

Smarter Workload Optimization – IBM Software And POWER Unleashed

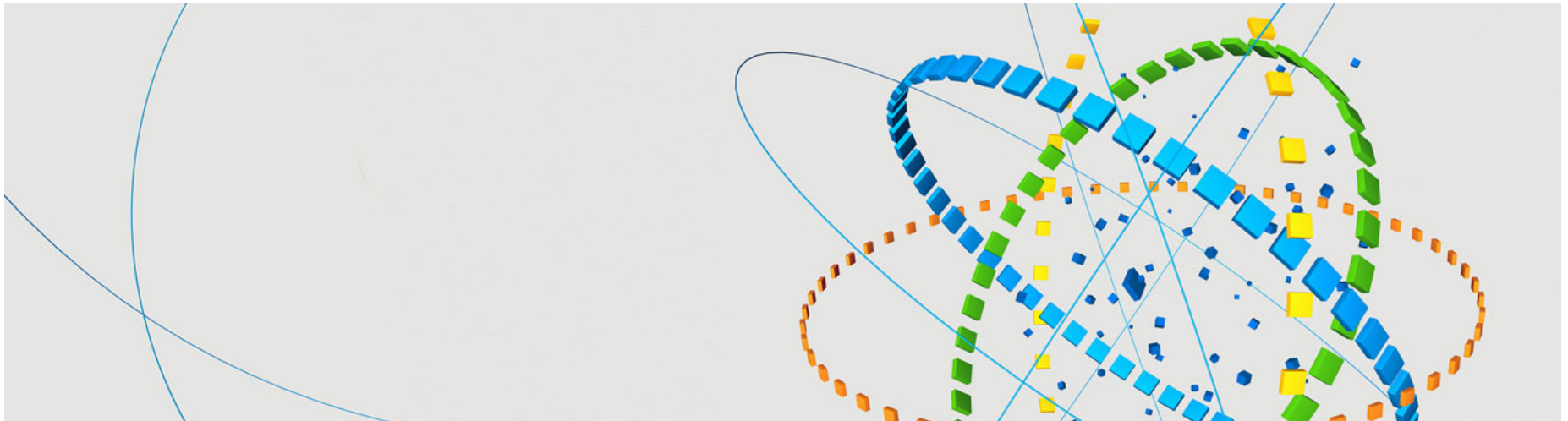


Private Clouds – Virtualization Without Limits On POWER Servers

IBMDiscoveryDays2011

Copies of Today's Presentations:

<http://www.ibm.com/developerworks/offers/techbriefings/details/power.html>



Private Clouds With IBM Software And Power Simpler Deployment, Management And Lower Costs

My users are dissatisfied...
They want to start using a
public cloud service



**Service Oriented Finance
Data Center Manager**

A private cloud built with
**IBM solutions and Power
Systems** can help you
achieve your goals.



IBM

What Users Like About Cloud Computing

- Self-service requests
 - ▶ User request services via a web portal
- Instant provisioning
 - ▶ Automated provisioning/de-provisioning of resources as needed
- Scalability on demand
 - ▶ Resources can be elastically provisioned to quickly scale up or down as needed
- Pay as you go
 - ▶ Users pay for what they use

Businesses Have Legitimate Concerns About **Public Clouds**

■ **Lack of Reliability**

- ▶ Examples of public cloud outages
 - April 2011, Amazon, 2 full days
 - April 2011, Azure, 6 hours
 - Jan 2011, Salesforce, 1 hour
 - May 2010, Amazon, 4 outages in a week
 - April 2010, Azure, 40 mins
 - June 2009, Amazon, 5 hours
 - March 2009, Azure, 22 hours

■ **Lack of Security/Compliance**

- ▶ Isolation of applications and data, data encryption/segregation
- ▶ Compliance with laws and regulations

■ **Limited Archiving**

- ▶ Network performance and amount of data involved are limiting factors

Amazon's Trouble Raises Cloud Computing Doubts

April 22, 2011 Computerworld

As technical problems interrupted computer services provided by [Amazon](#) for a second day on Friday, industry analysts said the troubles would prompt many companies to reconsider relying on remote computers beyond their control.

Deliver Services via Private Clouds

- **Private Cloud**

- ▶ Data center provides services to enterprise employees using a cloud deployment model

- User satisfaction

- More reliable and secure

- Actually **costs less** than traditional dedicated servers

IBM Software and Power Systems Can Deliver Private Clouds And Reduce IT Costs

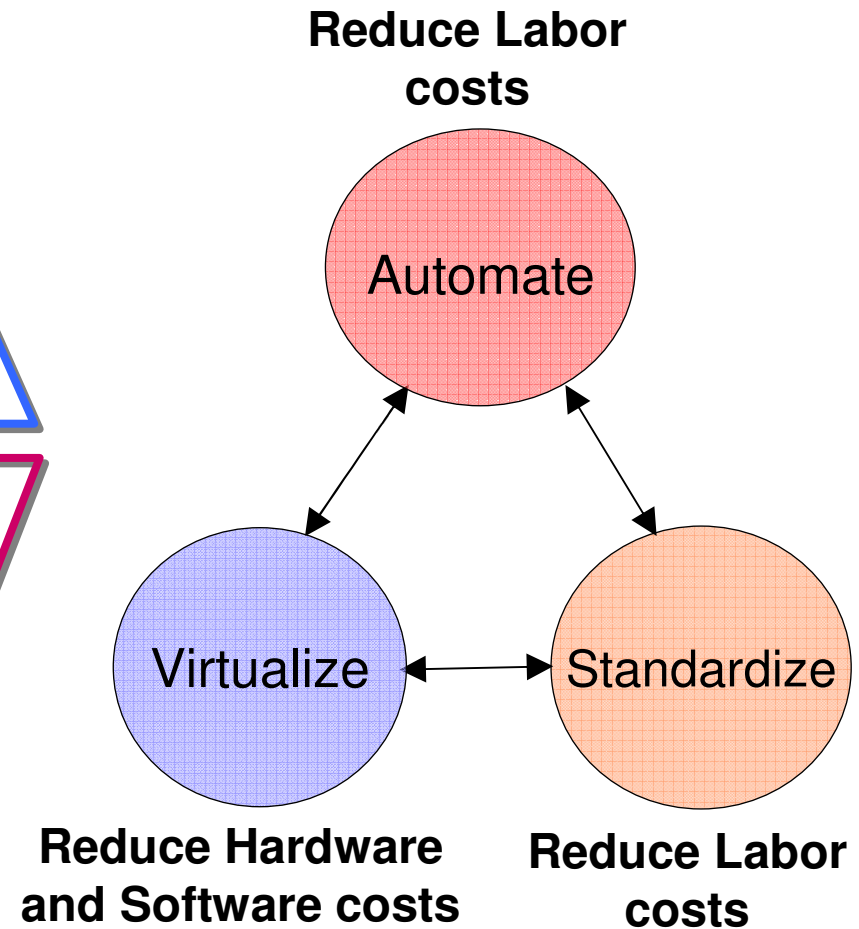
IBM Software

Virtual Server lifecycle management, self-service automated provisioning, and metering and billing



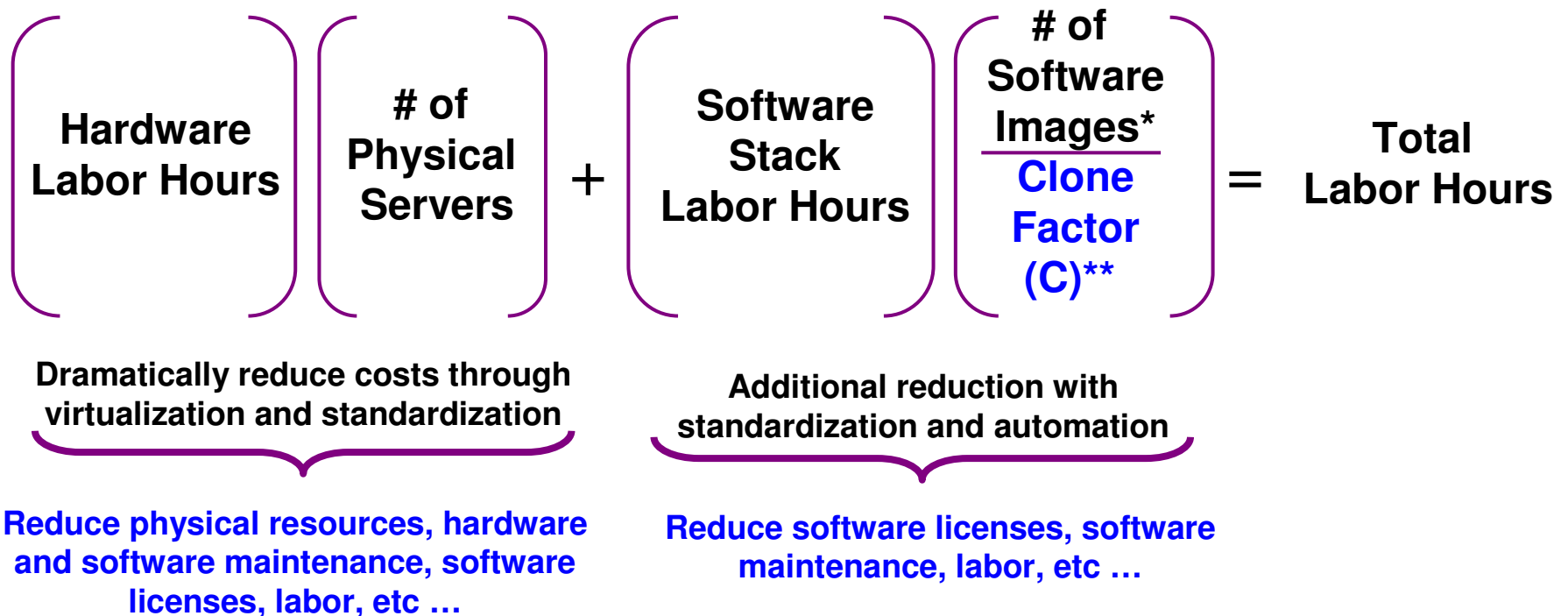
IBM Power Systems

Built-in POWER server virtualization with superior hypervisor efficiencies and bullet-proof security



