Cloud Computing

I am here to help

buzzetti@us.ibm.com

IBM Design Centers – architect innovative solutions for our clients and leverage the latest technologies to accelerate their IT transformation

- The IBM World-Wide Design Centers comprise certified IT architects and specialists using state-of-the-art methodologies and technologies in the IBM portfolio.
- We work with global clients and business partners to design and architect advanced IT infrastructure solutions.
- Proven strategies and best-practices through years of experience.
- IBM understands that achieving real business results requires an open, integrated and adaptive infrastructure that provides a scalable, available, secure and energy-efficient environment.

Welcome to Poughkeepsie, New York

Technology Focus Areas

Worldwide Design Centers

Helping our clients realize the full value of IBM technology solutions

Smart Analytics

- Advanced Analytics & Optimization Services help clients achieve their business objectives faster, with less risk and lower costs, by enhancing organizational performance through advanced data analytics and optimization techniques.

Cloud Computing

- IBM provides a breadth of cloud workload solutions for your IT infrastructure including analytics, collaboration, development and test, desktop and devices, infrastructure, storage and business services.

Smarter Computing

- IBM provides a complete portfolio of solutions and services that integrate your business and IT infrastructures, while taking a smarter, more streamlined approach to improve service, reduce cost, and manage risk.

Workload Optimized Systems

- Different types of workloads have unique needs and run more purposefully and enable higher levels of client value when matched with the optimal IT resources. IBM offers a range of workload optimized systems.

Integrated Service Management

- Only Integrated Service Management provides the software, systems, best practices and expertise needed to manage infrastructure, people and processes—across the entire service chain—in the data center, across design and delivery.

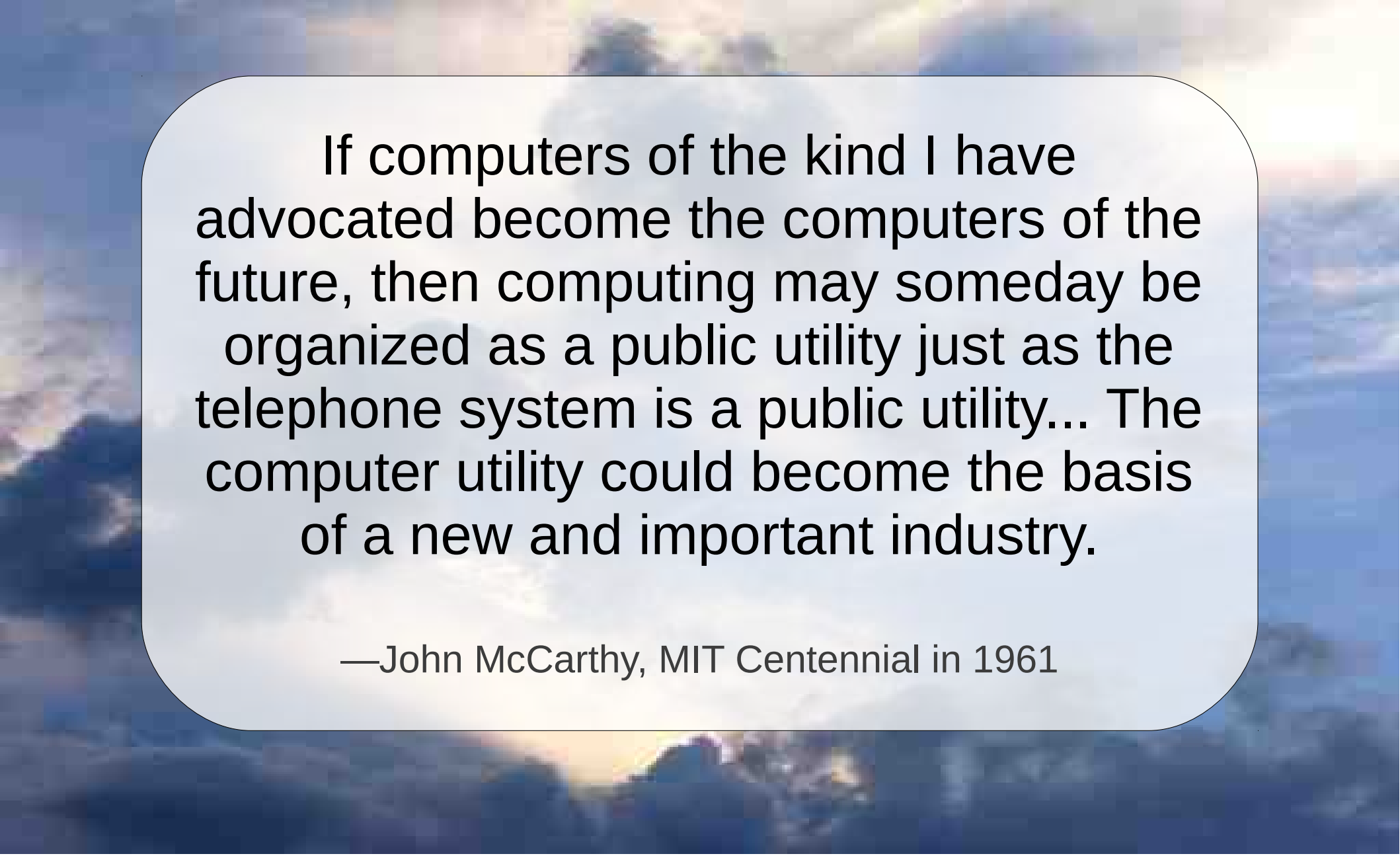
Systems Storage

- Bringing together infrastructure management, virtualization and productivity software, IBM System Storage™ systems deliver innovative disk, tape and storage networking solutions.

The IBM Design Center Cloud on System z Workshop is a 1-2 day engagement which enables a business build a high level design and plan for a system z cloud. It will leverage the existing process and procedures that are inherent in the current mainframe environment and augment them with the powerful tools and processes that IBM has developed for cloud. The high level design and plan can reduce up to 6 months of the development time of a new cloud project on system z.

- Sample Agenda
  - Day 1
    - Introduction and Welcome
    - Overview of objectives
    - Overview of Cloud (Level Set)
    - Requirements gathering (Understand the customer environment and the pain points.
    - Lunch
    - Requirements gathering (part 2 if needed)
    - Choosing the right service (s) to migrate to the cloud
  - Day 2
    - Overview of Cloud Management Software (Tivoli Service Automation Manager)
    - Gap analysis of TSAM vs Client operations model
    - Lunch
    - Build a plan to overcome discovered gaps
    - Detail how to extend Cloud environments for future growth (zBX, AIX, Windows, etc)

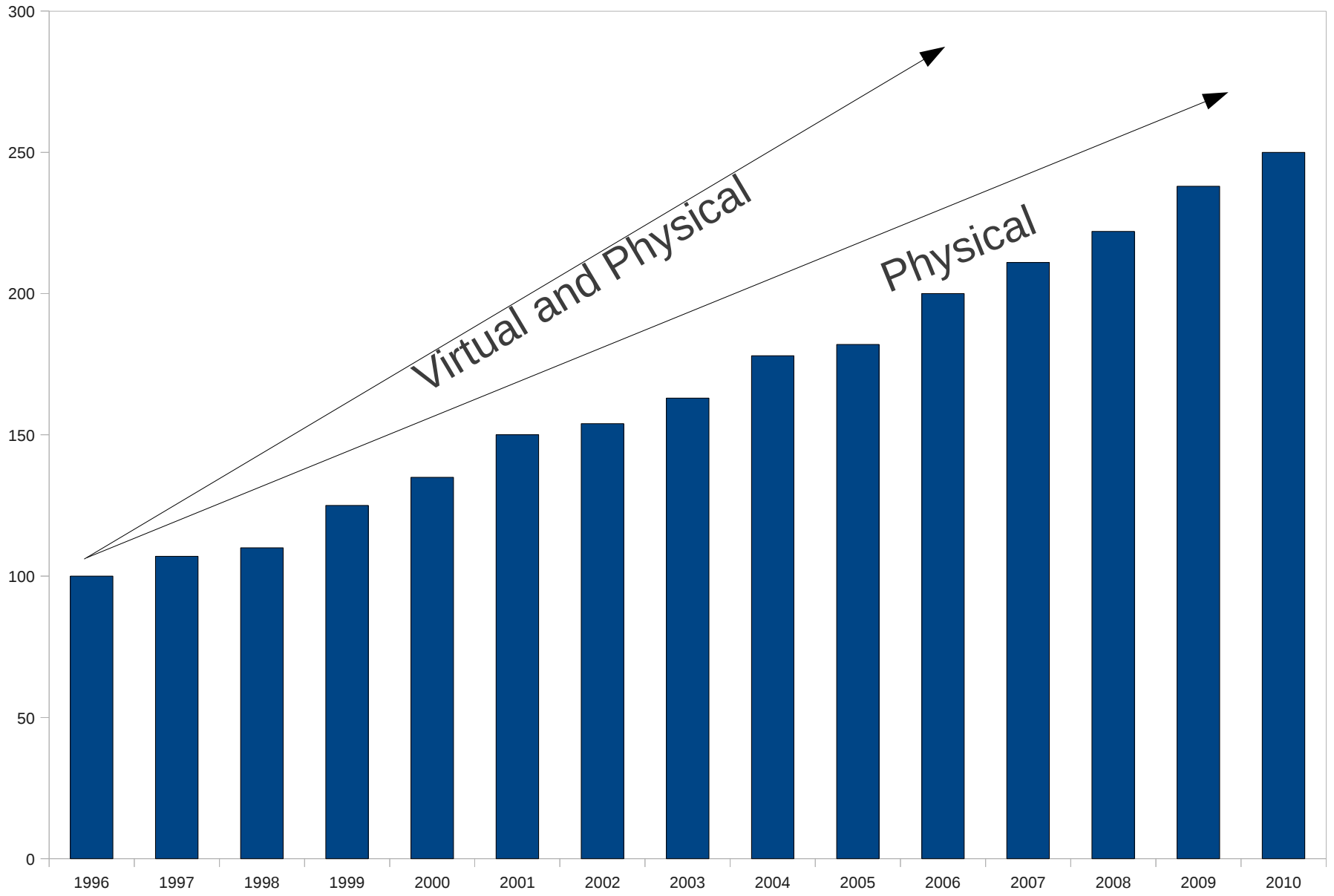
IBM Cloud on System z Workshop


If computers of the kind I have advocated become the computers of the future, then computing may someday be organized as a public utility just as the telephone system is a public utility... The computer utility could become the basis of a new and important industry.
—John McCarthy, MIT Centennial in 1961

Cloud

Business Driver for Cloud

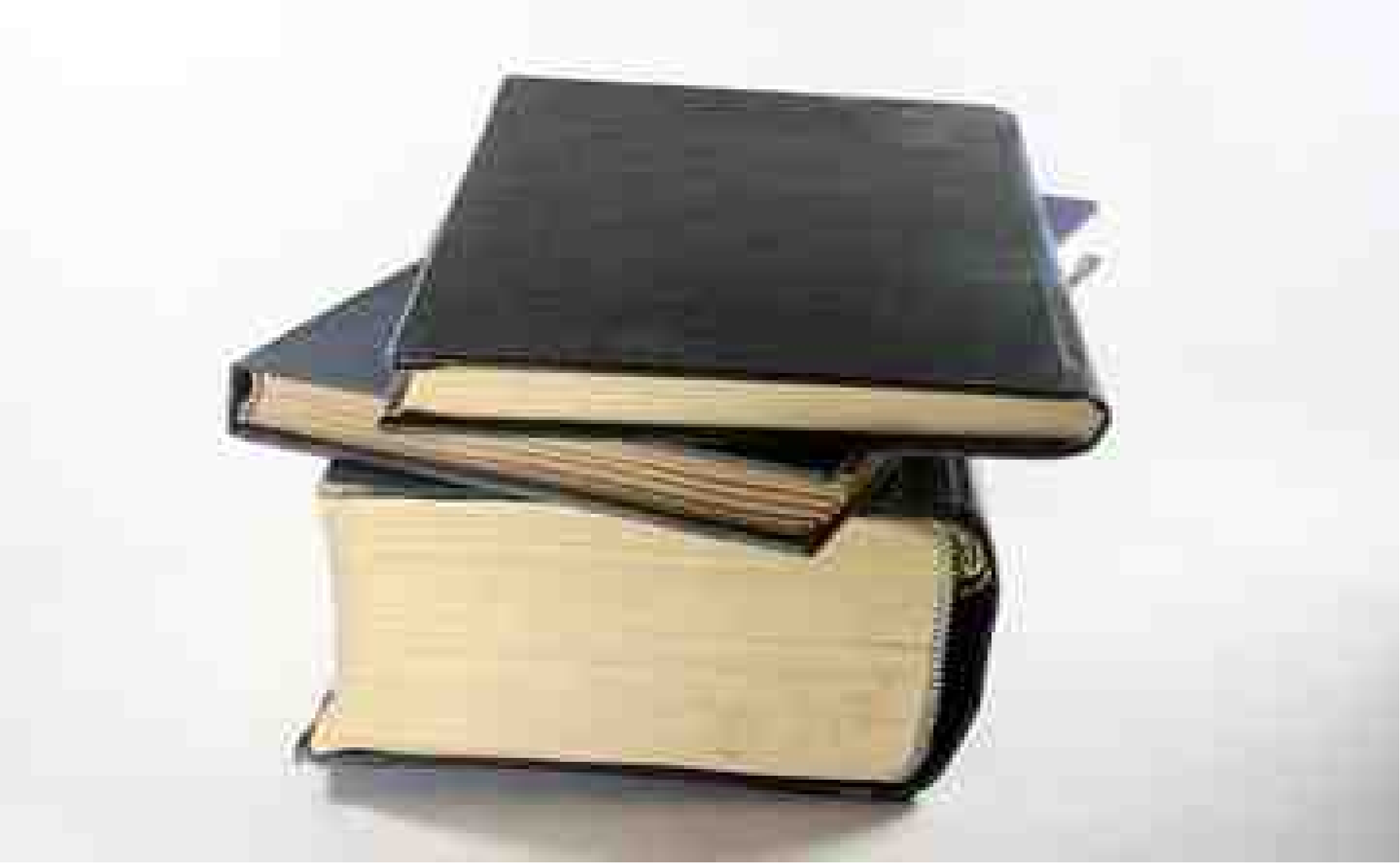
We Show this to Clients All the Time



Economics

Risk Management

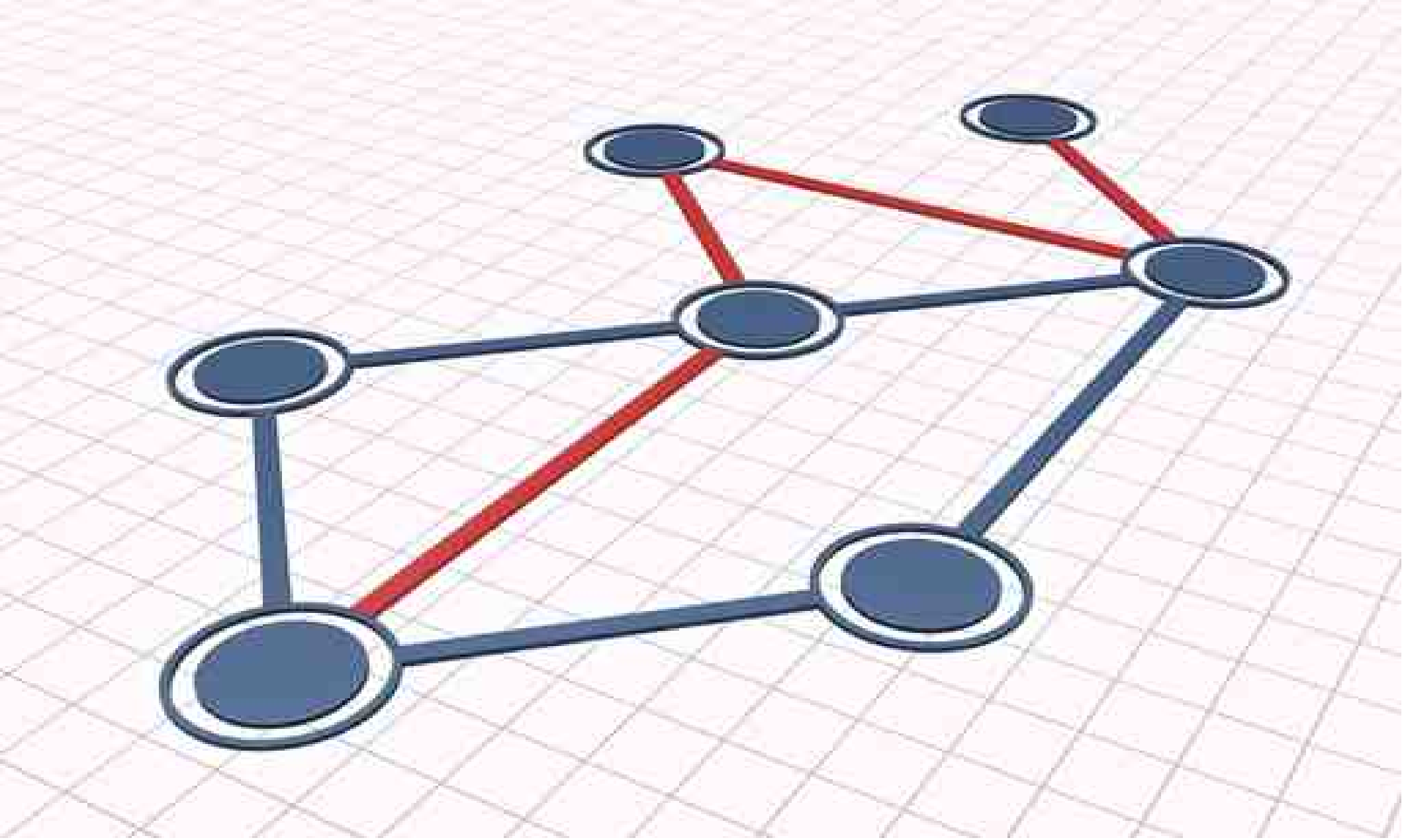
Time to Market



Information Society

Ubiquitous Society


NIST



Characteristics

Self Service

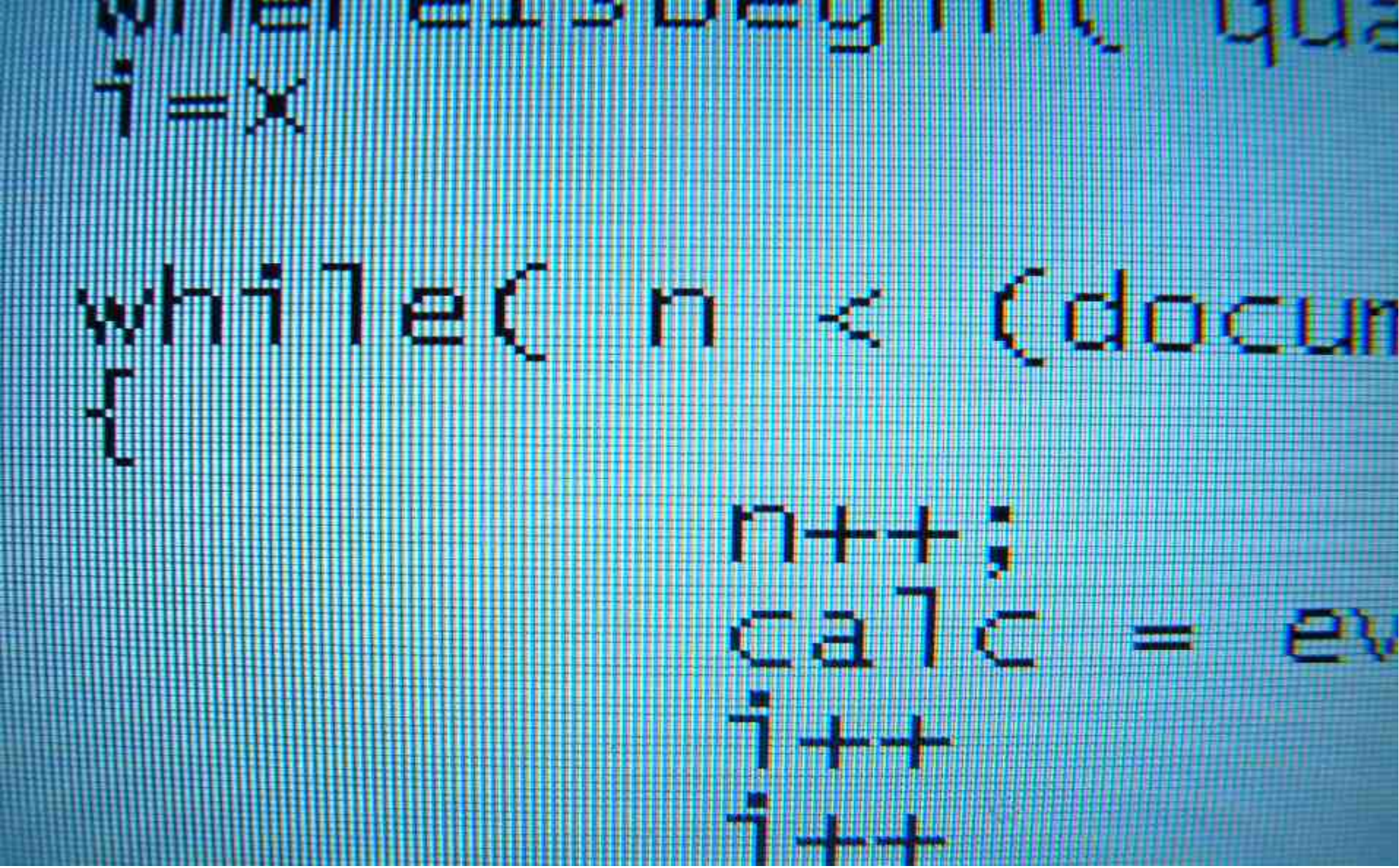
Broad Network Access

Resource Pooling

Rapid Elasticity

Measured Service

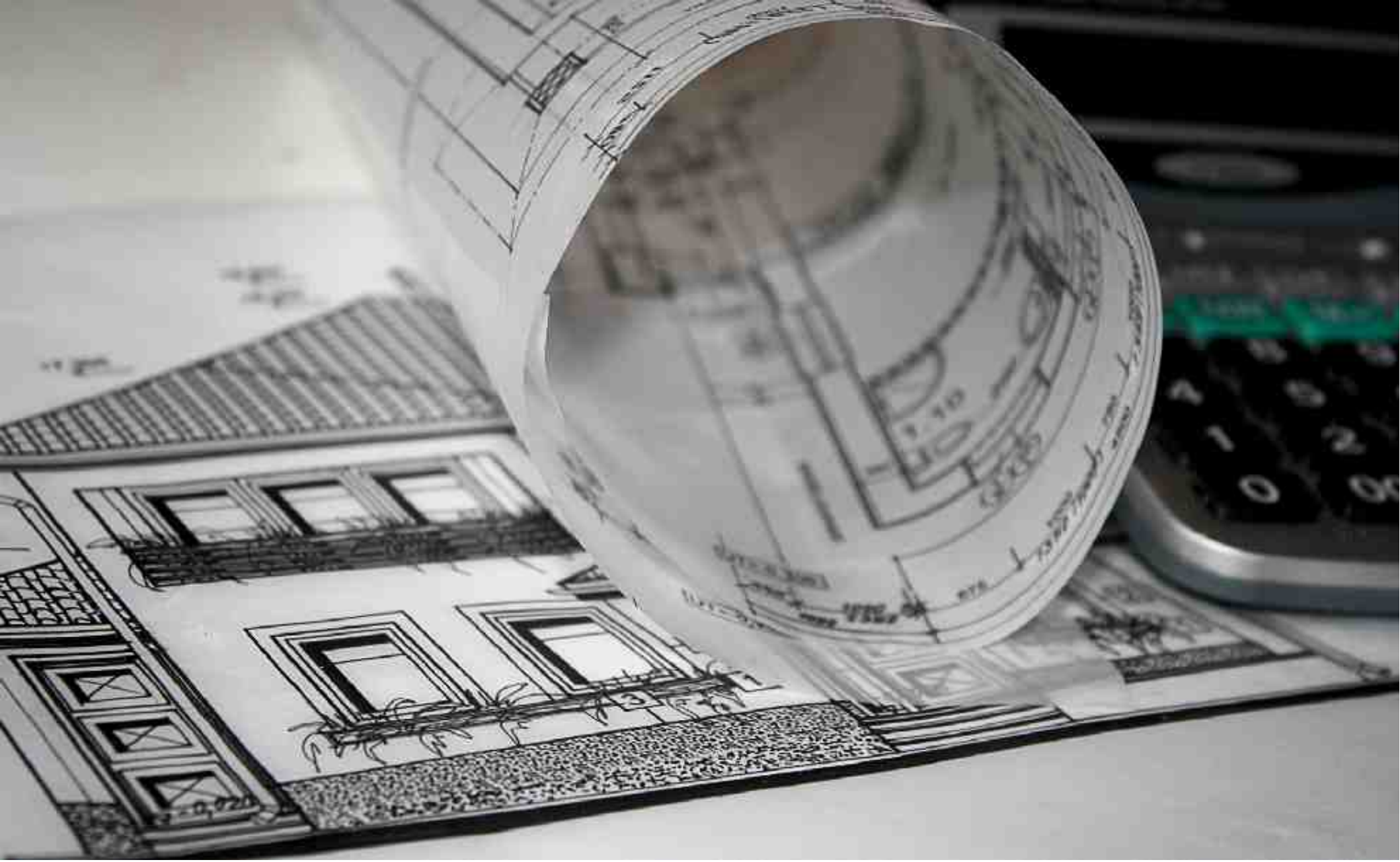
Service Models



SaaS

PaaS

IaaS



Deployment Models

Private Cloud

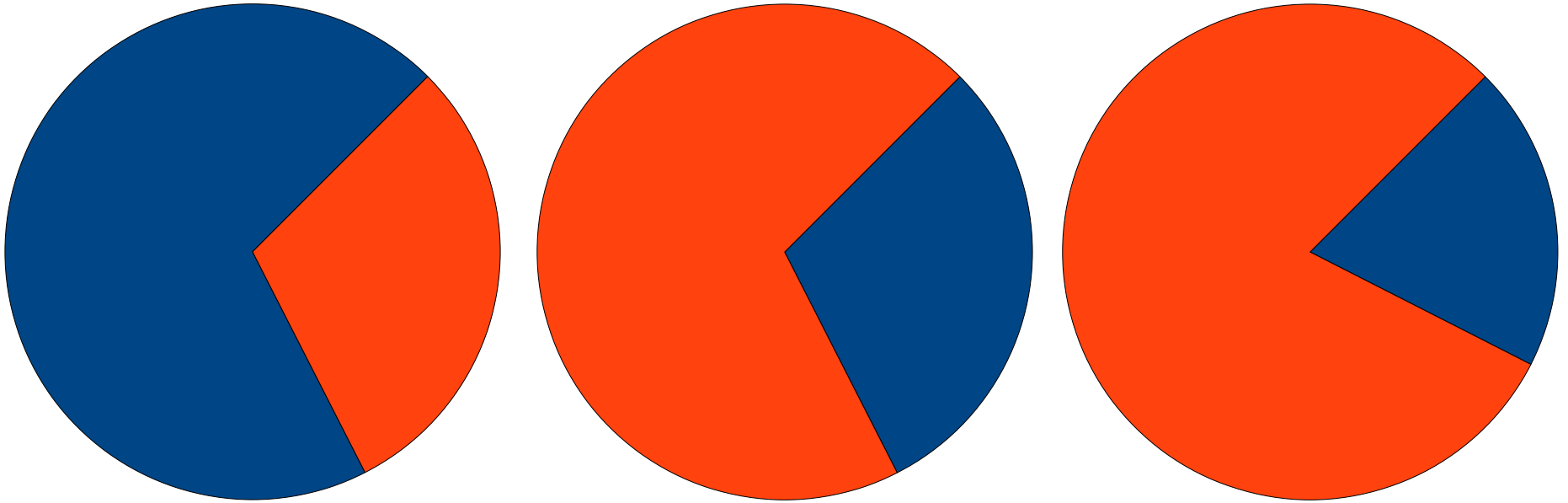
Public Cloud

Community Cloud

Hybrid Cloud

Why System z ?

Which is an Efficient Computer?

