



7 Kasım 2012 - Çırağan Palace Kempinski

# IBM Connected 2012 Istanbul

Learn. Collaborate. Innovate.

## Getting Started With A Secure Private Cloud on System z

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IBM



# Getting Started With zEnterprise For A Private Cloud

## Virtualization Platform

zEnterprise and DS8000 Storage  
BladeCenter Extension (zBX)  
Unified Resource Manager (zManager)  
Enterprise Linux Server Solution Edition for Enterprise Linux

Multi-architecture secure virtual environment

Elasticity

## Entry Cloud

zEnterprise Cloud Starter Edition

Adds

Automated provisioning  
Resource monitoring

## Advanced Cloud

System z Solution Edition for Cloud Computing

Adds

Self-service  
Metering and billing

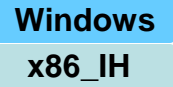
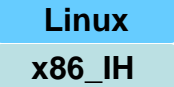
# zEnterprise Provides An Ideal Private Cloud Platform – Broad Architectural Support

Use a Best Fit Strategy for Workload Assignment

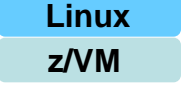
POWER7  
Blades



System x Blades



Optimizer  
Blades



Specialty  
Appliances



zEnterprise BladeCenter  
Extension (zBX)



+

zEC 12



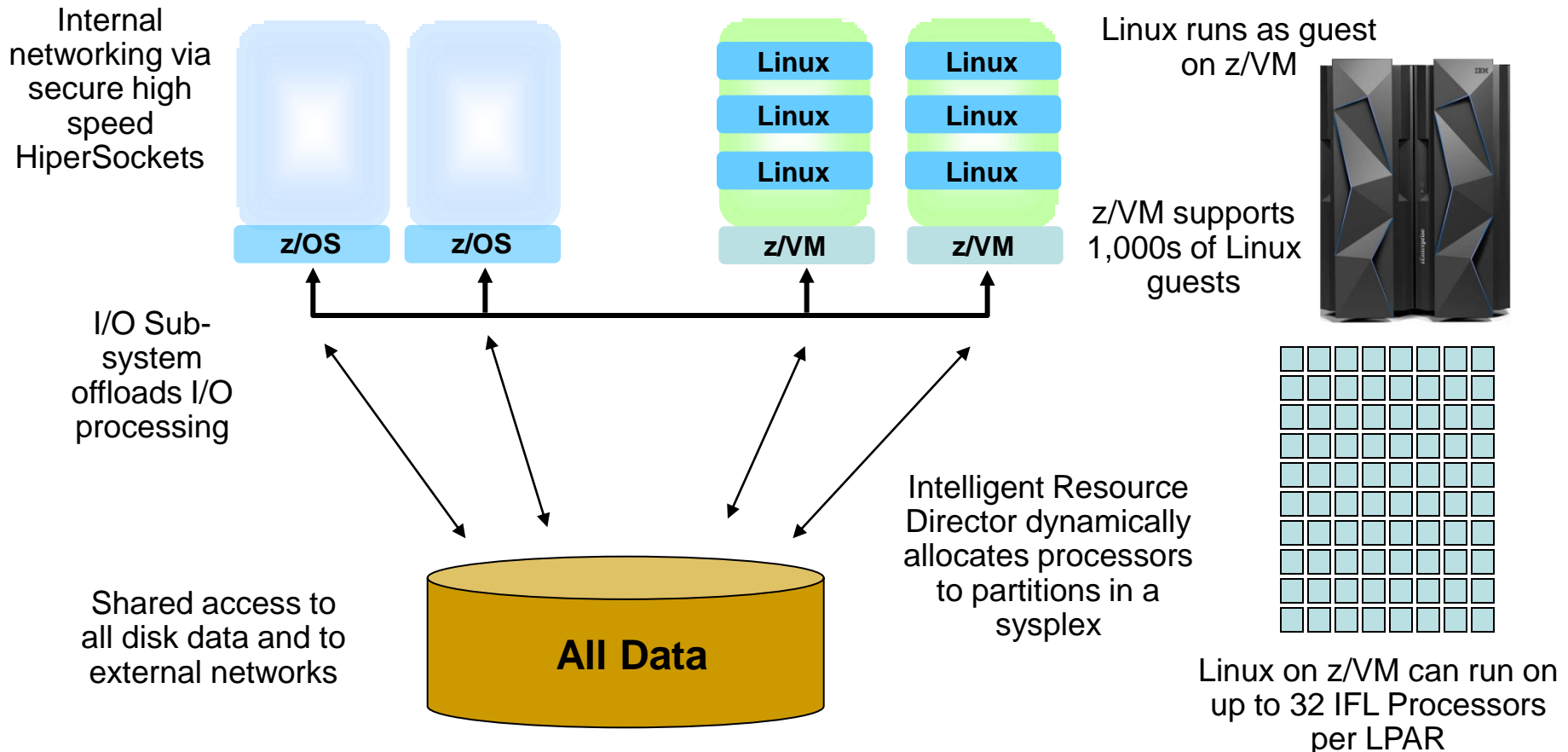
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IBM DB2 Analytics  
Accelerator



# A Closer Look At Linux On z/VM

## Logical Partitions Share Processors, Common Cache Structures, and I/O



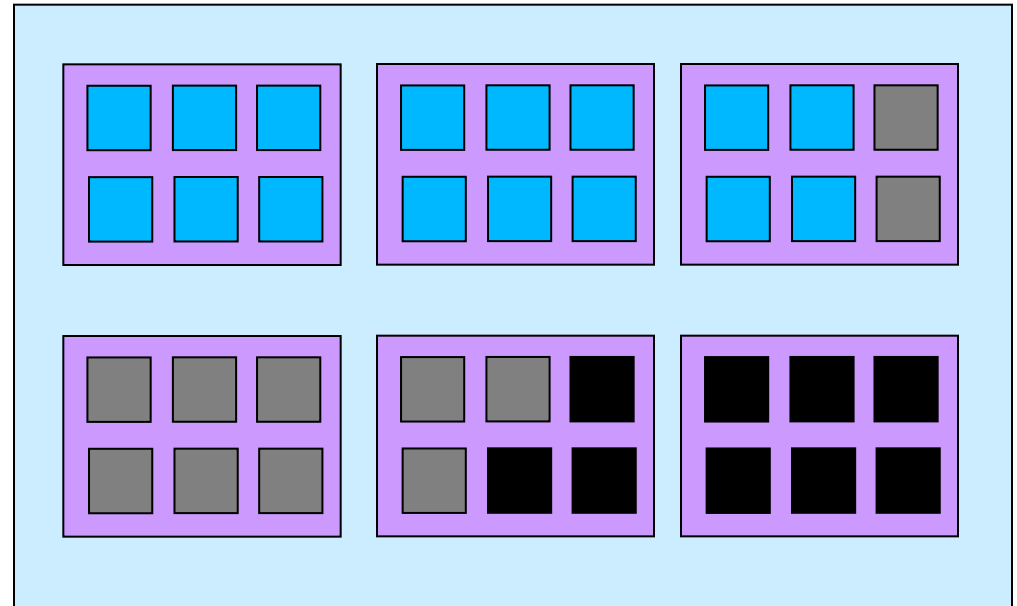
# Linux On z/VM Workloads Inherit System z Qualities Of Service

- Reliability, availability, serviceability characteristics of System z
- Growth, elasticity and flexibility without service disruption
  - Capacity on Demand upgrades
  - Dynamically add physical processors to an LPAR
- Site failover for disaster recovery

