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Win with Cloud on System z

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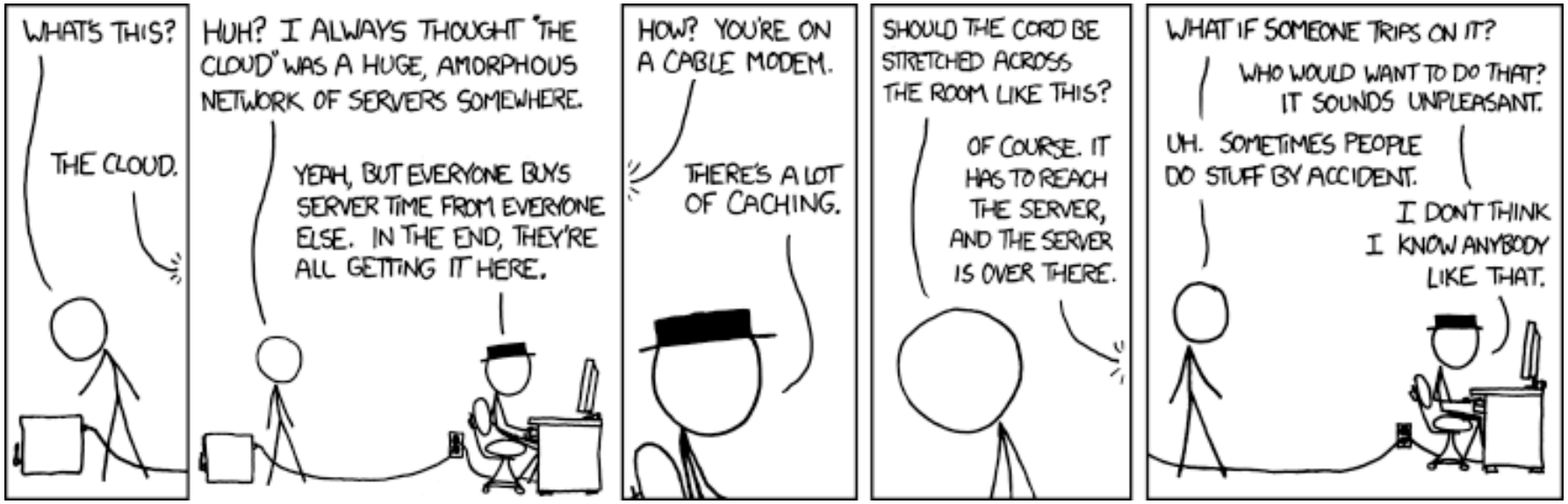
From XKCD – Why they Need us!



There is planned downtime every night when we turn on the Roomba and it runs over the cord

Today's Challenges

85% idle

In distributed computing environments, up to 85% of computing capacity sits idle.

70¢ per $1

70% on average is spent on maintaining current IT infrastructures versus adding new capabilities.

1.5x

Explosion of information driving 54% growth in storage shipments every year.

$40 billion

Consumer product and retail industries lose about $40 billion annually, or 3.5 percent of their sales, due to supply chain inefficiencies.

33%

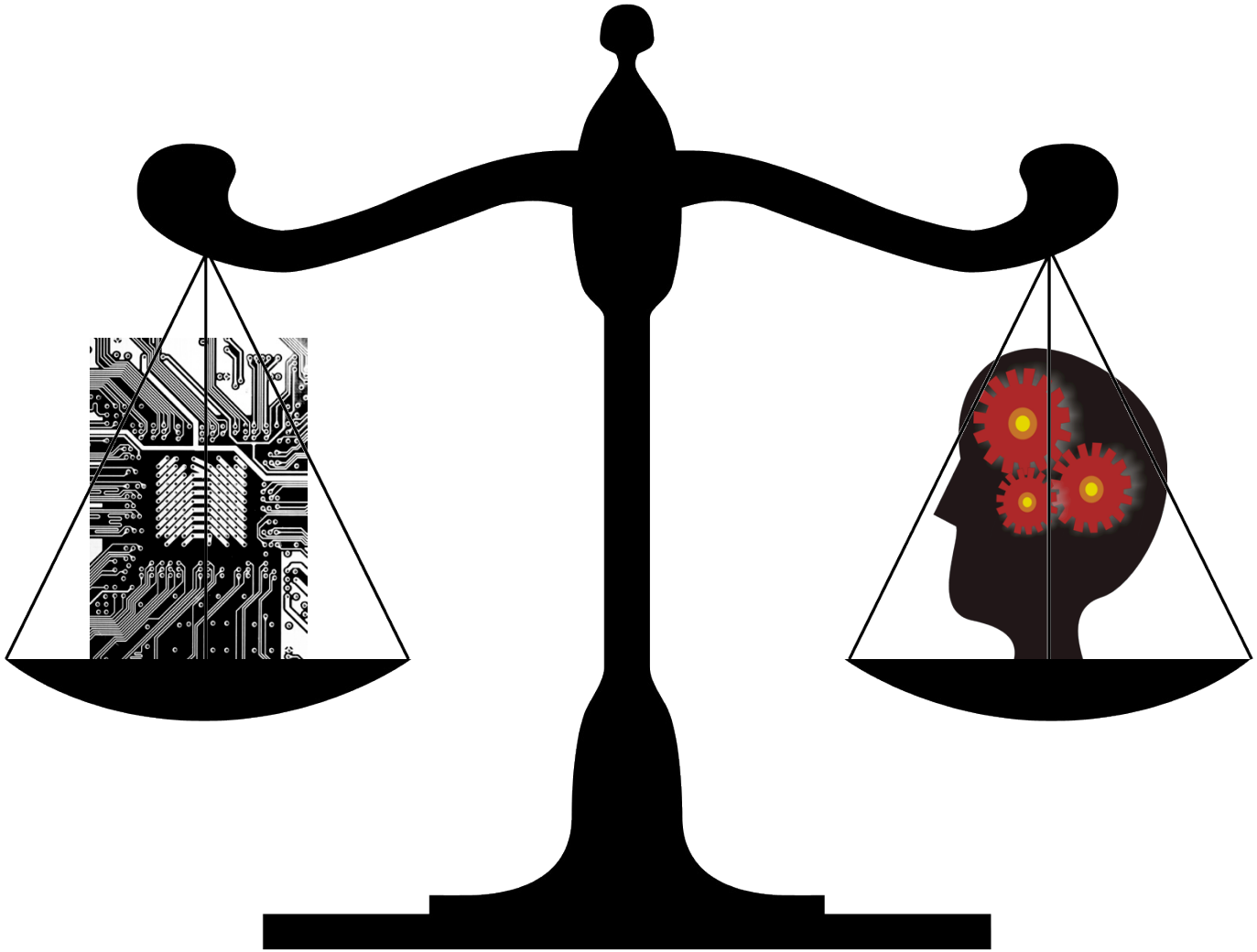
33% of consumers notified of a security breach will terminate their relationship with the company they perceive as responsible.

