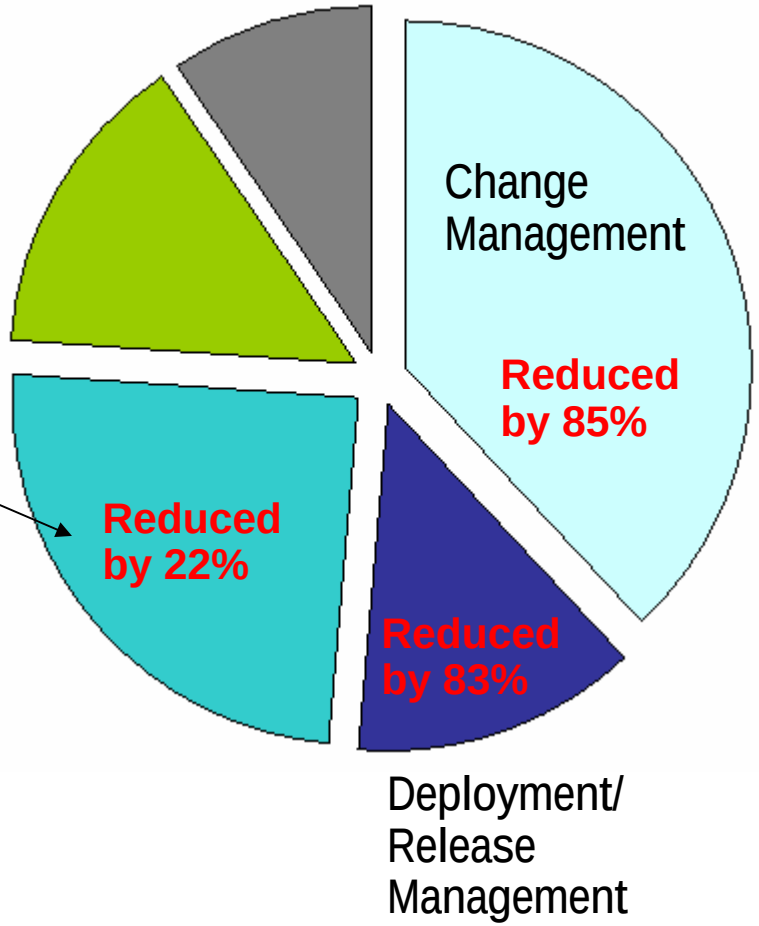
zEnterprise Server TOTAL **8,885 hrs**

Consolidation + Automation On zEnterprise Provides Significant Labor Savings



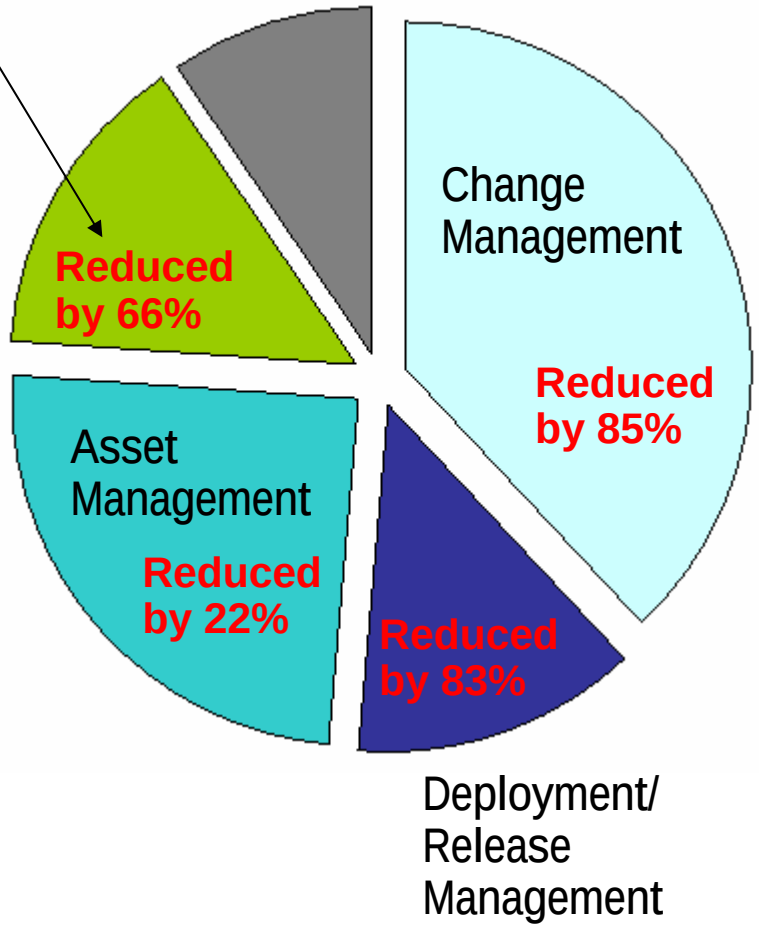
Example - Cost Reduction Strategies

- **Reduce asset management costs**
  - **Consolidation** on zEnterprise reduces the number of assets
  - **Automation** of asset management