# zEnterprise EC12 Capacity On Demand – Elasticity Without Service Disruption

- On/Off Capacity on Demand (On/Off CoD)
  - Flexible, easy, temporary additional capacity
  - Self-managed
  - Total flexibility within number of books installed
- New capacity is immediately available for work without service disruption
- Can be automated

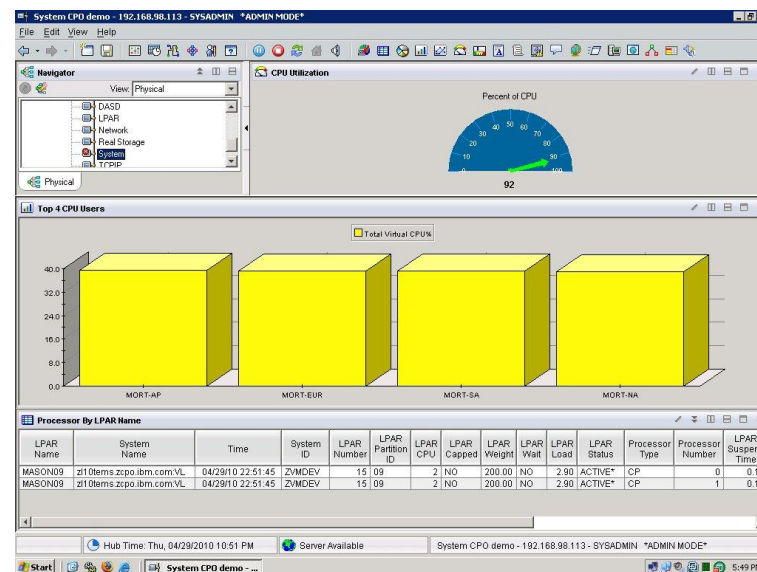
One zEC12 Book with 36 Processors



- Active processors – pay full price
- Inactive processors (On/Off CoD) – pay only 2% of full price
- Dark processors (unused) – no charge

# DEMO: Dynamically Add New Processor To z/VM LPAR To Handle Increased Workload

1. A customer has in-house Risk Analysis program running on Linux on System z
2. Increased workload to all 4 Linux guests is causing z/VM LPAR utilization of 90%+
3. Customer determines this is a long term trend - additional physical capacity needed
4. New capacity made available to LPAR as new Logical CPU, available for work
  - u Without disruption in service