Private Cloud Labor Model That Will Be Used To Demonstrate The Costs Involved In A Private Cloud

IBM developed a simple formula that is used in our internal studies



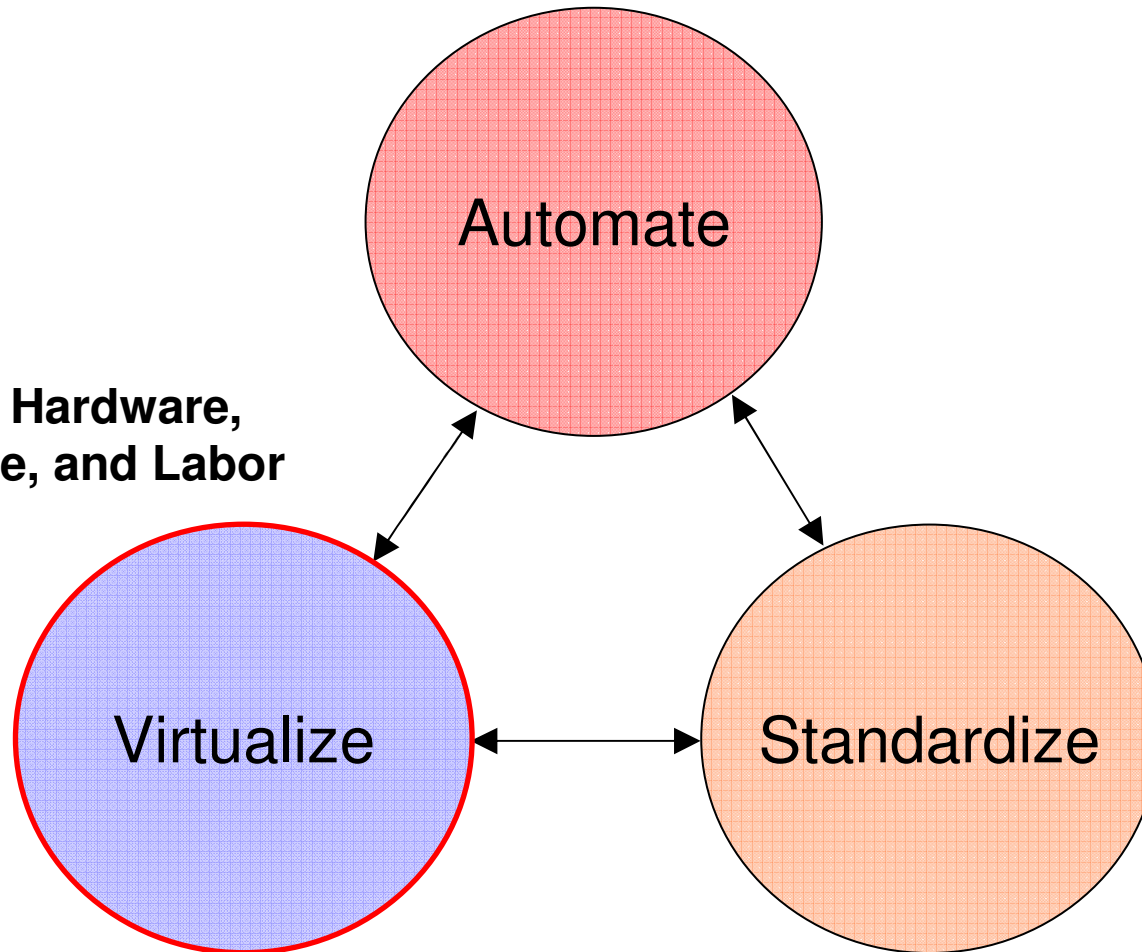
* This is the number of unique stacks to maintain.

** C = Average number of times a standard software image is re-used

First You Need A Server Platform Optimized For Virtualization

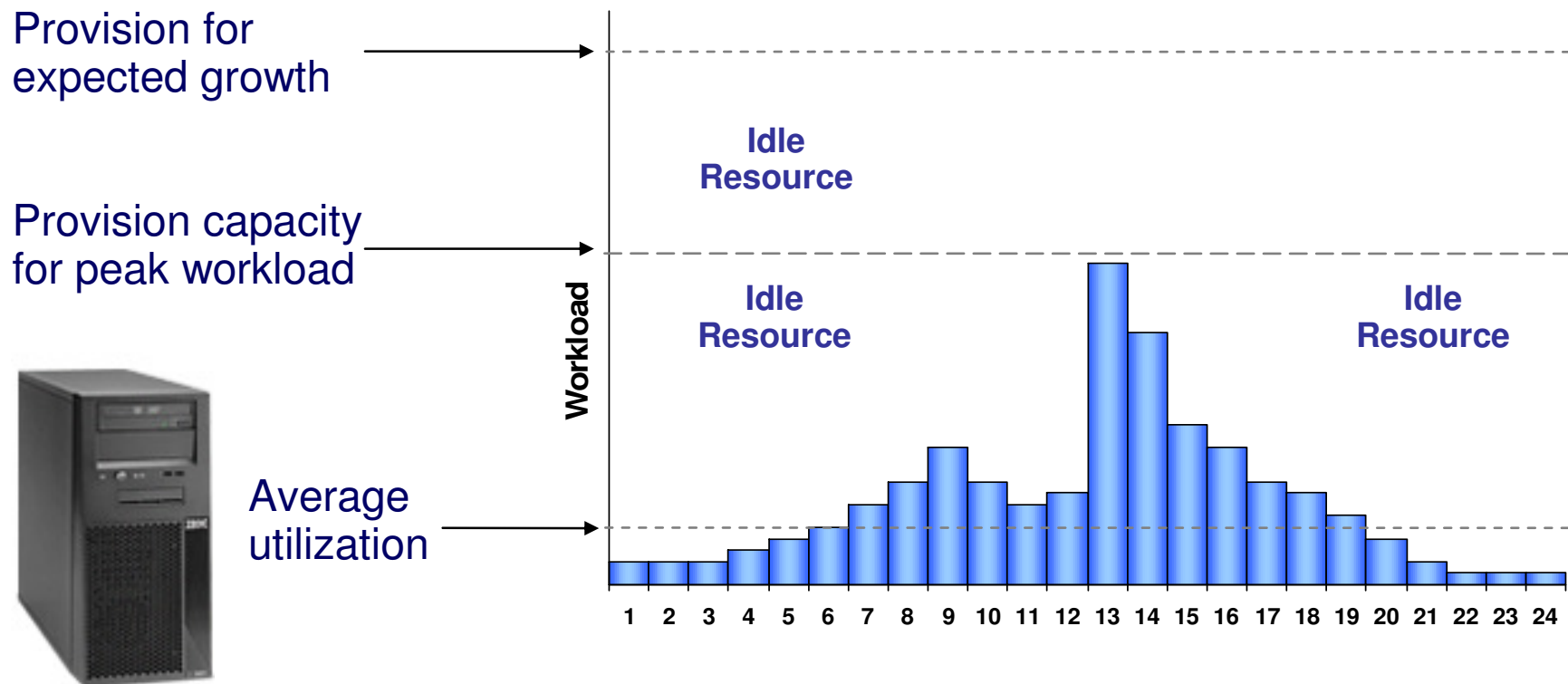


**Reduce Hardware,
Software, and Labor
Costs**

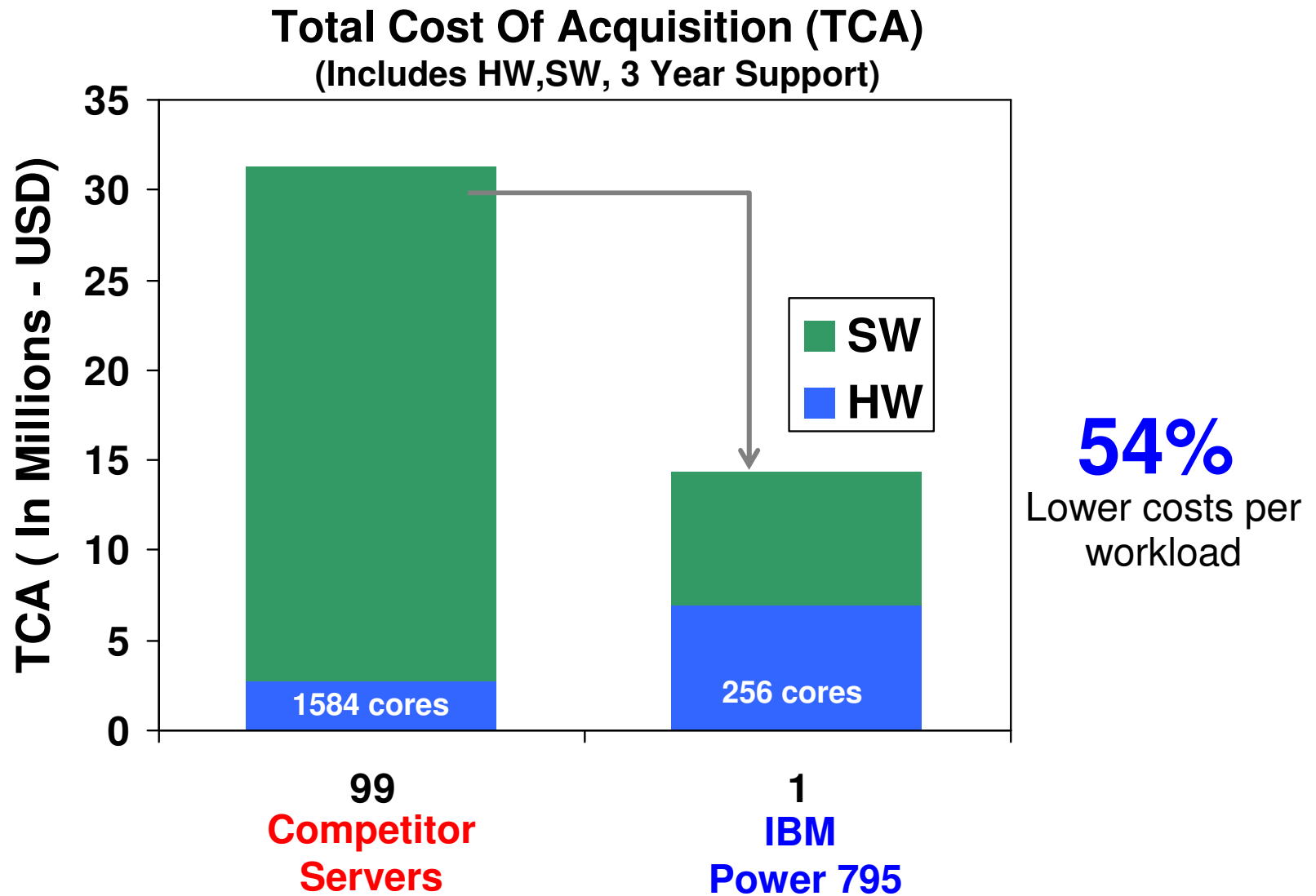


Dedicated Servers Are Underutilized And Drive IT Costs Up

The typical UNIX or x86 server running a single operating environment is only 10 - 20% utilized