It's time to start thinking

Differently

about infrastructure

Cloud is a User Model



12 Steps for Creating a Cloud Service

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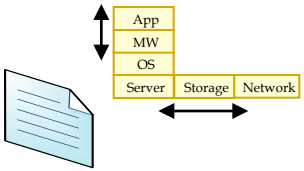
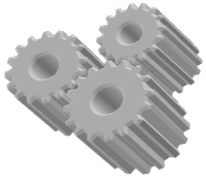
1. Specify cloud service description



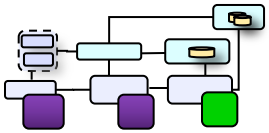
Describe function, price , SLA of cloud service, incl. management scope

2. Implement runtime functionality



Examples: Select off-the-shelf hypervisor (VMaaS), implement custom app (e.g. LotusLive)

3. Define unit of delivery & rating



Examples: VM, file system, distributed app, virtual IP address, queue, web conference, RDBMS, 3-tier business app, etc.

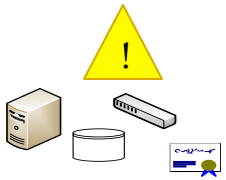
4. Implement self-service delivery & management functionality

Examples: "Create VM, add more nodes to WAS cluster, change max # of seats for LotusLive web conf

5. Implement monitoring metrics & event correlation rules

Select existing agent / implement new agent for monitoring JVM heapsize, hypervisor swap file size, # of processes, etc.

6. Implement incident, problem and asset mgmt processes

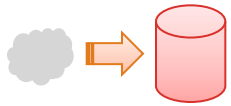


Incident, problem & asset mgmt process is specific to cloud service → customization needed

7. Implement resiliency SLA

Examples: HA for management system, delivered WAS cluster must be highly available

8. Implement backup approach

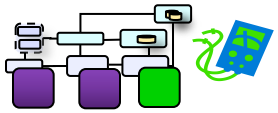


Examples: Backup all VMs, backup DB of LotusLive application

9. Implement security functions

Implement authentication, auditing, data protection, governance & audit

10. Implement cloud service specific billing metrics



Examples: CPU/hour, # of DB transactions, GB/month, # of users/webconf/hour, etc.

11. Implement rates for charging cloud service consumption

Examples: $0.11/VMhour; $0.19/MBsTransferred; $0.02/webconference; $0.05/fraudAnalysis

12. Register cloud service to service catalog

A cloud service must be registered to the service catalog to be externally accessible, entitlements need to be configured,

Cloud Service Lifecycle Management

Deploy Service
- Request Driven Provisioning
- Management Agents and Best Practices
- Application / Service On Boarding
- Self-service interface

Subscribe to Service
- Request a service
- "Sign" Contract

Manage Operation of Service
- Visualize all aggregated information about situations and affected services
- Control operations and changes
- Event handling
- Automate activities to execute changes
- Include charge-back

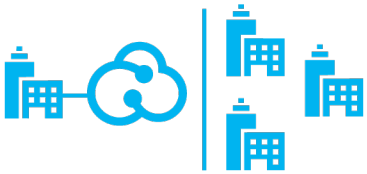
Offer Service
- Register Services and Resources
- Add to Service Catalog

Service Creation
- Scope of Service
- SLAs
- Topologies, Best Practices Management Templates

Terminate Service
- Controlled Clean-up

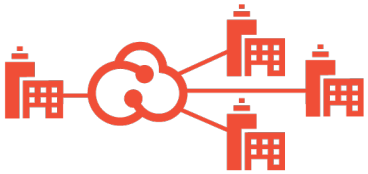
6 Components of Cloud

Cloud Models for All Needs & Priorities



Private cloud

On or off premises cloud infrastructure operated solely for an organization and managed by the organization or a third party



Public cloud

Available to the general public or a large industry group and owned by an organization selling cloud services.