Note: Assumes available processors on installed books

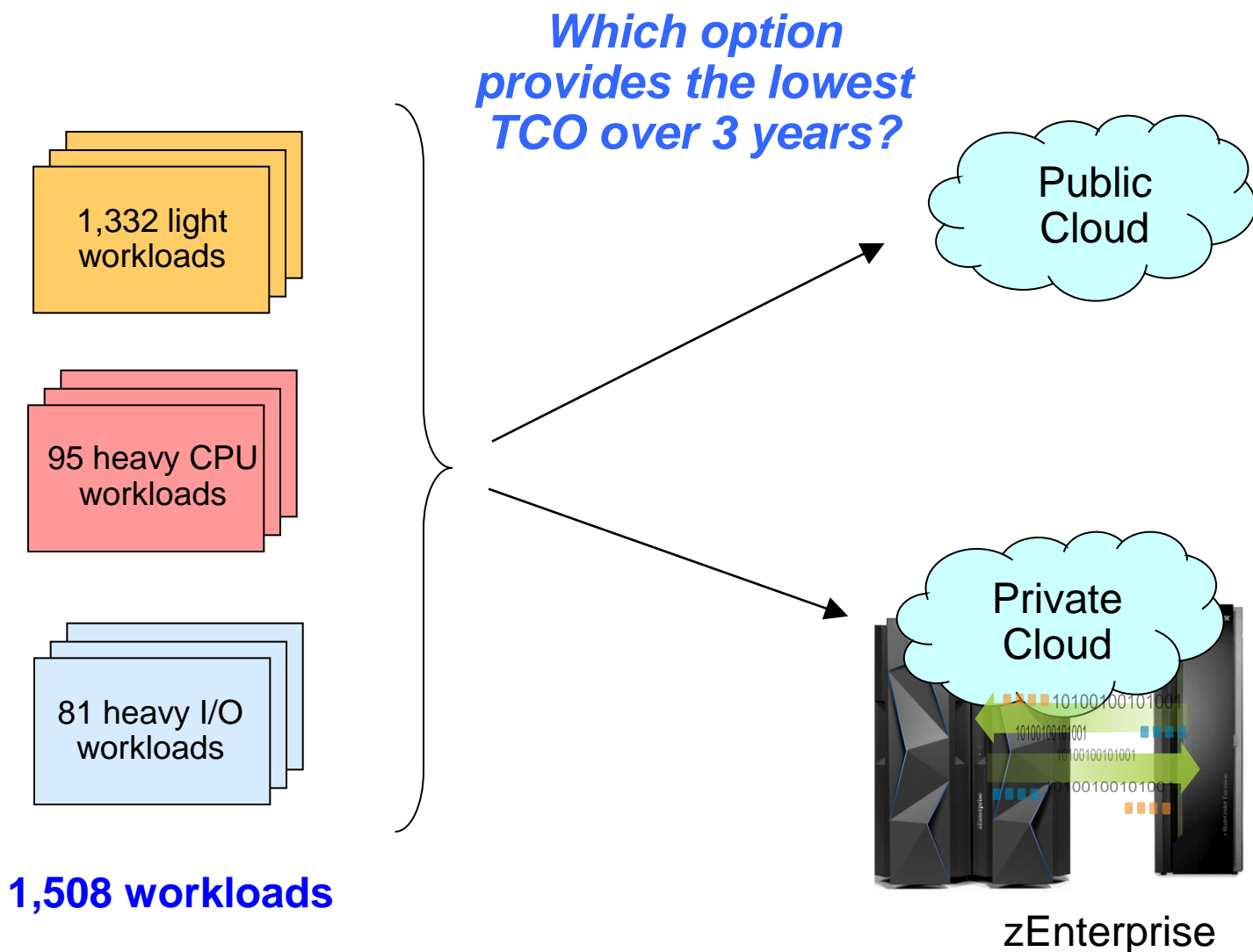


# zEnterprise Provides A Highly Secure Platform For A Private Cloud

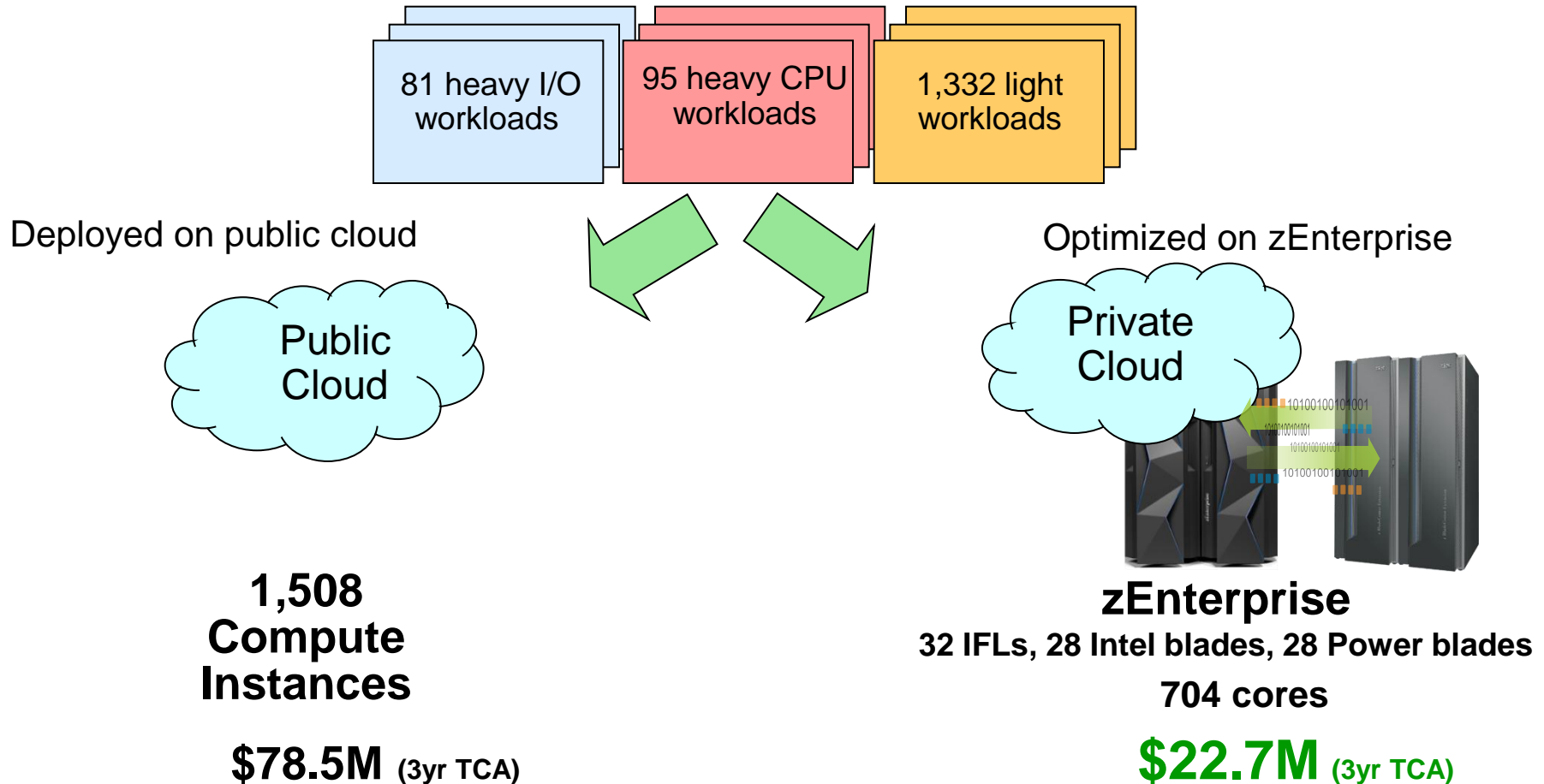
- System z has a proven record of running multiple tenants concurrently in a highly secure way
- zEC12 supports the highest Common Criteria Evaluation Assurance Level for security with EAL5+ certification for LPARs
- Secure, private networks between the zBX and zEC12 for data and management
- Security for internet with secure sockets layer (SSL) transactions and secure co-processing with Crypto Express 4S
- Supports standards for digital signatures with support for PKCS #11
- Supports Elliptic Curve Cryptography (ECC), a modern public-key algorithm



# Public vs. Private Cloud: Which Option Costs Less For Delivering Mixed Workloads?



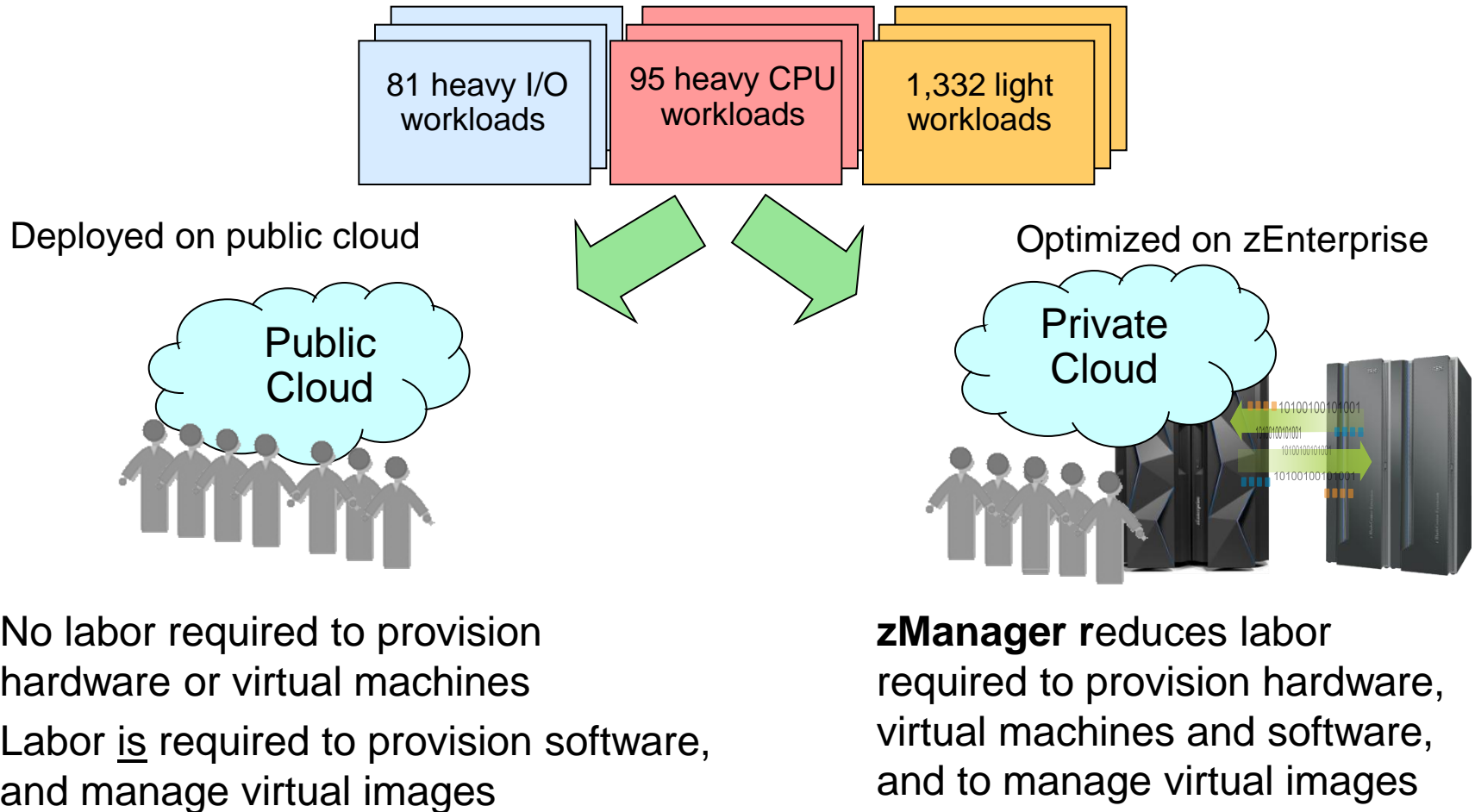
# Compare Cost Of Acquisition For 3 Years



Server configurations are based on consolidation ratios derived from IBM internal studies.  
Prices are in US currency and will vary by country  
Amazon case includes costs of instances and network  
zEnterprise case includes costs of hardware, software, network, storage and power