Virtualization Effectiveness With PowerVM Delivers Significant Lower Costs Per Workload



Labor Costs For A Consolidated POWER Server And Competitive Servers Per Year

POWER server TOTAL

99 Workloads

Total HW labor hours	Total # of servers	Total SW labor hours	Total unique stacks
32 hr	1	36 hr	99

+ = **3596 hrs per year**

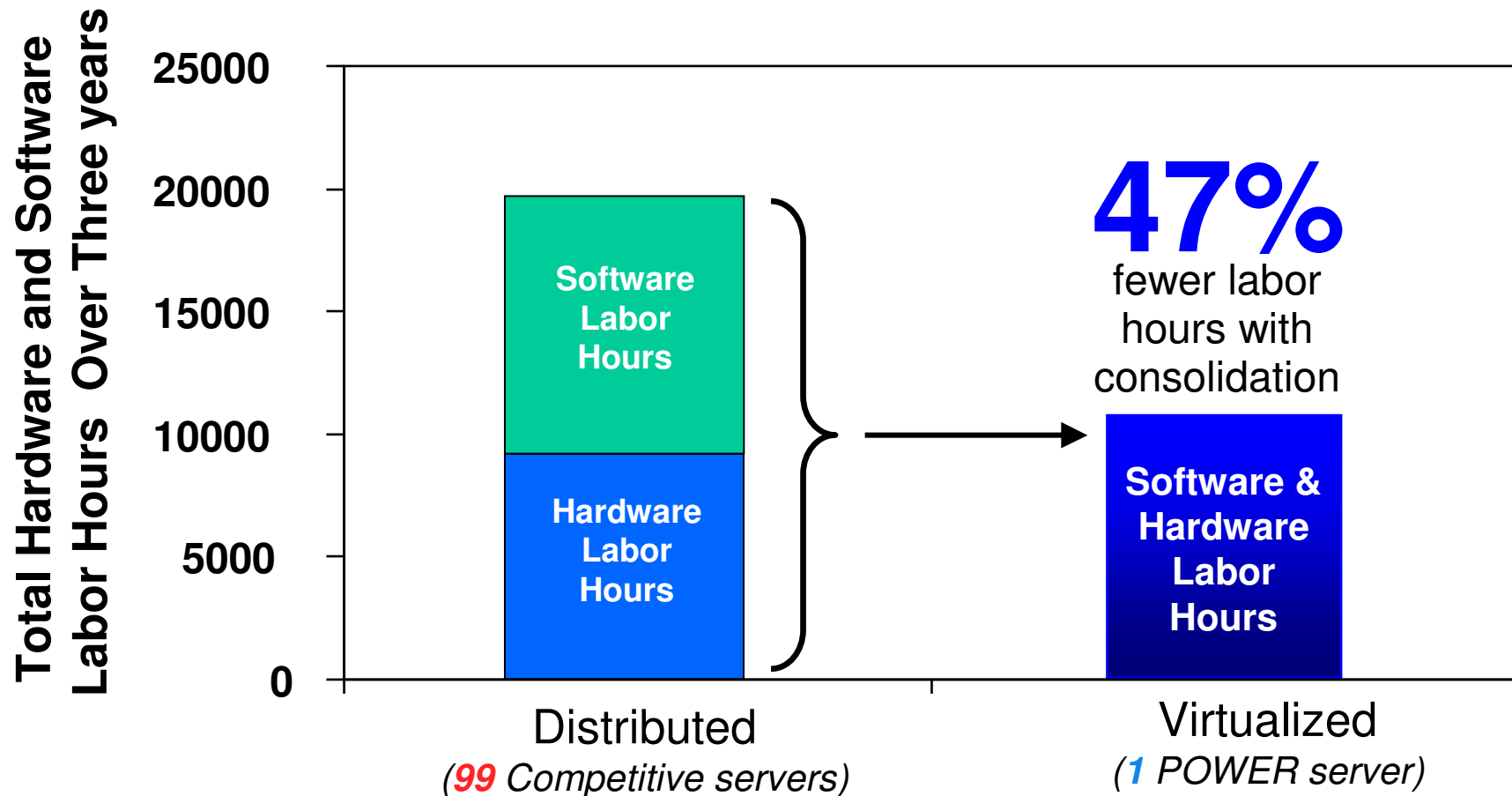
Competitive servers TOTAL

99 Workloads

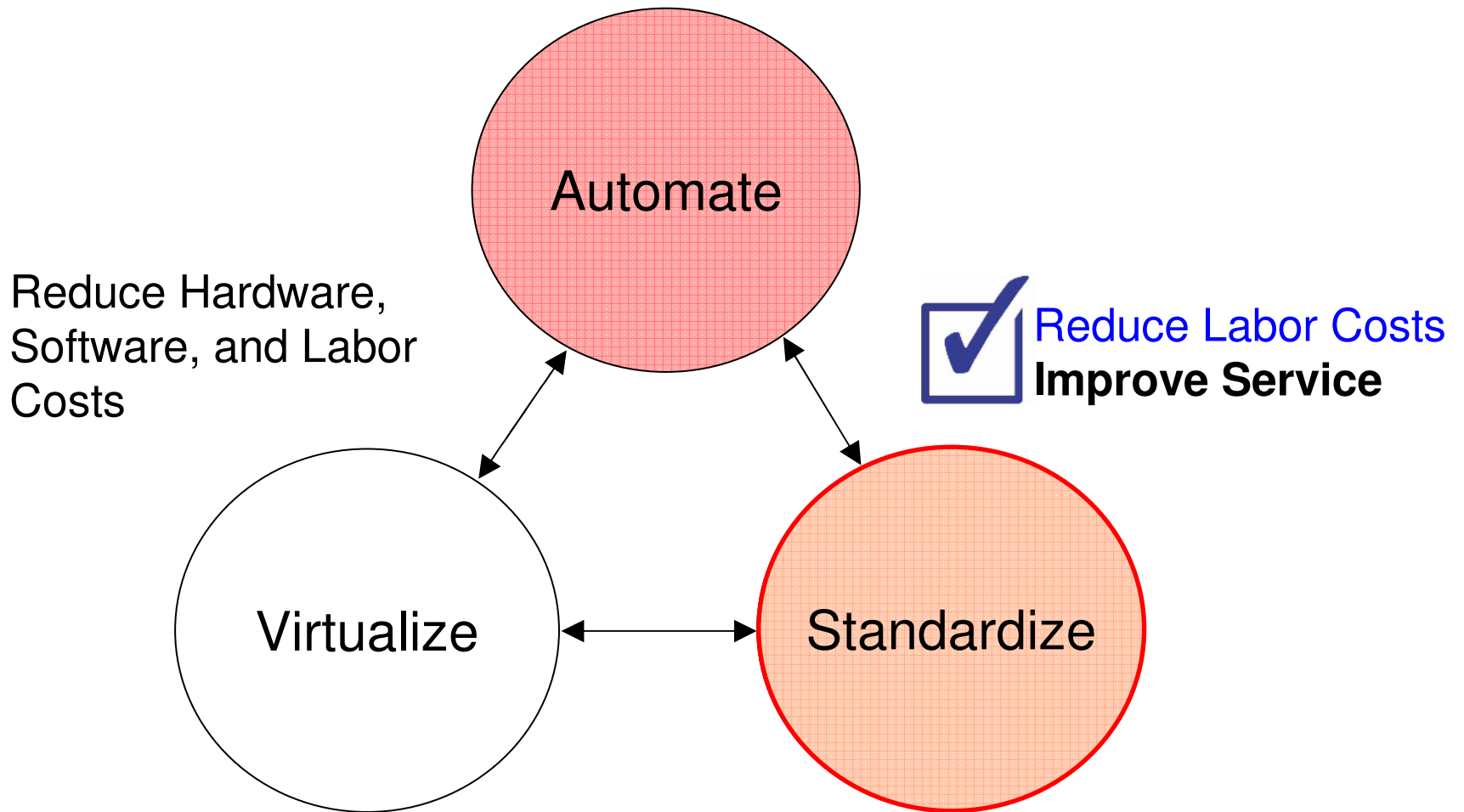
Total HW labor hours	Total # of servers	Total SW labor hours	Total unique stacks
32 hr	99	36 hr	99

+ = **6732 hrs per year**

The Greater the Consolidation You Can Achieve, The Lower You Can Drive Hardware Labor Hours



Standardize - Support For Near-instant Provisioning Of Services



IT Data Centers Struggle With Manual Provisioning

- Takes weeks to set up development, test and production environments
- Labor intensive and expensive
- Inconsistent images exist across the organization
- Maintenance is time consuming and difficult
- Inexperience leads to mistakes and lost time

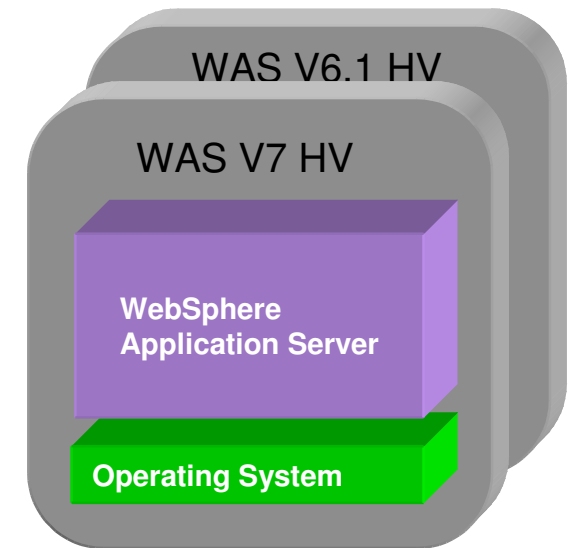


Standardization Helps Streamline Cost Of Managing Workloads

- A server needs a full set of software to run a workload
 - ▶ Operating System, Middleware, Applications
 - ▶ Patches, configuration specifications } **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”
 - ▶ Standardized workloads can dramatically lower infrastructure management costs