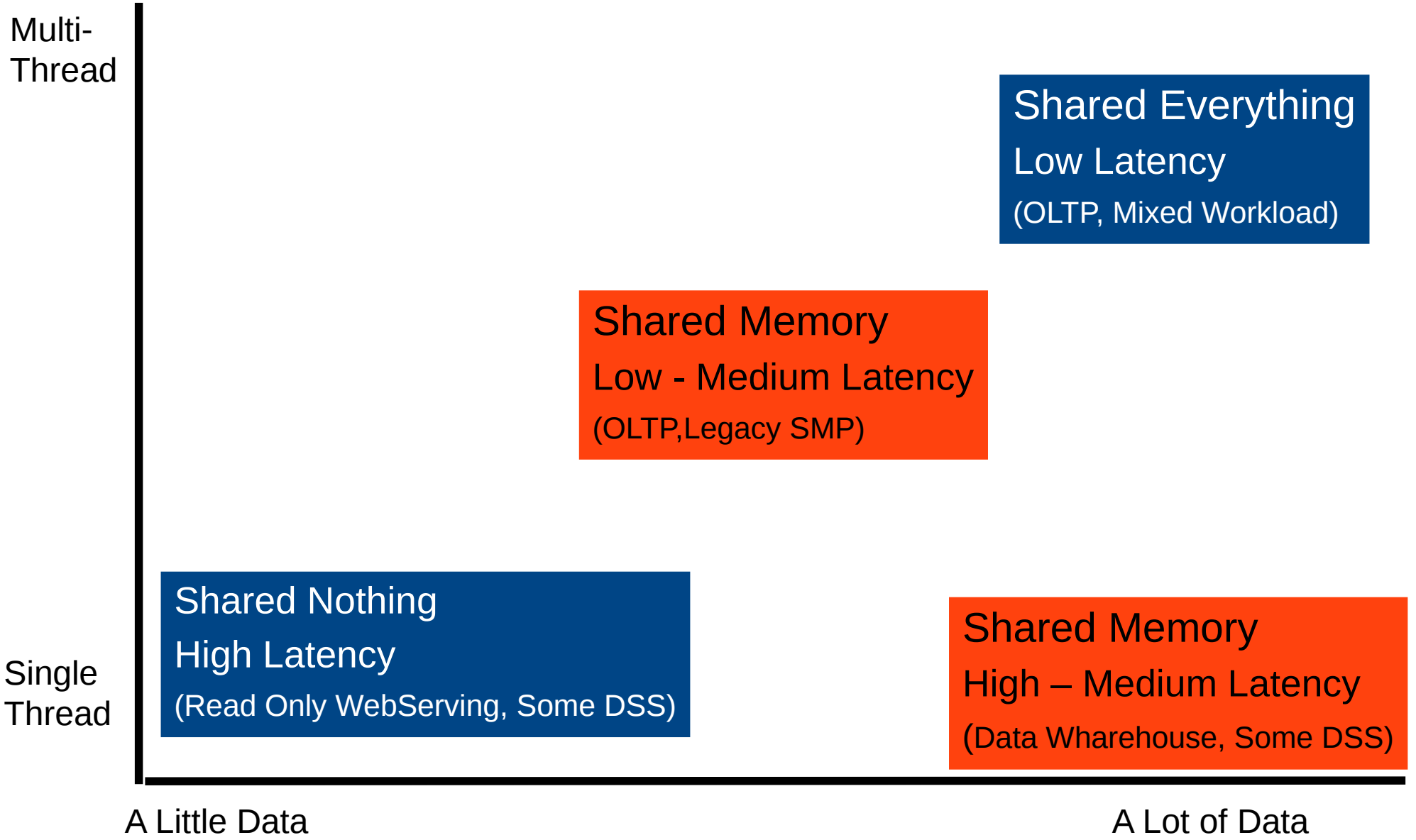


Mainframe UNIX x86

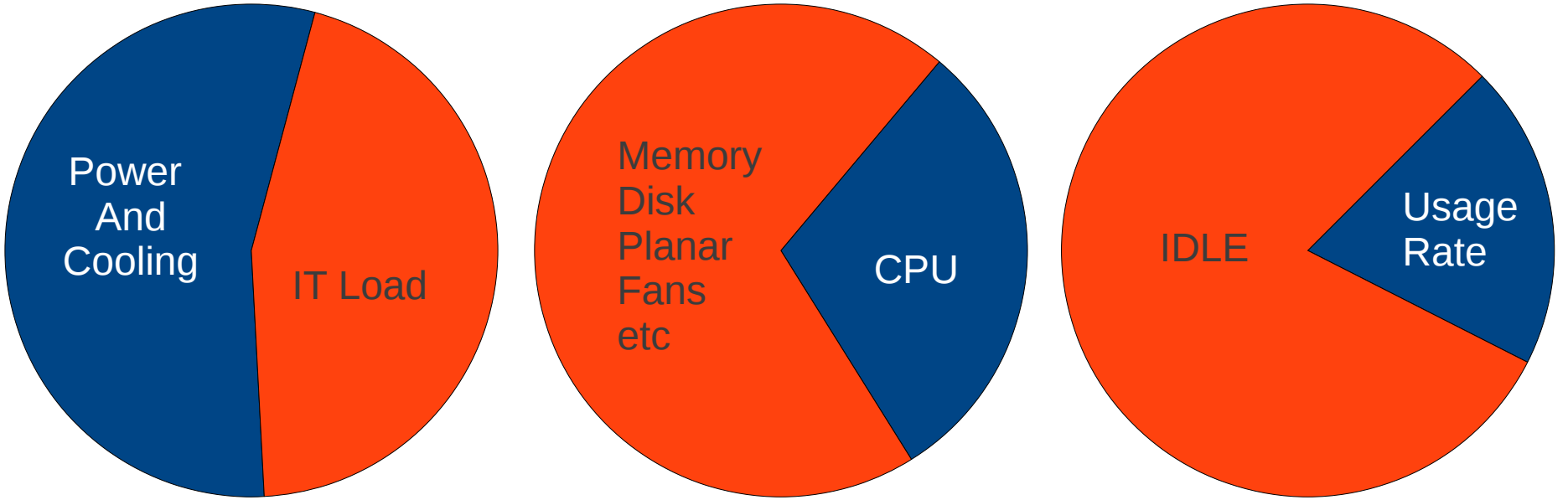
Used Resources

Wasted Resources

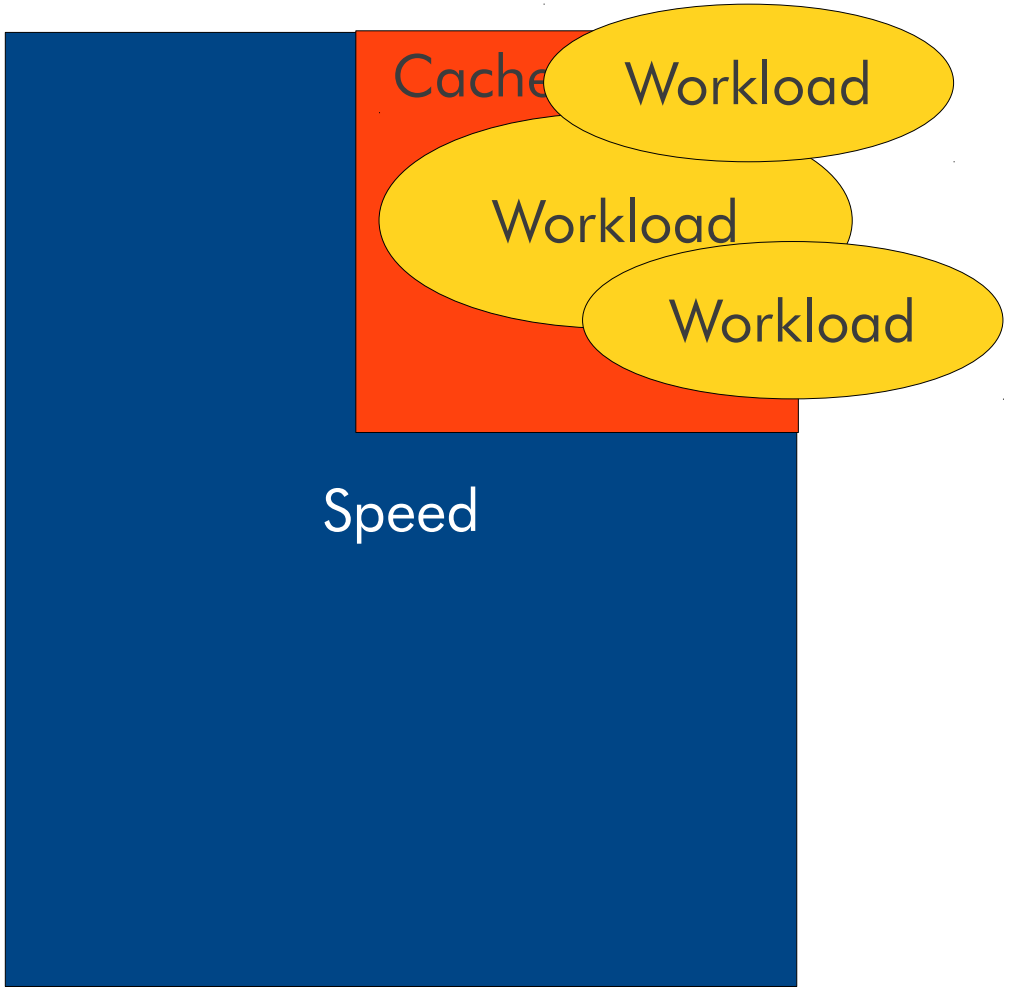
Not all Computers are Created Equally

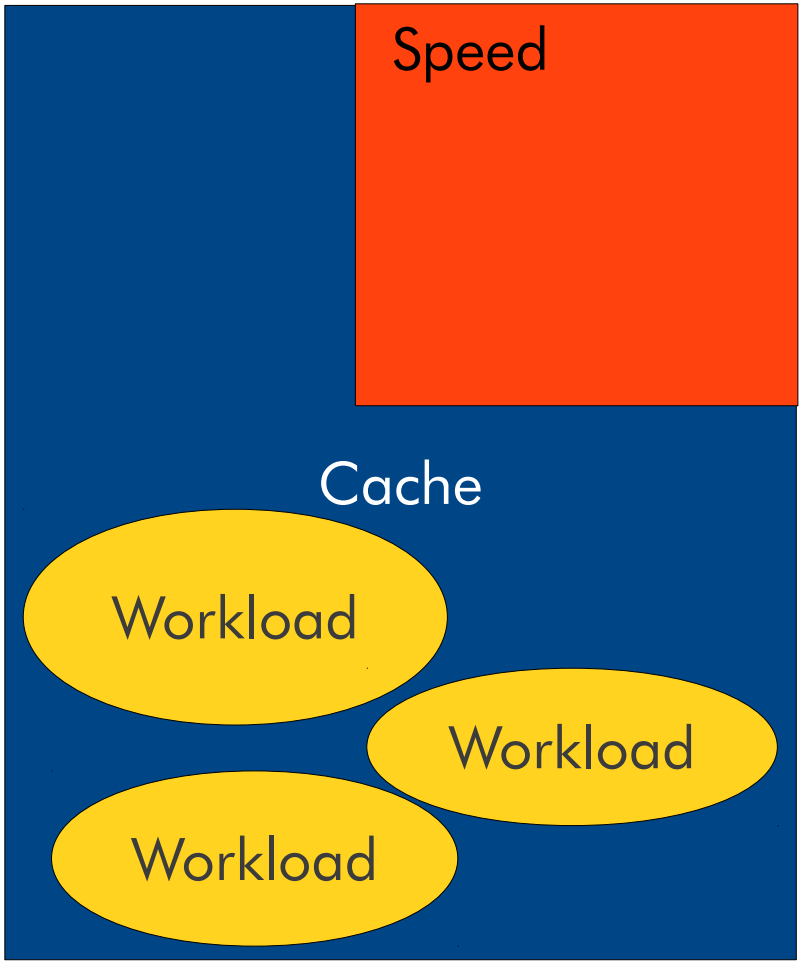


Its All About the Data Center

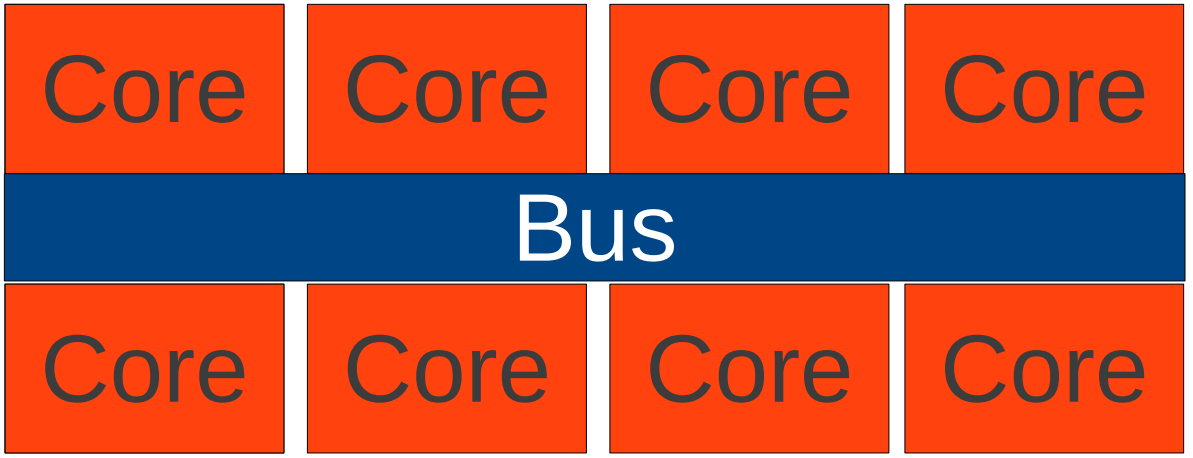


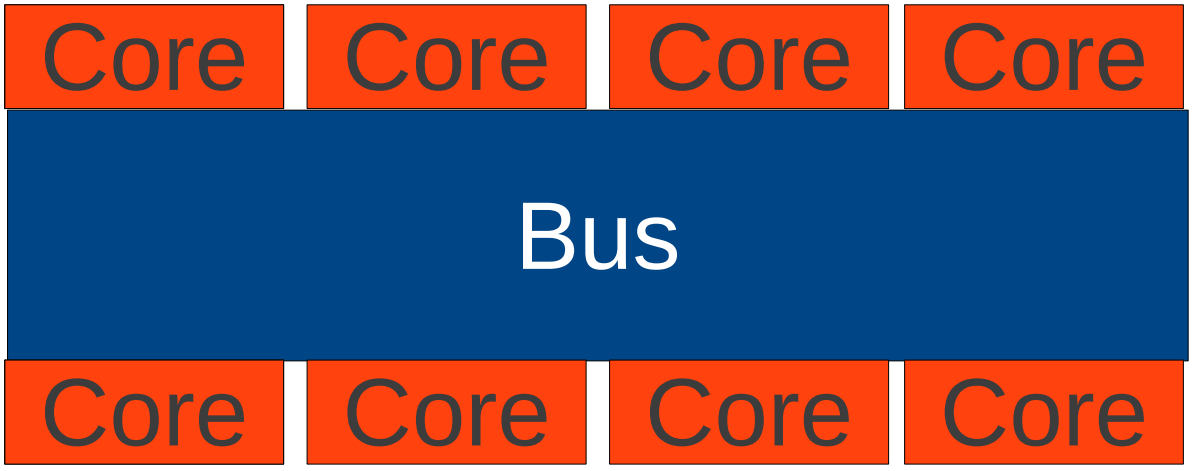
Chip Design Affects Virtualization



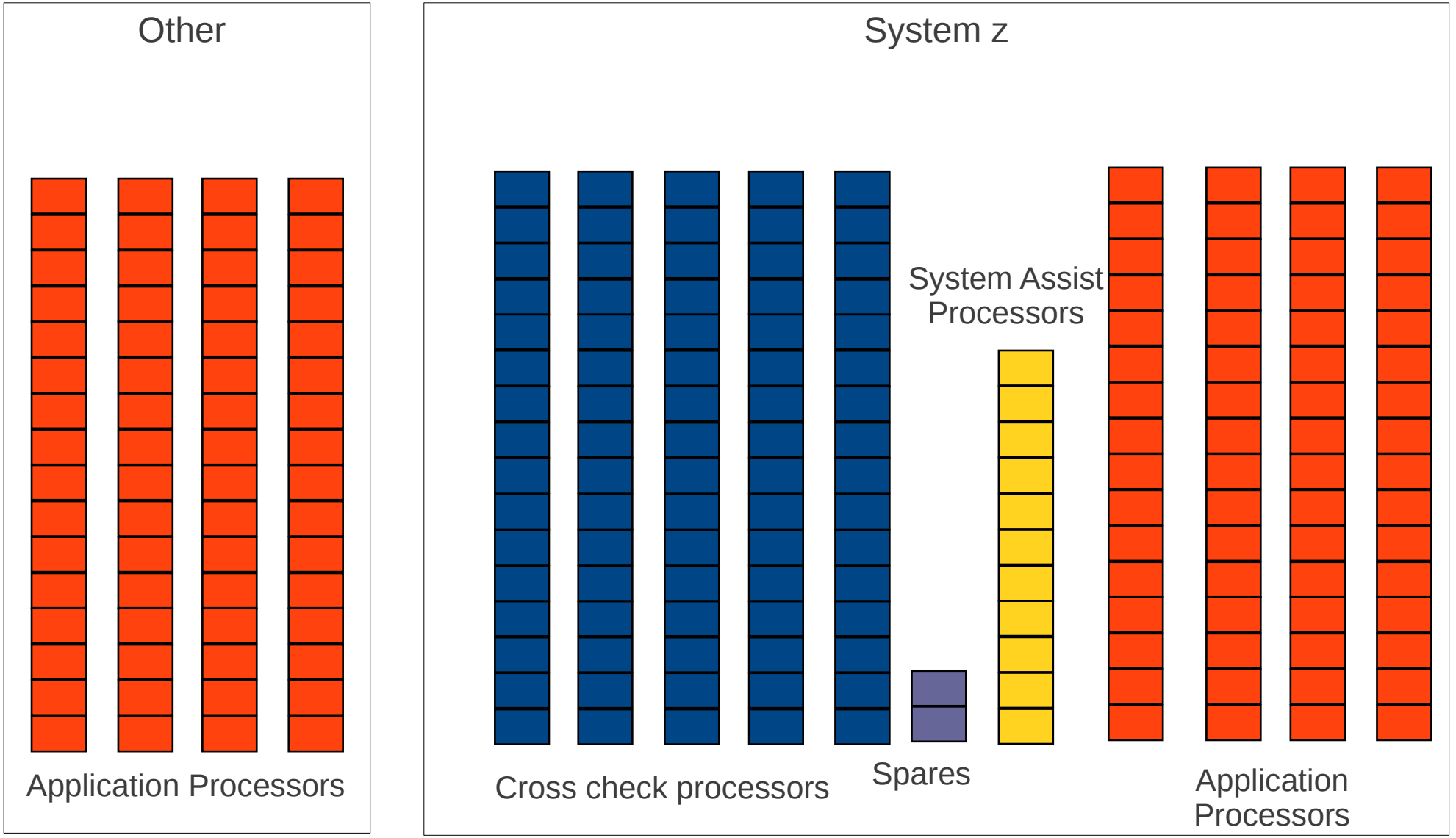


Design Differences

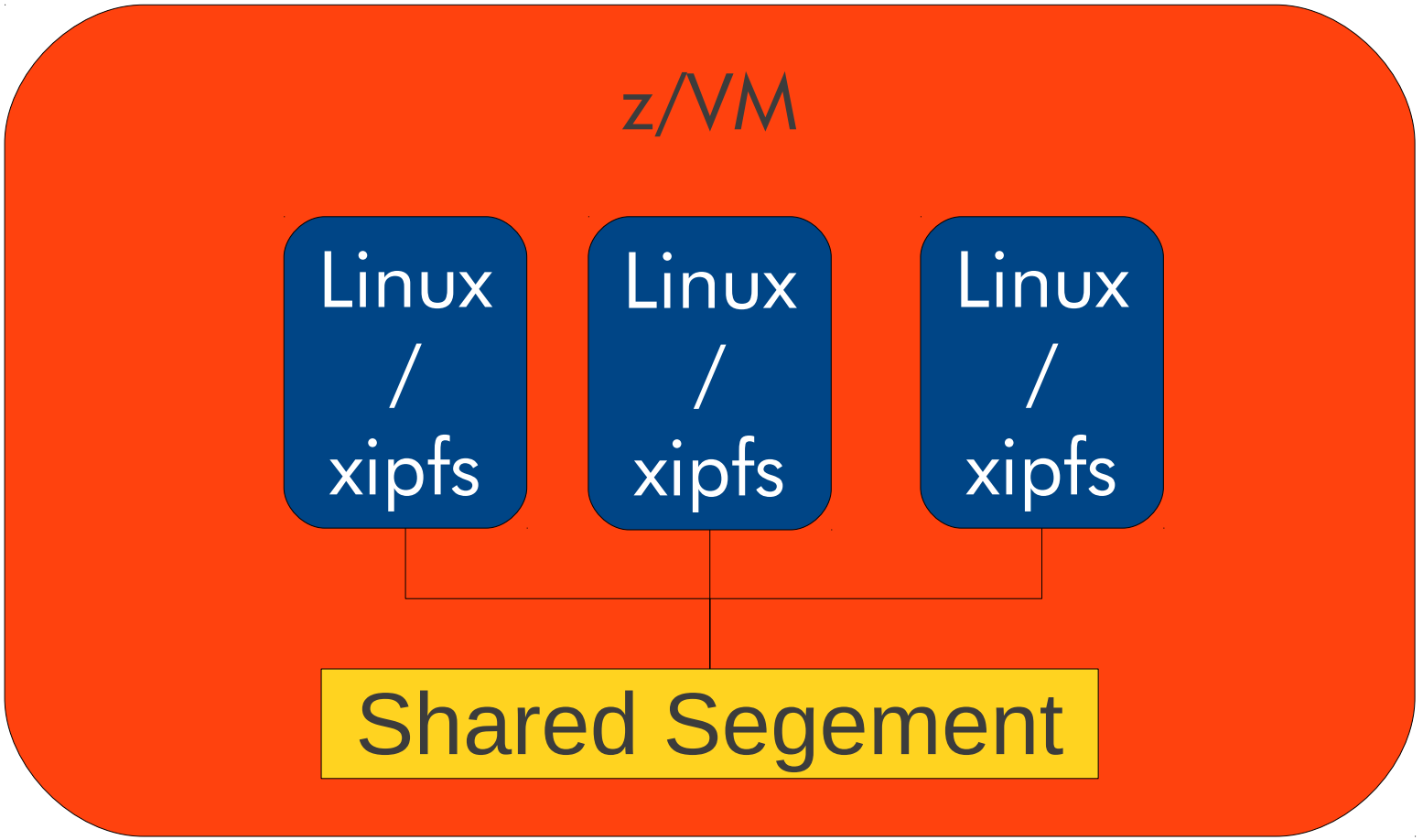




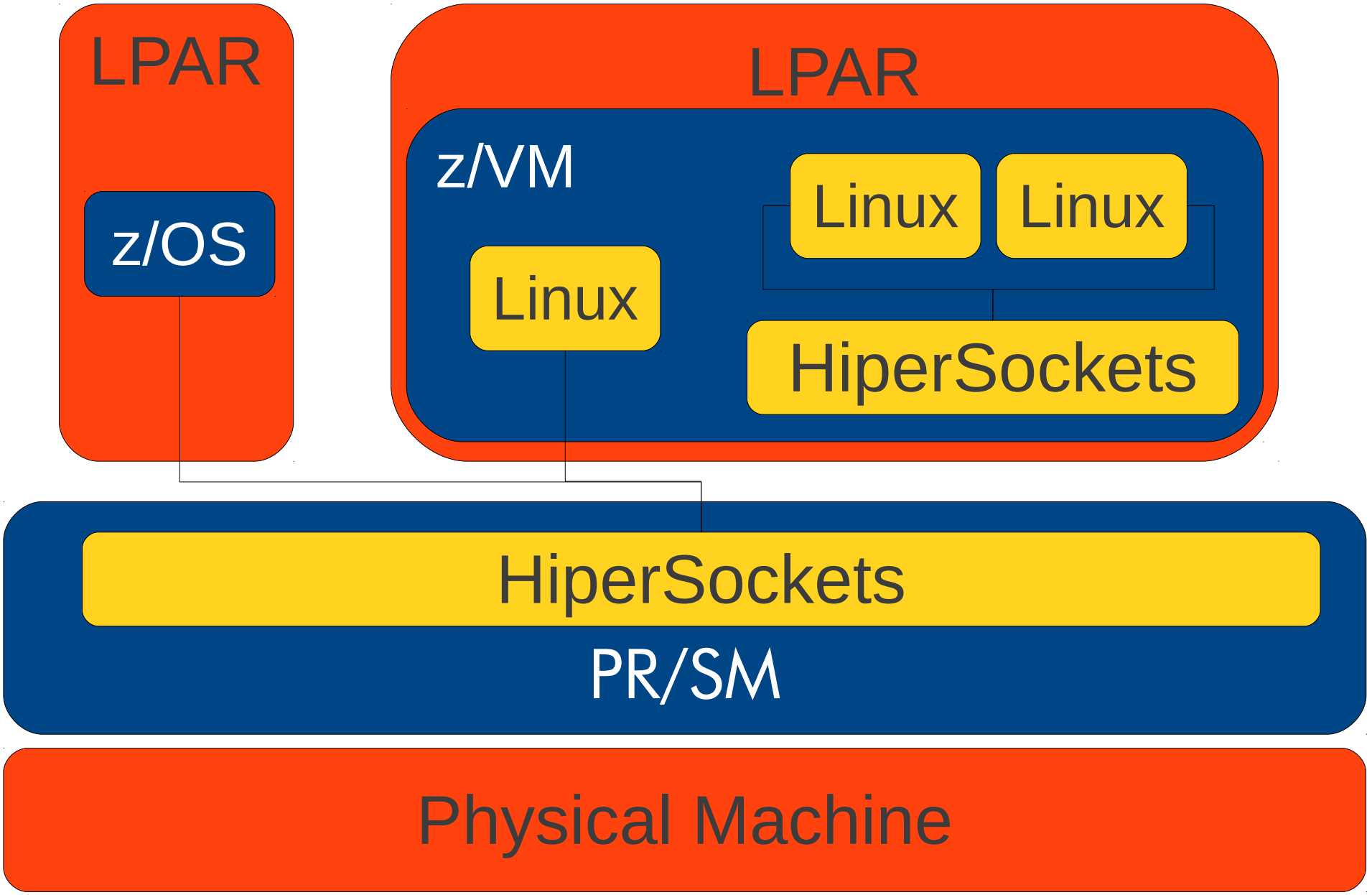
Comparison of n-way Machines



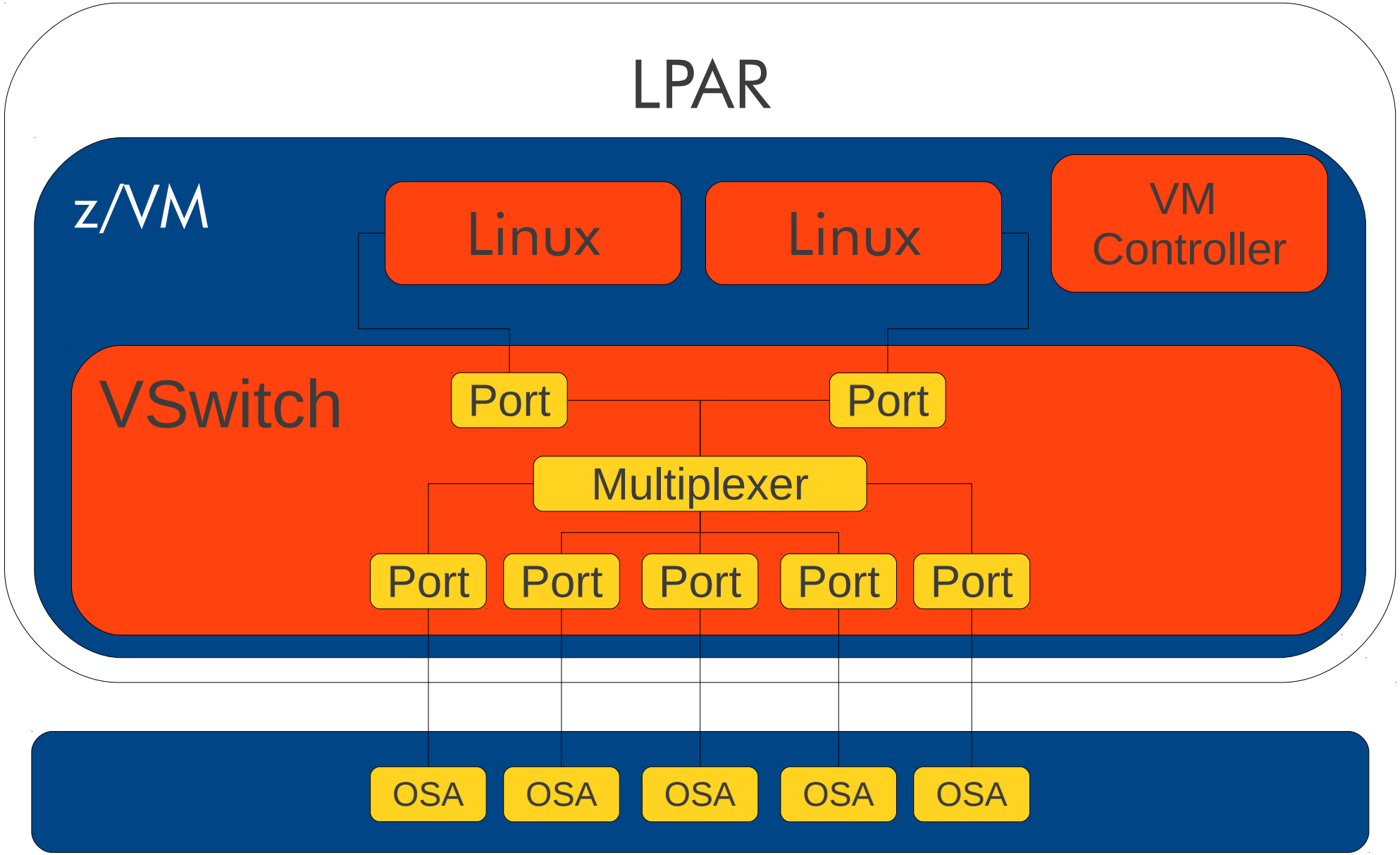
DCSS and XIP

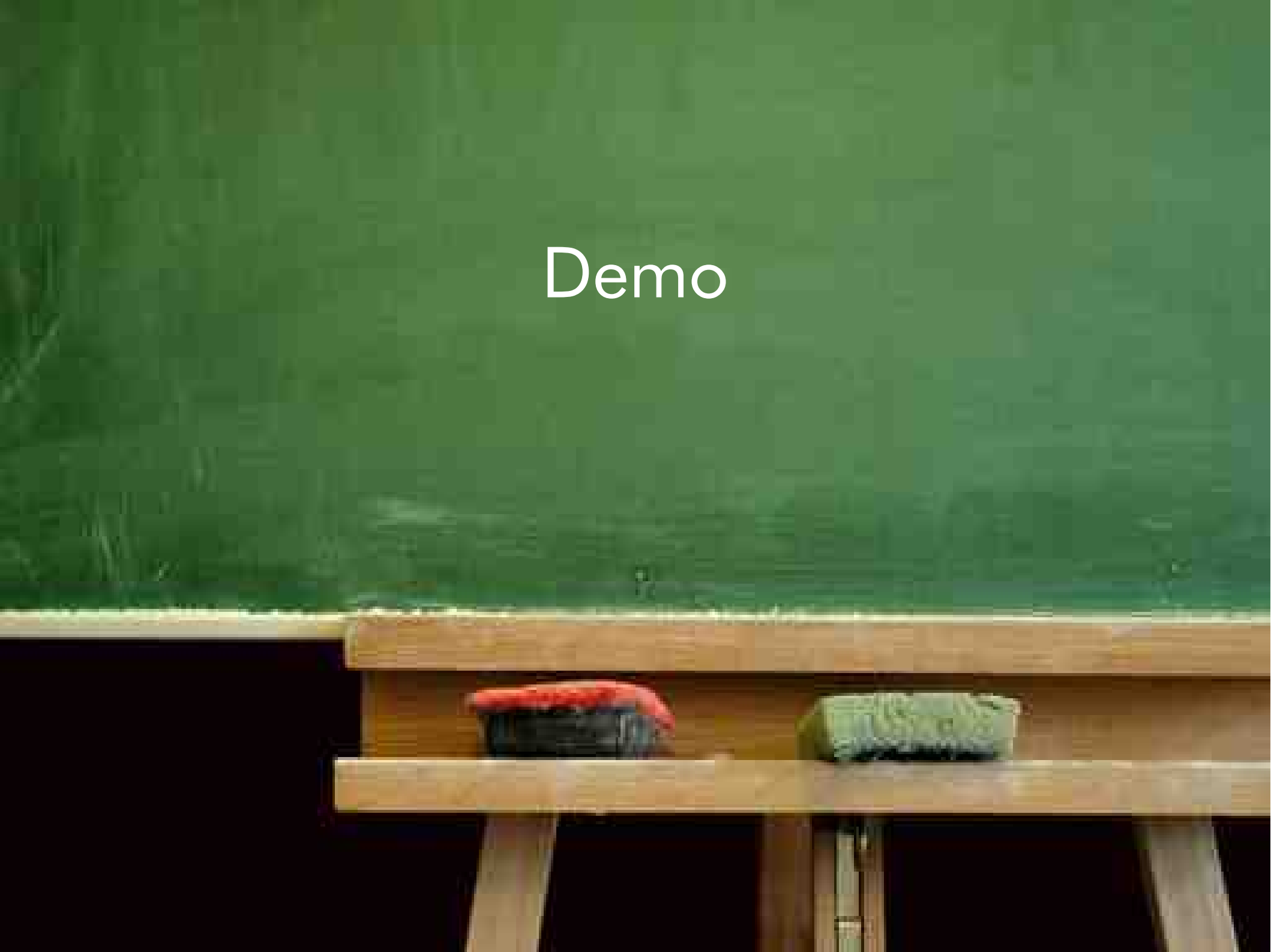


HiperSockets



VSwitch


LPAR
z/VM
Linux
Linux
VM Controller
VSwitch
Port
Port
Multiplexer
Port
Port
Port
Port
Port
OSA
OSA
OSA
OSA
OSA


Demo

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Abstract

Cloud computing, using shared resources in public spaces instead of in-house IT organizations, is the latest thing in IT. Lines of business even bypass their own IT shops to take advantage of external providers of cloud offerings. However, many of the users that employ public cloud services have not considered issues involving security, compliance, and availability.

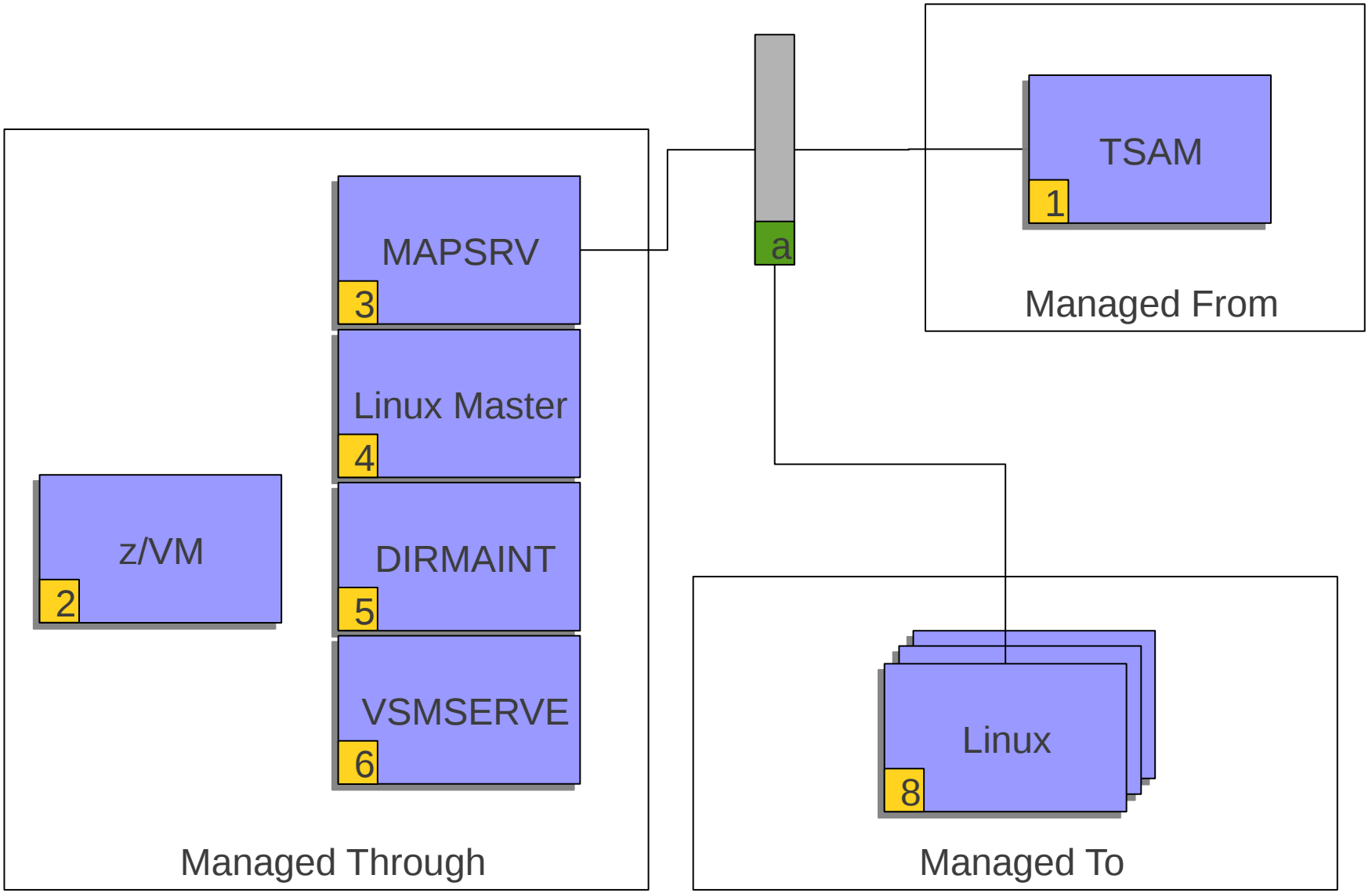