Hybrid IT

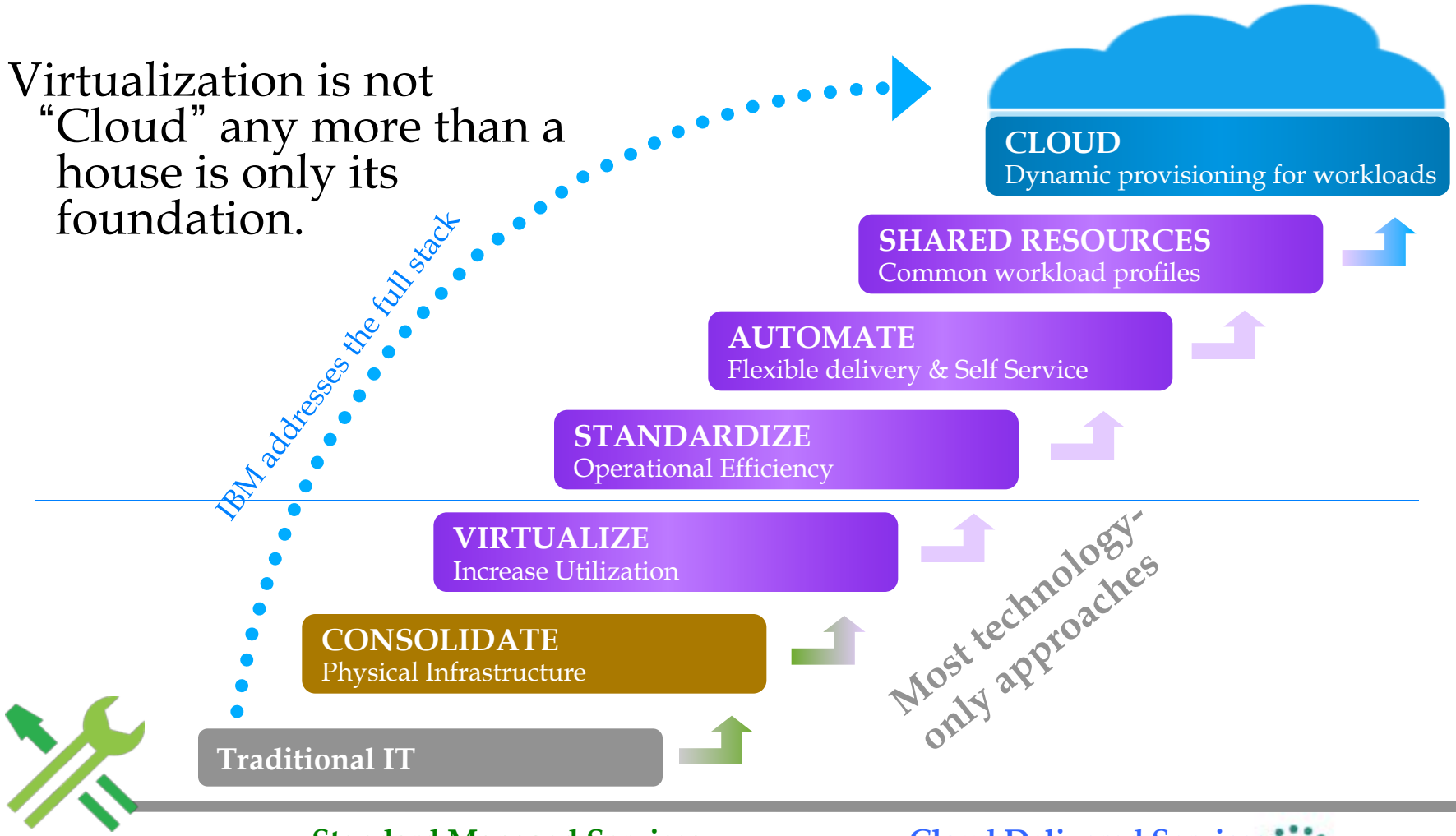
Traditional IT and clouds (public and/or private) that remain separate but are bound together by technology that enables data and application portability

Traditional IT

Appliances, pre-integrated systems and standard hardware, software and networking.

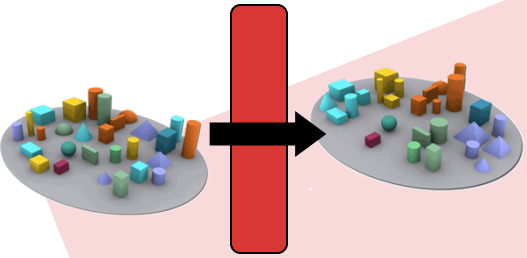
Evolving to Cloud

Virtualization is not "Cloud" any more than a house is only its foundation.