IBM Hypervisor Edition Products Make It Easier To Get Started With Virtualization

- IBM Middleware shipped as an .OVF virtual image, ready to run on a hypervisor
- The following products offered
 - ▶ WebSphere Application Server
 - ▶ WebSphere Process Server
 - ▶ WebSphere Portal Server
 - ▶ DB2
 - ▶ WebSphere Message Broker
 - ▶ WebSphere Business Monitor
 - ▶ WebSphere Message Queue (announced)
- Products support various combinations of:
 - ▶ VMware ESX, z/VM and/or PowerVM hypervisors
 - ▶ Red Hat Enterprise Linux, SUSE Linux, AIX
- Maintenance, support, and fixes through IBM for both middleware and operating system
 - ▶ New images include most recent GA components of IBM middleware, as well as OS patches



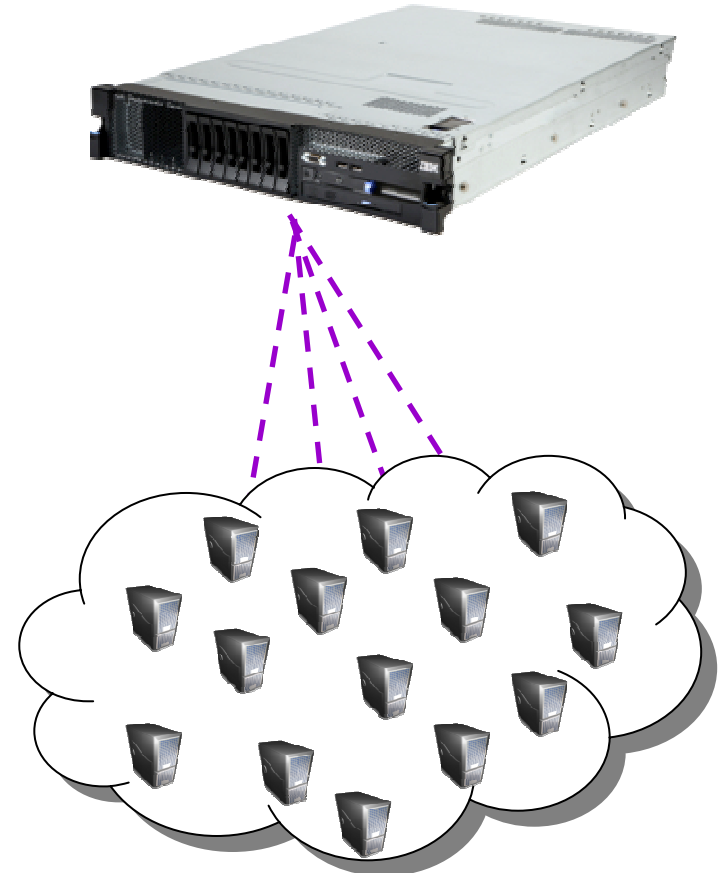
OVF = *Open Virtualization Format*

Standardization - IBM Workload Deployer Dispenses Hypervisor Edition Images

Accelerates Time To Value In Virtualized Environments

- 2U Hardware appliance used to create a cloud from customer's existing hardware
- Dispenses **hardened patterns** of Hypervisor Edition images
- Patterns leverage years of best practices deployment and configuration experience
- Enables consistent and repeatable deployment

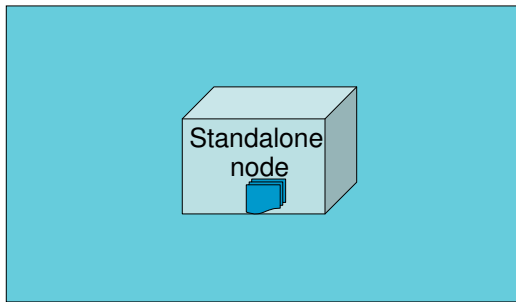
IBM Workload Deployer



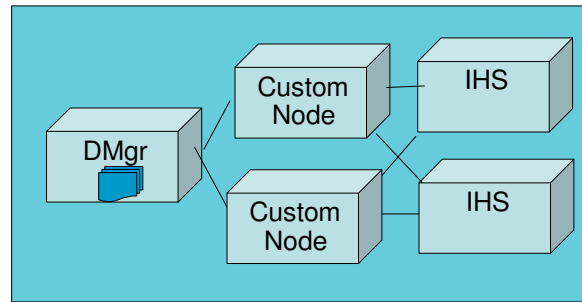
Preloaded Best Of Industry Patterns Are Also Included To Reduce Time To Deploy

A pattern is one or more virtual images and script packages from the catalog to satisfy a certain deployment topology

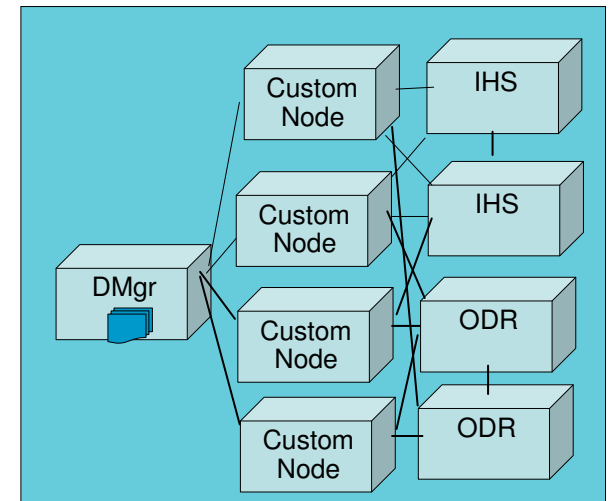
Single Server



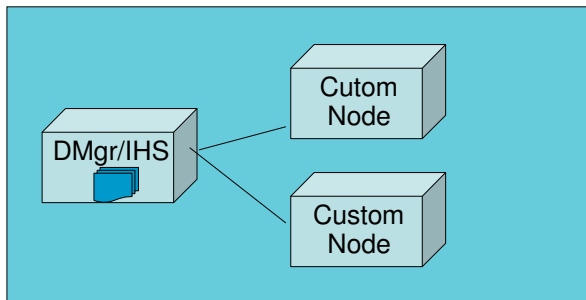
WebSphere cluster



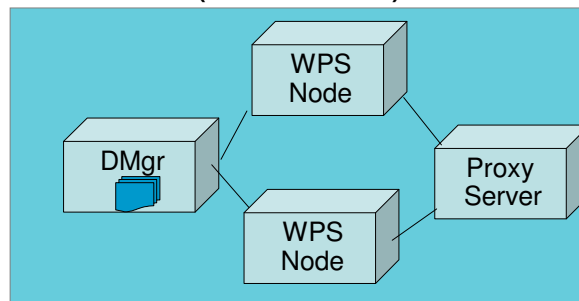
WebSphere Advanced Cluster



WebSphere cluster (dev)



WebSphere Process Server (Scalable)



Advanced Options for messaging, session persistence, and global security available

DMgr = Deployment Manager

IHS = IBM http Server

IBM Workload Deployer – Intelligent And Integrated Standardization

- **Understands what it is dispensing**
 - ▶ Can do more of the work required for deploying an environment
- **Offers full lifecycle management for workload patterns**
 - ▶ Middleware-aware auto-scaling
 - ▶ Configuration of connections between different components
- **Benefits**
 - ▶ More of the deployment is automated
 - ▶ More labor savings
 - ▶ More consistent deployments

IHS

WAS

Portal

DB2

DB2

IBM Workload Deployer knows how IBM products are given “personality” and “wired together.” It takes care of setting:

- IP addresses
- node names
- configuring clusters

Oracle Virtual Assembly Builder – Architected For “Heavy Lifting”

A very different approach.....

** Very little help!*

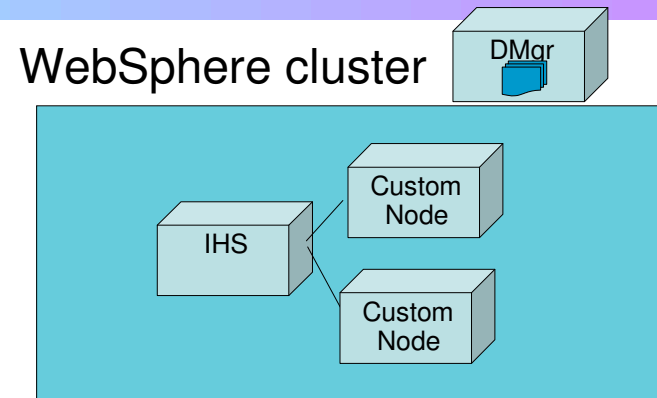
** Very slow process*



- Oracle Introspects current environment and then leaves the **heavy-lifting** to the user
 - ▶ No Patterns provided
 - ▶ Limited set of templates provided
 - ▶ Limited and inappropriate set of VMs to use as reference solutions
 - ▶ User must manually create reference solutions