Cloud represents a new business model that requires a process discipline as well as the use of a corresponding set of technologies. The new model requires an understanding of the hardware configuration, software images, a virtualized storage infrastructure, and network management.

For many organizations that have mainframe resources, the IT professionals already manage these different disciplines and aspects of resources as part of their overall management of the platform. The mainframe's proven capability to efficiently and securely provide virtualization, combined with the existing skills in the IT organization, suggest that in-house mainframe resources provide an ideal environment in which to pilot cloud computing.

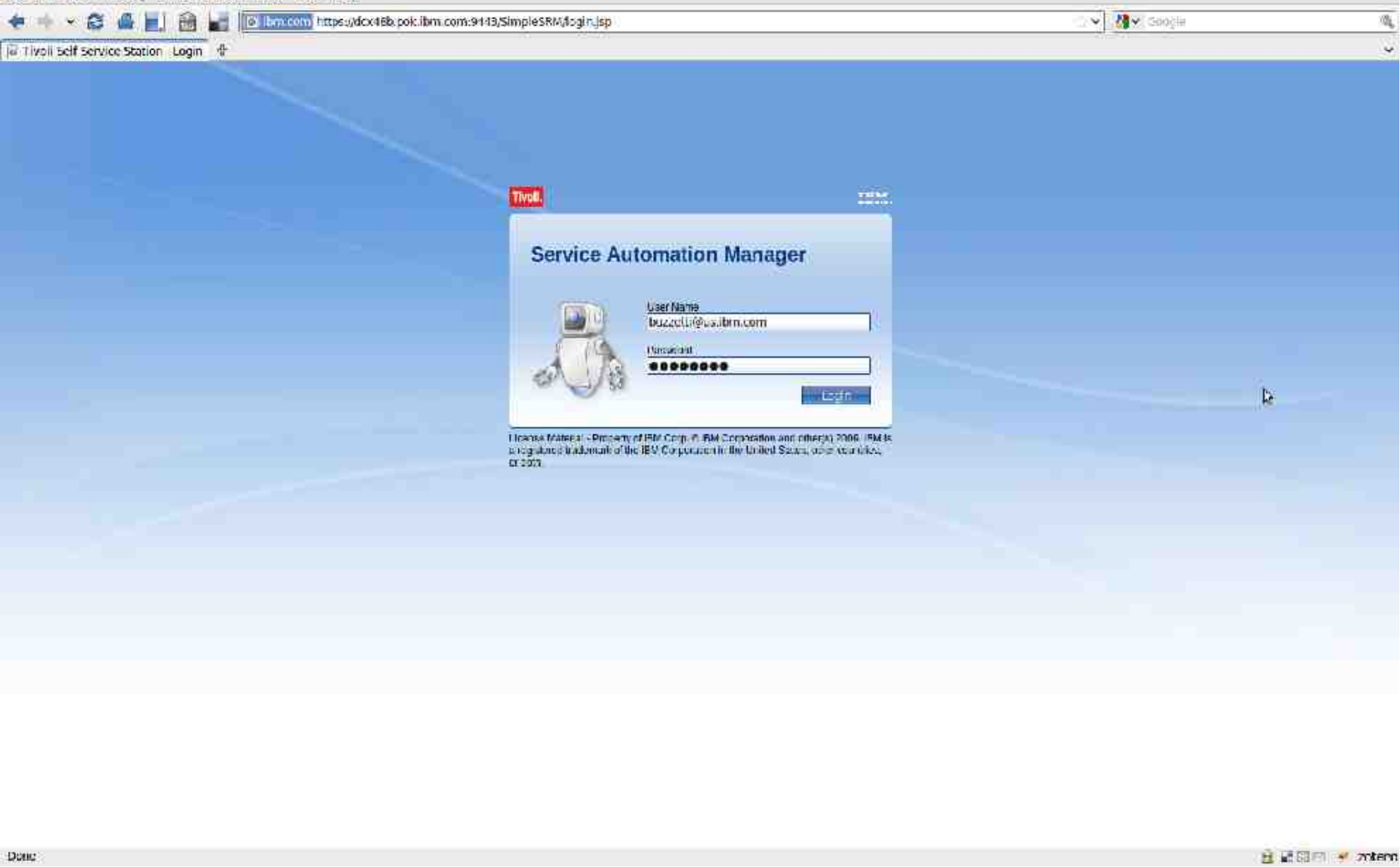
This IBM® Redpaper™ document describes the steps we took to create an environment that can efficiently deploy and manage a cloud in a Linux®-based Infrastructure as a Service (IaaS).

Related links

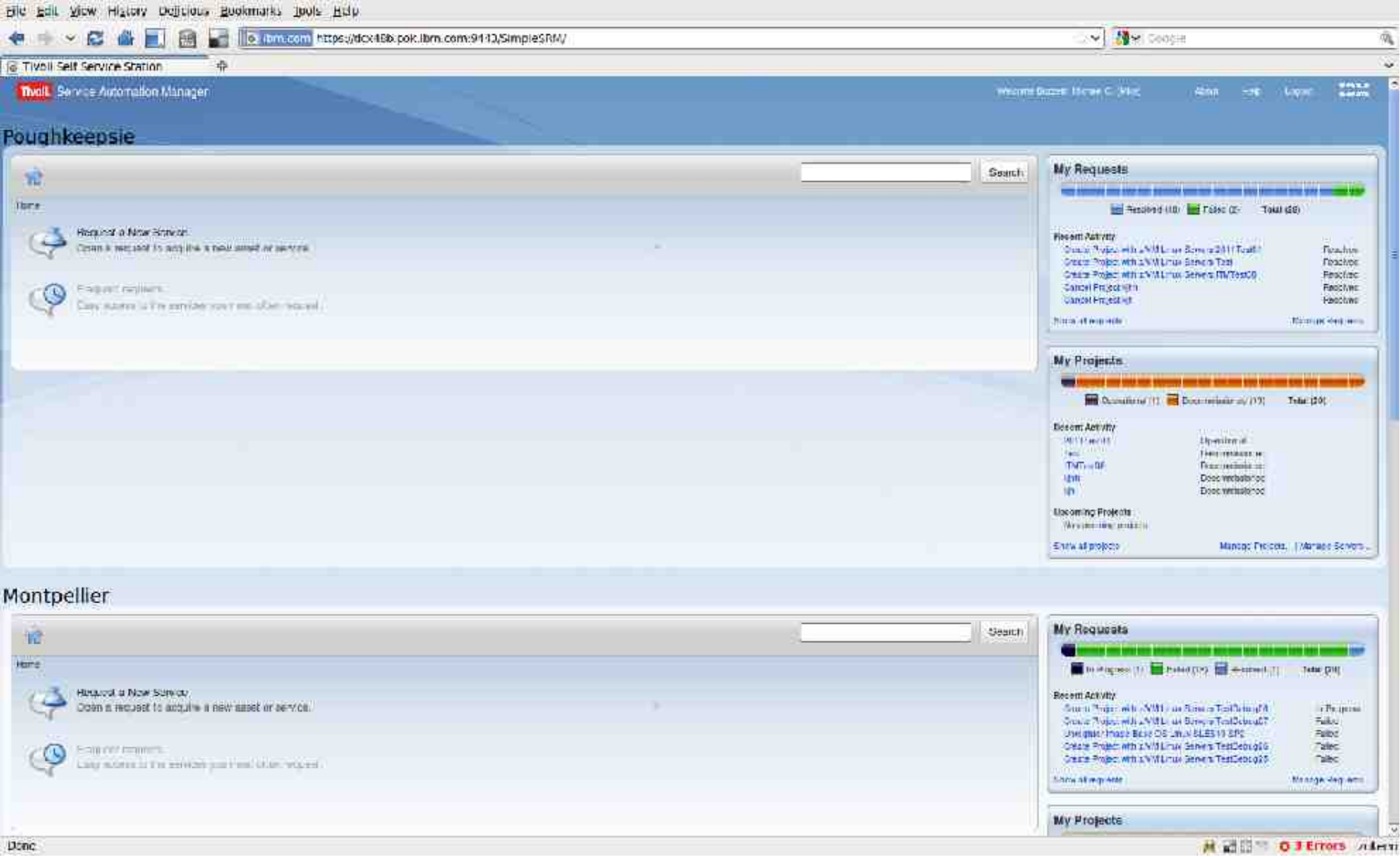
- IBM Publications
- Technical training
- Developers
- developerWorks wikis
- IBM Business Partners
- IBM Press books



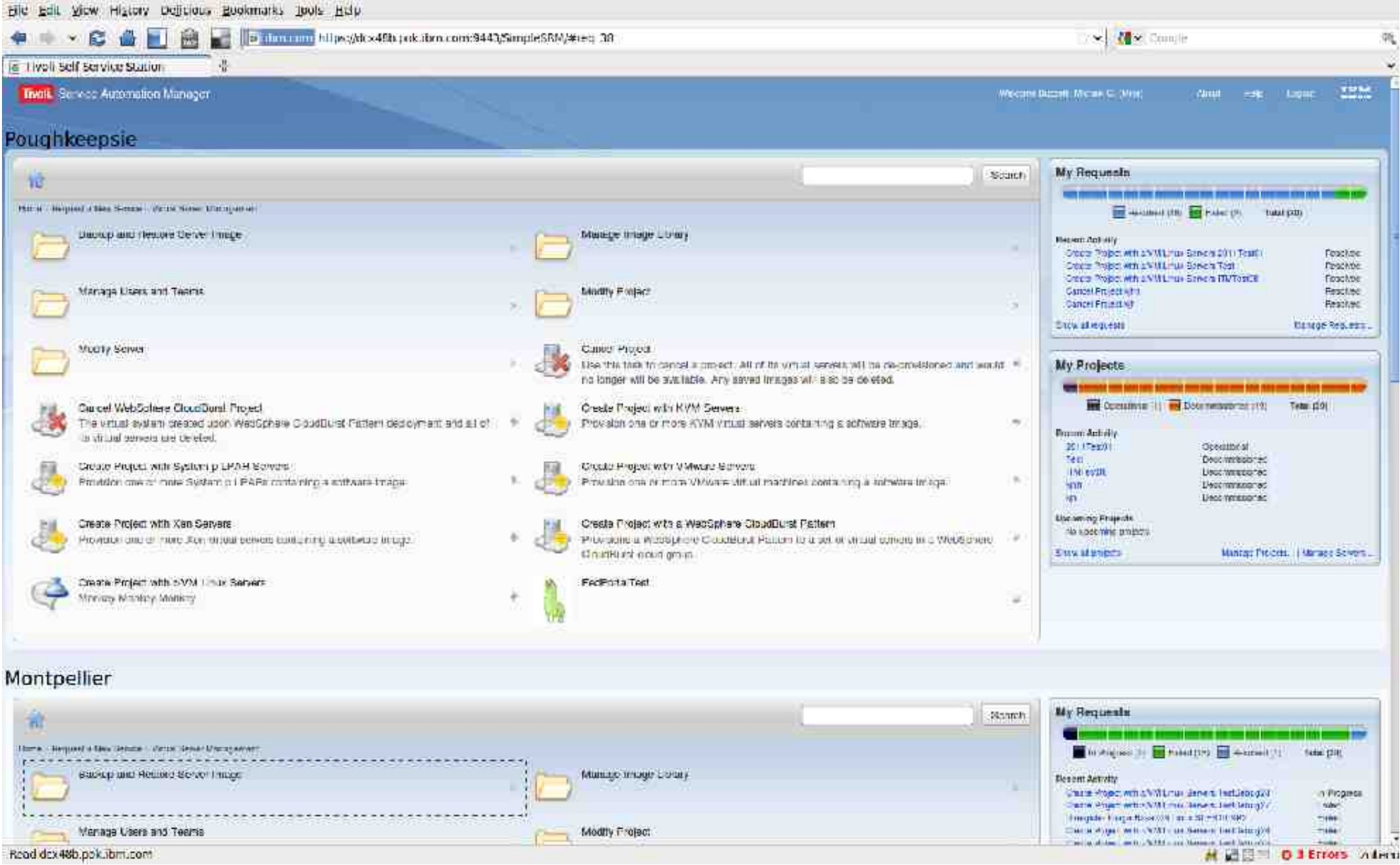
Logical Domains


Tivoli Self Service Station Login
https://dcx486.pok.ibm.com:9443/SimpleSRM/login.jsp
Tivoli.
IBM
Service Automation Manager
User Name
Password
Login
Done

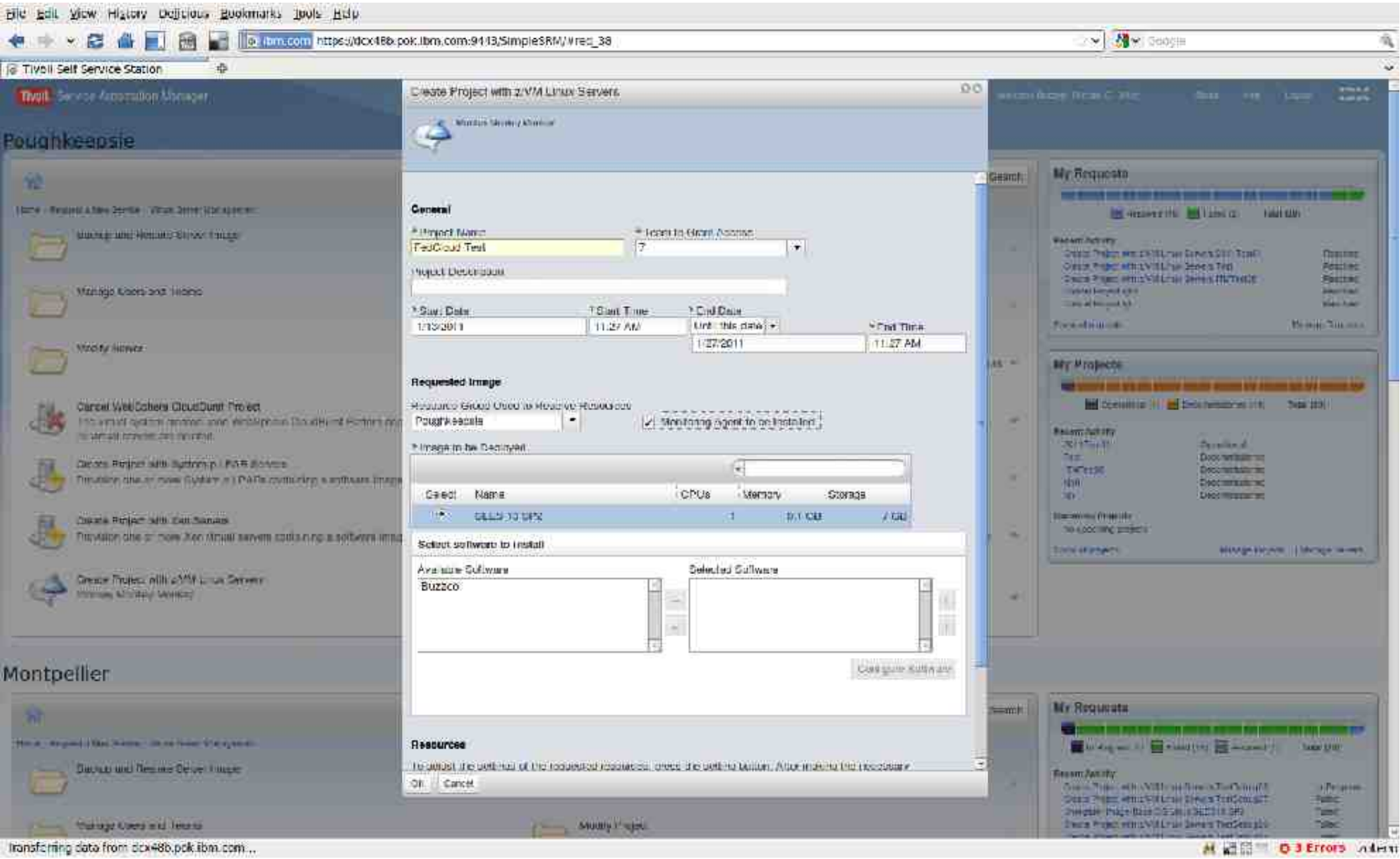
Login


Tivoli Service Automation Manager
Poughkeepsie
Search
Home
My Requests
My Projects
Montpellier
Search
Home
My Requests
My Projects