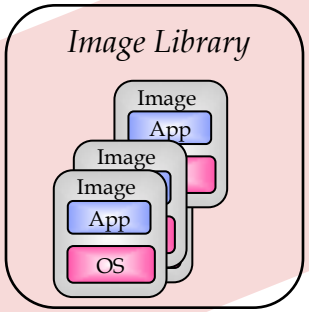
Building a Cloud Foundation

Consolidate and Virtualize



- Virtualization must become strategic across all platforms – servers and storage
- Monitor the virtualized environment
- Discovery, dependency and change tracking

Automate and Manage



- Automated provisioning / de-provisioning
- Pool standardized virtualized building blocks
- Capture and catalog virtual images used in the data center
- Management of the virtualized environment

Optimize Cloud Ready

- Integrated virtualization management with IT service delivery processes
- Elastic scaling
- Pay for use
- Self-service provisioning
- Simplified deployment with virtual appliances

STANDARDIZATION

LIFE CYCLE MANAGEMENT

Security: a Top Concern for Cloud

80%

Of enterprises consider security the #1 Inhibitor to cloud adoption

48%

Of enterprises are concerned about the reliability of clouds

33%

Of enterprises are concerned with cloud interfering with their ability to comply with regulations.

Source: "Driving Profitable Growth Through Cloud Computing", IBM Study conducted by Oliver Wyman

Cloud Needs to be Continuously Available

December 2010: Amazon says outage in Europe due to hardware failure, not hacking attack

September 10 2010:…Microsoft **BPOS** suffered another **outage** of some sort today it's **the second time in less than a week** that Microsoft's cloud has given some SaaS partners and customers fits…

Gmail was up 99.984 percent of time which means seven minutes of downtime per month over last year.

Cloud Data Integrity is Critical

October 11, 2009: Microsoft Cloud Loses T-Mobile customer data

October 2nd, 2007: Amazon EC2 Outage Wipes Out Data

Piecing together islands of data from multiple locations involves synchronization and is not simply a data restore

Cloud Computing Reference Architecture

Cloud Service Consumer

- Consumer End user
- Cloud Service Integration Tools
- Service Integrator
- Consumer Business Manager

Consumer In-house IT

- Business Processes
- Applications
- Middleware
- Infrastructure
- Service Management

- Consumer Administrator

Cloud Service Provider

Cloud Services

Existing & 3rd party services, Partner Ecosystems

- BPaaS — API — BP Mgmt Interfaces
- SaaS — API — Software Mgmt Interfaces
- PaaS — API — Platform Mgmt Interfaces
- IaaS — API — Infrastructure Mgmt Interfaces

Common Cloud Management Platform

Service Manager, Business Manager

Service Consumer Portal & API

OSS – Operational Support Services

- Service Delivery Catalog
- Service Automation Management
- Service Request Management
- Change & Configuration Management
- Image Lifecycle Management
- Provisioning
- Incident & Problem Management
- IT Service Level Management
- Monitoring & Event Management
- IT Asset & License Management
- Capacity & Performance Management
- Platform & Virtualization Management

BSS – Business Support Services

- Customer Account Management
- Service Offering Catalog
- Service Offering Management
- Contracts & Agreement Management
- Service Request Management
- Order Management
- Subscription Management
- Pricing
- Entitlement Management
- Metering
- Rating
- Billing
- Clearing & Settlement
- Accounts Payable
- Accounts Receivable

Service Development Portal & API

Service Provider Portal & API

Deployment Architect, Transition Manager, Operations Manager, Security & Risk Manager, Customer Care