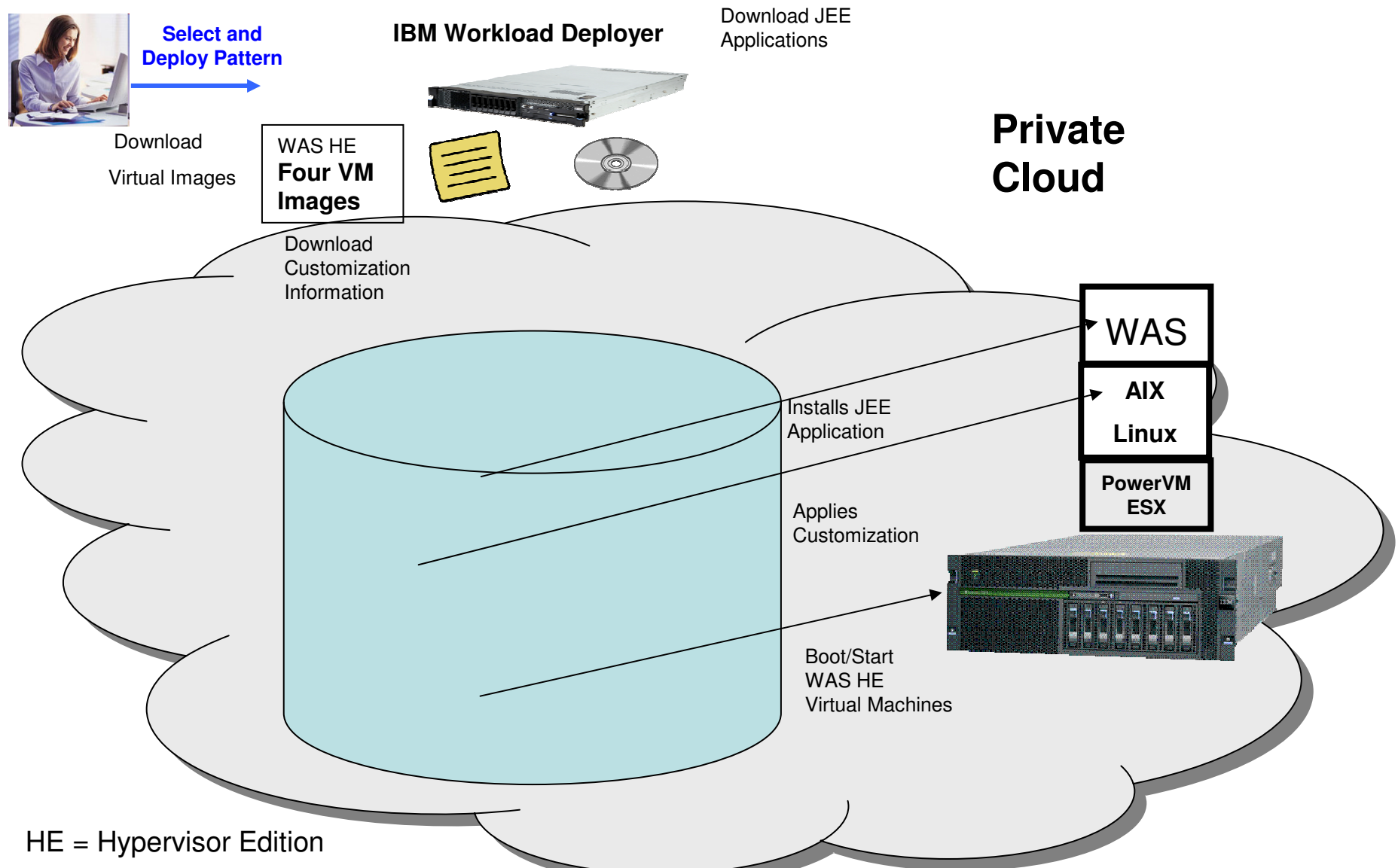
Example: Normal Deployment Steps For WAS High Available Clustered Environment

1. Involves creating 4 servers
 - ▶ 1 WebSphere deployment manager
 - ▶ 1 IBM HTTP Server
 - ▶ 2 WebSphere Node
2. Install the WAS Update Installer and install the required iFixs
3. Configure the HTTP Server
4. Create WebSphere Cluster with 2 members
5. Configure Session replication on servers to support Failover
6. Deploy the Application to the WebSphere Cluster
7. Regenerate the HTTP server plug-in



All of these steps are done automatically with IBM Workload Deployer

DEMO: Use Standardized, Pre-Built Images To Streamline Deployment (Four Images)



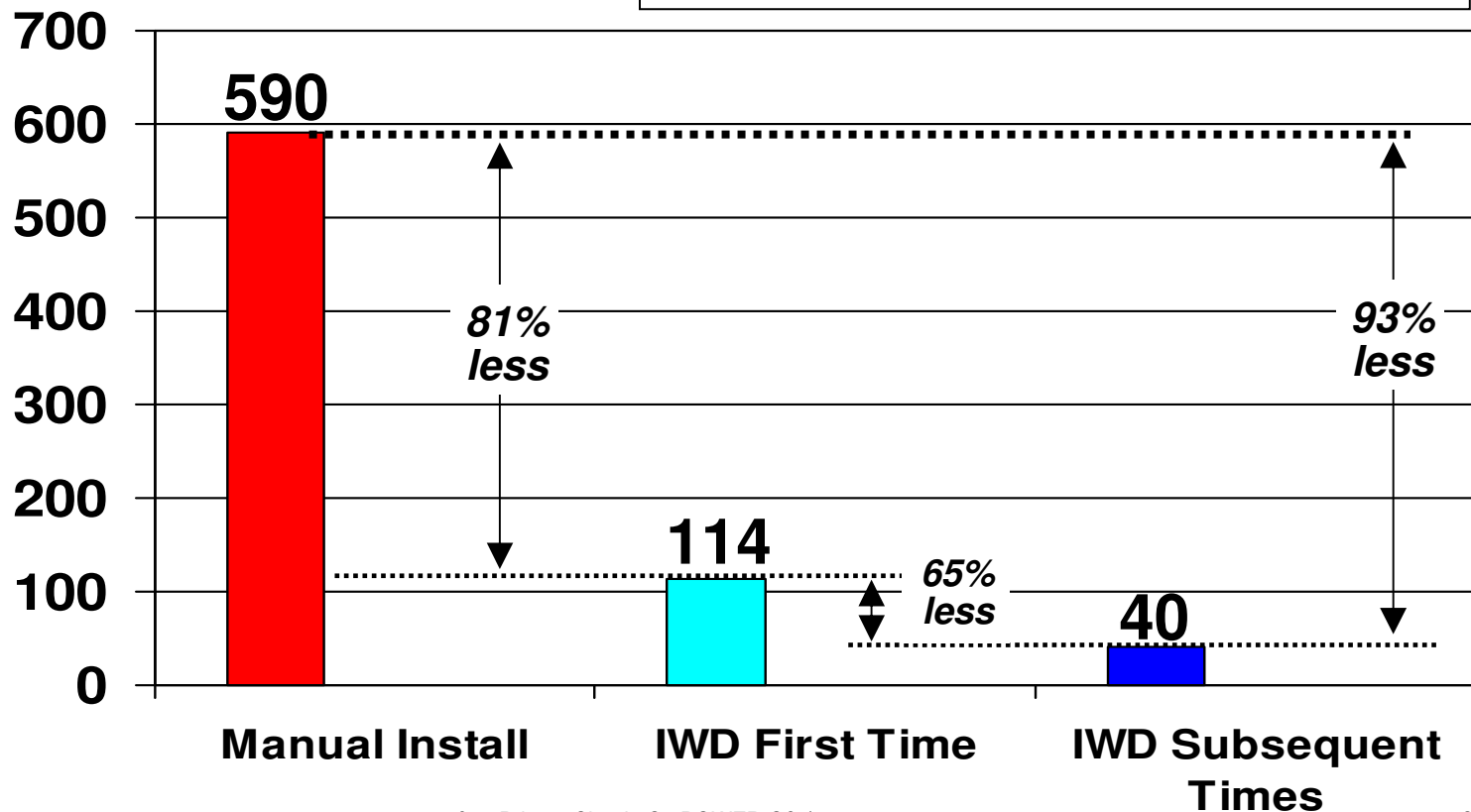
IBM Workload Deployer Is Fast!

Reduce Deployment of Images by a factor of 10x

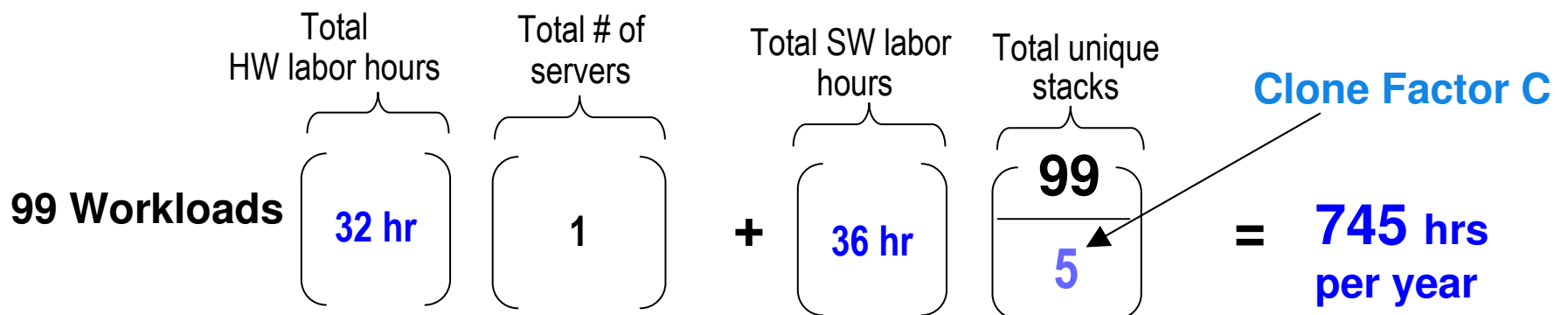
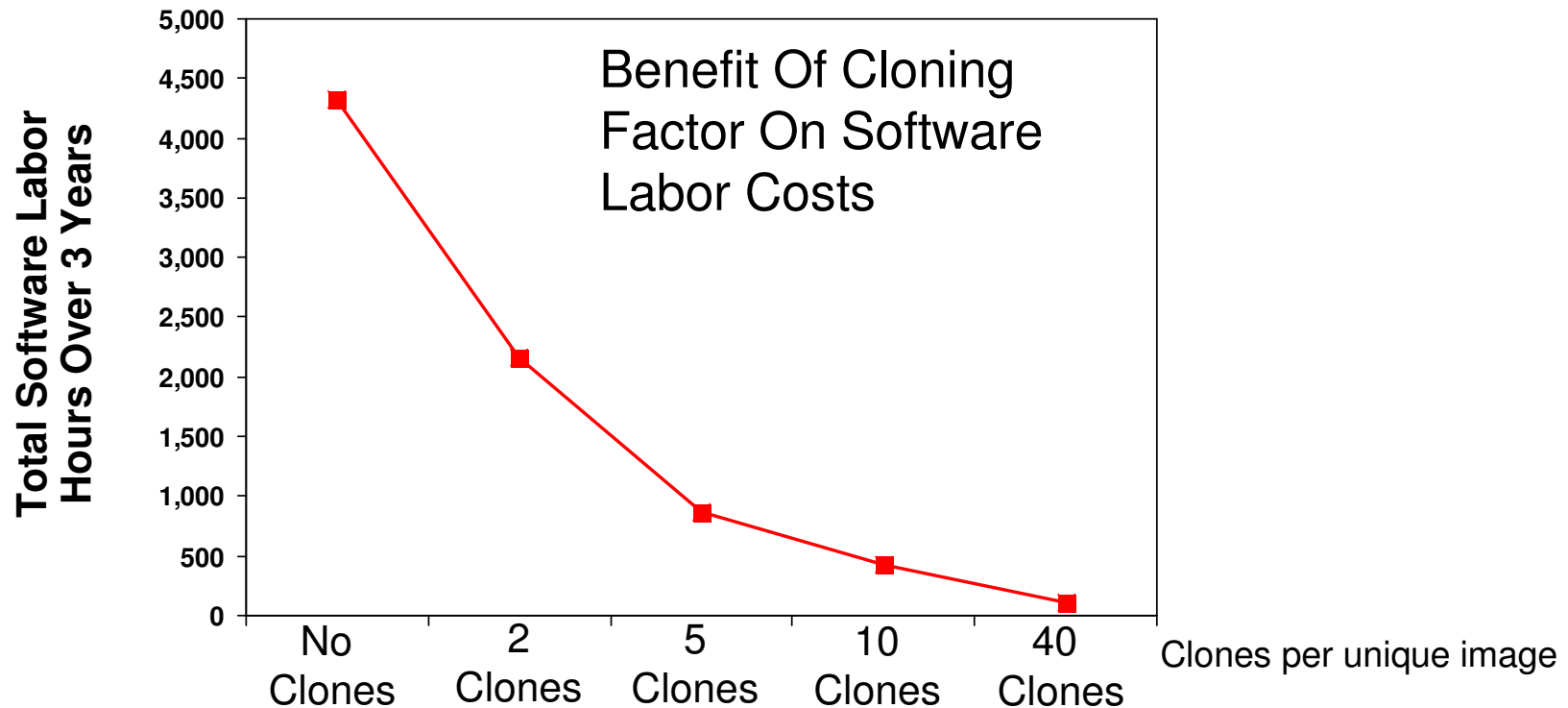
High Level Steps Performed