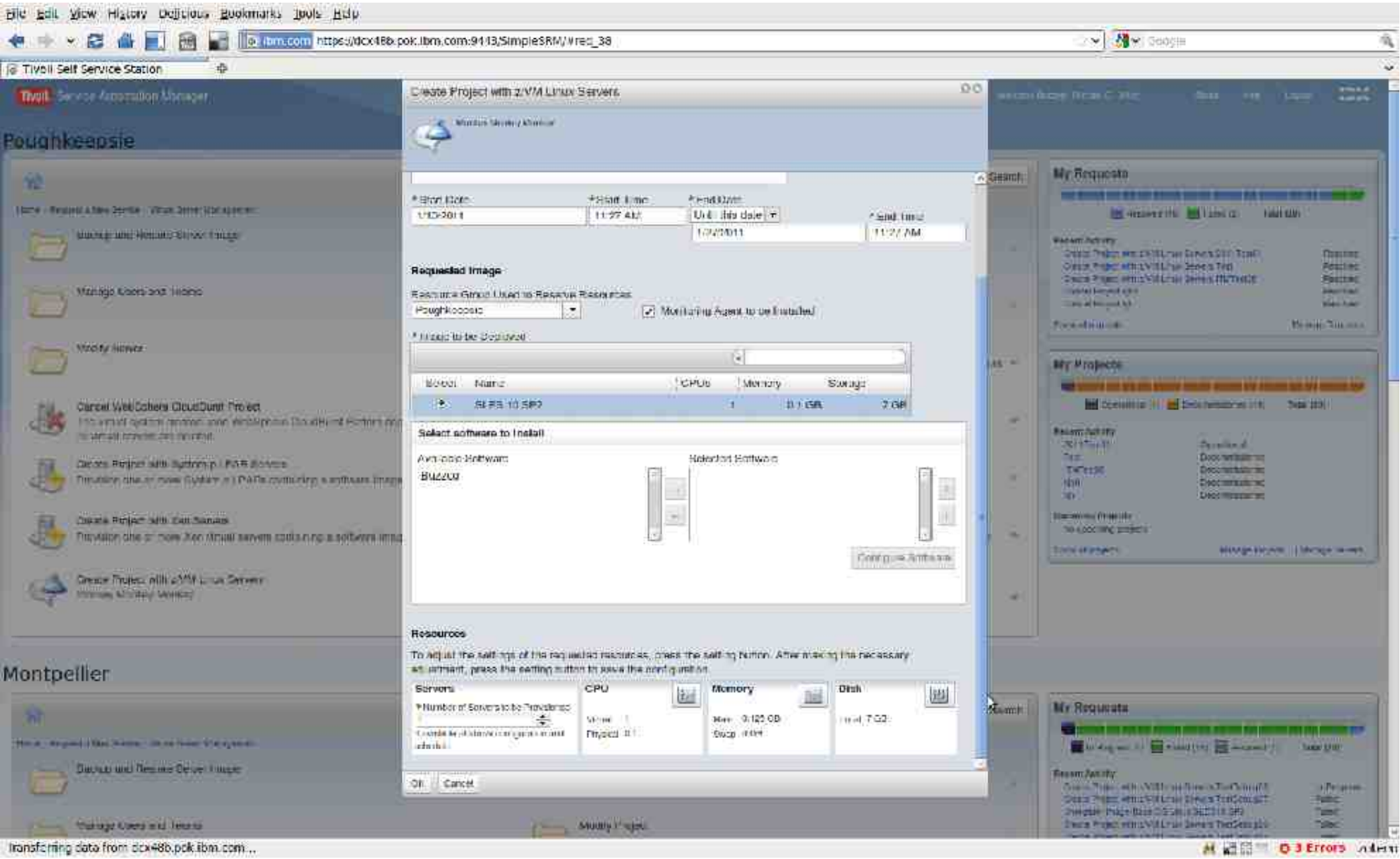
Main Window



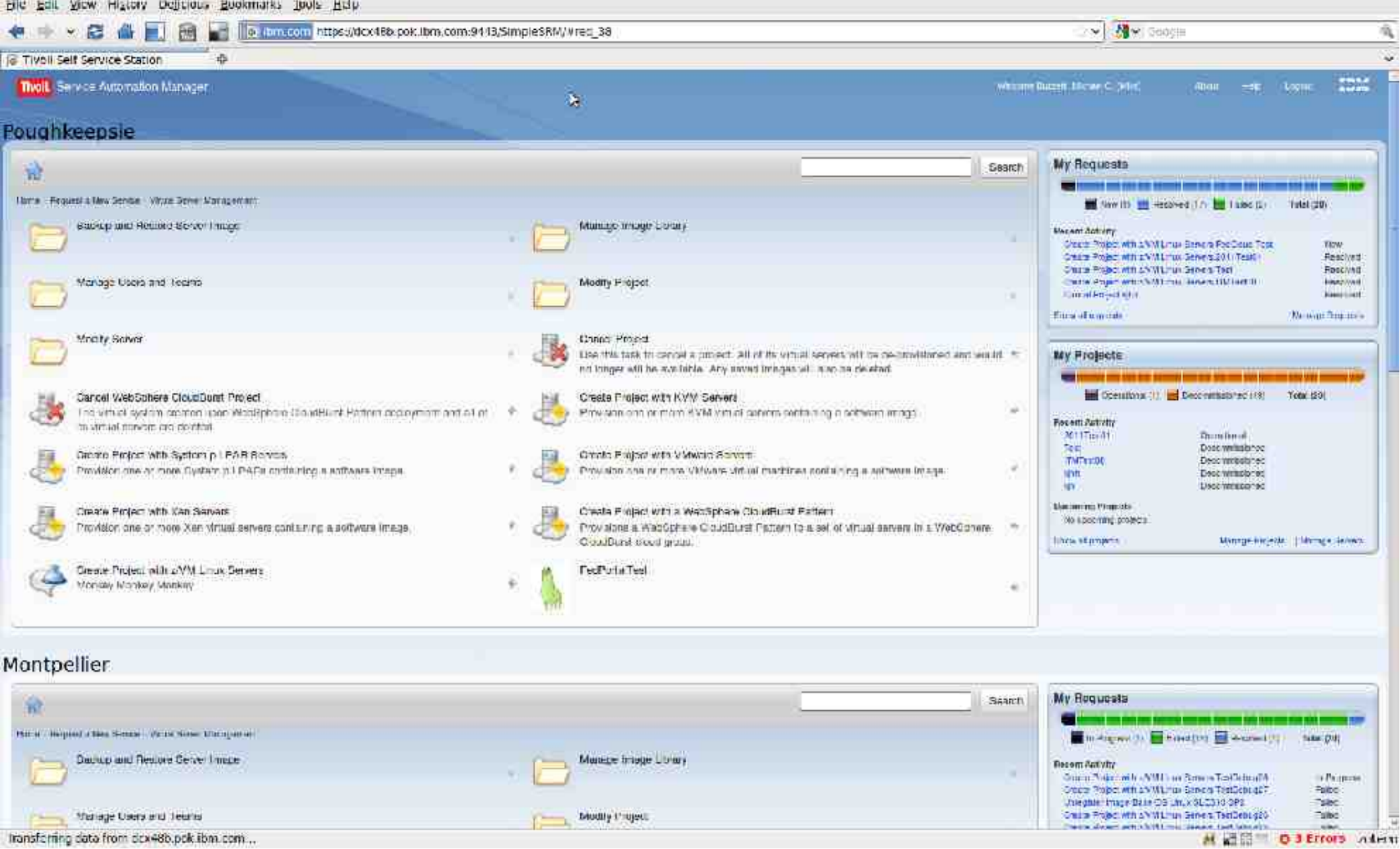
Virtual Server Selection



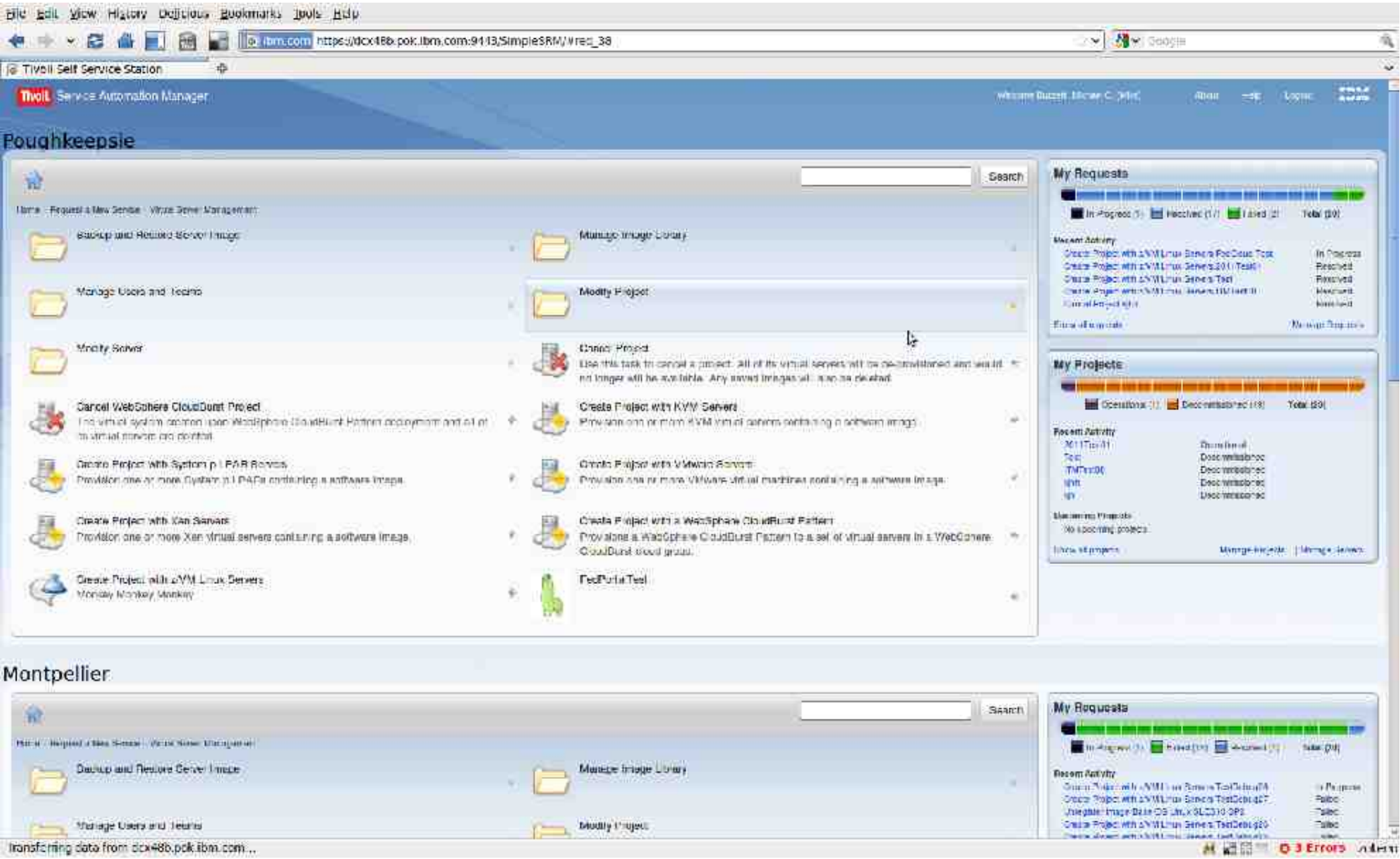
VS Characteristics



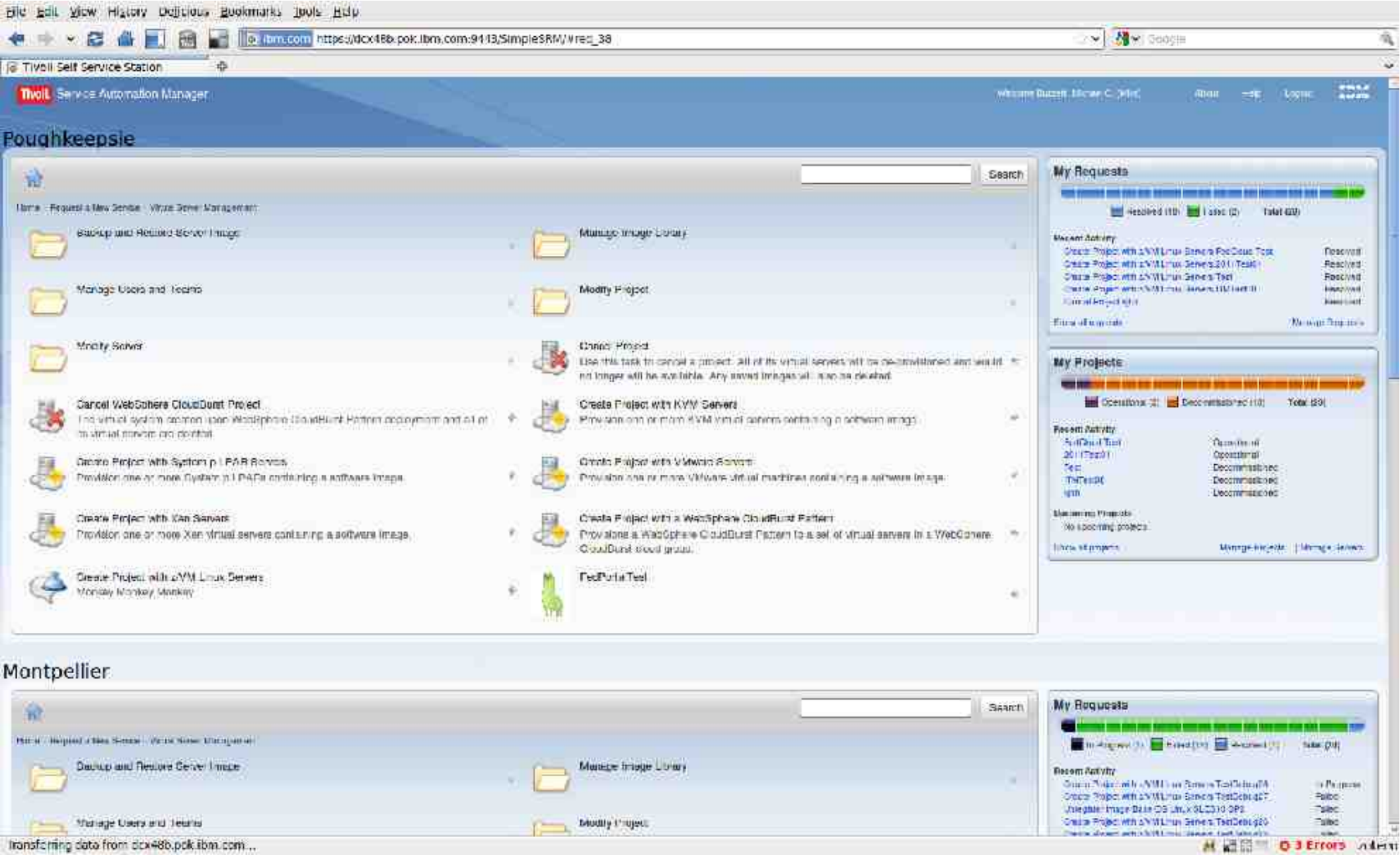
VS Characteristics (cont)



Service Requested


Tivoli Service Automation Manager
Poughkeepsie
Search
My Requests
My Projects
Create Project with KVM Servers
Create Project with a WebSphere CloudBurst Pattern
Create Project with a VM Linux Servers
Montpellier
Search
My Requests
Transferring data from dcx48b.pok.ibm.com...
3 Errors

In Progress


Tivoli Service Automation Manager
Poughkeepsie
Search
My Requests
My Projects
Montpellier
Search
My Requests

Complete !

Your request to start a new Project has been processed

root@localhost to: Michael Buzzetti

Cc: mike.buzzetti

Default custom expiration date: 01/13/2012

Dear Michael C. Buzzetti

You have started a new Project FedCloud Test with the following topology:

The server zlnx03 has been added with the following parameters:
  Hostname of Server: zlnx03
  Number of CPU(s): 1
  Number of tenths of physical CPUs: 1
  Amount of Memory: 128 MB
  Swap Size: 0 GB
  Disk Space Size: 7
  Admin Password:TUjDODI?

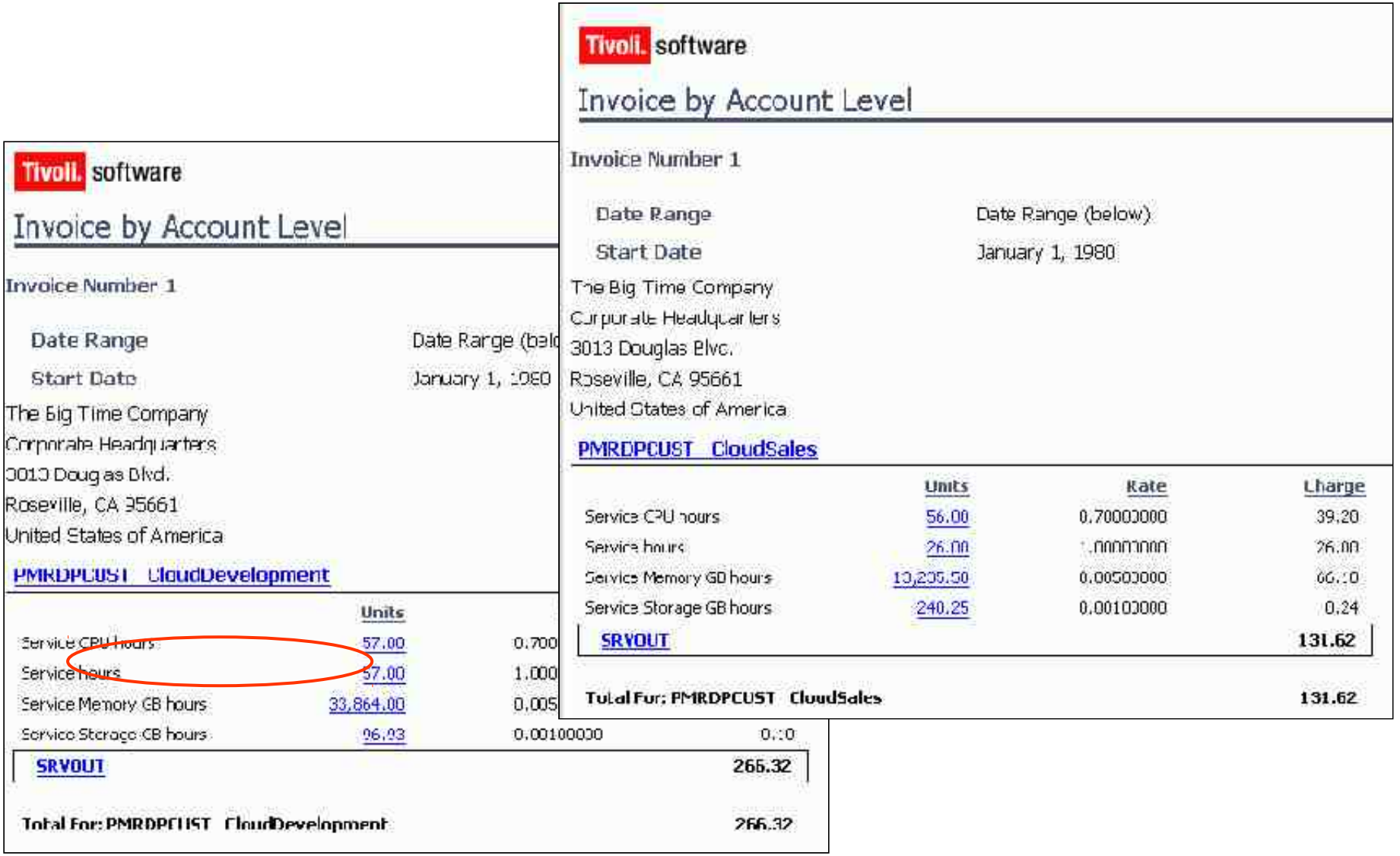
The server zlnx02 has been added with the following parameters:
  Hostname of Server: zlnx02
  Number of CPU(s): 1
  Number of tenths of physical CPUs: 1
  Amount of Memory: 128 MB
  Swap Size: 0 GB
  Disk Space Size: 7
  Admin Password:s?Hx93WM

The user of group 7 has been notified.

Regards,

Your Service Automation Team

Notification


Tivoli. software
Invoice by Account Level
Invoice Number 1
Date Range
Date Range (below)
Start Date
January 1, 1980
The Big Time Company
Corporate Headquarters
3013 Douglas Blvd.
Roseville, CA 95661
United States of America
PMRDPCUST CloudSales
Units
Rate
Charge
Service CPU hours
56.00
0.70000000
39.20
Service hours
26.00
1.00000000
26.00
Service Memory GB hours
10,235.50
0.00500000
66.10
Service Storage GB hours
240.25
0.00100000
0.24
SRVOUT
131.62
Total For: PMRDPCUST CloudSales
131.62
Tivoli. software
Invoice by Account Level
Invoice Number 1
Date Range
Start Date
The Big Time Company
Corporate Headquarters
3013 Douglas Blvd.
Roseville, CA 95661
United States of America
PMRDPCUST CloudDevelopment
Units
Service CPU hours
57.00
Service hours
57.00
Service Memory GB hours
33,864.00
Service Storage GB hours
96.03
0.00100000
SRVOUT
265.32
Total For: PMRDPCUST CloudDevelopment
266.32

Metering

Tivoli. software

Invoice Detail

SRVOUT for PMRDPCUST CloudSales by DEPLOYMENT_INSTANCE

Start Date January 1, 1980 End Date

DEPLOYMENT_INSTANCE		805 - Service hours	806 - Service CPU hours	807 - Service Memory GB hours	808 - Service Storage GB hours
Big Splash Campaign Appservers	11/14/2011	24.00	48.00	12,288.00	240.00
	Total	**24.00**	**48.00**	**12,288.00**	**240.00**
Client Demo	11/14/2011	2.00	8.00	947.50	0.25
	Total	**2.00**	**8.00**	**947.50**	**0.25**
Total		**26.00**	**56.00**	**13,235.50**	**240.25**

Metering (Detail)

Tivoli. software

Top 10 Cost

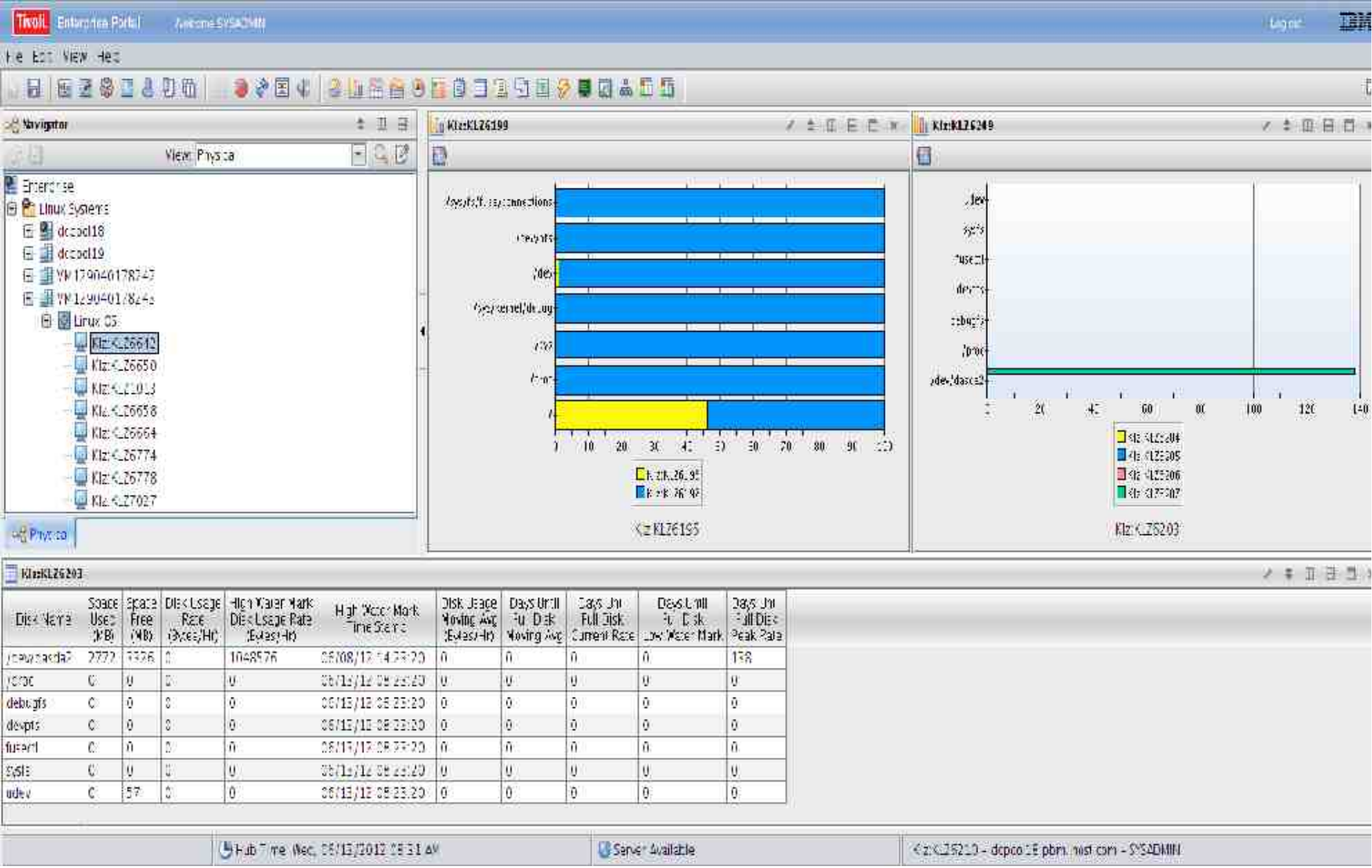
Lowest Possible Account - Highest Possible Account

Date Range Date Range (below)

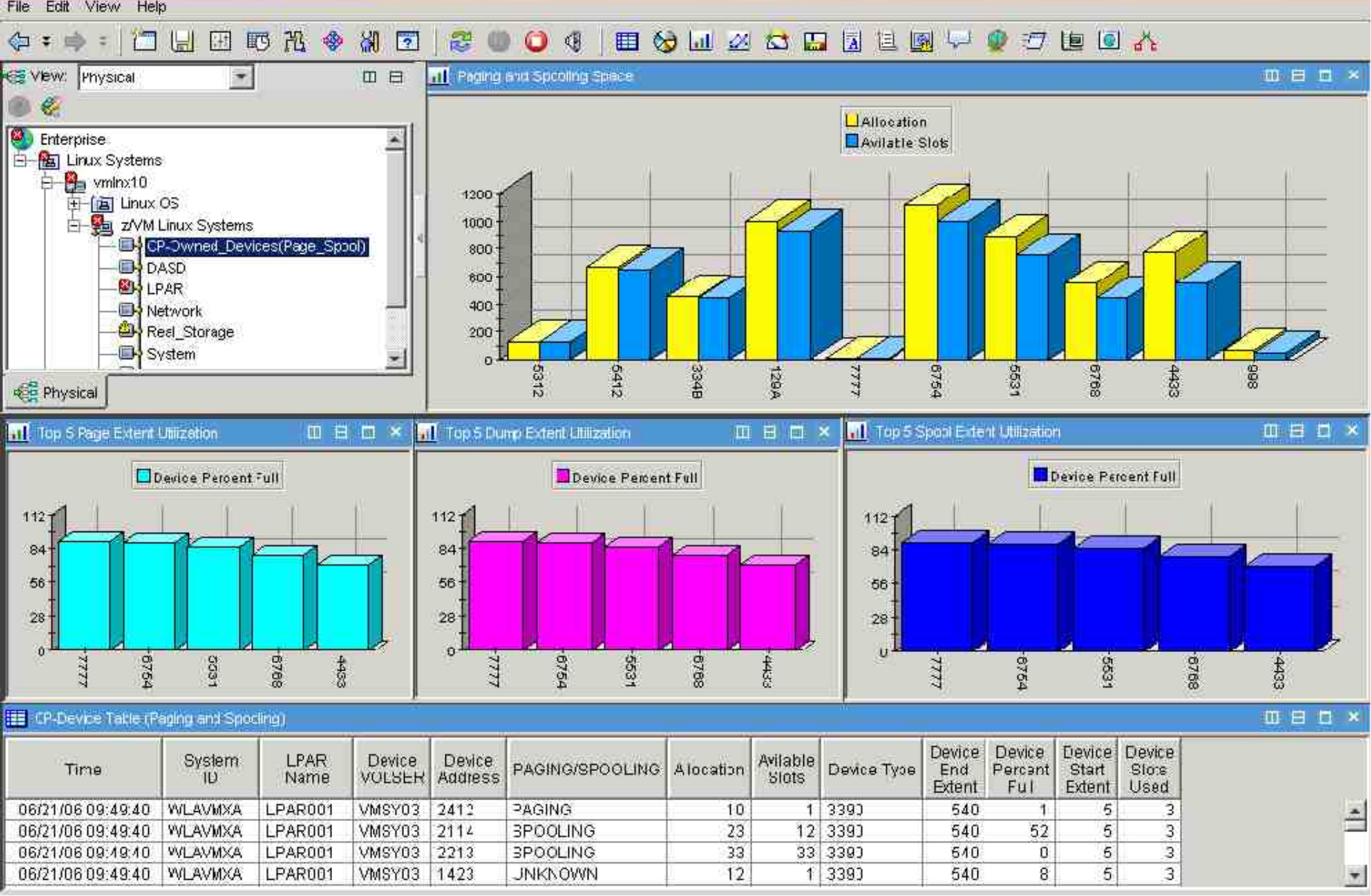
Start Date January 1, 1980 **End Date** November 24, 2011

Account Code		Percentage	Charges	
⊟ PMRDPCUST CloudDevelopment		34.27%	266.32	PMRDPCUST CloudDevelopment Invoice
	Service Memory GB hours	63.58%	169.32	
	Service hours	21.40%	57.00	
	Service CPU hours	14.98%	39.90	
	Service Storage GB hours	0.04%	0.10	
⊞ PMRDPCUST CloudFinance		18.33%	142.42	PMRDPCUST CloudFinance Invoice
⊞ PMRDPCUST - PMRDPCUST Account Code		17.31%	134.50	PMRDPCUST Invoice
⊞ PMRDPCUST CloudSales		16.94%	131.62	PMRDPCUST CloudSales Invoice
⊞ PMRDPCUST CloudMarketing		13.16%	102.28	PMRDPCUST CloudMarketing Invoice
Run Total			**777.14**	

Metering (Top 10)



Monitoring (ITM)



Time	System ID	LPAR Name	Device VOLSER	Device Address	PAGING/SPOOLING	Allocation	Available Slots	Device Type	Device End Extent	Device Percent Full	Device Start Extent	Device Slots Used
06/21/06 09:49:40	WLAVMXA	LPAR001	VMSY03	2412	PAGING	10	1	3390	540	1	5	3
06/21/06 09:49:40	WLAVMXA	LPAR001	VMSY03	2114	SPOOLING	23	12	3390	540	52	5	3
06/21/06 09:49:40	WLAVMXA	LPAR001	VMSY03	2213	SPOOLING	33	33	3390	540	0	5	3
06/21/06 09:49:40	WLAVMXA	LPAR001	VMSY03	1423	UNKNOWN	12	1	3390	540	8	5	3

Monitoring (OM XE)

Getting Started

Homogenization to Enable Cloud

Reduce

- Number of supported Operating Systems
- Number of configuration for patch and change management
- Number of supported middleware versions

Chargeback and Process

Are enterprise IT consumers customers of the IT Dept?