Infrastructure

Cloud Service Creator

- Service Component Developer
- Service Composer
- Offering Manager

Service Creation Tools

- Service Management Development Tools

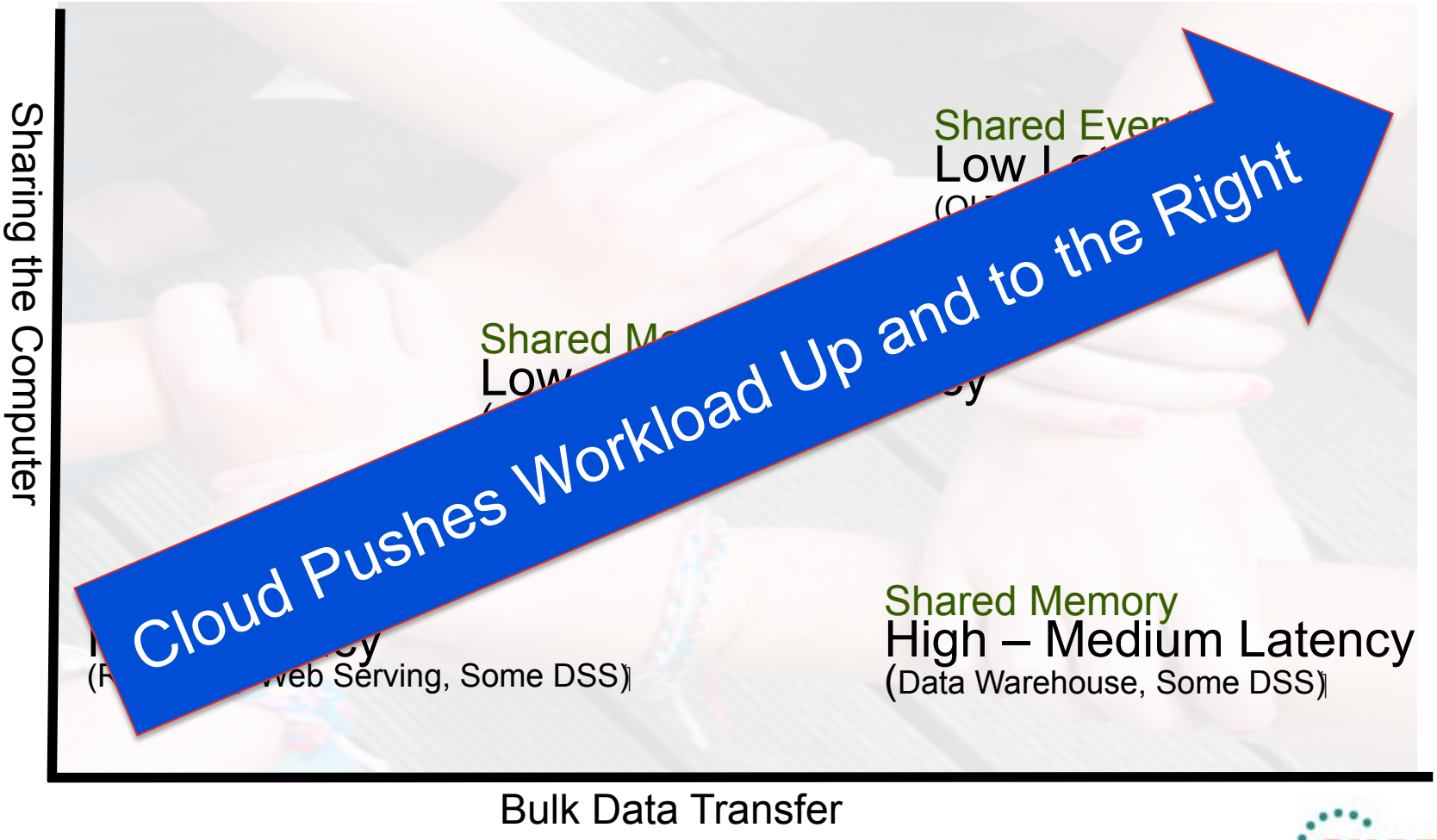
Service Runtime Development Tools

- Software Development Tools
- Image Creation Tools

Security, Resiliency, Performance & Consumability

Governance

Not All Computers are Created Equally

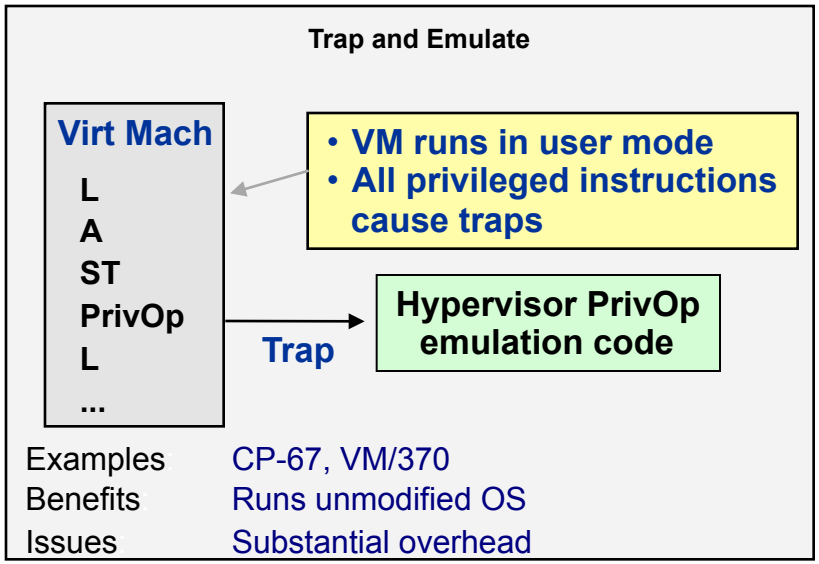


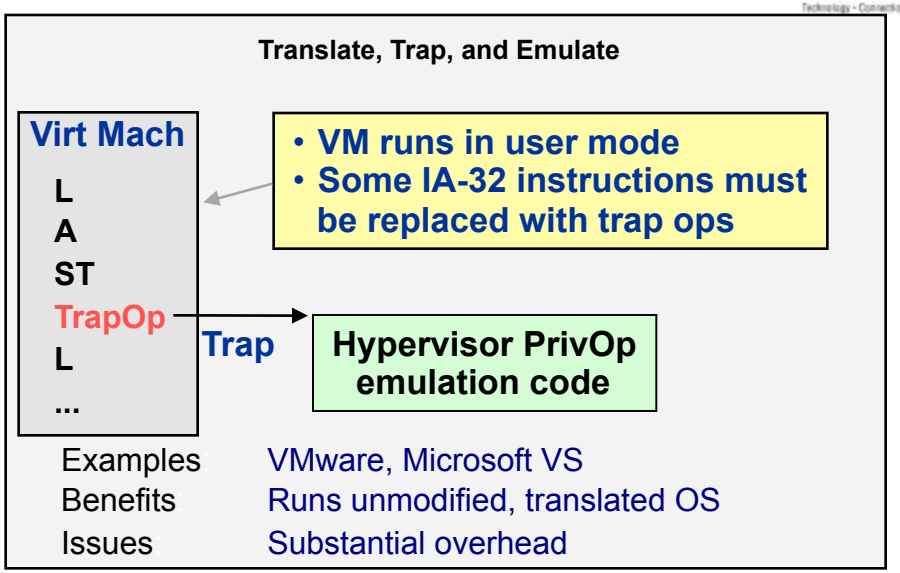
Welcome to the Party Pal!!!