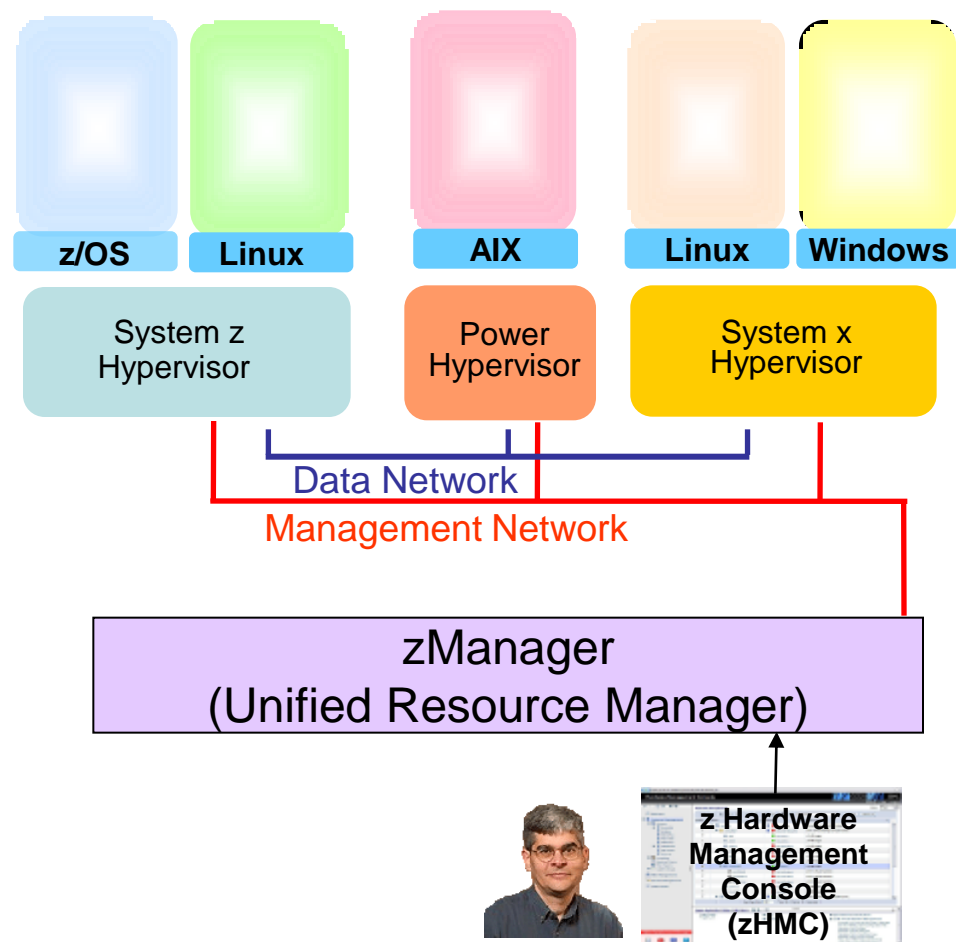
**71% less**

# Which Option Provides The Lowest Labor Costs Over Same 3 Years?



# zManager Provides Consistent Structured Management For All Virtual Environments

- Manage machine resources from a single focal point
  - Add processors while running
  - Add and configure a zBX blade while running
  - Create virtual machines and networks quickly
  - Runs in service element
- Manage full virtual machine lifecycle
  - Create, monitor, optimize, destroy
- Includes automated functions to reduce time and labor



# zManager Capabilities Reduce Labor Required

Process	Typical Distributed Management Practices	zManager
<b>Deployment Management</b>	<ul style="list-style-type: none"> <li>Manually configure hypervisor and physically set up and configure networks</li> </ul>	<ul style="list-style-type: none"> <li>Automated deployment of hypervisor and out-of-the box physically isolated networks</li> </ul>
<b>Incident And Capacity Management</b>	<ul style="list-style-type: none"> <li>Passive monitoring</li> <li>No end-to-end transaction monitoring</li> <li>Manually monitor virtual machine performance and adjust resources to meet performance goals</li> </ul>	<ul style="list-style-type: none"> <li>Active and continuous monitoring to fix problems quickly</li> <li>End-to-end transaction monitoring to isolate and fix issues</li> <li>Automatic resource adjustments for workloads to meet performance goals</li> </ul>
<b>Asset Management</b>	<ul style="list-style-type: none"> <li>Discover assets with ad hoc manual methods</li> <li>Manual entitlement management</li> </ul>	<ul style="list-style-type: none"> <li>Automated discovery and management of entitlement of assets</li> </ul>
<b>Security Management</b>	<ul style="list-style-type: none"> <li>Multiple, disparate user access management</li> </ul>	<ul style="list-style-type: none"> <li>Centralized, fine-grain user access management</li> </ul>
<b>Change Management</b>	<ul style="list-style-type: none"> <li>No visibility into impact of changes. No standardized procedure to retrieve and apply firmware changes</li> </ul>	<ul style="list-style-type: none"> <li>Visibility into impact of changes. Retrieve and apply firmware changes in a standardized fashion</li> </ul>

# zManager Minimizes Time And Labor For Hardware Setup (Hypervisor And Network)

- Read the entitlements for blades
- Auto-discover and inventory all elements
  - No need to install and configure libraries or sensors
- Automatically setup and configure the hypervisor

zBX Blades

Select	Location	MTMS	New Entitlement	Current Entitlement	Valid Entitlements
<input type="checkbox"/>	B01BBS04	7870-PEL/YK105000B504	Not entitled	Not entitled	ISAO
<input type="checkbox"/>	B01BBS03	7870-PEL/YK105000B503	Not entitled	Not entitled	ISAO
<input type="checkbox"/>	B01BBS02	7778-23X/YK105003B502	Not entitled	Not entitled	PASB
<input type="checkbox"/>	B01BBS01	7778-23X/YK105003B501	Not entitled	Not entitled	PASB
<input type="checkbox"/>	B10BBS04	7778-23X/YK105003B504	PASB	Not entitled	PASB
<input type="checkbox"/>	B10BBS03	7778-23X/YK105003B503	Not entitled	Not entitled	PASB
<input type="checkbox"/>	B10BBS02	7872-ACI/YK105002B502	Not entitled	Not entitled	XASB
<input type="checkbox"/>	B10BBS01	7872-ACI/YK105002B501	Not entitled	Not entitled	XASB
<input type="checkbox"/>	C01BBS04	7778-23X/YK105003B504	Not entitled XASB	Not entitled	PASB
<input type="checkbox"/>	C01BBS03	7778-23X/YK105003B503	Not entitled	Not entitled	PASB
<input type="checkbox"/>	C01BBS02	7778-23X/YK105003B502	Not entitled	Not entitled	PASB

Total: 16 Filtered: 16 Selected: 0

zBX Blade entitlement counts

Entitlement Type	Current	Maximum	Spares
ISAO	0	10	6
WDPXI50B	0	10	0
PASB	0	10	8
XASB	0	10	2

OK Cancel Help

# Hypervisor Setup And Configuration Lab Test – Manual vs. zManager

Manual Tasks (per Blade)	Elapsed Time	Labor Time
Initial communication setup & education	6 min 26 sec	6 min 26 sec
Boot VIOS disc & install (creates LPAR for VIOS automatically)	38 min	36 min
Configure VIOS networking	2 min 49 sec	2 min 49 sec
Create new storage pool for LPARs	35 sec	35 sec
Install VIOS service fixpacks	61 min 5 sec	20 sec
<b>TOTAL TIME</b>	<b>1 hr 48 min 53 sec</b>	<b>46 min 10 sec</b>

zManager Tasks (per Blade)	Elapsed Time	Labor Time
Add entitlement for a blade	90 min	92 sec
<b>TOTAL TIME</b>	<b>1 hr 30 min</b>	<b>1 min 32 sec</b>