Is procurement done on individual machines?

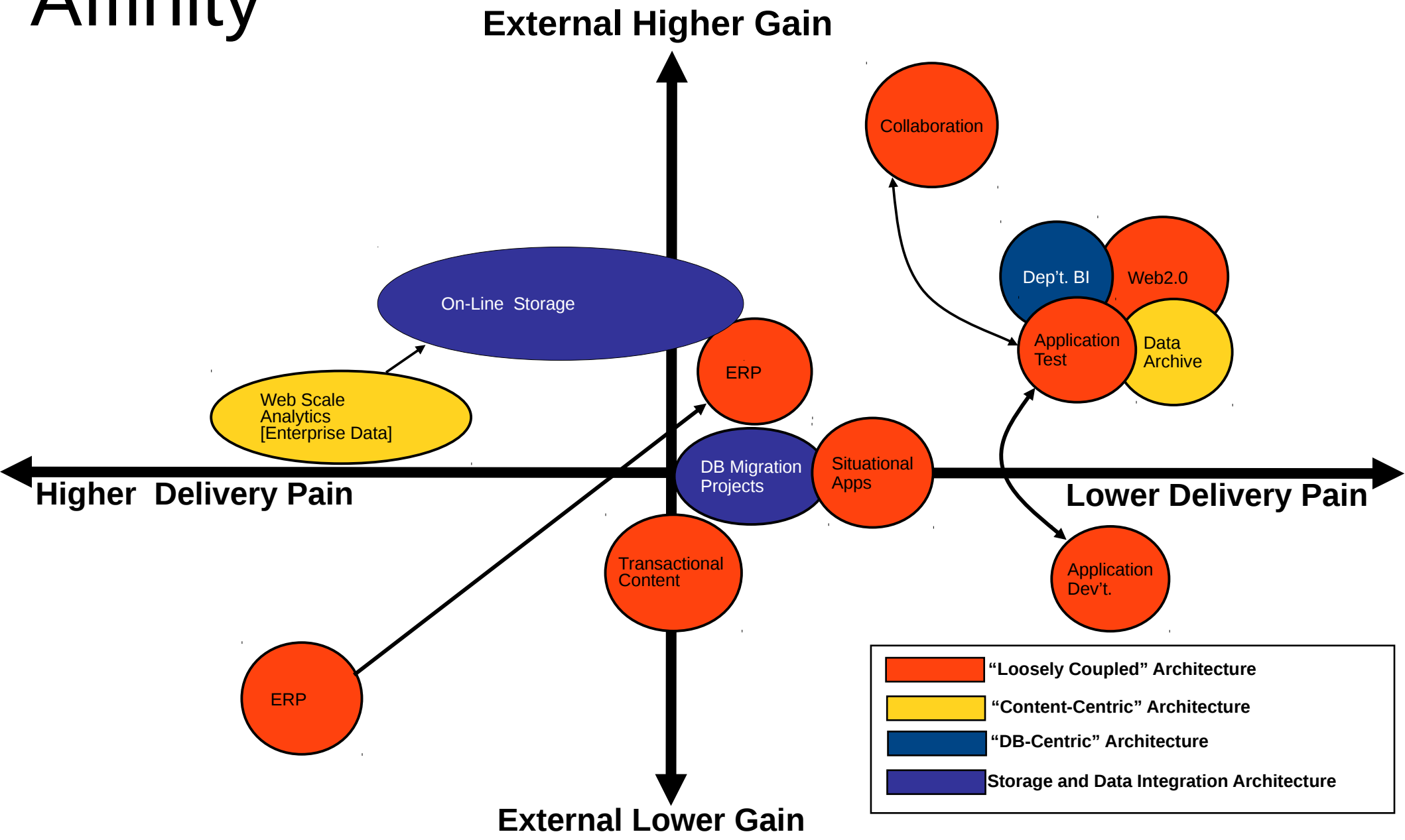
How is procurement and charging done on multi-tenant machines?

Support model: often full access is allowed on cloud servers. This is a security and process constraint.

Is there a multi-tenant utilization model?

How is procurement and charging done on multi-tenant machines?

Mapping Workloads to Architectural Affinity



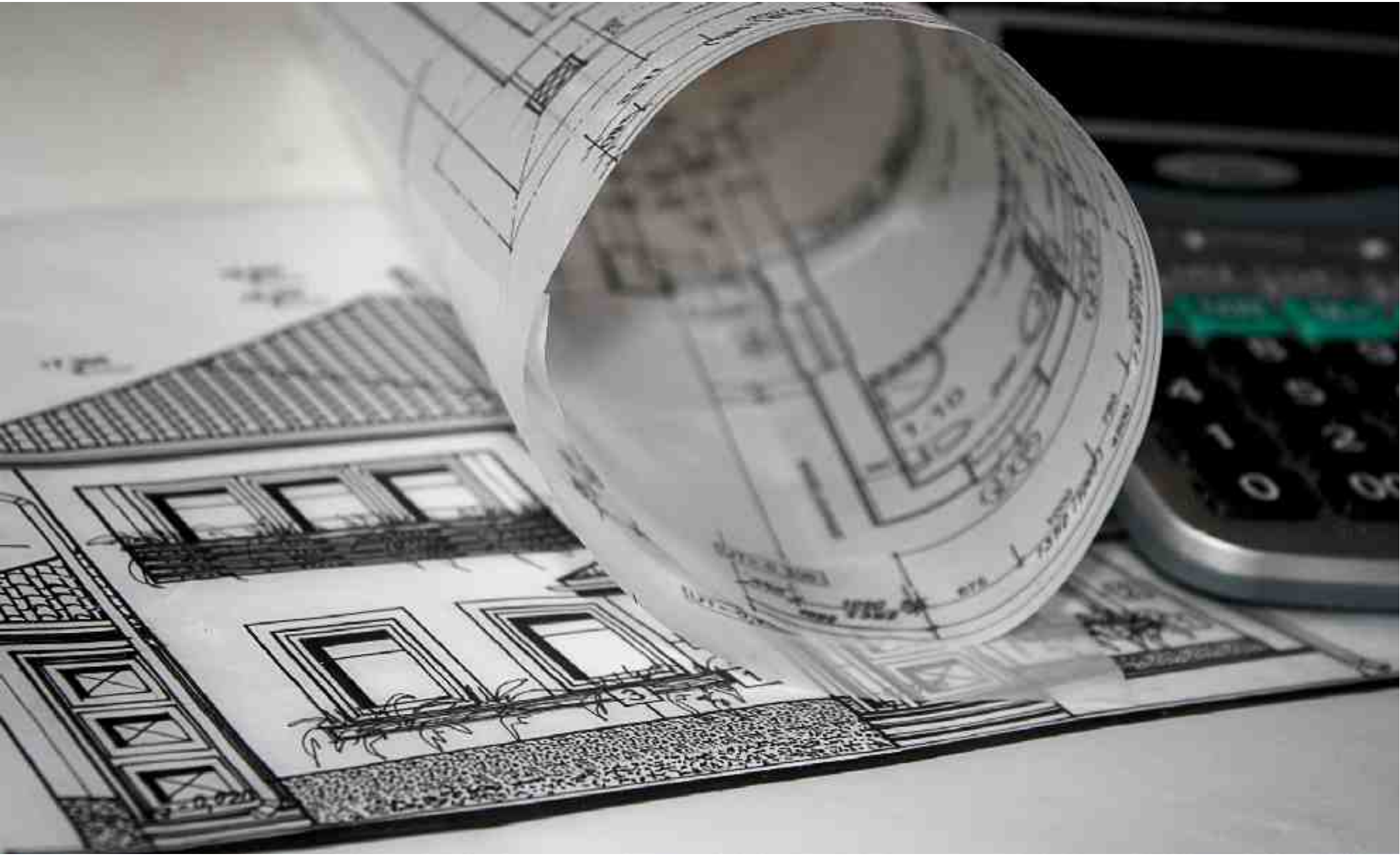
Optimal environments for Cloud

- Development, Test, and QA
- Hadoop / Map Reduce nodes
- On the production side:
  - Software as a Service
  - SOA Applications
- Lightweight Internally supported applications
  - Wiki
  - Blogs
  - Etc.

Buy or build ?

Define Service Catalog

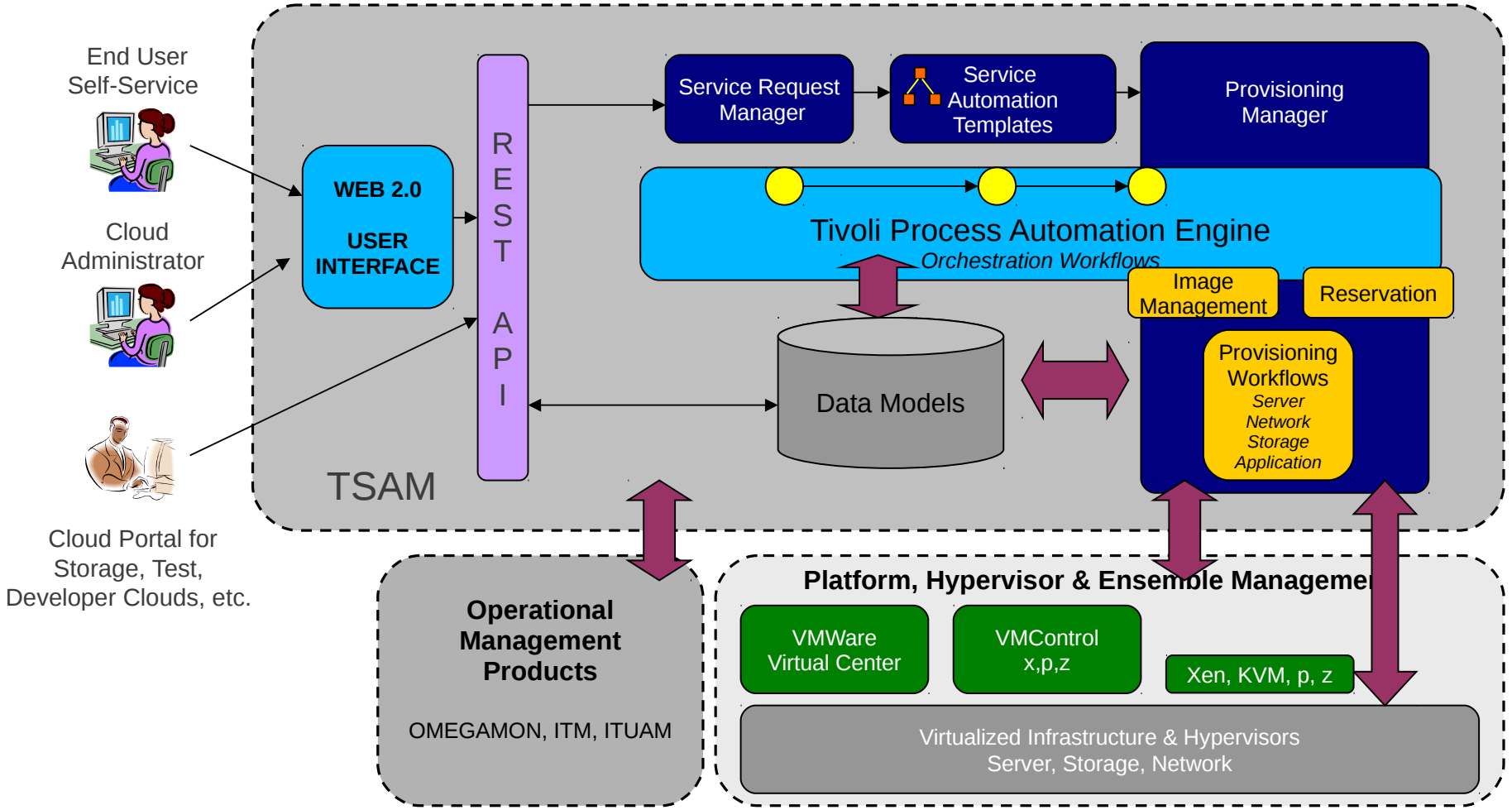
Define your SLA



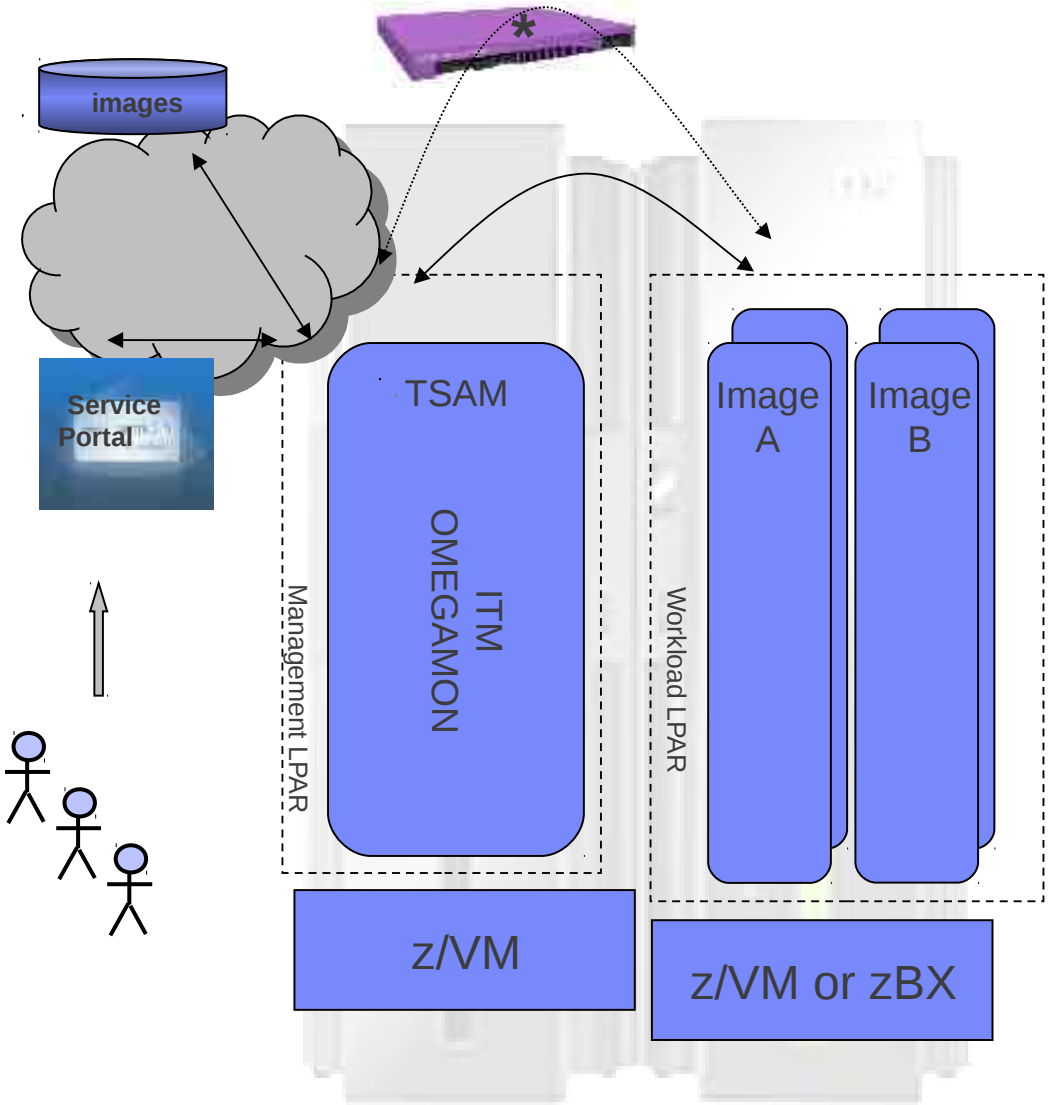
Business Plan

Know your costs

Converged service delivery platform for cloud computing



The management services from Tivoli

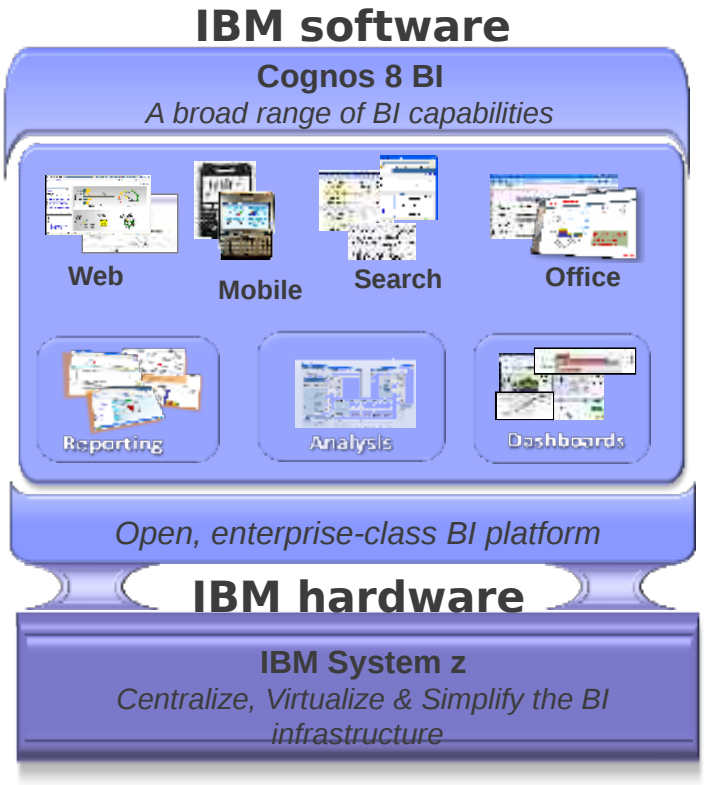


- Management from LPAR for rapid provisioning/de-provisioning and services lifecycle management
- The workload LPAR supports the customer defined cloud images
  - Linux & z/OS support under z/VM
  - A sample workload is provided
- WS Cloudburst appliance can be used for rapid provisioning of best practice WebSphere workloads

Architecture overview

A private cloud optimized for analytic services in large enterprises

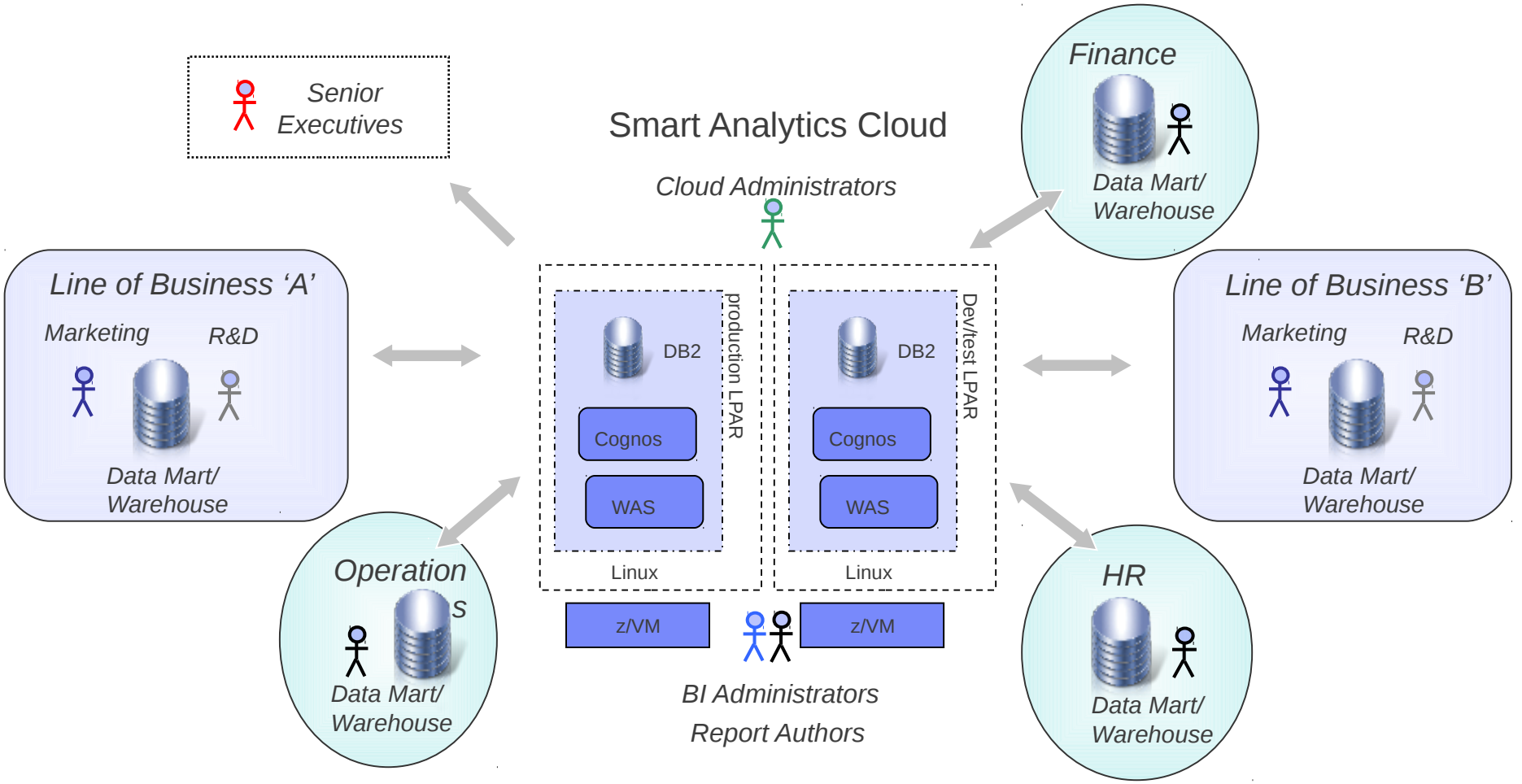
	Defined as …	To create…	That delivers …
Smart Analytics Cloud	IBM Smart Business - services with industry leading hardware & software	A private cloud computing solution for business intelligence (BI) & analytics	A services solution for delivering business intelligence to the entire organization



IBM Services

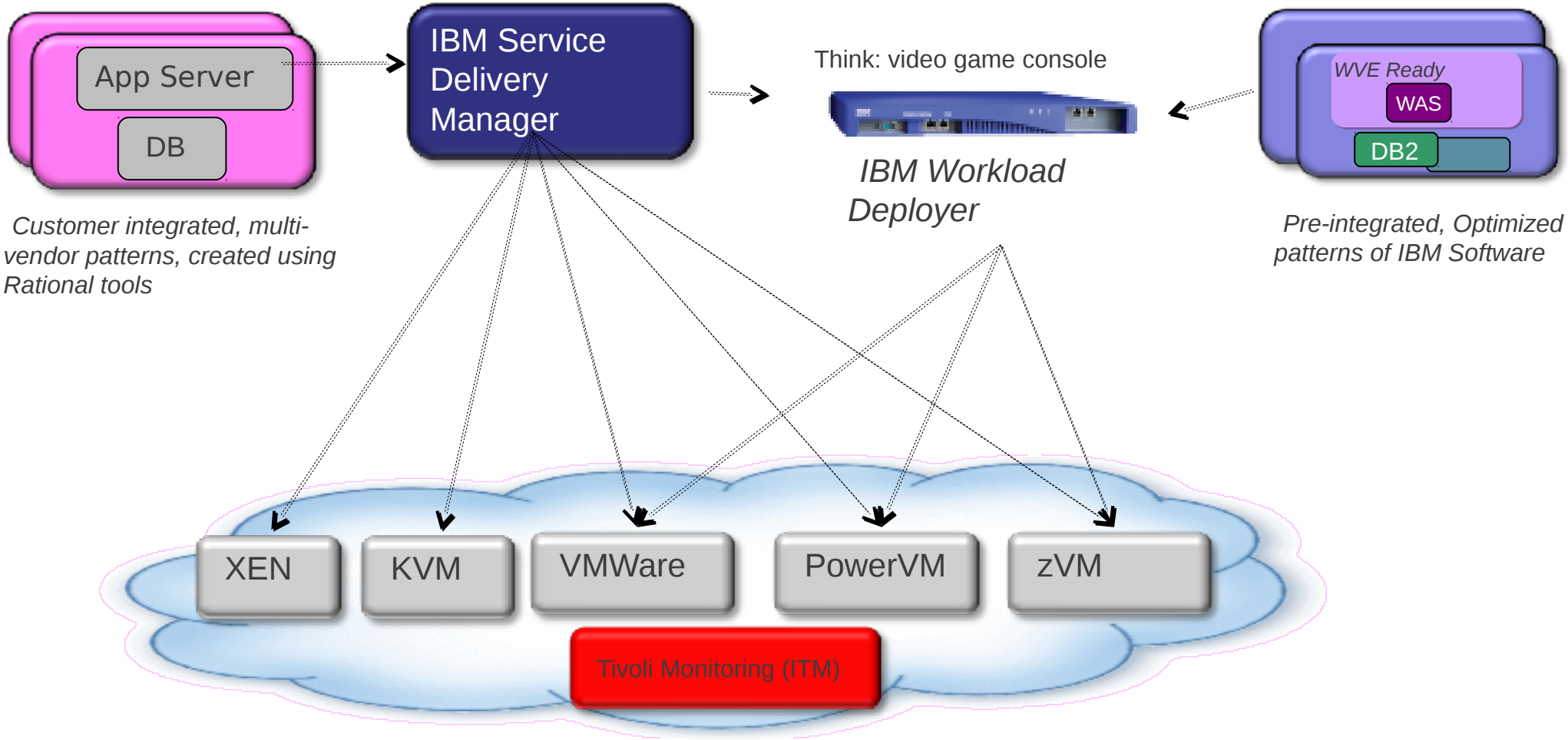
- Create awareness of BI and understand the needs for a BI strategy across the organization
- Complete a readiness assessment to define the scope and priorities for the solution
- Deploy Cognos 8 BI for Linux on System z as a private cloud
- Provide the skills for the on going management & expansion of their BI private cloud deployment

Smart Analytics Cloud



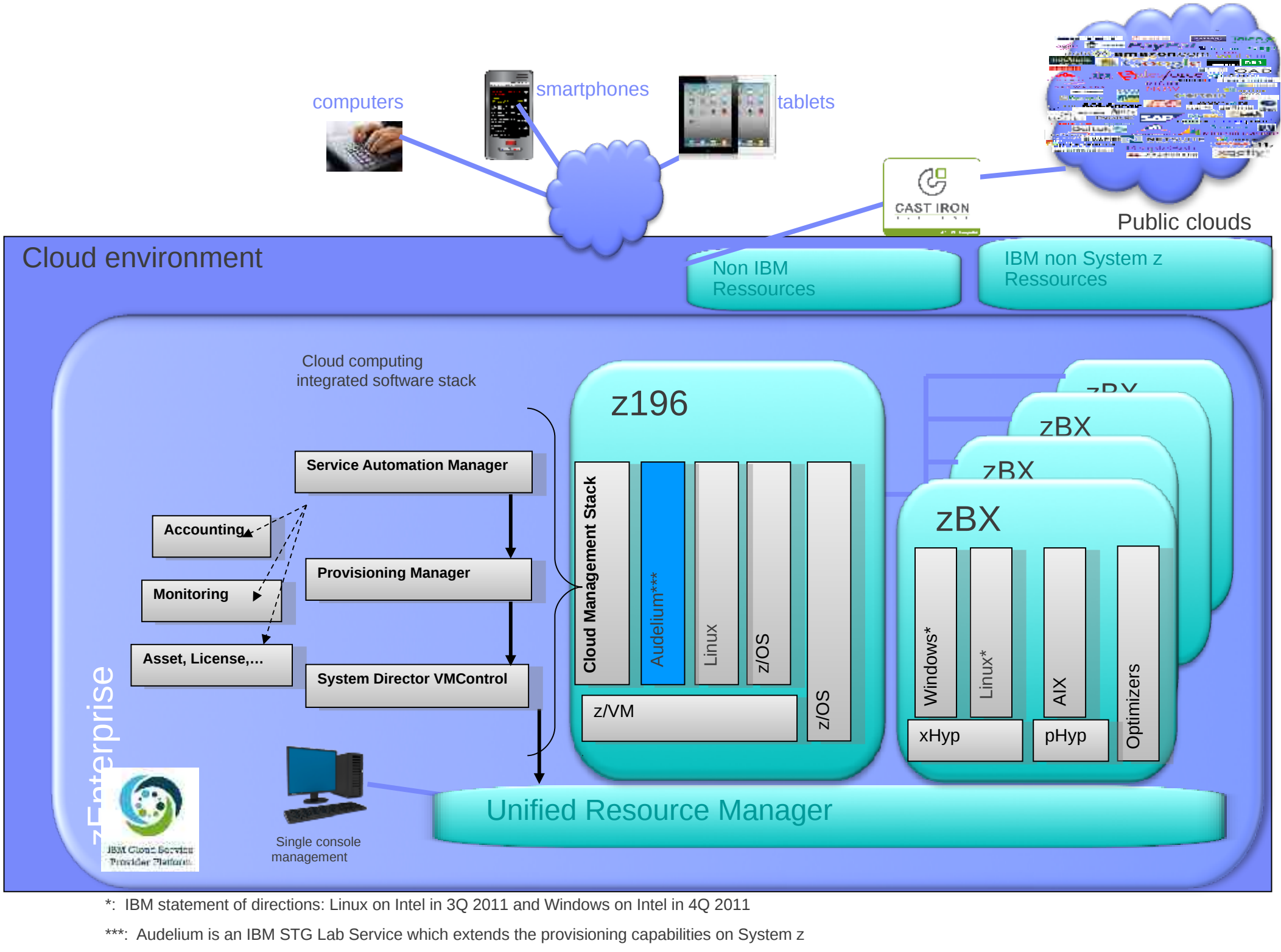
This offering transforms the delivery of business intelligence and performance management into a service that is readily available and affordable to corporate users.