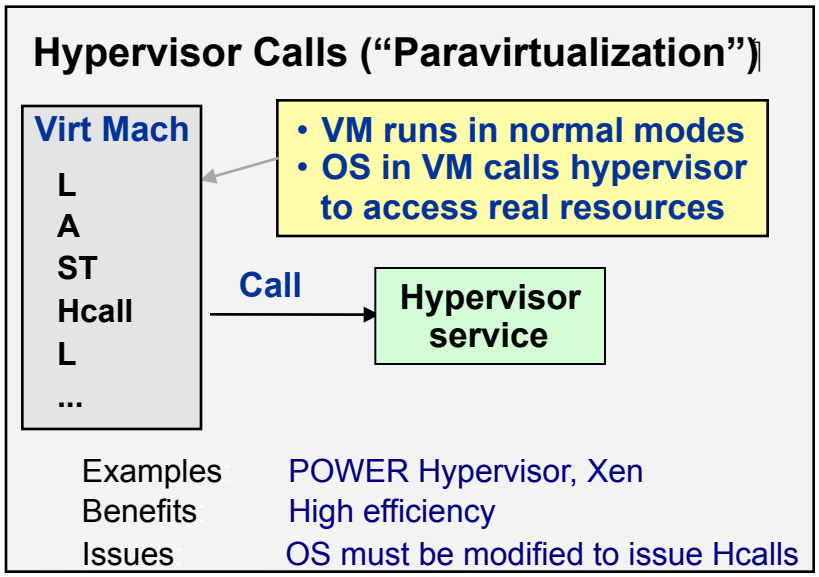
System z: Enterprise-Class Computing

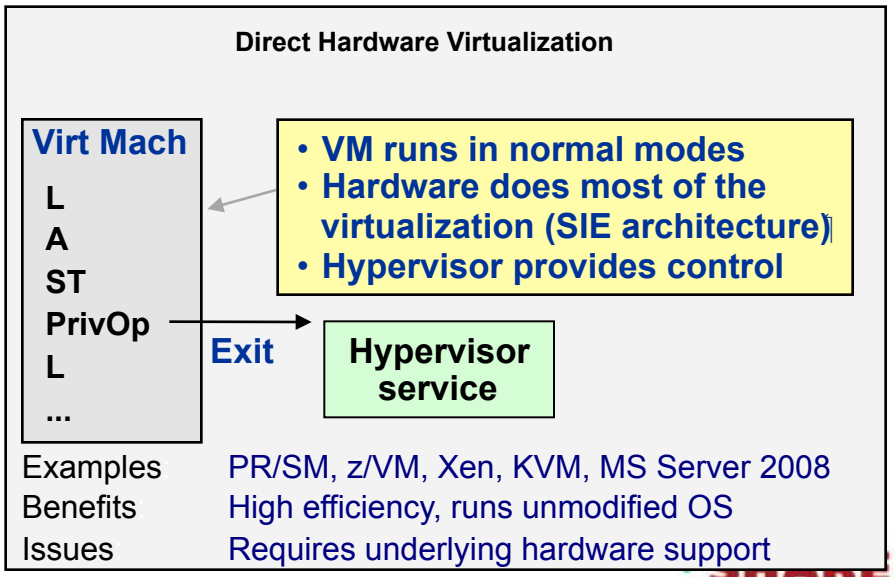
Pain Point	x86	Power	System z
Avoiding downtime	Good	Better	**Best** Unmatched system reliability and redundancy of server hardware assets.
Managing growth	Good	Better	**Best** Dynamically add real hardware; share system resources with multiple hypervisors in a single machine.
Underutilized Resources	Good (~ 50%) Very little hardware sharing as you scale	Better (~ 80%) Moderate hardware sharing as you scale	**Best** (up to 100%) Extensive hardware sharing as you scale; extremely granular sharing of system resources.
Need for flawless system monitoring	Good	Better	**Best** Superior statistics and operational insight.
Workload management	Minimal	Moderate	**Extensive** Also able to span architectures with zEnterprise (z/p/x).
Time to market	Good	Better	**Best** Server cloning can be achieved in seconds; granular and efficient sharing of resources facilitates rapid provisioning.