**97%** reduction  
in labor time



# Network Setup And Configuration Lab Test – Manual vs. zManager

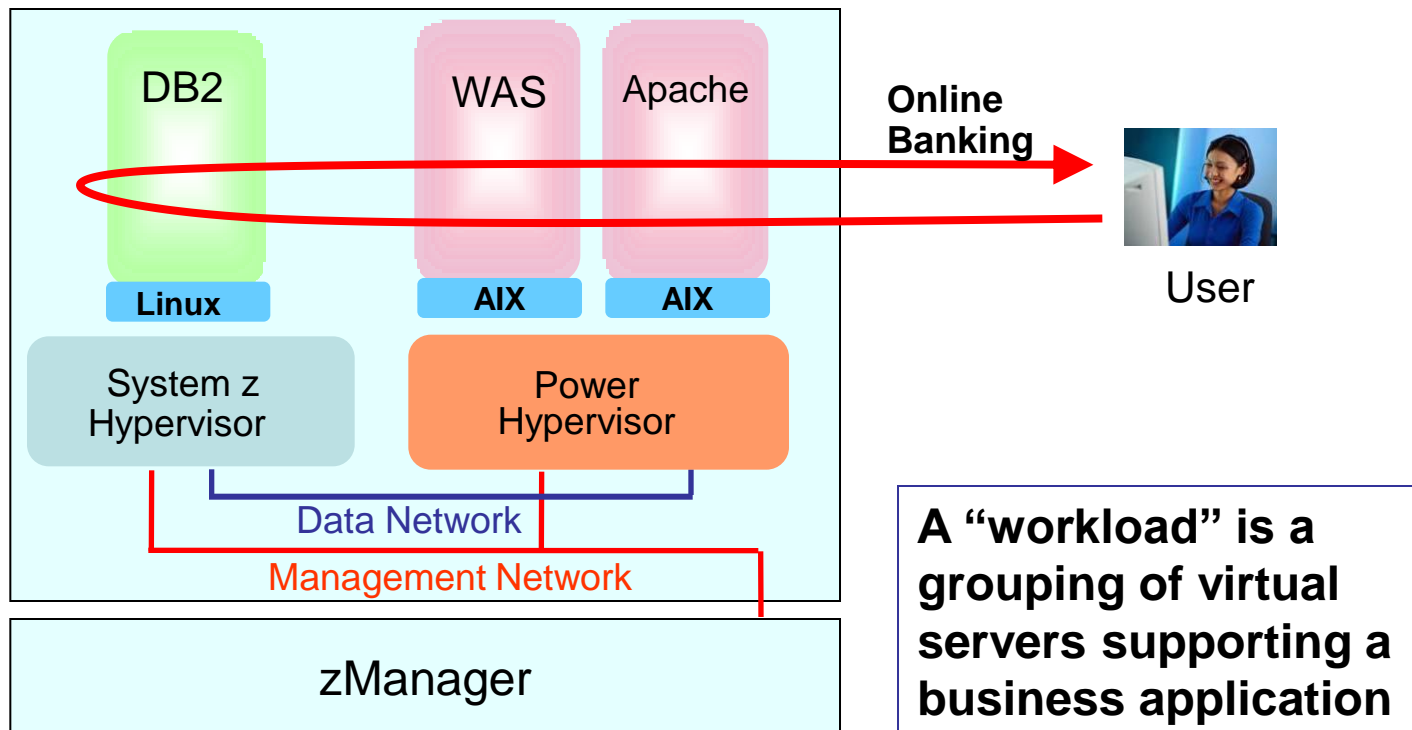
Manual Tasks (for two BladeCenters)	Elapsed/Labor Time
Planning (includes time to go over docs, etc)	5 hrs
Cabling	2 hrs
AMM Configuration	2 hrs
Logical Configuration (L2)	8 hrs
Blades network configuration	4 hrs
Testing	2 hrs
Documenting the configuration	3 hrs
<b>TOTAL TIME</b>	<b>26 hrs</b>

zManager Tasks (for two BladeCenters)	Elapsed/Labor Time
Planning	3 hrs
Cabling (pre-cabled in zBX)	0 hrs
AMM Configuration (done in zBX)	0 hrs
Logical configuration (L2)	30 mins
Blades network configuration	1 hr 30 mins
Testing (pre-tested)	0 hrs
Documenting the configuration (all part of zManager)	0 hrs
<b>TOTAL TIME</b>	<b>5 hrs</b>

**81%** reduction  
in labor time

# zManager Incident And Capacity Management

- Active and continuous monitoring to fix problems quickly
- Track transaction performance end to end to isolate bottlenecks
- Automatically adjust processor resource allocations on a particular hypervisor to achieve performance goals



# zEnterprise Cloud Starter Edition

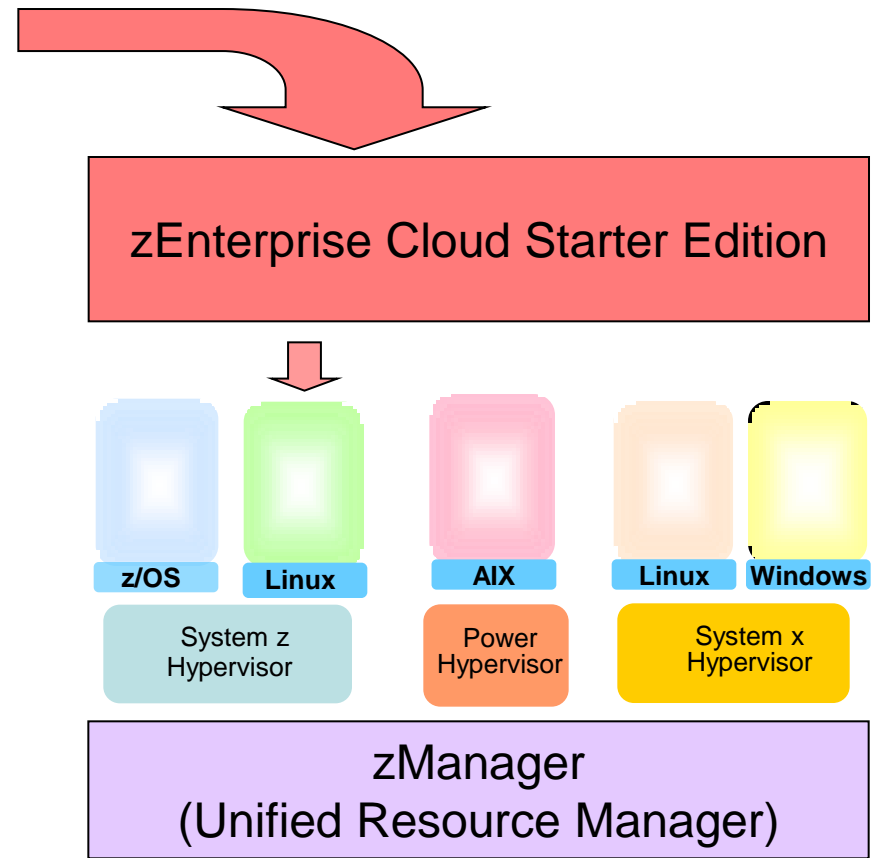
Adds package of software and services for automated provisioning and monitoring

- IBM Tivoli software (runs on Linux on System z)

- Automated provisioning
  - Tivoli Provisioning Manager (TPM)
- Monitoring
  - Tivoli OMEGAMON XE on z/VM and Linux