Smart Analytics Cloud



- IBM Service Delivery Manager (ISDM) provides service automation management across the enterprise
- ISDM provides automation and standardization for multi-vendor solutions across major hypervisors
- IBM Workload Deployer delivers pre-integrated & optimized middleware patterns deployable to VMware (Linux), System p (AIX), and System z (z/Linux)

Standardization & Automation

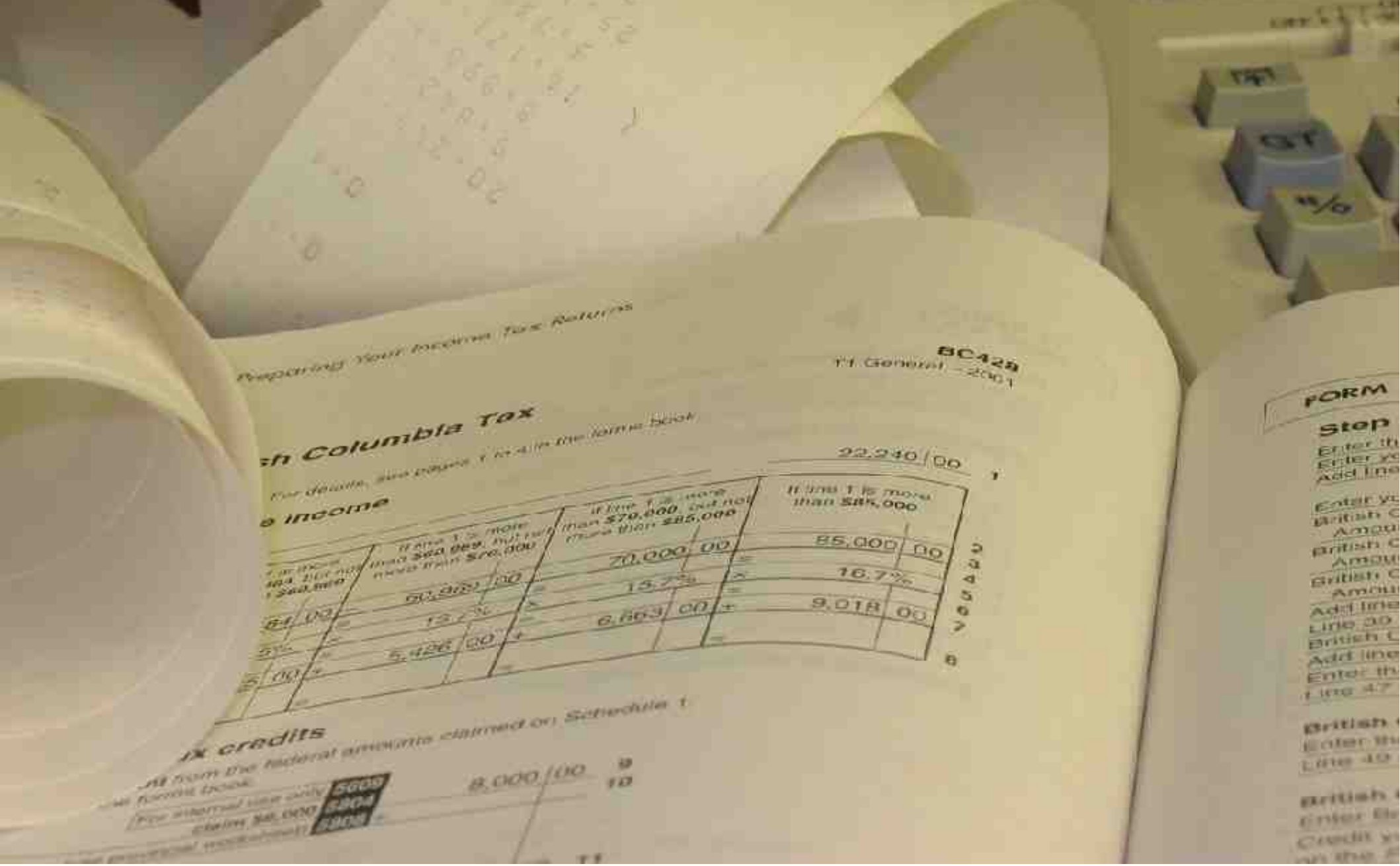


*: IBM statement of directions: Linux on Intel in 3Q 2011 and Windows on Intel in 4Q 2011

***: Audelium is an IBM STG Lab Service which extends the provisioning capabilities on System z

Questions??

Barriers to Adoption


Preparing Your Income Tax Returns
BC425
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85,000 00
16.7%
9,018 00
70,000 00
15.7%
6,563 00
ix credits
8,000 00

Compliance

Budgeting

Reliability

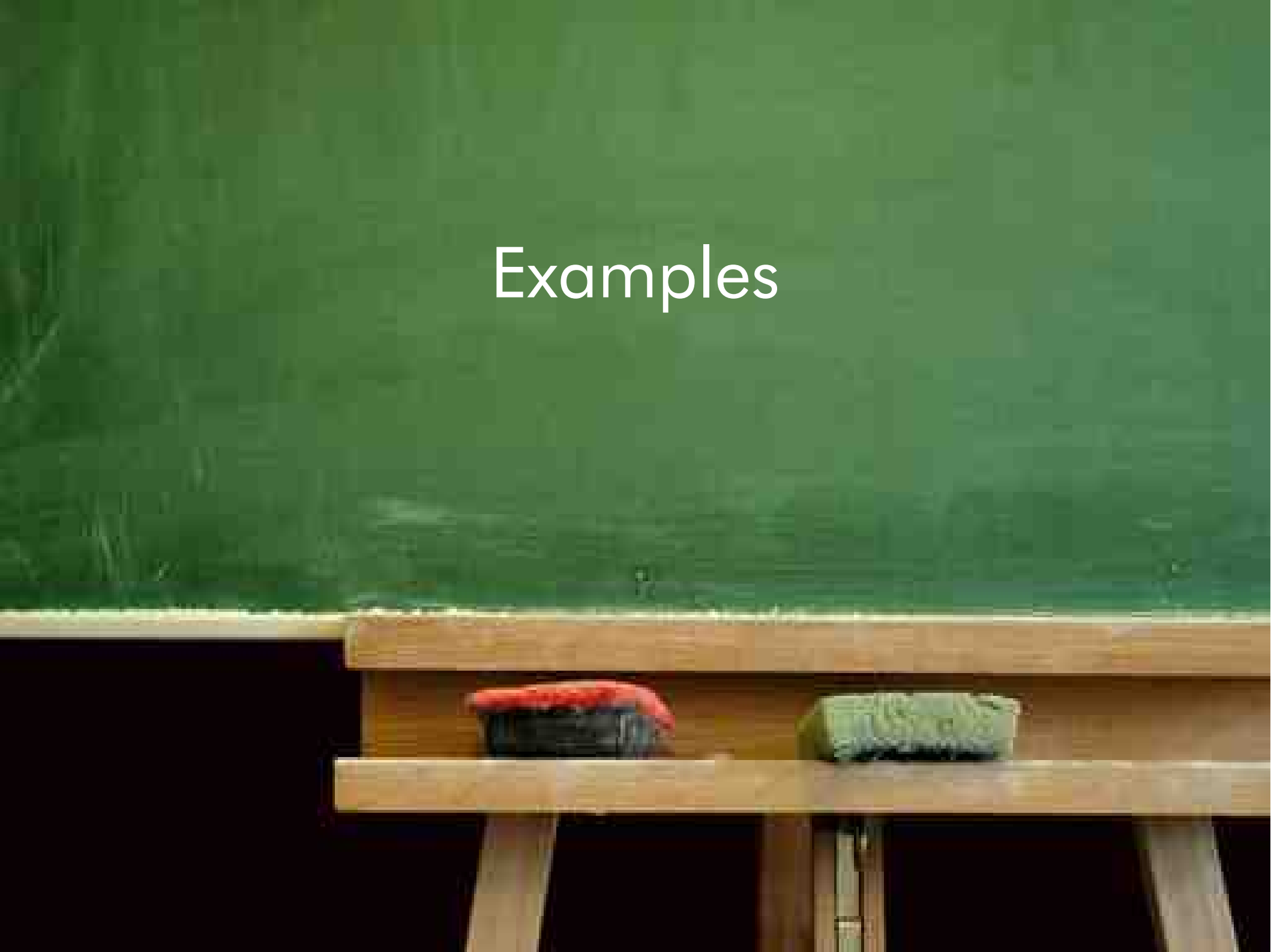
Security

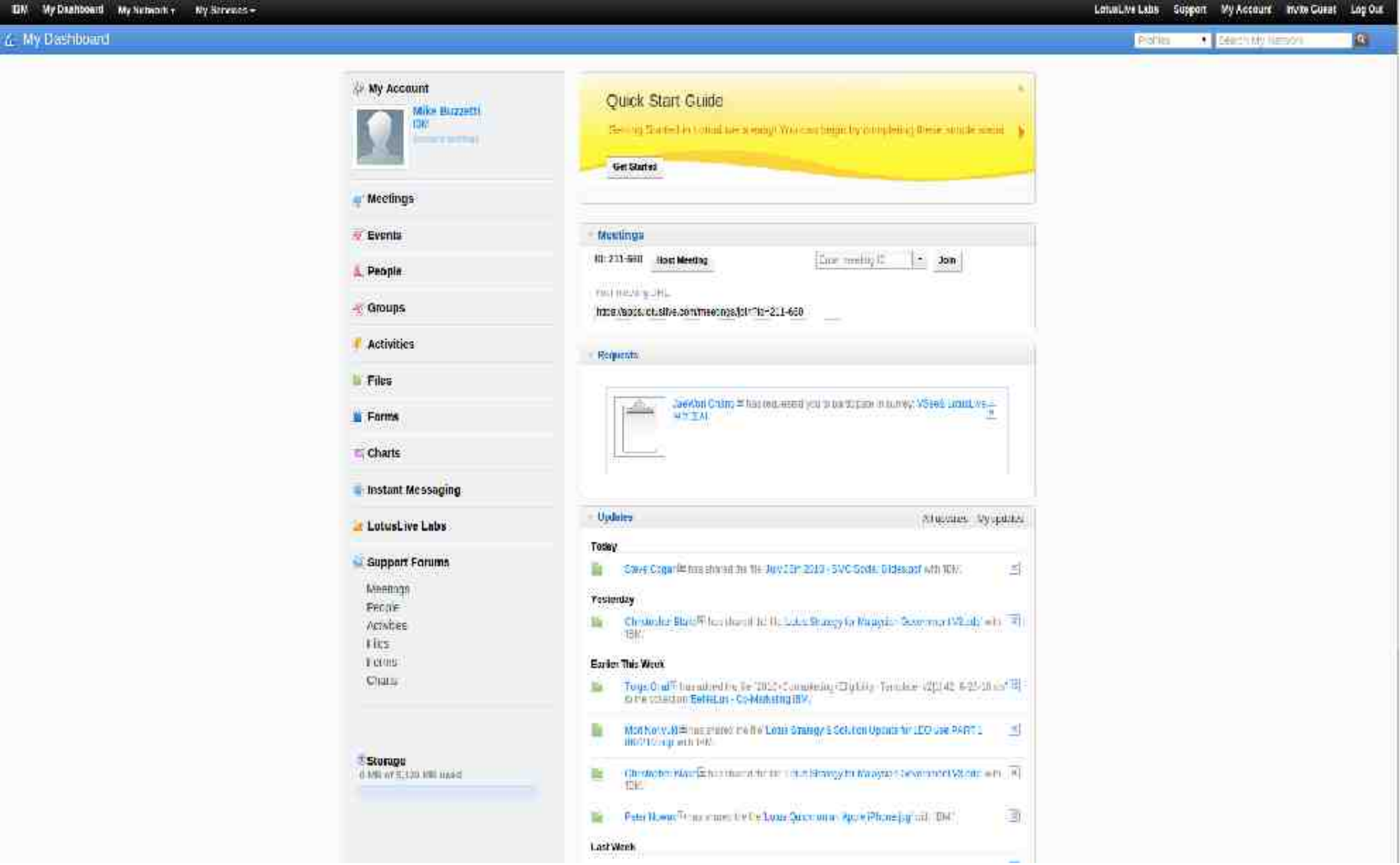
It's New

It's Magic

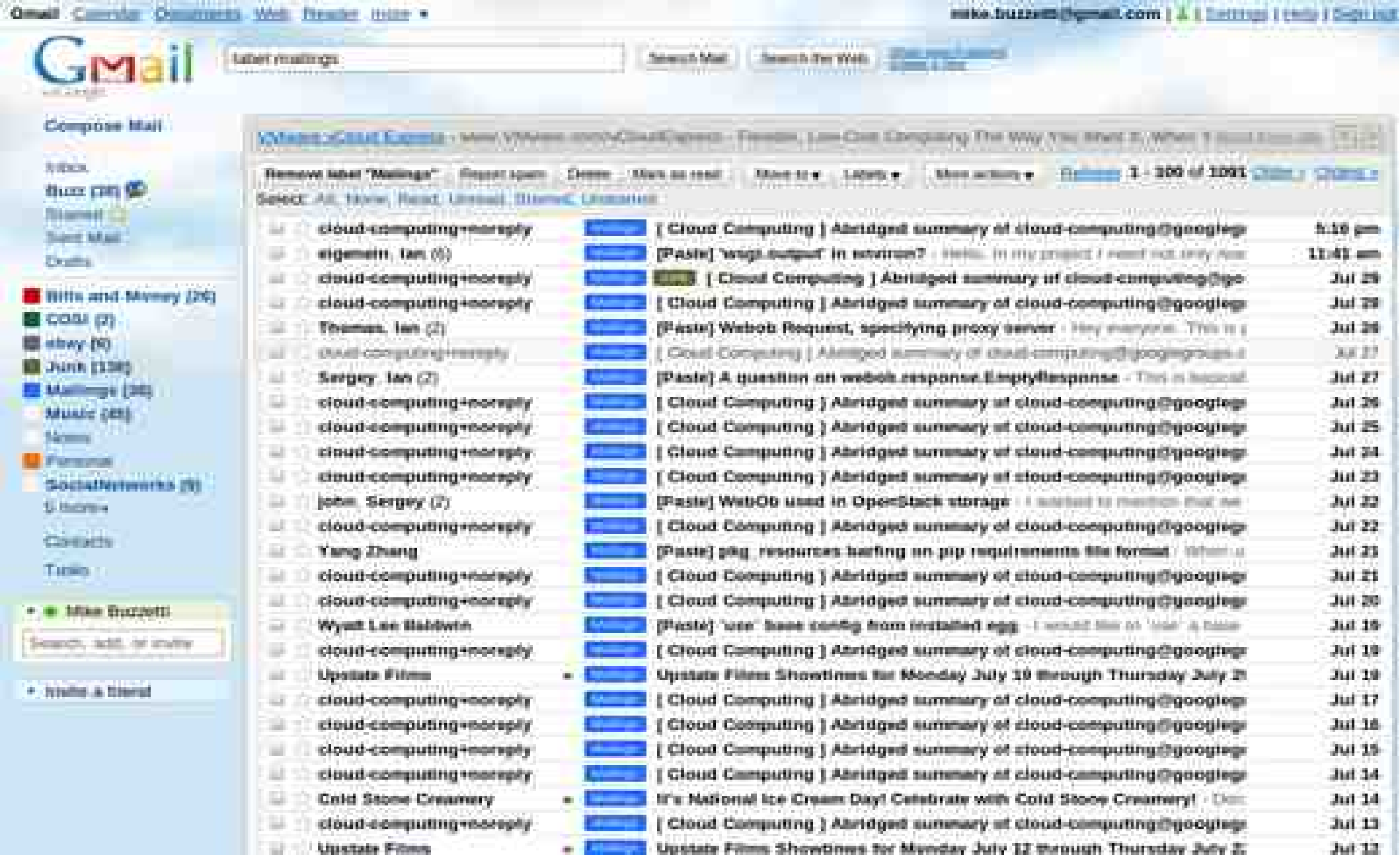
My two cents

Backup

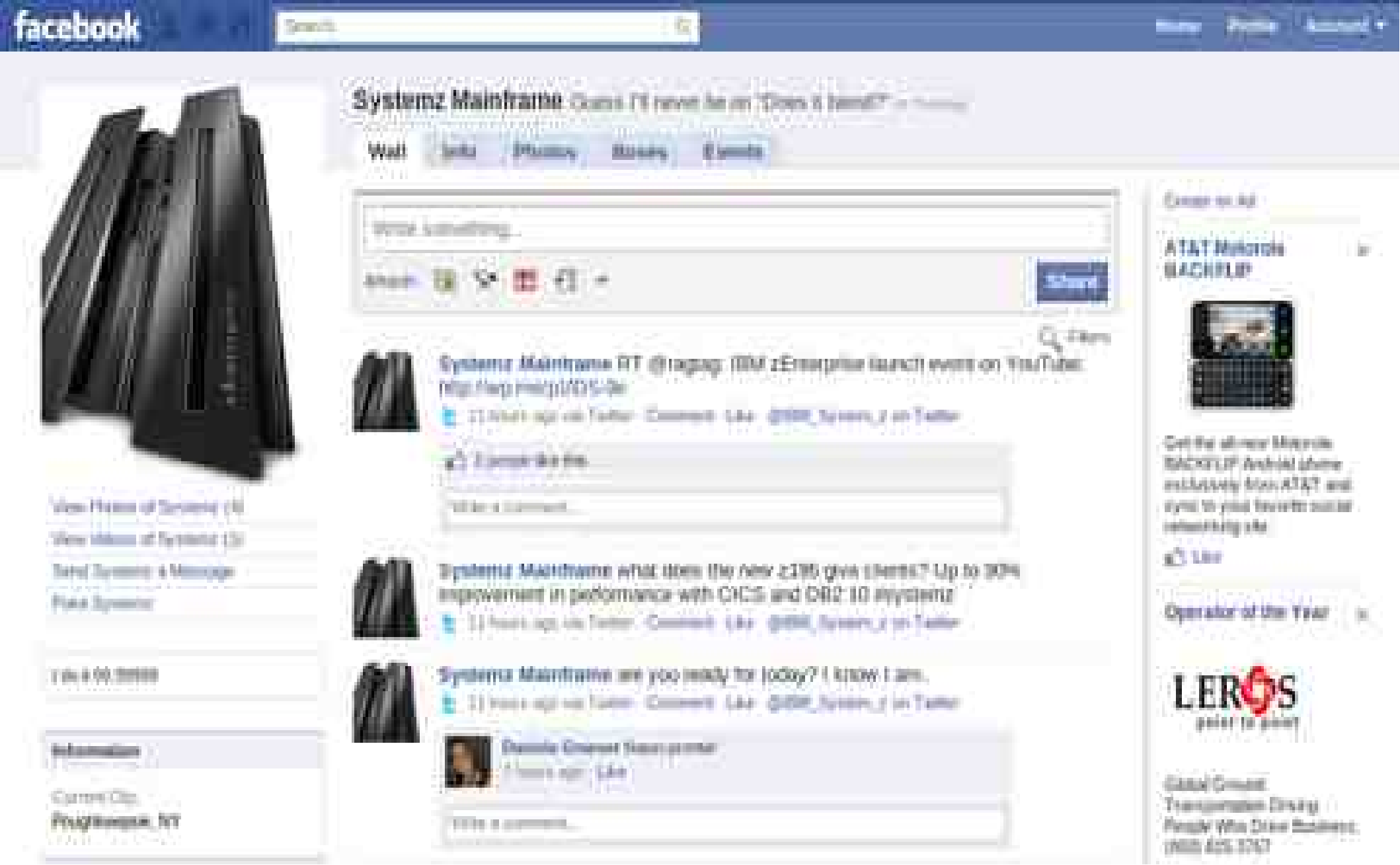

Examples


IBM
My Dashboard
My Network
My Services
LotusLive Labs
Support
My Account
Invite Guest
Log Out
My Dashboard
Profiles
Search My Network
My Account
Mike Buzzetti
IBM
Meetings
Events
People
Groups
Activities
Files
Forms
Charts
Instant Messaging
LotusLive Labs
Support Forums
Meetings
People
Activities
Files
Forms
Charts
Storage
Quick Start Guide
Get Started
Meetings
Host Meeting
Join
Requests
Updates
All updates
My updates
Today
Yesterday
Earlier This Week
Last Week

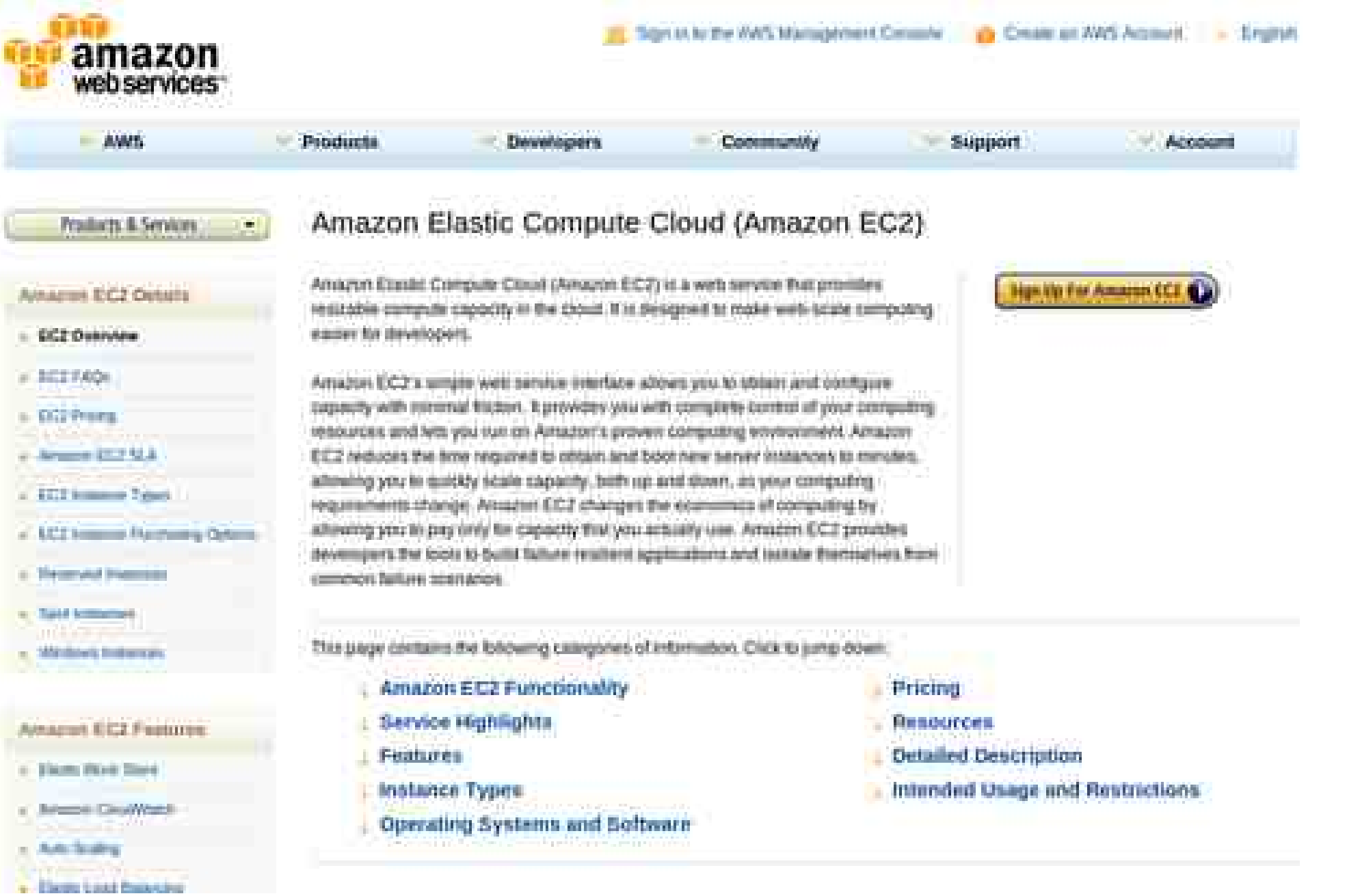
Lotus Live


Gmail
Compose Mail
Inbox
Buzz (28)
Starred
Sent Mail
Drafts
Bills and Money (26)
COSI (2)
ebay (6)
Junk (138)
Mailings (36)
Music (85)
Notes
Personal
SocialNetworks (9)
Contacts
Tasks
Mike Buzzetti
Invite a friend
Remove label "Mailings"
Delete
Mark as read
Move to
Labels
More actions
Select: All, None, Read, Unread, Starred, Unstarred
cloud-computing+noreply
[Cloud Computing] Abridged summary of cloud-computing@googlegr
5:19 pm
eigenein, Ian (6)
[Paste] 'wsgi.output' in environ?
11:41 am
Thomas, Ian (2)
[Paste] Webob Request, specifying proxy server
Jul 28
Sergey, Ian (2)
[Paste] A question on webob.response.EmptyResponse
Jul 27
[John, Sergey (2)
[Paste] WebOb used in OpenStack storage
Jul 22
Yang Zhang
[Paste] pkg_resources barfing on pip requirements file format
Jul 21
Wyatt Lee Baldwin
[Paste] 'use_base_config from installed egg
Jul 19
Upstate Films
Upstate Films Showtimes for Monday July 19 through Thursday July 2
Jul 16
Cold Stone Creamery
It's National Ice Cream Day! Celebrate with Cold Stone Creamery!
Jul 14
Upstate Films
Upstate Films Showtimes for Monday July 12 through Thursday July 2
Jul 12