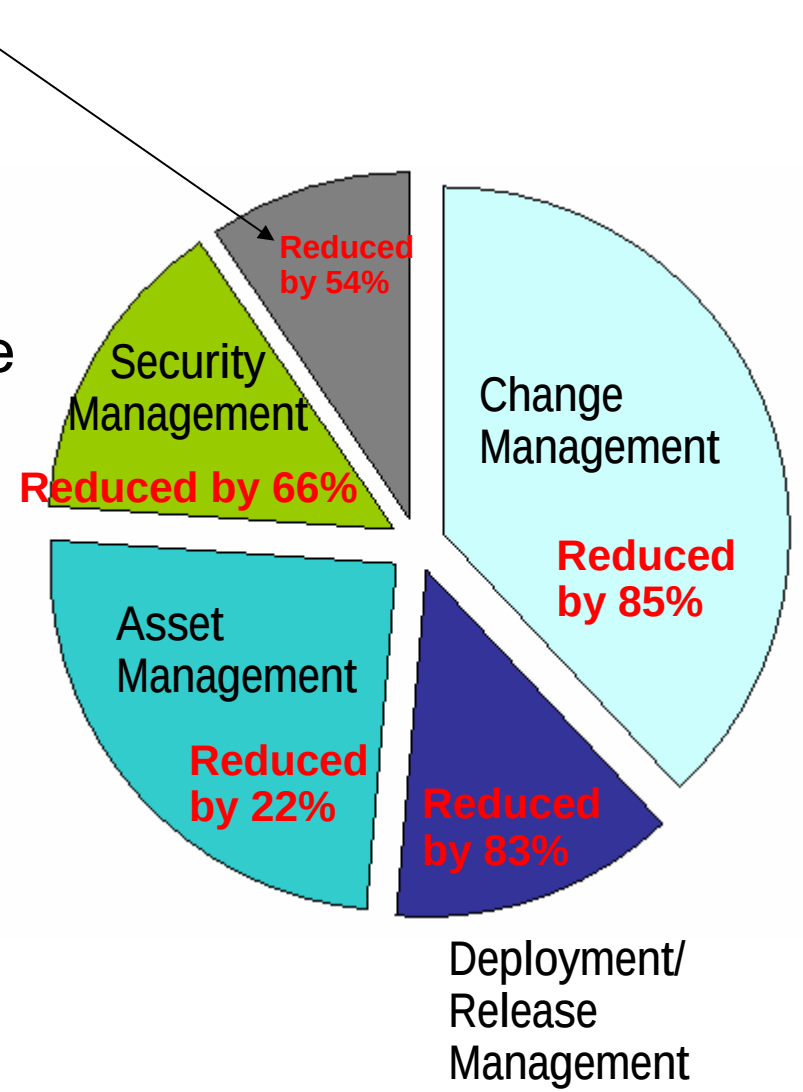
Example - Cost Reduction Strategies

- **Reduce security management costs**
  - **Consolidation** on zEnterprise reduces the number security mechanisms
  - **Self service** and **automation** improve productivity