- IBM Lab Services

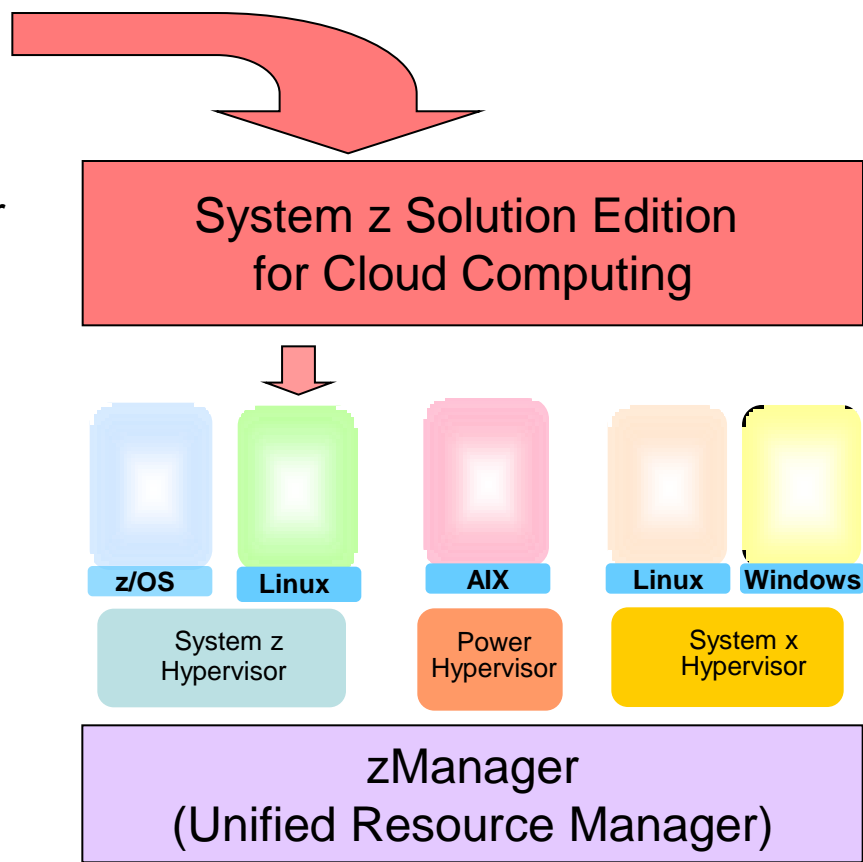
- Planning, installation, configuring, testing services



# IBM System z Solution Edition For Cloud Computing

**Adds package of software and services for self-service provisioning, metering, billing and monitoring**

- IBM Tivoli software (runs on Linux on System z)
  - Self-service provisioning
    - Tivoli Service Automation Manager (TSAM)
  - Metering and billing
    - Tivoli Usage and Accounting Manager (TUAM)
  - Monitoring
    - Tivoli OMEGAMON XE on z/VM and Linux
- IBM Lab Services
  - Planning, installation, configuring, testing services
  - Significant package discounts



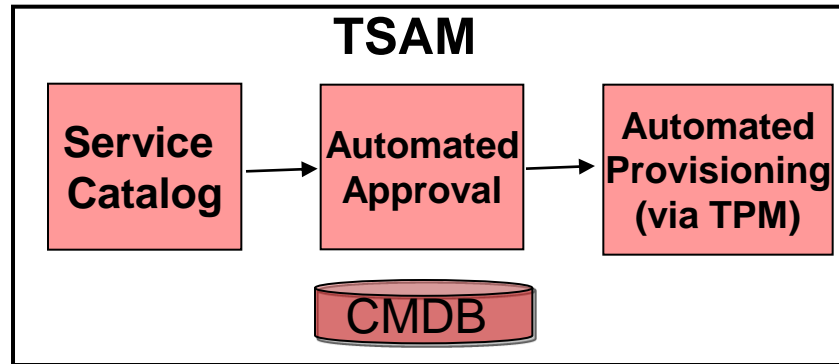
# Self-Service Provisioning With Tivoli Service Automation Manager (TSAM)