Gmail

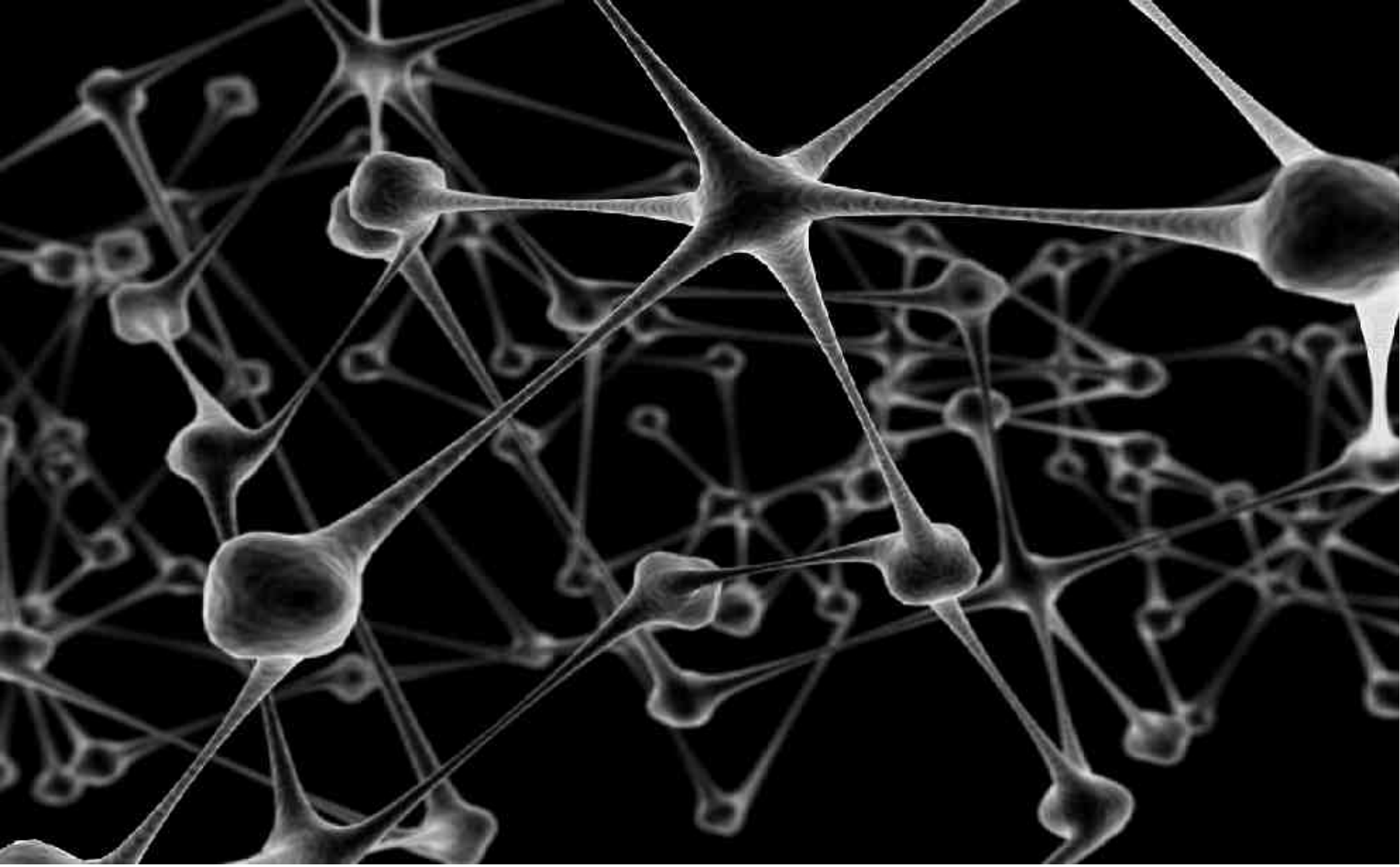

facebook
Systemz Mainframe
Wall
Systemz Mainframe RT @ragpg: IBM zEnterprise launch event on YouTube:
Systemz Mainframe what does the new z196 give clients? Up to 30% improvement in performance with CICS and DB2 10 #systemz
Systemz Mainframe are you ready for today? I know I am.
LEROS
point to point

Facebook


amazon web services
Sign in to the AWS Management Console
Create an AWS Account
English
AWS
Products
Developers
Community
Support
Account
Products & Services
Amazon EC2 Details
EC2 Overview
Amazon EC2 Features
Amazon Elastic Compute Cloud (Amazon EC2)
Sign Up for Amazon EC2
This page contains the following categories of information. Click to jump down:
Amazon EC2 Functionality
Service Highlights
Features
Instance Types
Operating Systems and Software
Pricing
Resources
Detailed Description
Intended Usage and Restrictions

Amazon EC2

Building Blocks



Virtualization

Service Management

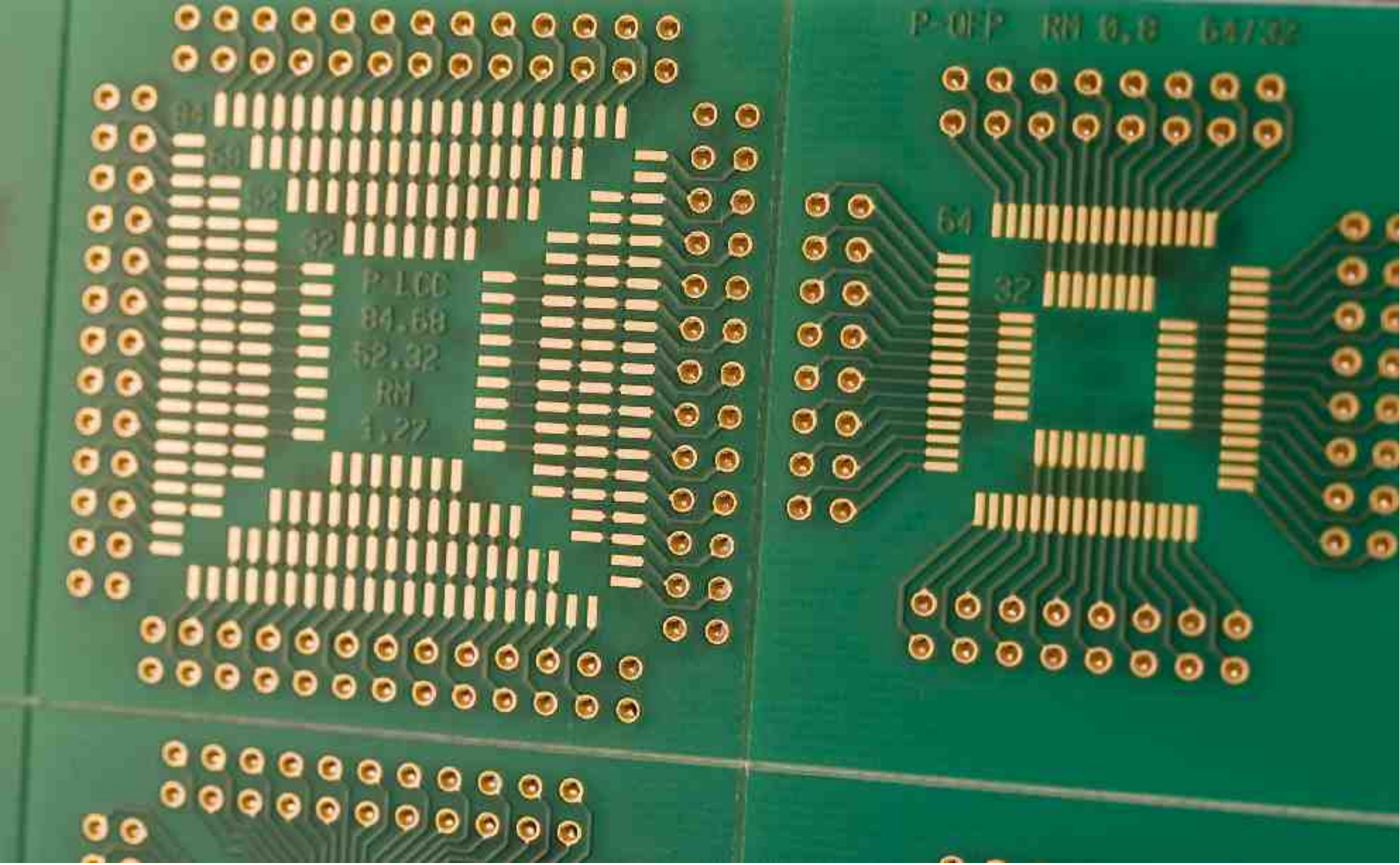
Web 2.0

How is it different ?

Delivery Model

Interface Model

Business Model



Technical Model

Customization


Cloud Computing

This is me. I am here to help. I include this chart so that people can have my email.

The reason I created this presentation is based on the past few years working with customers. Helping them understand that there is a lot of virtualization out there.

Although I might look young, I have been in the IT field for almost 15 years. Virtualization has been a core technology for me for most of it.

IBM Design Centers – architect innovative solutions for our clients and leverage the latest technologies to accelerate their IT transformation

- The IBM World-Wide Design Centers comprise certified IT architects and specialists using state-of-the-art methodologies and technologies in the IBM portfolio.
- We work with global clients and business partners to design and architect advanced IT infrastructure solutions.
- Proven strategies and best-practices through years of experience.
- IBM understands that achieving real business results requires an open, integrated and adaptive infrastructure that provides a scalable, available, secure and energy-efficient environment.

Welcome to Poughkeepsie, New York

Technology Focus Areas

Worldwide Design Centers

Helping our clients realize the full value of IBM technology solutions

Smart Analytics

- Advanced Analytics & Optimization Services help clients achieve their business objectives faster, with less risk and lower costs, by enhancing organizational performance through advanced data analytics and optimization techniques.

Cloud Computing

- IBM provides a breadth of cloud workload solutions for your IT infrastructure including analytics, collaboration, development and test, desktop and devices, infrastructure, storage and business services.

Smarter Computing

- IBM provides a complete portfolio of solutions and services that integrate your business and IT infrastructures, while taking a smarter, more streamlined approach to improve service, reduce cost, and manage risk.

Workload Optimized Systems

- Different types of workloads have unique needs and run more purposefully and enable higher levels of client value when matched with the optimal IT resources. IBM offers a range of workload optimized systems.

Integrated Service Management

- Only Integrated Service Management provides the software, systems, best practices and expertise needed to manage infrastructure, people and processes—across the entire service chain—in the data center, across design and delivery.

Systems Storage

- Bringing together infrastructure management, virtualization and productivity software, IBM System Storage™ systems deliver innovative disk, tape and storage networking solutions.

4

The IBM Design Center Cloud on System z Workshop is a 1-2 day engagement which enables a business build a high level design and plan for a system z cloud. It will leverage the existing process and procedures that are inherent in the current mainframe environment and augment them with the powerful tools and processes that IBM has developed for cloud. The high level design and plan can reduce up to 6 months of the development time of a new cloud project on system z.

- Sample Agenda
  - Day 1
    - Introduction and Welcome
    - Overview of objectives
    - Overview of Cloud (Level Set)
    - Requirements gathering (Understand the customer environment and the pain points.
    - Lunch
    - Requirements gathering (part 2 if needed)
    - Choosing the right service (s) to migrate to the cloud
  - Day 2
    - Overview of Cloud Management Software (Tivoli Service Automation Manager)
    - Gap analysis of TSAM vs Client operations model
    - Lunch
    - Build a plan to overcome discovered gaps
    - Detail how to extend Cloud environments for future growth (zBX, AIX, Windows, etc)

IBM Cloud on System z Workshop

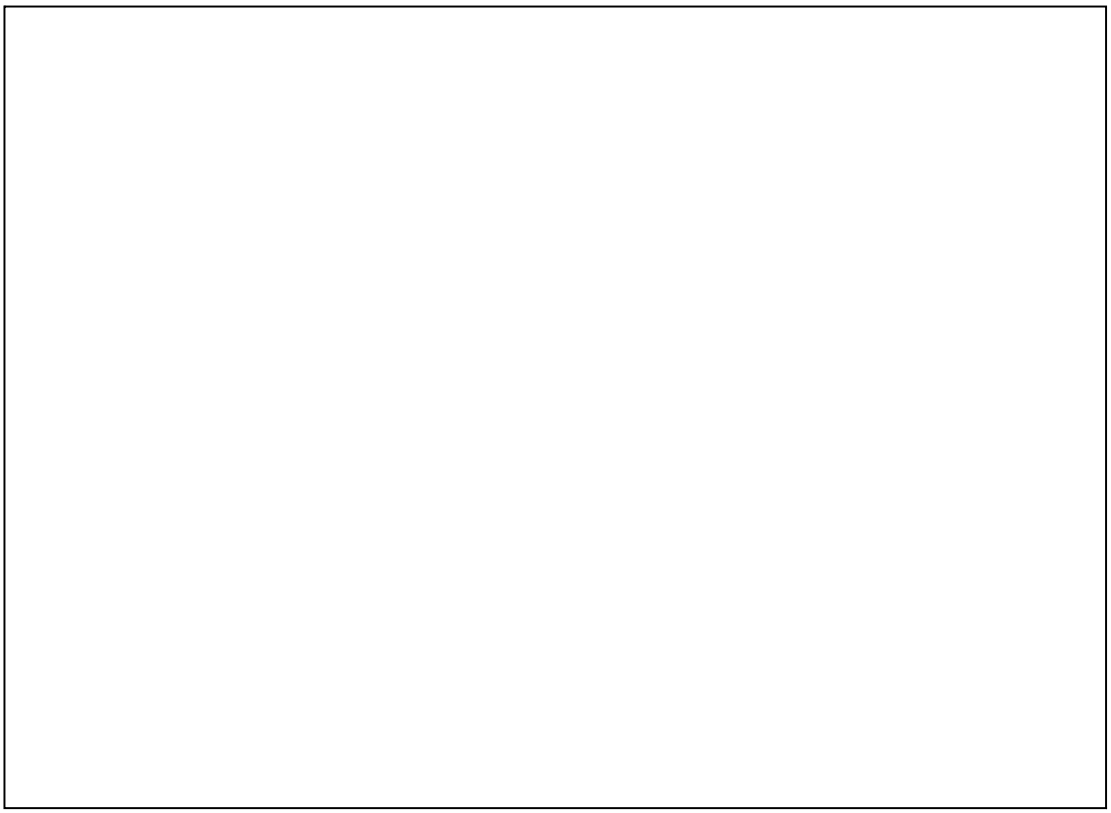
If computers of the kind I have advocated become the computers of the future, then computing may someday be organized as a public utility just as the telephone system is a public utility... The computer utility could become the basis of a new and important industry.

—John McCarthy, MIT Centennial in 1961

Cloud

What are the drivers for cloud ?
What are the big forces ?

There are many things driving people to cloud. Let us review some of these things before we deep dive into what cloud is.



This is a IDC based chart. We have seen that although physical machine purchases are still growing, the number is being dwarfed by the growth of virtual machines.

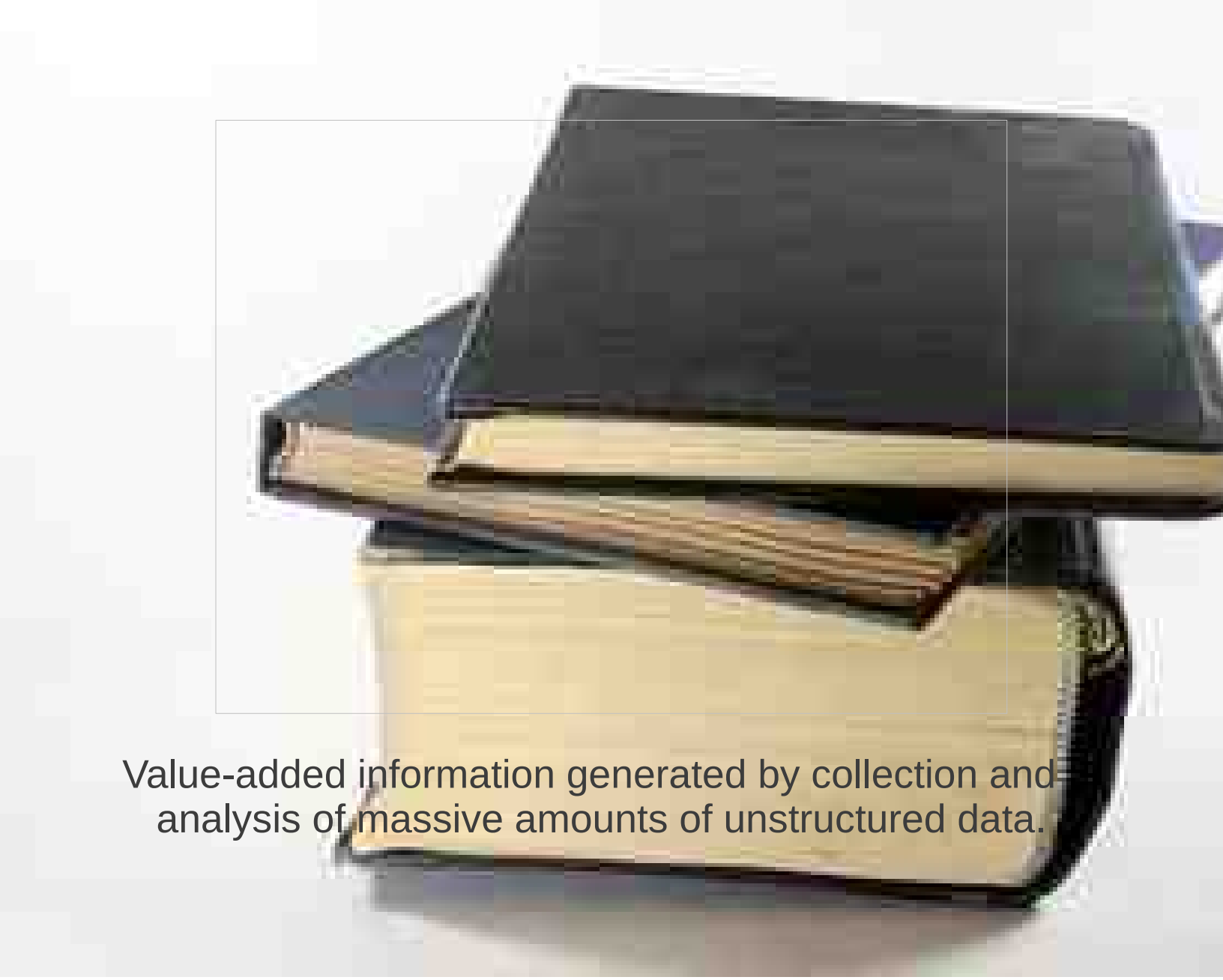
The gap between the two is the cost of operations...

Small up front investment and can be billed by consumption. Reduction of TCO allows clients to pursue operational efficiency and productivity.

Small up front commitment allows clients to try many new services faster and choose. This reduces big failure risks and allows clients to be innovative.

Time to Market

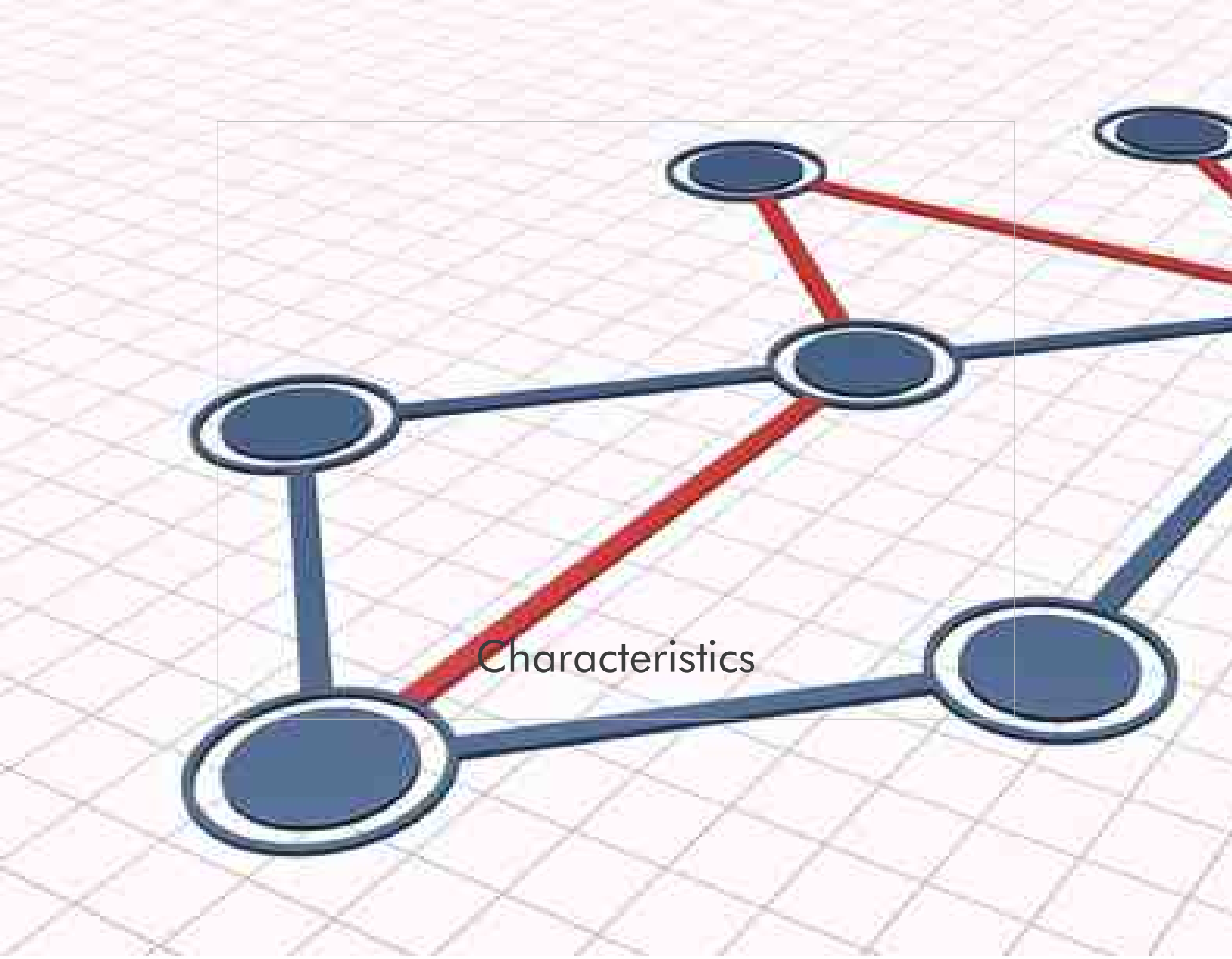
Adopt new services quickly for pilot usages and scale quickly to global scale.



Value-added information generated by collection and analysis of massive amounts of unstructured data.

Accessible via a heterogeneous set of devices (PC, phone, telematics...)

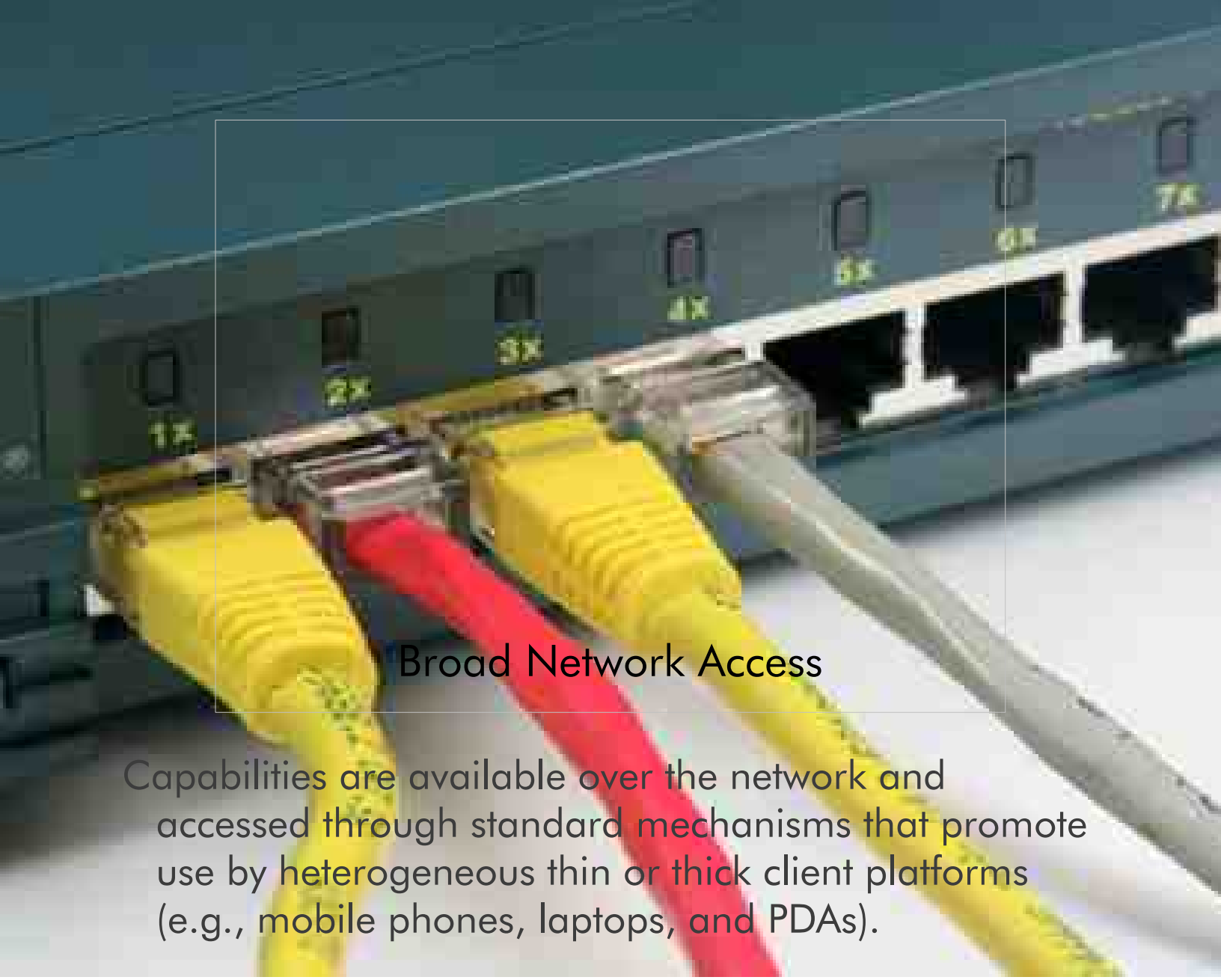
http://csrc.nist.gov/groups/SNS/cloud-computing/



Characteristics

Self Service

A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with each service's provider.



Broad Network Access

Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, laptops, and PDAs).

The provider's computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand.

There is a sense of location independence in that the customer generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e.g., country, state, or datacenter).

Examples of resources include storage, processing, memory, network bandwidth, and virtual machines.