1. Create LPAR (partition)
2. Install AIX and patches
3. Define Network & Security
4. Install WAS and patches
5. Install Application

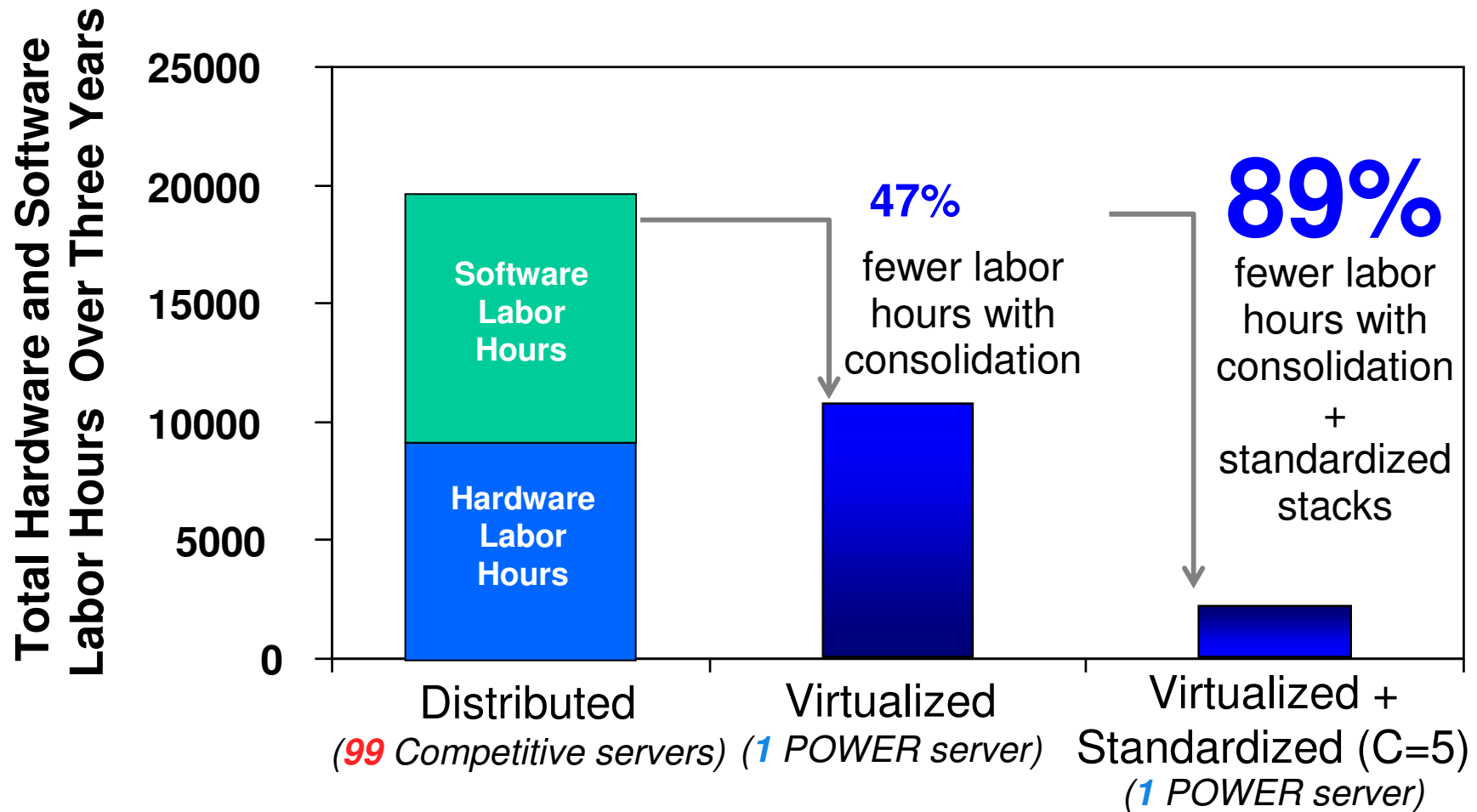
Minutes to install a WebSphere Cluster 4 images



Labor Costs For Power Server With Consolidation And Standardization With C=5



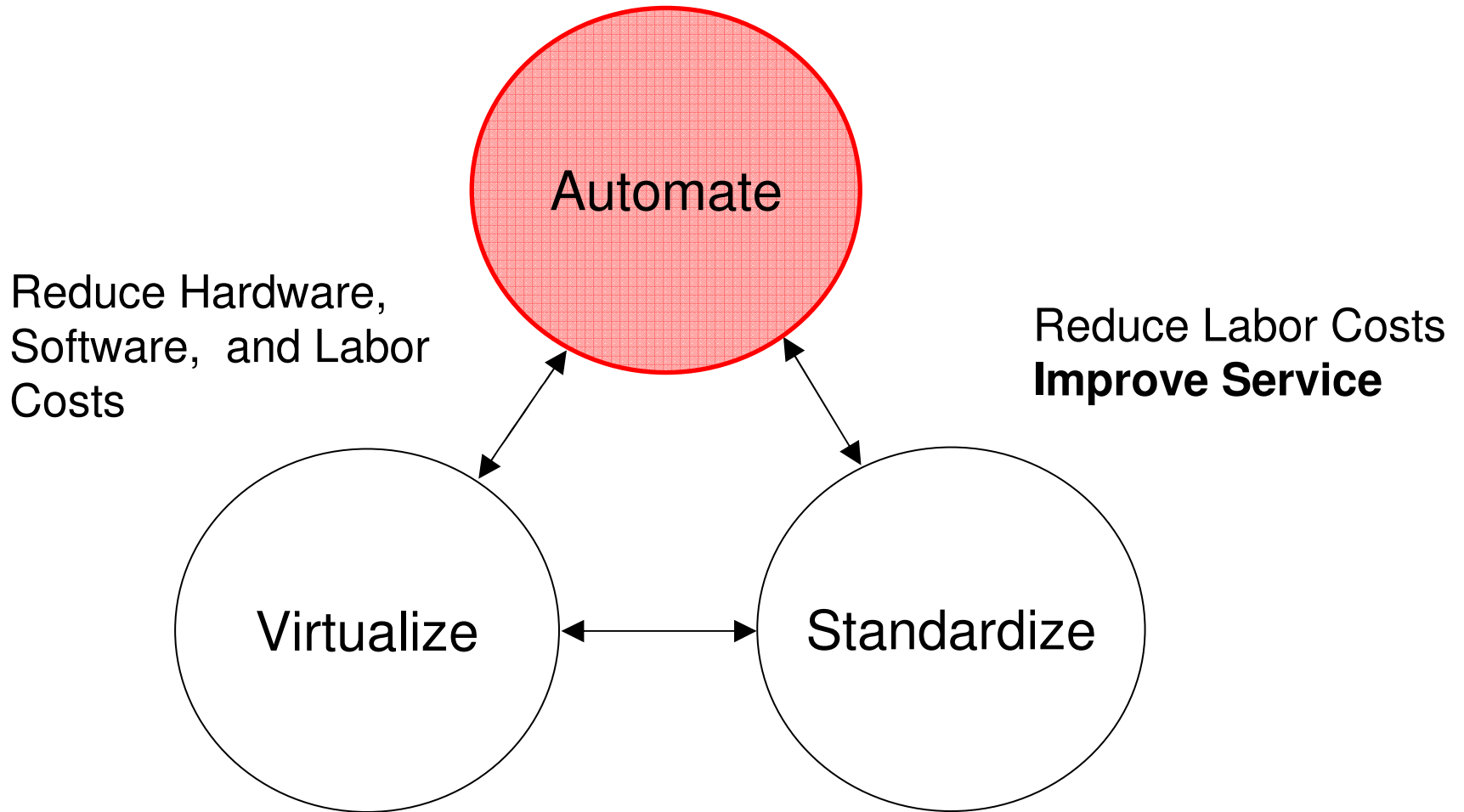
Significant Labor Savings Possible With Virtualization And Standardization



Automate – Self-service Portal For Users To Request Services And Track Usage



Reduce Labor Costs
Enable Automation



Integrated IBM Service Delivery Manager Is Key To Automation (ISDM)

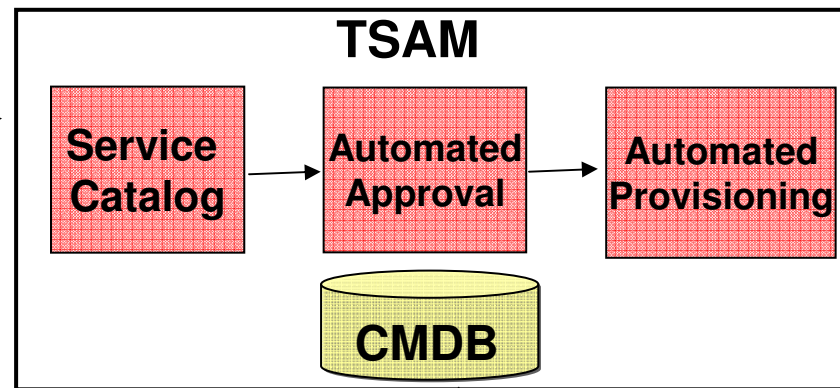
Provides the visibility, control and automation needed for efficient service delivery.