Example - 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



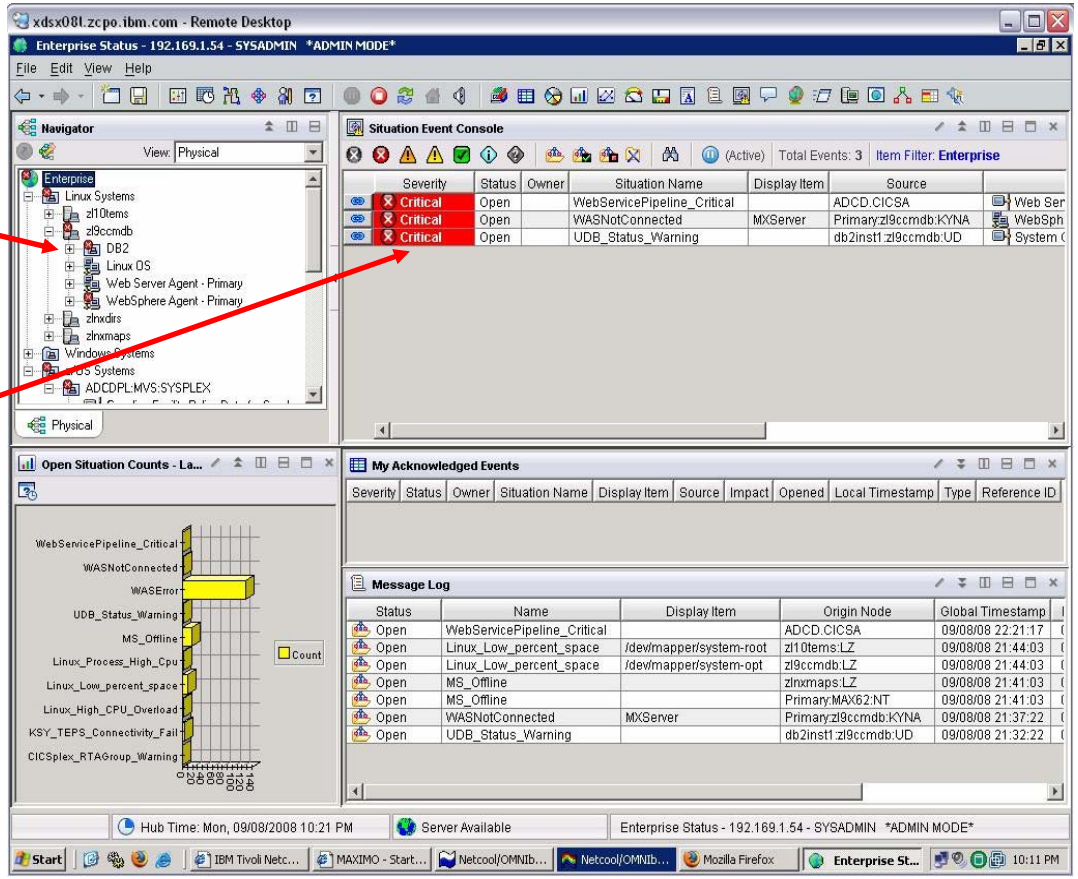
Streamline Incident And Capacity Management With IBM Tivoli

- IBM Tivoli Service Request Manager
  - Central service desk to control service requests for help, information and service
  - Create incident templates for common service desk calls and library of reusable solutions
- IBM Tivoli Application Management for zEnterprise
  - Provide end-to-end centralized view into transactions and services to isolate and resolve performance issues quickly
- IBM Tivoli Application Resilience for zEnterprise
  - Automate tasks required to startup, shutdown, and restart composite applications to adjust capacity
  - Shrink batch windows by planning, orchestrating, and executing multiple batch- and event-driven workloads and services in parallel while maintaining cross-environment dependencies
- Improves administrator productivity up to **50%***