User browses service catalog

Adds service to shopping cart

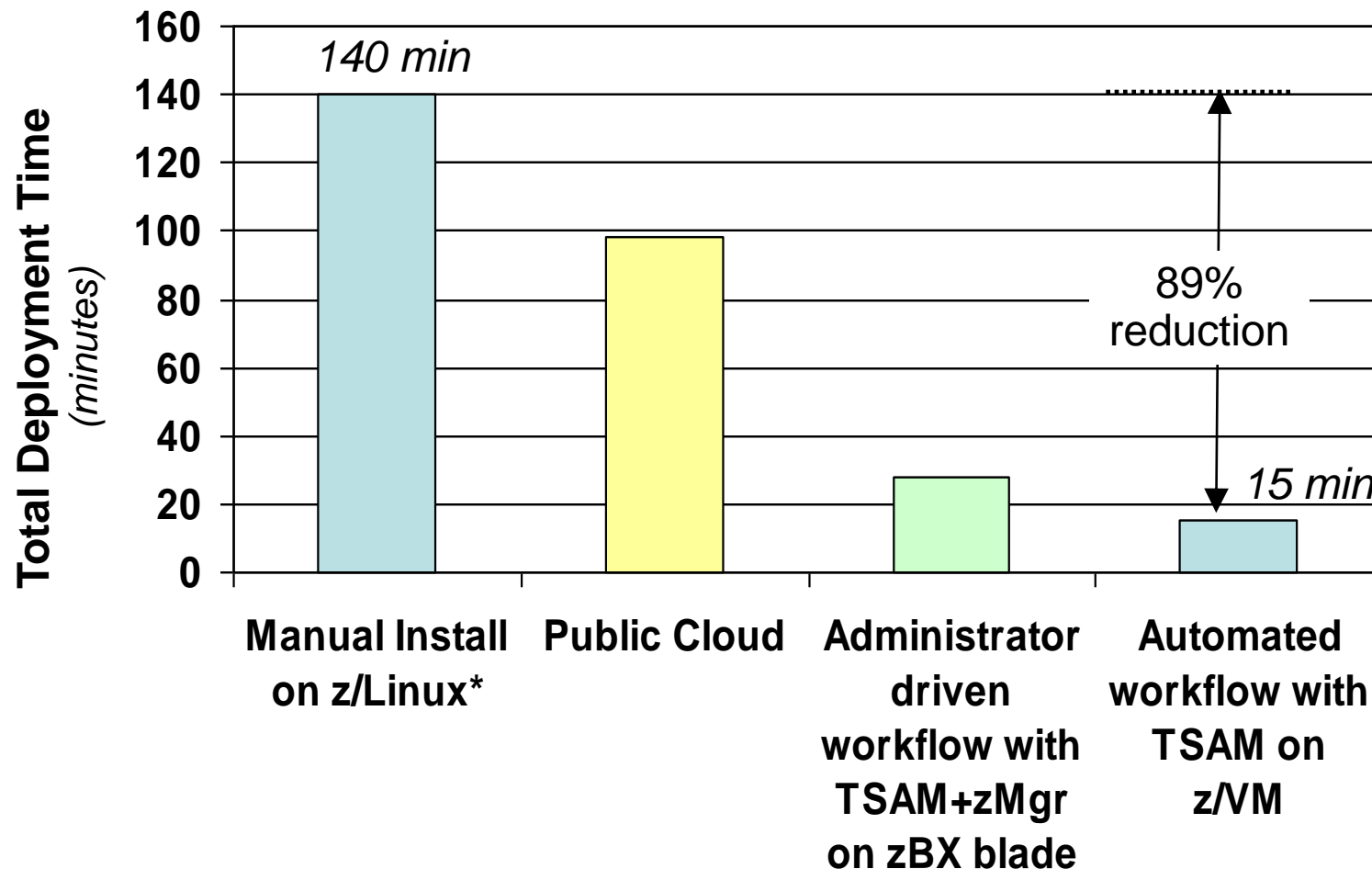
Submits request



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

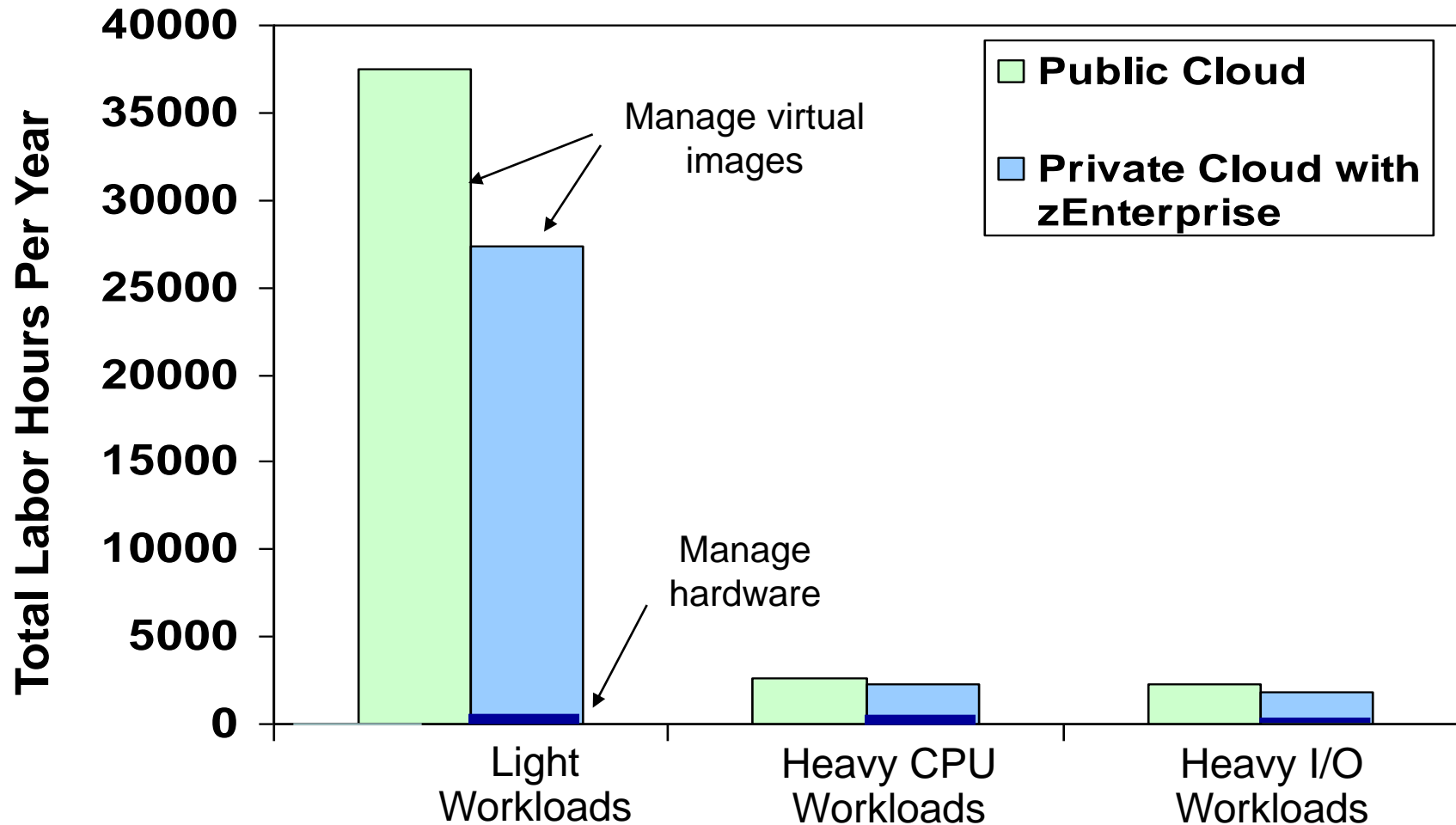
- Self-service portal for users
- Enables standardization via a catalog of service offerings
- Automates request processing with pre-defined workflows
- Fast provisioning of virtual servers