- Automated provisioning of virtual systems from self service catalogue
Tivoli Service Automation Manager **(TSAM)**
 - ▶ Self-service portal to reserve resources
 - ▶ Service request manager
 - ▶ Automated provisioning and de-provisioning of resources
- Tivoli Usage and Accounting Manager **(TUAM)**
 - ▶ Usage accounting manager and billing
- Tivoli Monitoring (ITM)
 - ▶ Real-time monitoring of cloud resources
- Tivoli System Automation
 - ▶ Automated system start up and shut down

Self-Service Portal With Tivoli Service Automation Manager (TSAM)



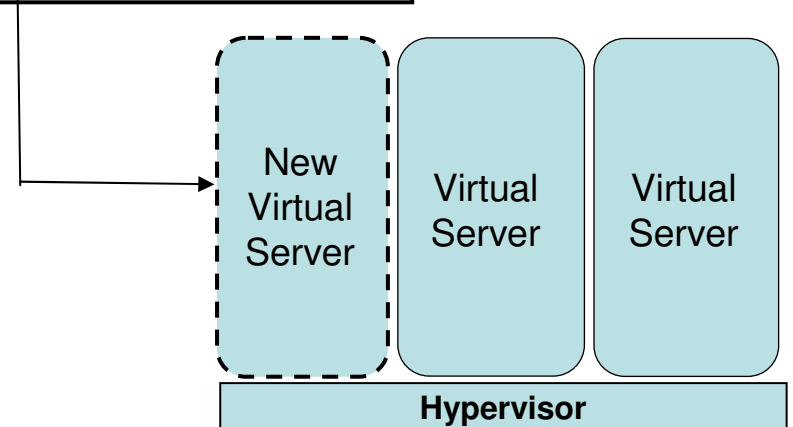
1. User browses service catalog
2. Adds service to shopping cart
3. Submits request



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

TSAM provides **automated** approval

TSAM supports **automated** provisioning



Power System

CMDB = Configuration Management database

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

- Web-based self-service interface to initiate request
- Submit a request to add a new LPAR to an existing project
- LPAR is created with a complete software stack (AIX, WebSphere, Service Oriented Finance application and Tivoli Monitoring agent) installed
- Requester is notified via email when the request is completed

TSAM

Add System p LPAR Servers

Add one or more System p LPAR virtual servers to the project.

General

*Project Name
SOF Web Testing

Project Details Operational

Project Name	SOF Web Testing
Project Description	SOF Web Application Testing
Project Type	RDP
Start Date	1/25/2010
End Date	2/7/2010
Team Access	TESTERS

Requested Image

Resource Group Used to Reserve Resources
Power Systems LPAR Monitoring Agent to be Installed

*Image to be Deployed

Select	Name	Hypervisor	CPUs	Memory	Storage
<input checked="" type="radio"/>	SOF Investment	LPAR	1	2 GB	10 GB
<input type="radio"/>	SOF Mortgage	LPAR	1	2 GB	10 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
1
2 available at above configuration and schedule

CPU

Virtual	1
Physical	0.5

Memory

Main	2.000 GB
Swap	0.000 GB

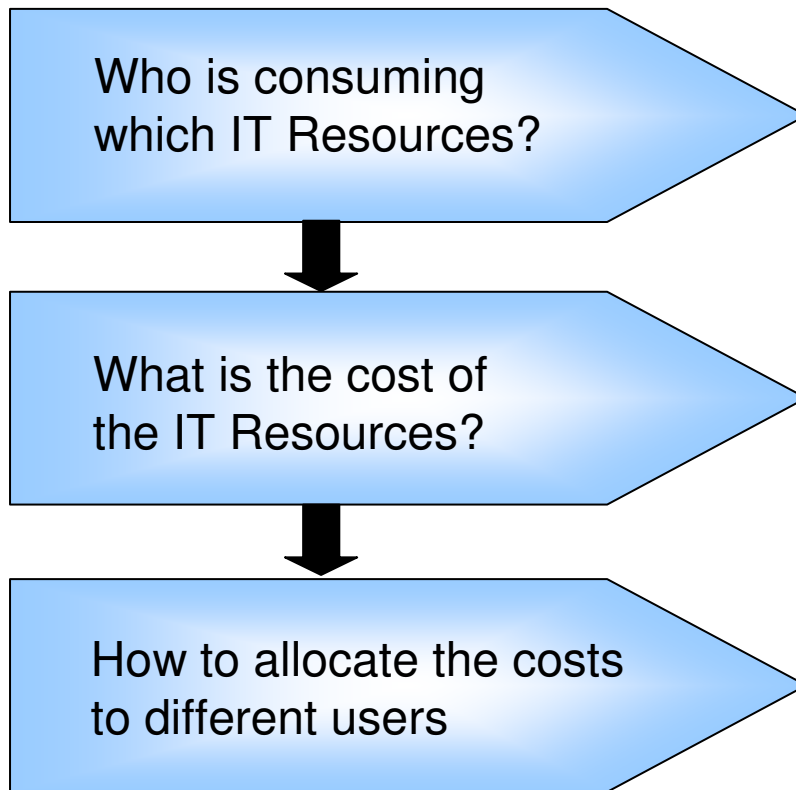
Disk

Local	10 GB
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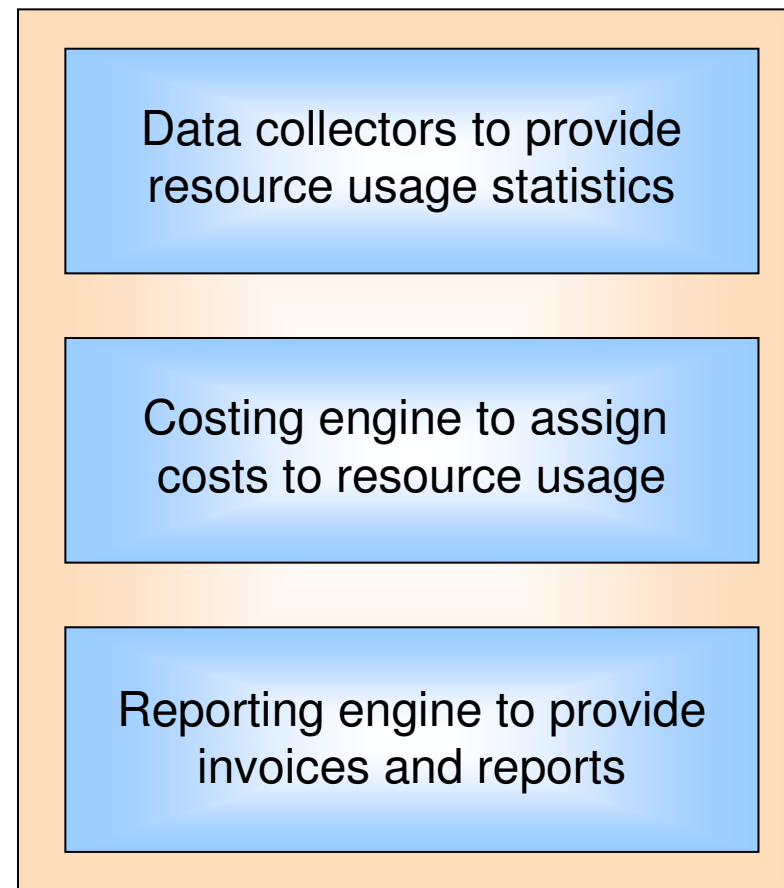
Cancel

Customers Pay for What They Use In A Private Cloud – **Tivoli Usage and Accounting Manager**

Usage and accounting drives more effective use of resources



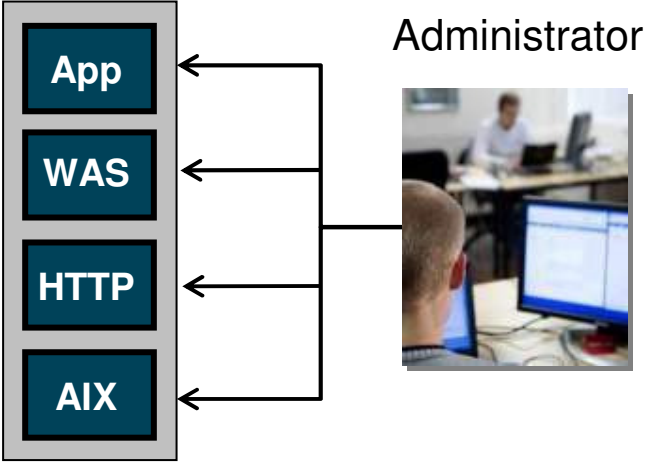
TUAM provides Usage and Metering function