* Based on results from IBM customer references

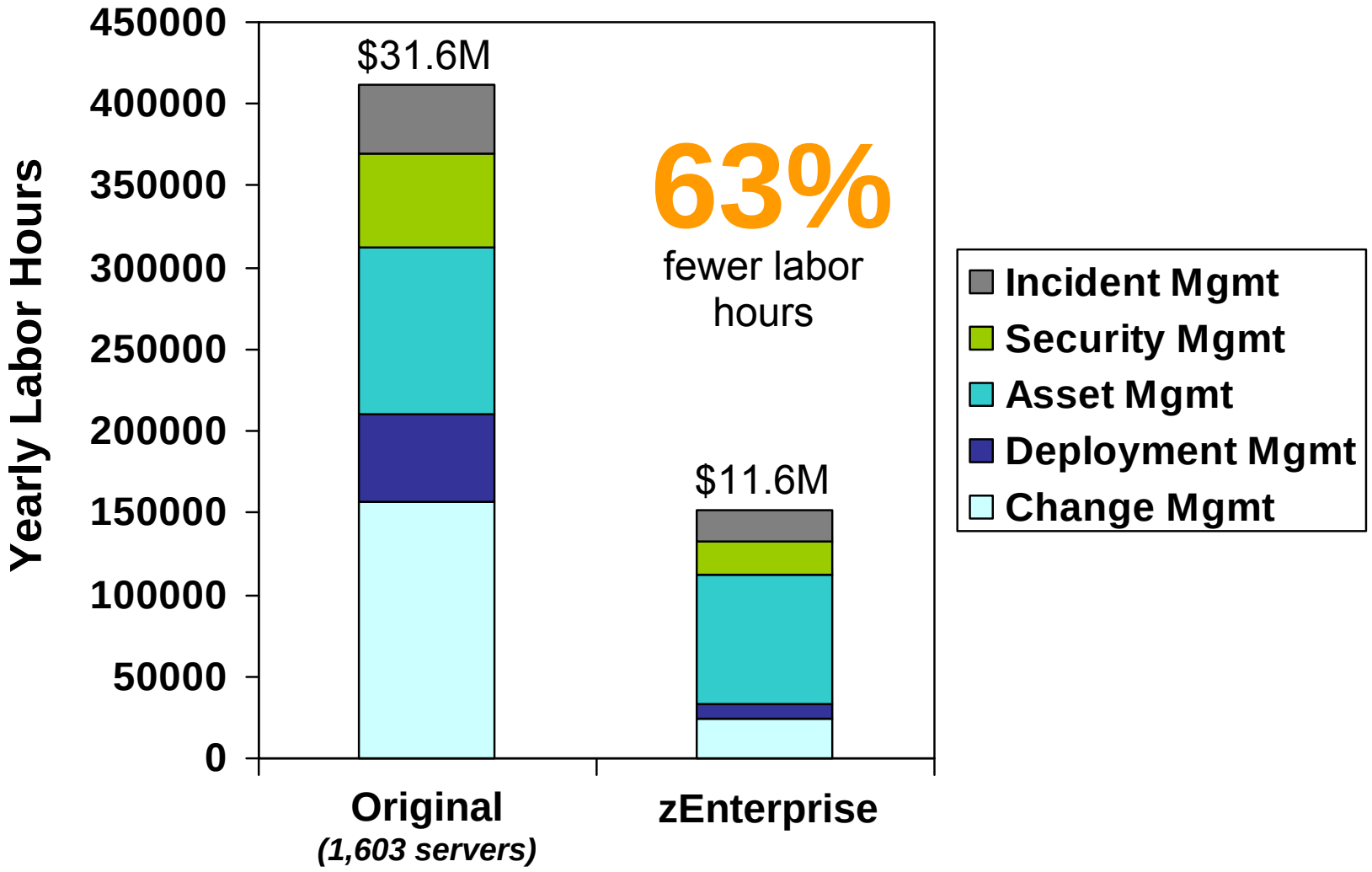
DEMO: Tivoli Enterprise Portal (TEP)

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

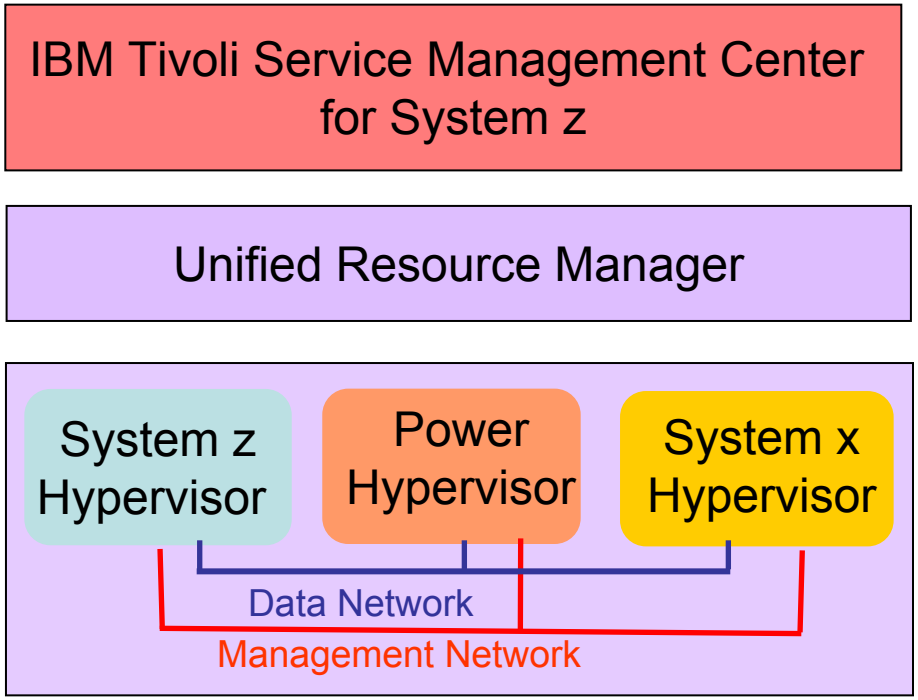


A Dynamic Role-based Portal for Centralized Management!

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



zEnterprise And Tivoli Support Structured Management Practices For All Workloads



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

IBM