Not All Virtualization is Equal

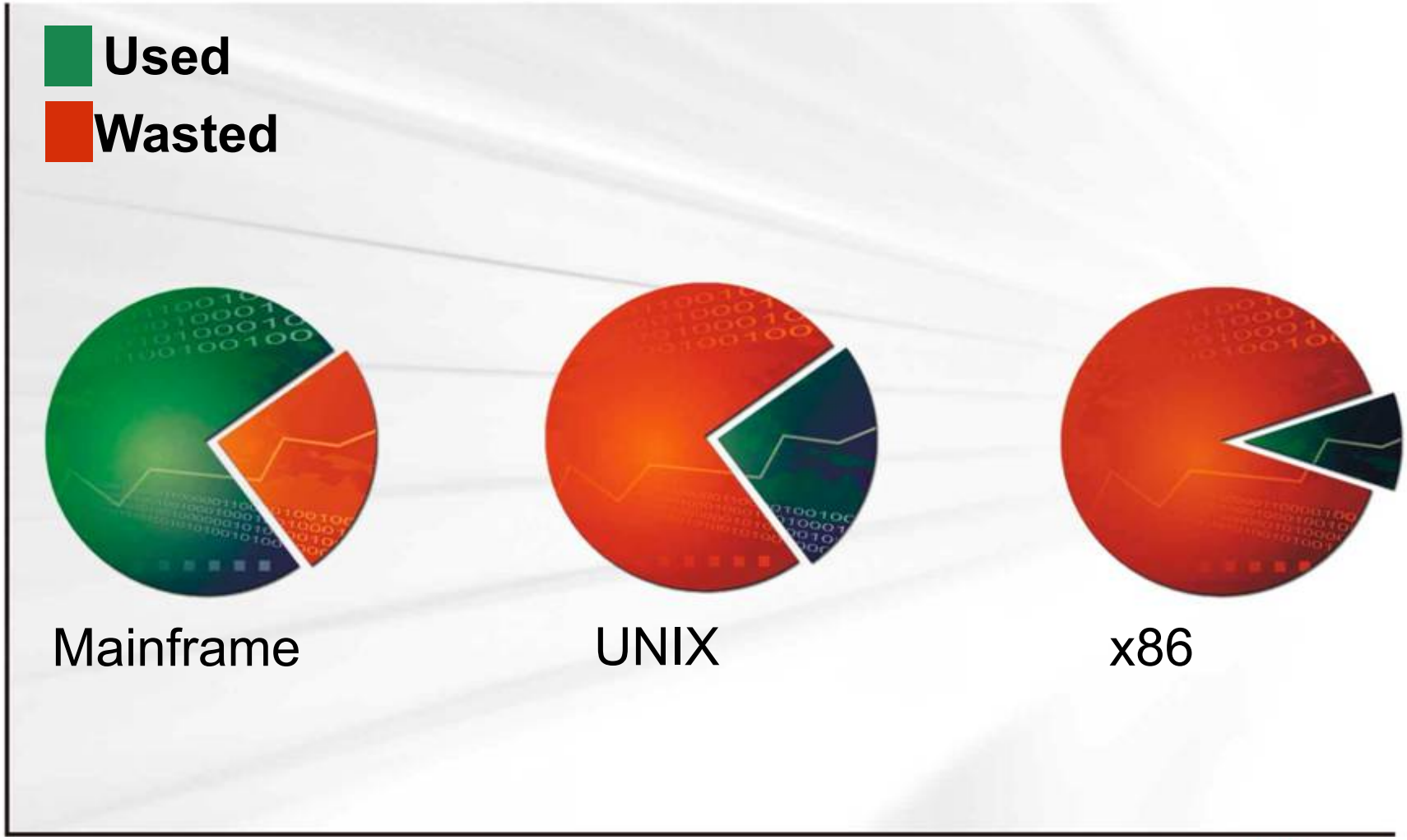








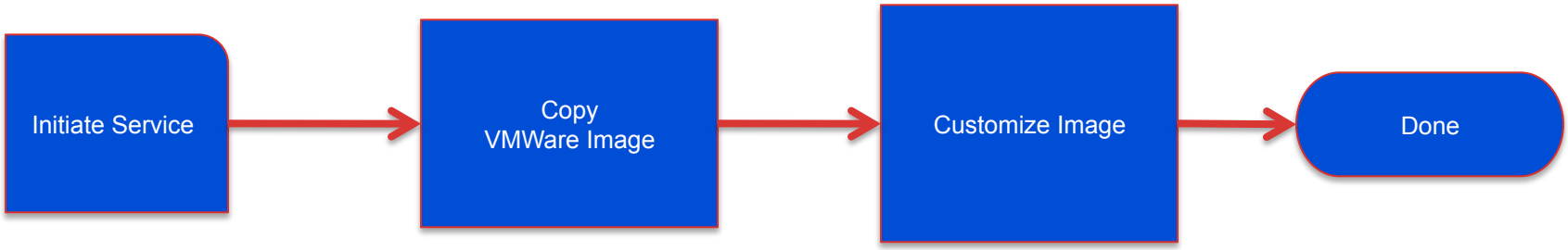
Efficiency Keeps the Data Center Small

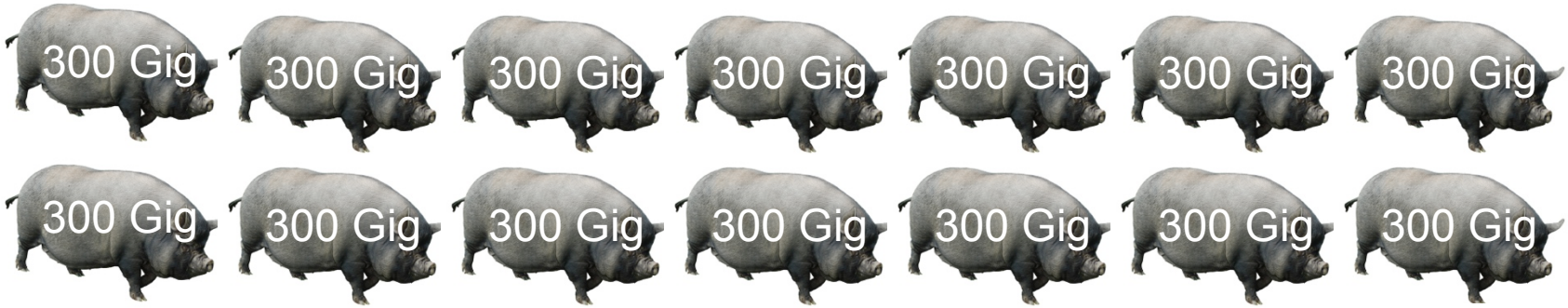


A Real Production Cloud Example

Replicate 

master image 16 times



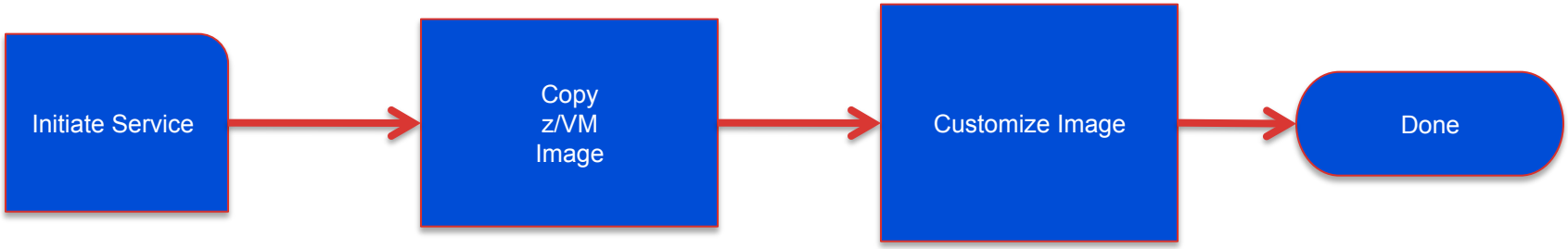


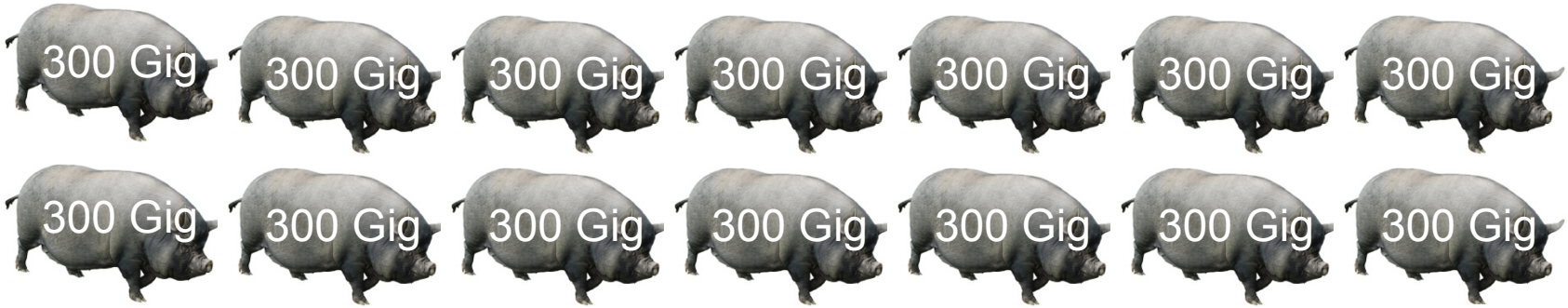
Total Provisioning Time: **3 Days**

A Real Production Cloud Example

Replicate 

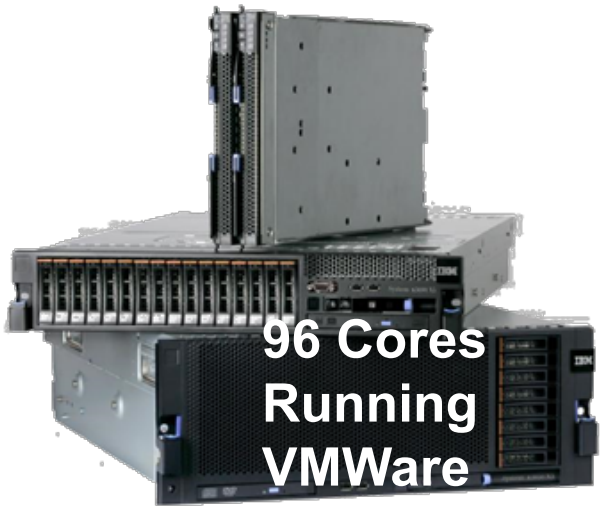
master image 16 times





Total Provisioning Time: **1 Hour**

Real Cloud Production Example



VS

Major Asset: System z Staff

Major Asset: System z Staff

Ever hear of ITIL?

How many systems do you run?

Where is your system configuration?

How many variations are you running?

Where is your Software library?

How do you keep track of usage?

Role and Value of System z

Function	Cloud Model	z/VM	z/OS
Hardware Configuration	CMDB	HMC	HMC
Hw/SW Relationships	CMDB	System Directory	SYS1.PARMLIB
Monitoring	ITM	Performance toolkit	SMF/RMF/ OMEGAMON
Software configs	DSL	VMSES	SMP
Usage	TUAM	Performance Toolkit	SMF/RMF
Image Repository	Hipervisor / SAN	System Directory + Guest MiniDisks	SYS1.PARMLIB + DASD
Provisioning	TPM + HiperVisor	TPM Support	No TPM Support yet
Automation	TPAE	Netview	MPF - Netview
Service Request Management	TSRM	NA	NA
Pervasive Security	None	RACF/ACF2 etc.	RACF/ACF2 etc.

Cloud is a Whole IT Strategy!