# TSAM Automated Provisioning Is Fast



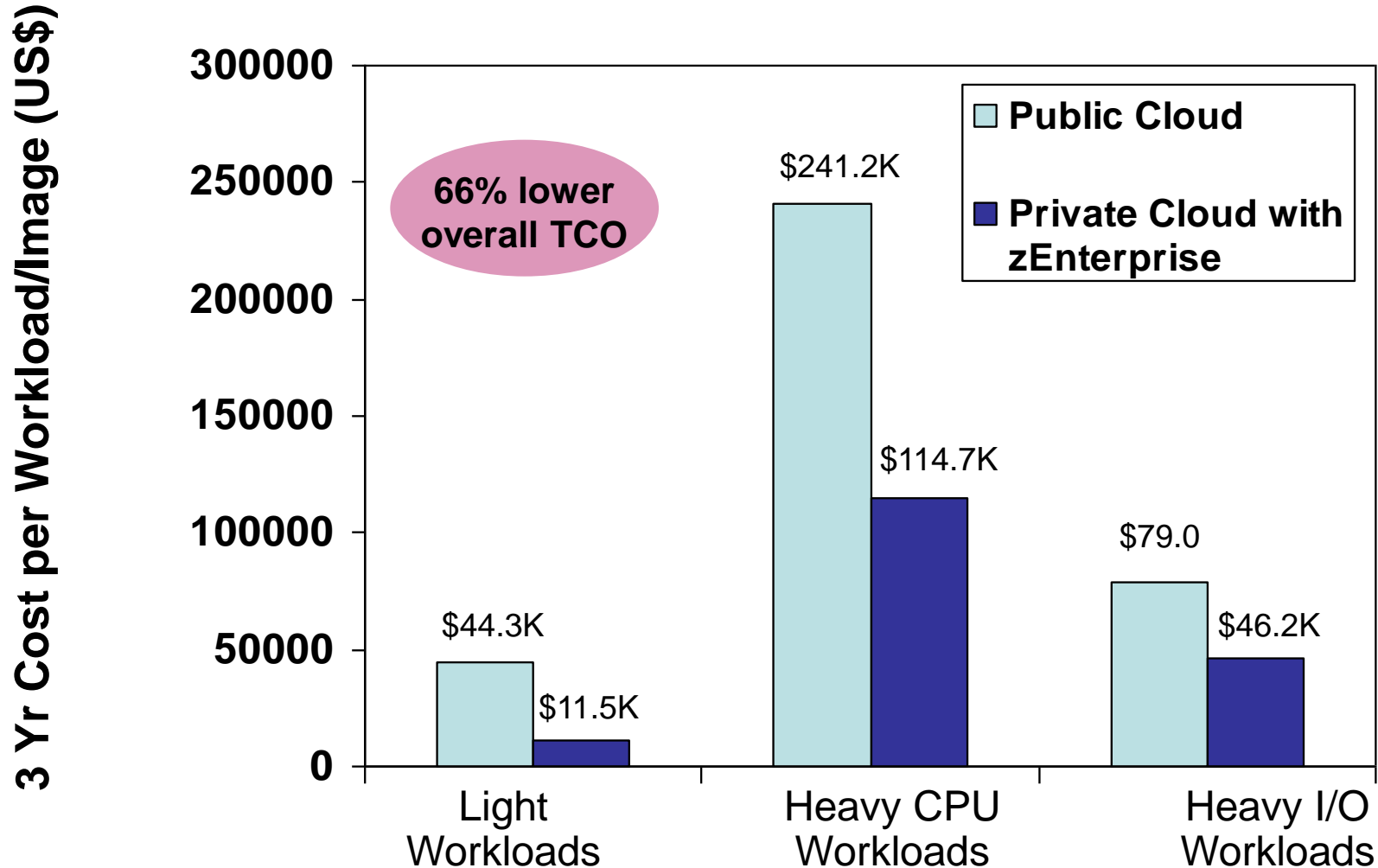
\*Measured with hands-on work

# Comparison Of Total Labor Hours – Public vs Private Cloud With zEnterprise



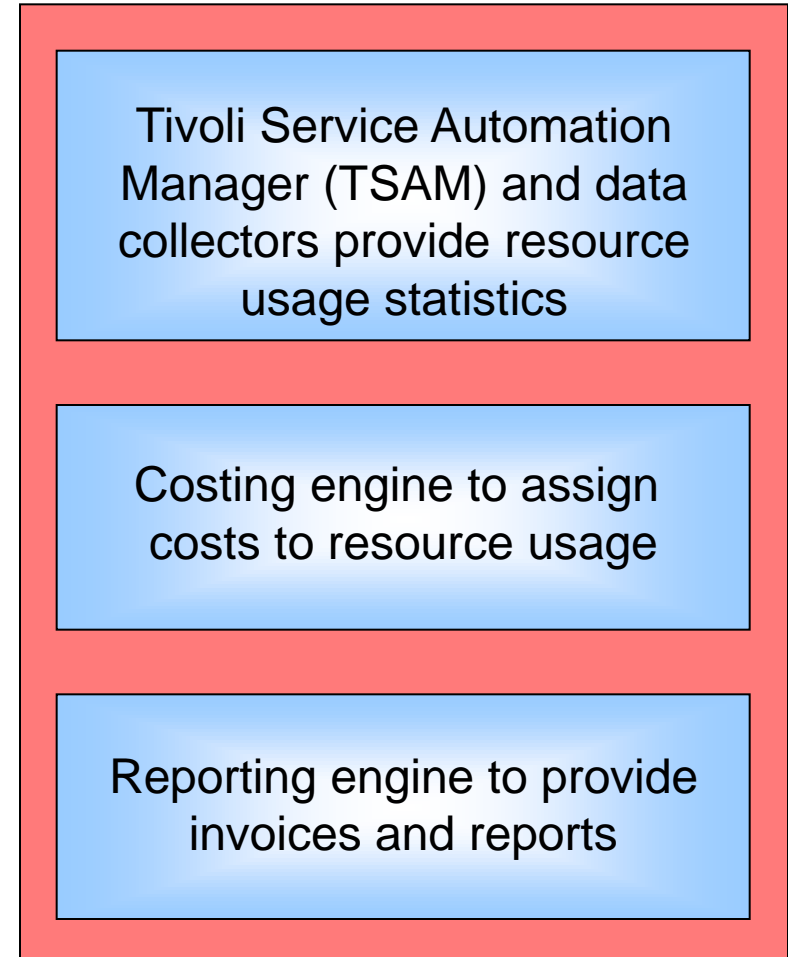
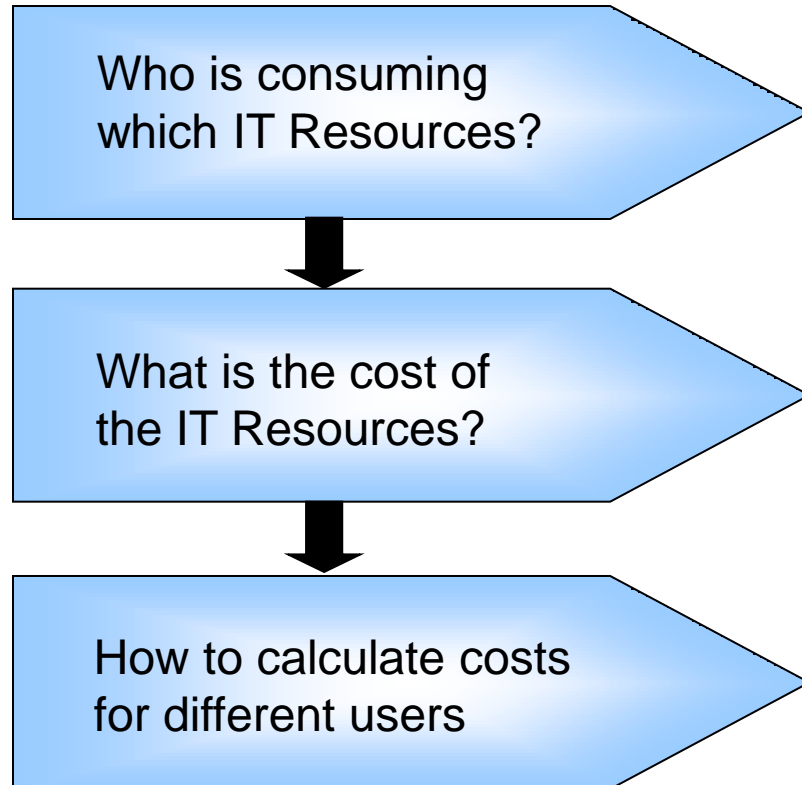


# Comparison Of Acquisition And Labor Costs – Public vs Private Cloud With zEnterprise



Source: IBM internal study. zEnterprise configurations needed to support the three workload types were derived from IBM comparisons. Public cloud sizing needed to support the three workload types was calculated based on compute capacity of public cloud services. 3 yr TCO for public cloud based on pricing info available by the service provider. 3 yr TCO for zEnterprise includes hardware acquisition, maintenance, software acquisition, S&S and labor. US pricing and will vary by country.

# Pay-As-You-Go Chargeback With Tivoli Usage And Accounting Manager (TUAM)



**Provided by Tivoli Usage and Accounting Manager\***

# University Of Bari Deploys A System z Cloud

Premier educational institution in southern Italy, with nearly 70,000 students and more than 1,800 teaching staff

## ■ Business need

- University needed a platform to facilitate cost-effective, flexible application development

## ■ Solution

- Virtualized infrastructure with IBM System z, IBM System Storage, SUSE Linux Enterprise Server for IBM System z
- IBM System z Solution Edition for Cloud Computing (IBM Tivoli Service Automation Manager)

## ■ Benefits

- Virtualize the University laboratory for students
- Provide very rapid provisioning and management of new development, test and production environments, and enable each environment to scale up or down to meet demand



*“The IBM System z Solution Edition for Cloud Computing eliminates the trouble and expense of buying and managing new infrastructure, making the development of small-scale solutions much more viable.”* —Professor Visaggio, full professor of Software Engineering at the University of Bari

# Get Started With A Secure Private Cloud On zEnterprise

- ✓ Standardized services
- ✓ Flexibility
- ✓ Elasticity
- ✓ Security
- ✓ Reduce costs



Data Center  
Manager

- ✓ Self-service
- ✓ Fast provisioning
- ✓ Elasticity
- ✓ Low cost pay as you go



User