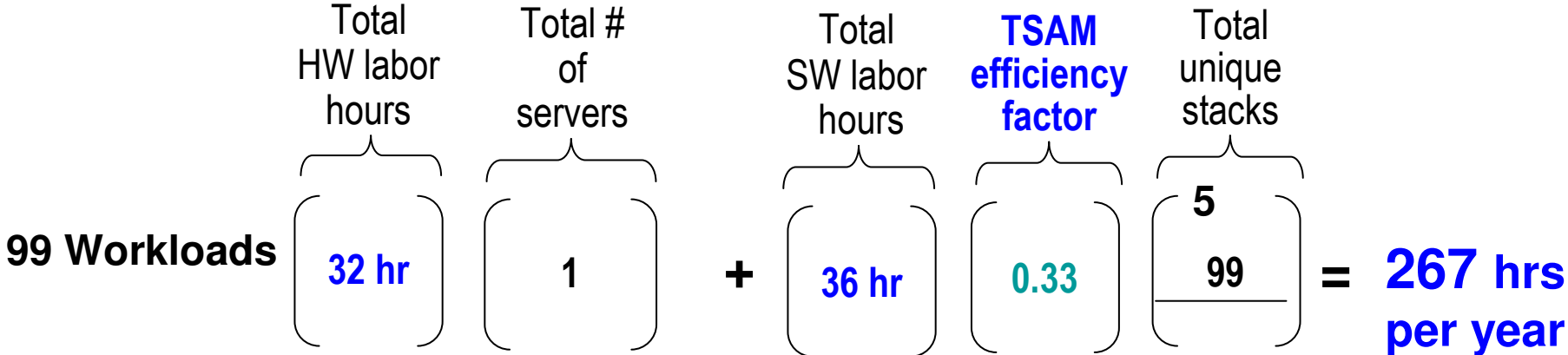
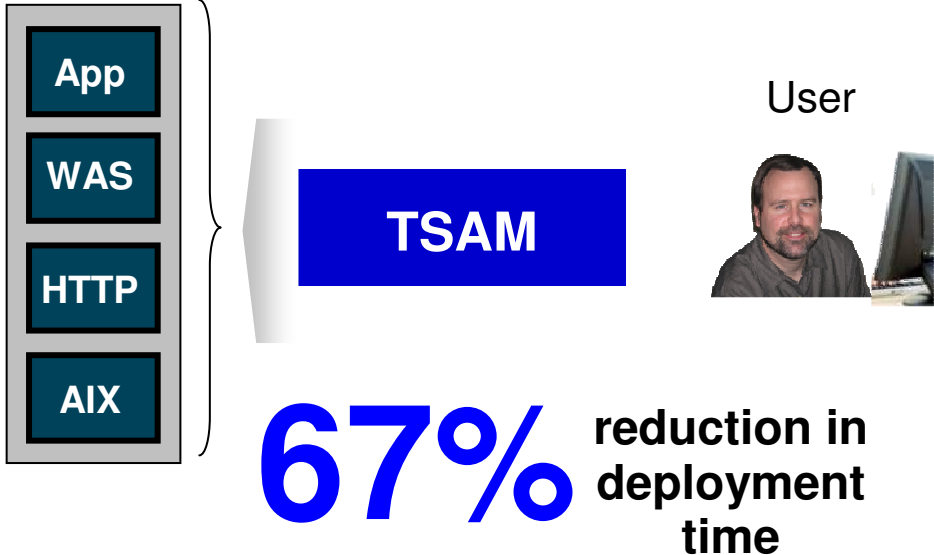
TUAM = Tivoli Usage and Accounting Manager

Deployment Study On The Labor Benefits Of Self-Service Provisioning And Automated Install

Manual Install

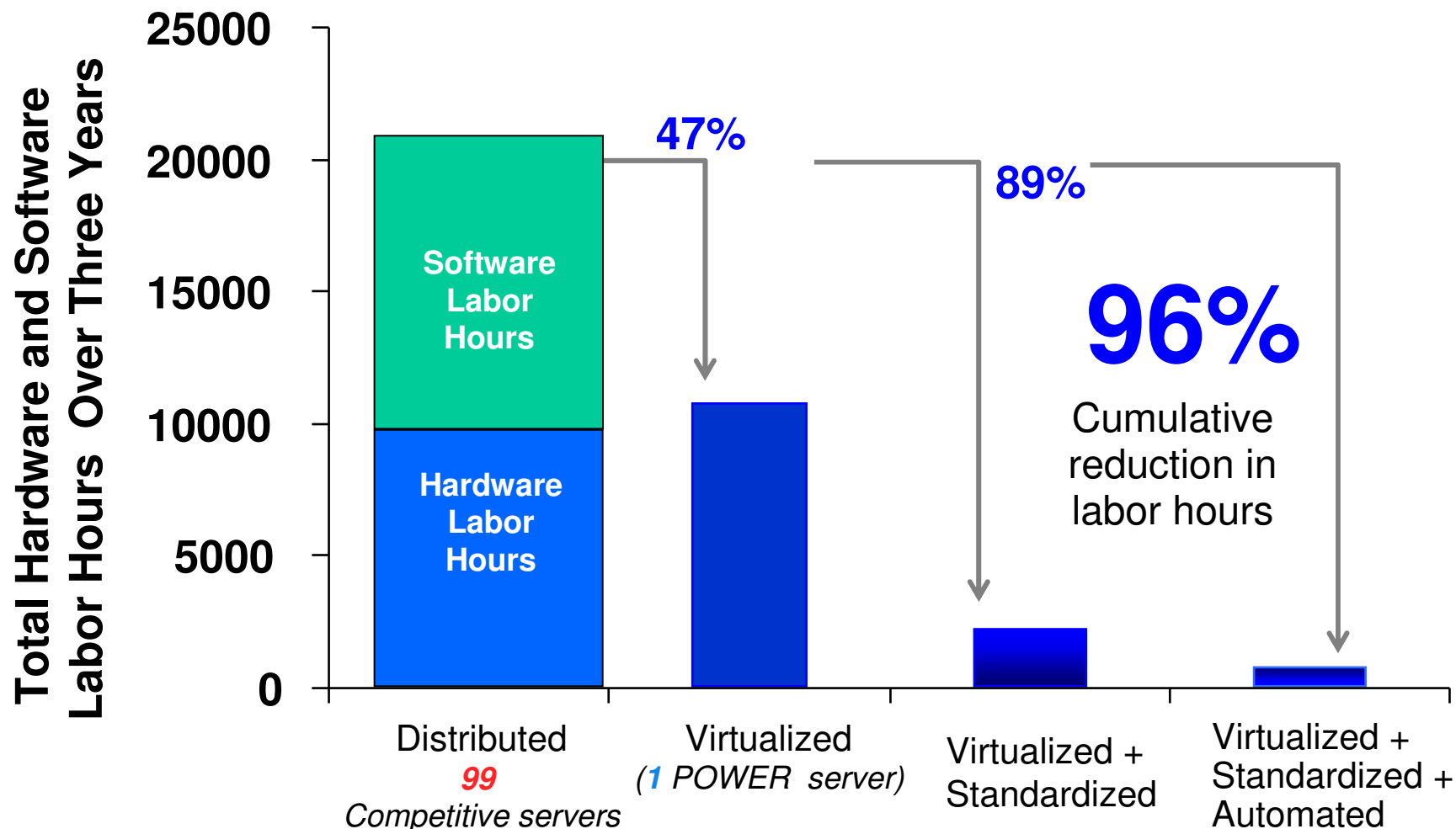


Self-Service Provisioning and Automated Install



Source: IBM Software Group Internal Study

Adopting A Virtualization, Standardization, And Automation Strategy Achieves Greatest Labor Savings



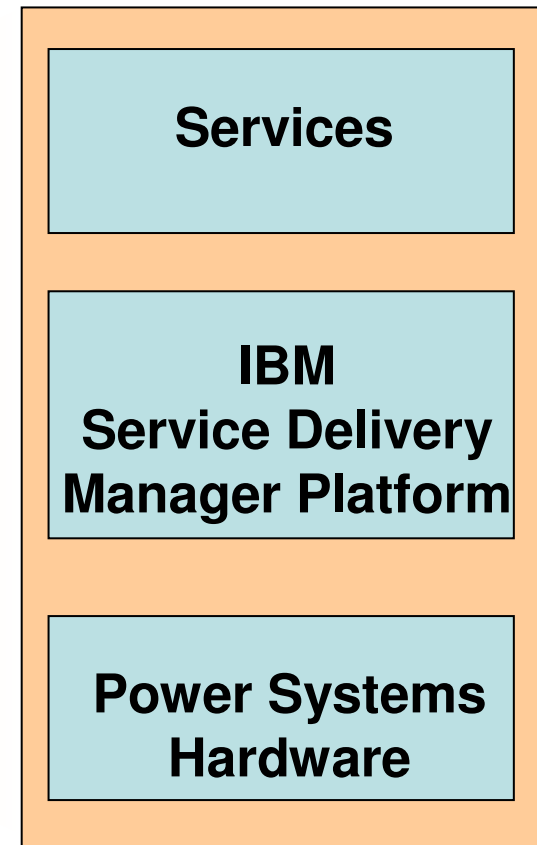
IBM Cloudburst For Power: Workload-Optimized System For Private Clouds

A Single Packaged “Ready To Roll” Private Cloud on Power

- Single Product
- Single Delivery
- Single Installation
- Single Support Structure



Power 750



Complete private cloud environment including both the cloud management infrastructure and the cloud resources

Oracle Exalogic

Lacks Key Private Cloud Capabilities

- No support for virtualized environments (in version 1)
- No standardization with existing hardened / proven patterns
- No automatic deployment capabilities
- No user self-service automated provisioning
- No billing or metering capabilities

Oracle Exalogic X2-2 announced October 2010



Lower Costs And Improve Agility With A Dynamic Application Infrastructure

- Management and administration is the largest component of infrastructure cost
- Many companies are turning to private clouds as a Smarter Computing strategy to deliver I/T services more cost effectively

■ Achieve superior economics:

- ▶ Virtualization and consolidation with **PowerVM hypervisor** can drive down labor costs by up to 96%
- ▶ Standardization of software stacks enables cloning, which minimizes software labor costs with **IBM Workload Deployer**
- ▶ Automation and self-service provisioning further drives down software labor costs per unique stack
 - **(TSAM / TUAM or IBM Service Delivery Manager)**