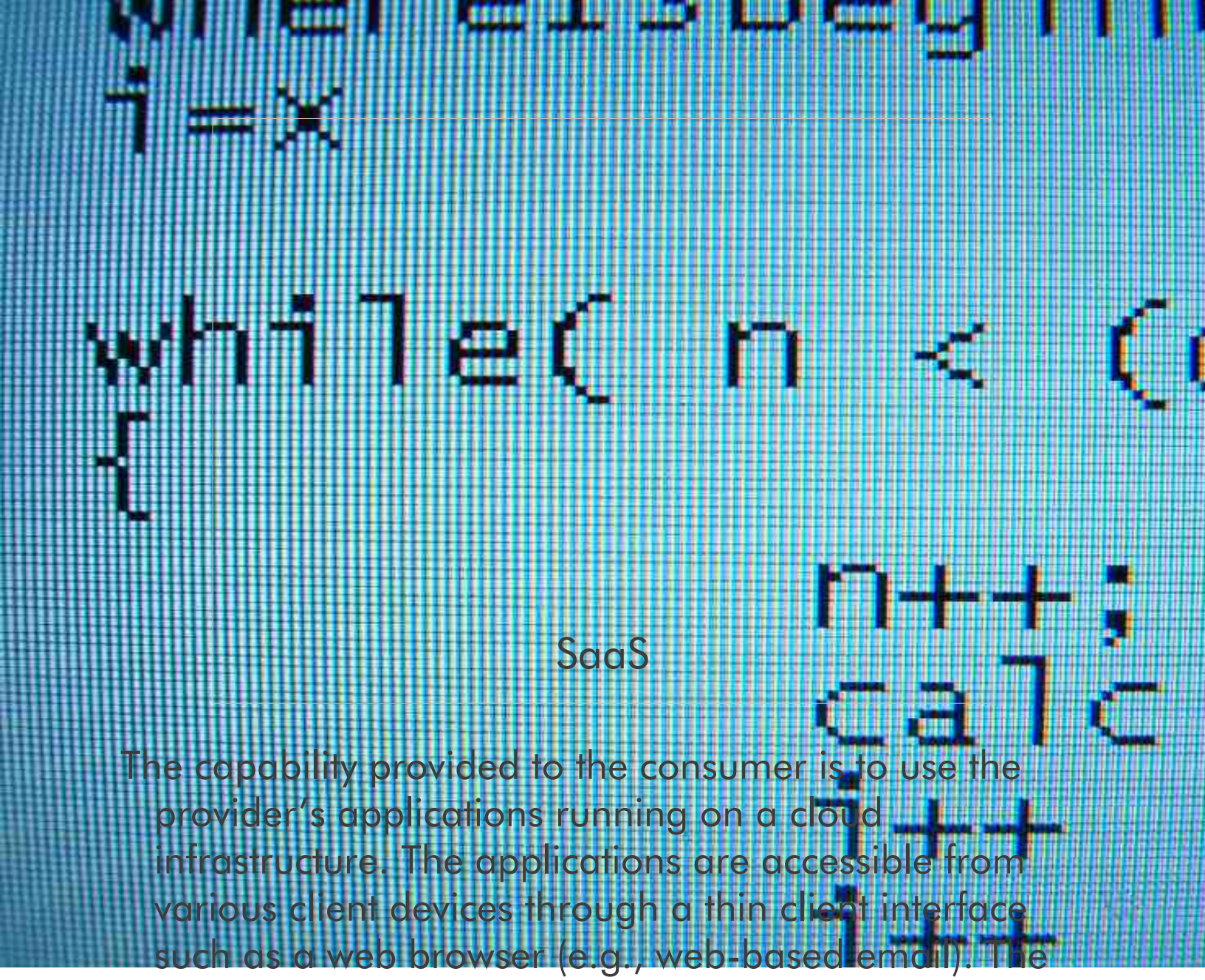
Rapid Elasticity

Capabilities can be rapidly and elastically provisioned, in some cases automatically, to quickly scale out and rapidly released to quickly scale in. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be purchased in any quantity at any time.

Measured Service

- Cloud systems automatically control and optimize resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts).
- Resource usage can be monitored, controlled, and reported providing transparency for both the provider and consumer of the utilized service

Cloud introduces some new ways for businesses to delivery service to consumers.

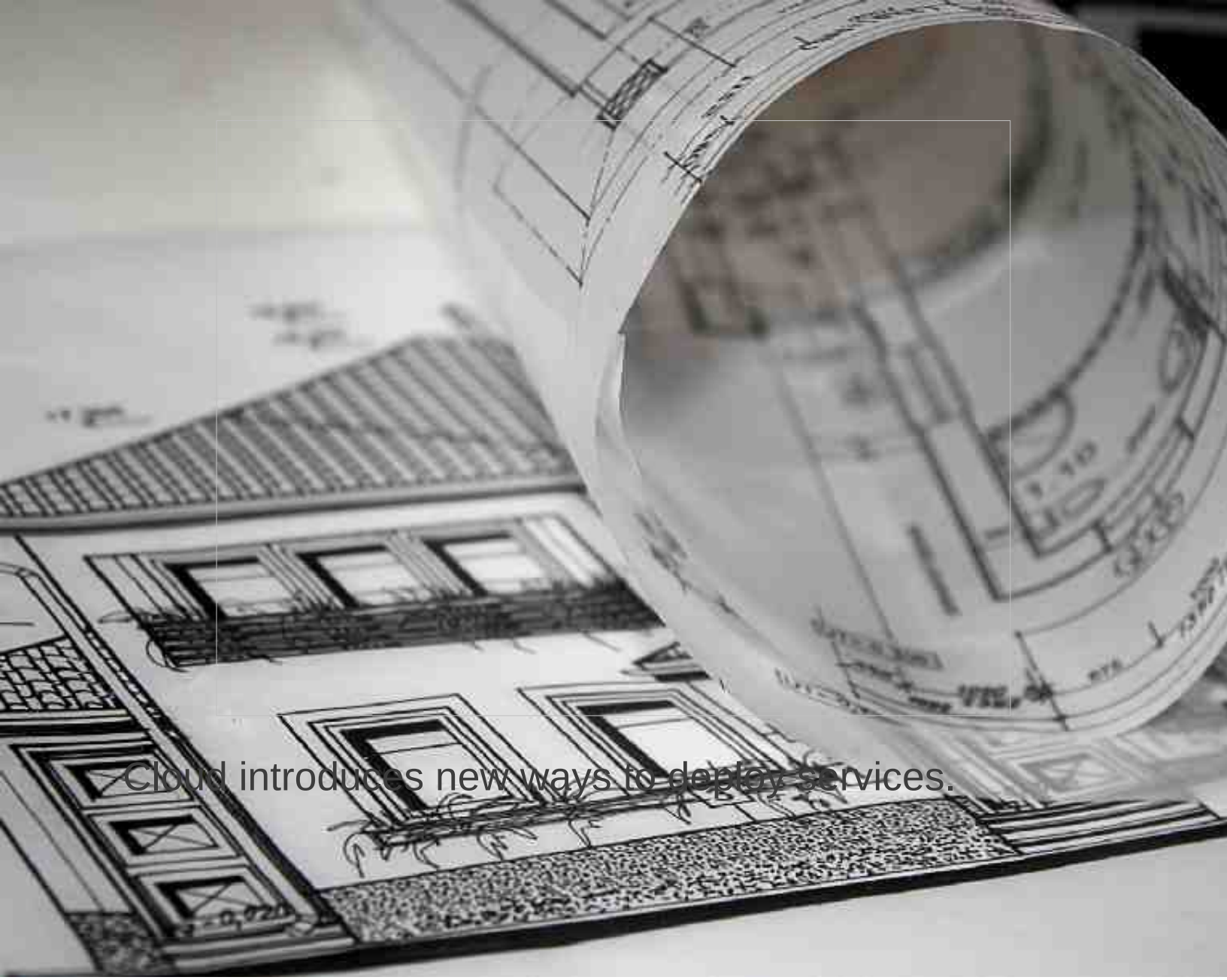


SaaS

The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through a thin client interface such as a web browser (e.g., web-based email). The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings.

The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly application hosting environment configurations.

The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, deployed applications, and possibly limited control of select networking components (e.g., host firewalls).



Cloud introduces new ways to deploy services.

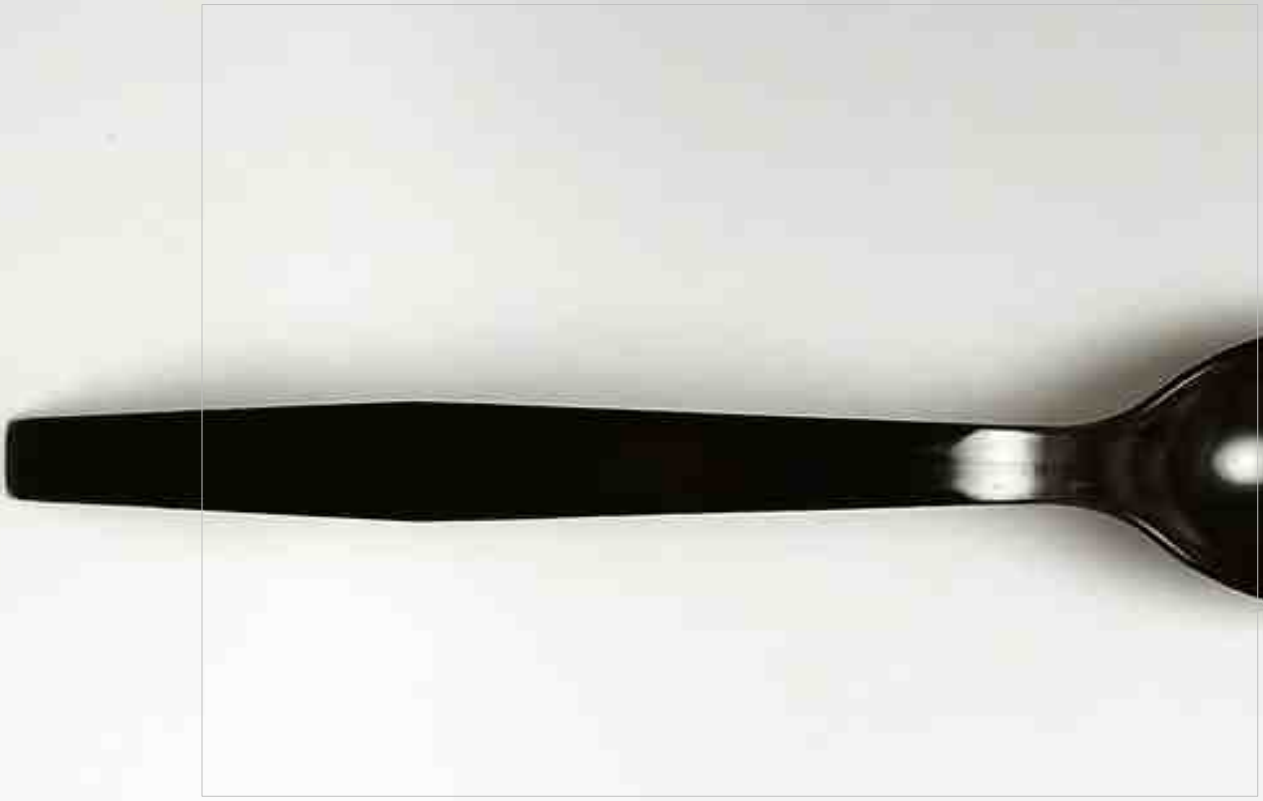
Private Cloud

The cloud infrastructure is operated solely for an organization. It may be managed by the organization or a third party and may exist on premise or off premise.

Public Cloud

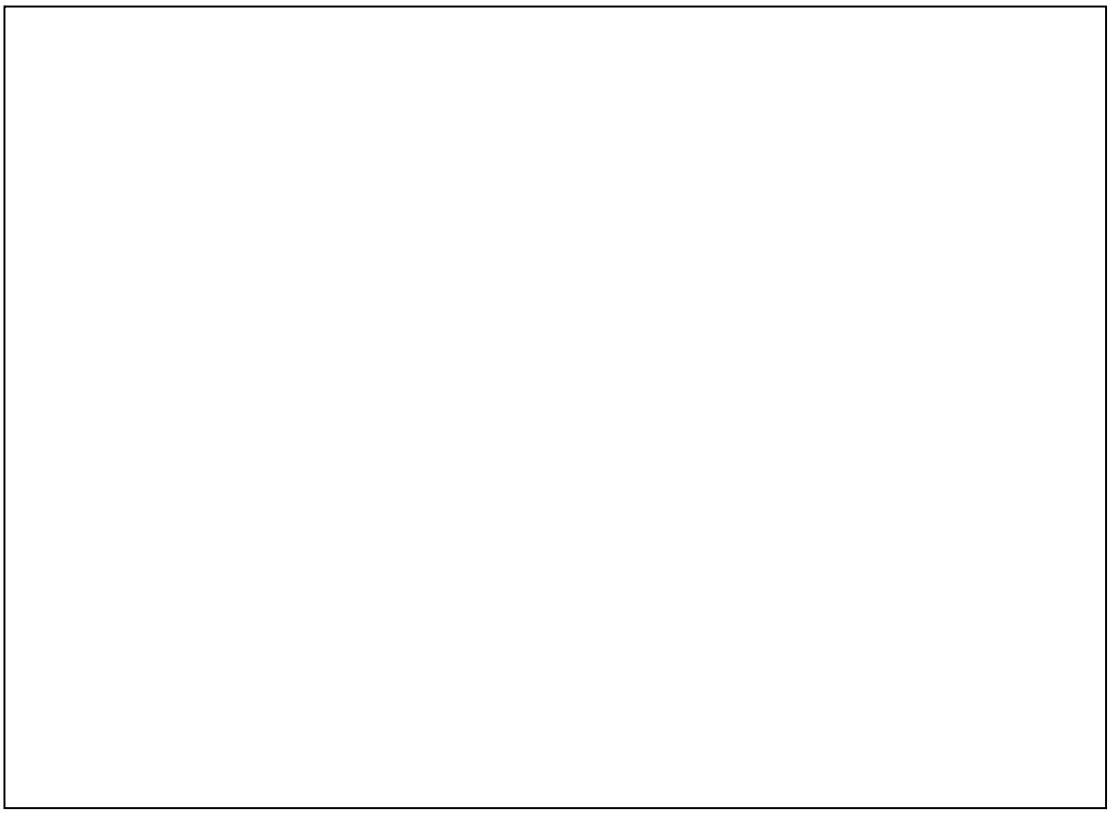
The cloud infrastructure is made available to the general public or a large industry group and is owned by an organization selling cloud services.

The cloud infrastructure is shared by several organizations and supports a specific community that has shared concerns (e.g., mission, security requirements, policy, and compliance considerations). It may be managed by the organizations or a third party and may exist on premise or off premise.

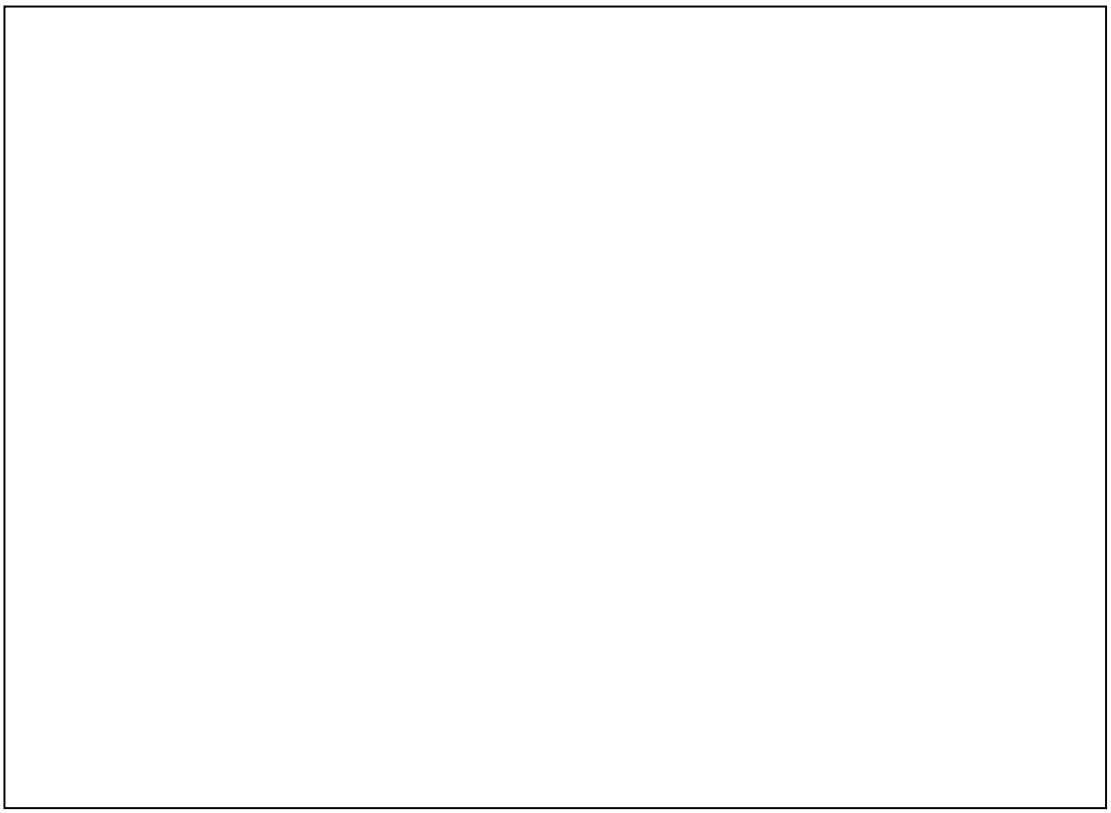


The cloud infrastructure is a composition of two or more clouds (private, community, or public) that remain unique entities but are bound together by standardized or proprietary technology that enables data and application portability (e.g., cloud bursting for load-balancing between clouds).

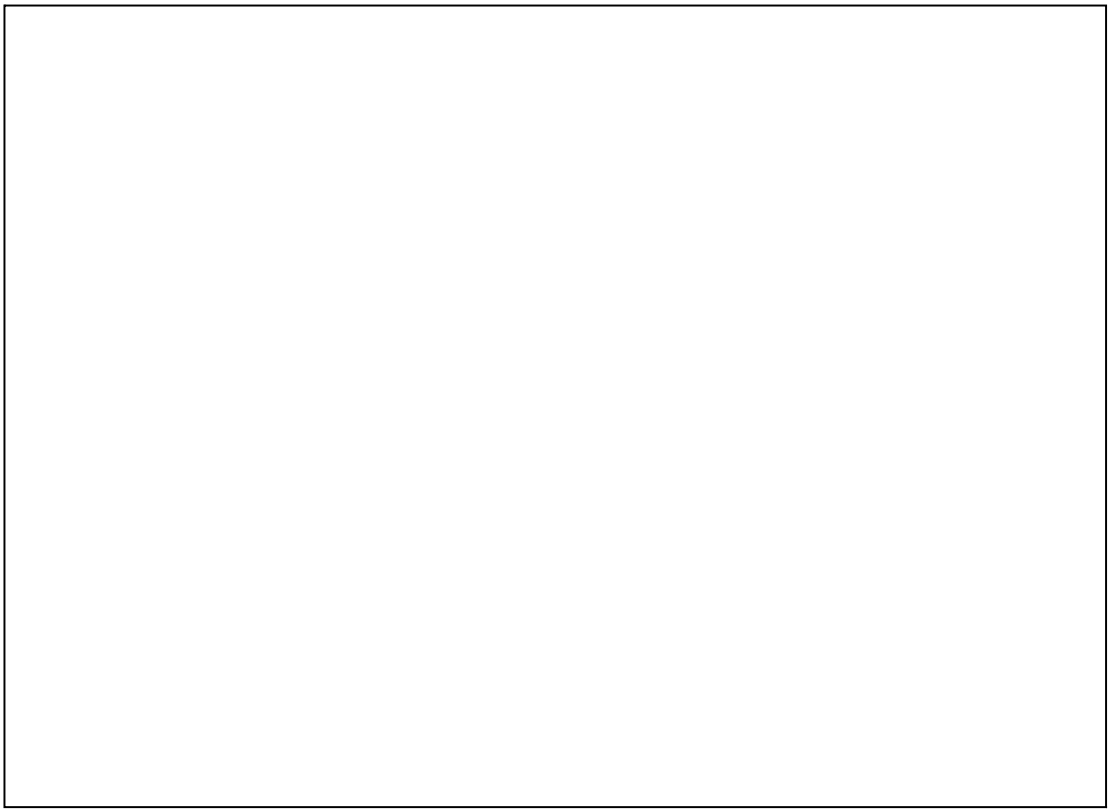
Why System z ?



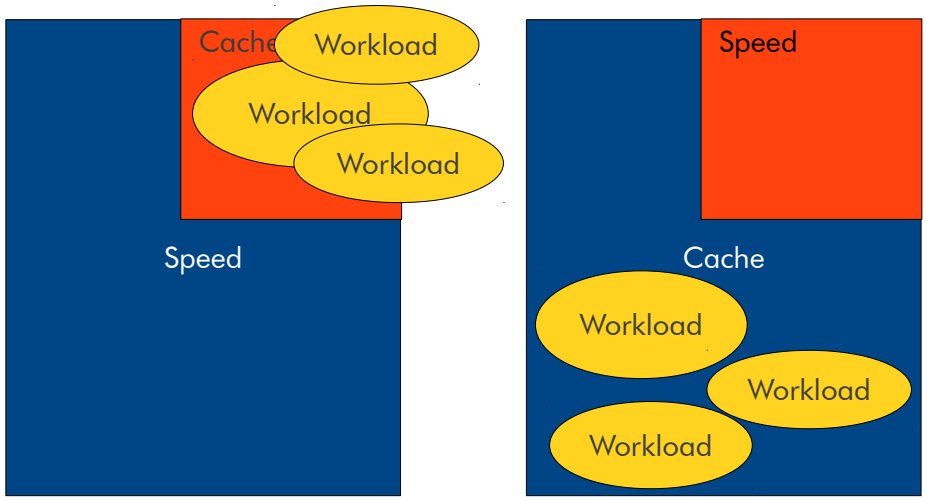
Generally speaking, mainframes have a lot less wasted resources. It is normal for operators to over commit resources and drive up consumption to near 100%



Smarter IBMers than I have built this philosophy of workload optimized systems. Some machines are better at certain workloads than others.



Chip Design Affects Virtualization



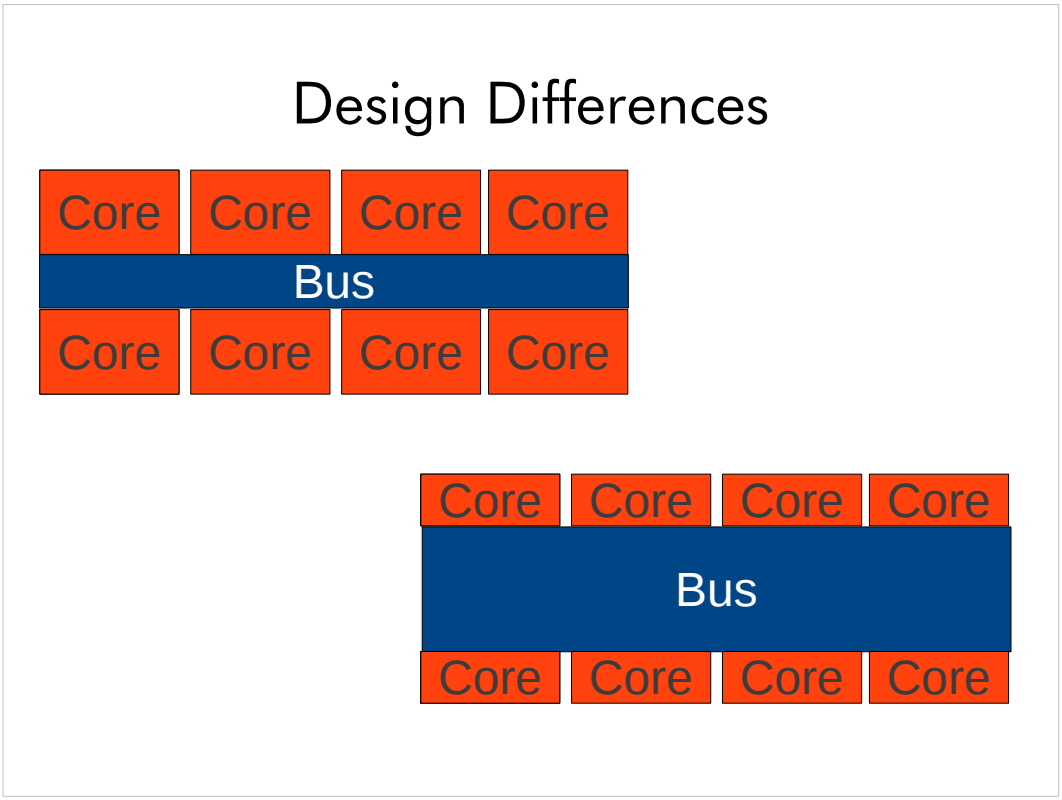
Mixed workloads stress cache usage, requiring more context switches

Working sets may be too large to fit in cache

“Fast” processor speed is not fully realized due to cache misses

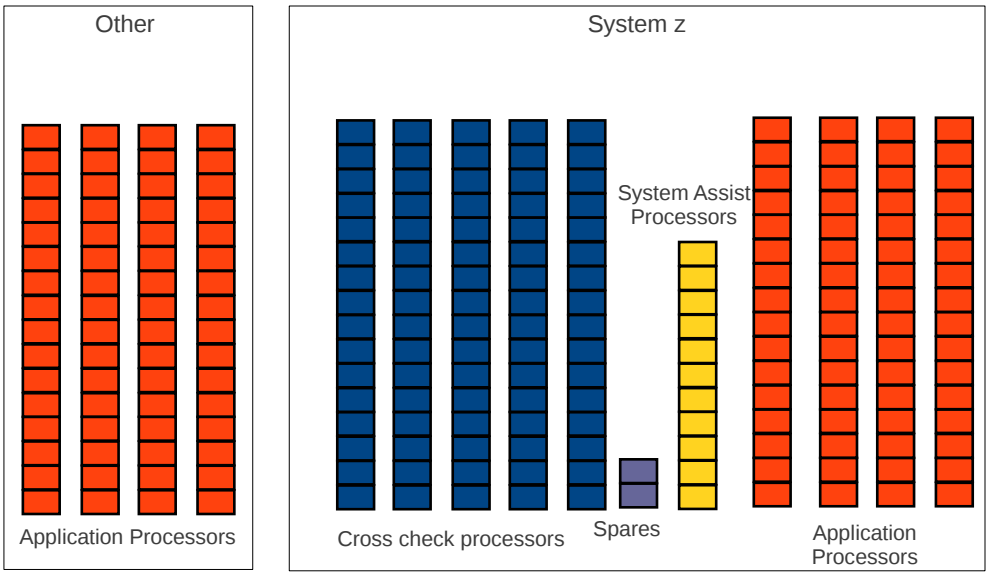
System z cache is able to contain more working sets

Processor speed is optimized by increased cache usage



The top box is a distributed arch. The bottom is z.
The top has more speed, but small bus where as the z has smaller core but larger bus.
For workloads that are shipping lots of data, a larger bus prevents the core for data starving.
This is great for virtualization due to the fact that we are sending large parts of the machine between CPs

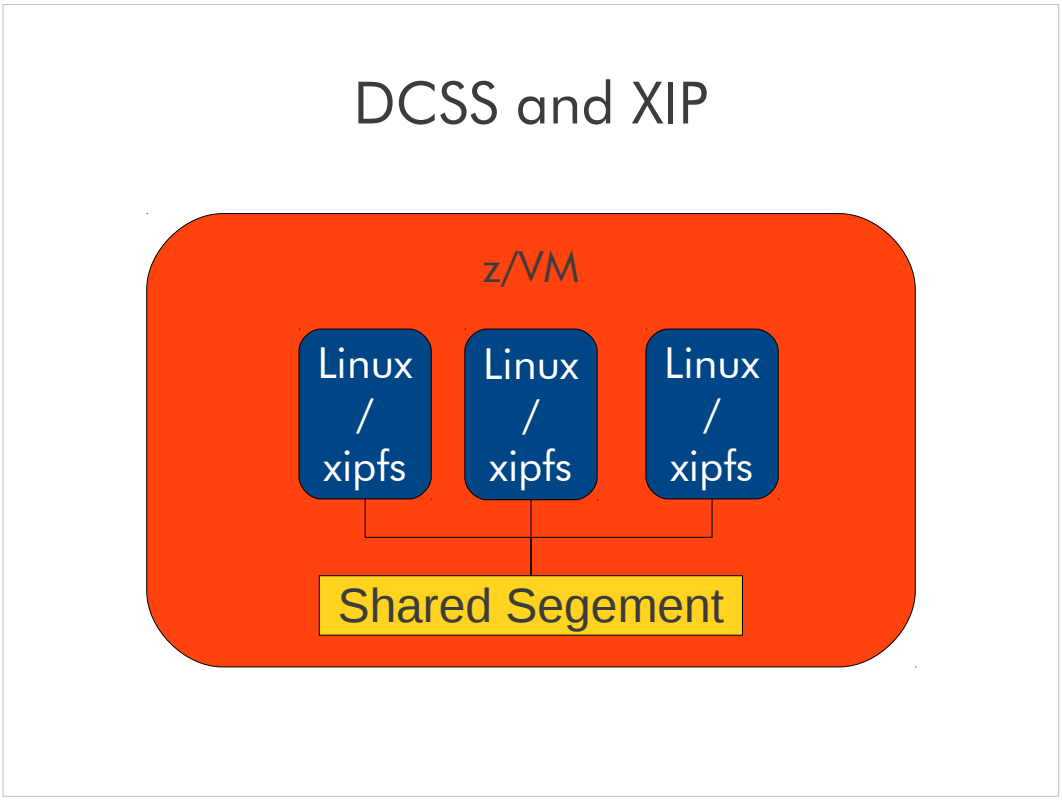
Comparison of n-way Machines



Generally speaking, there is way more processors in a system z machine. Each of the processors may have different abilites.

Another thing to state with this chart is you can over by processors. Say you get a full book and only use one. You have an upgrade path.

CPS can also be used for zIIP zAAP and IFLs.



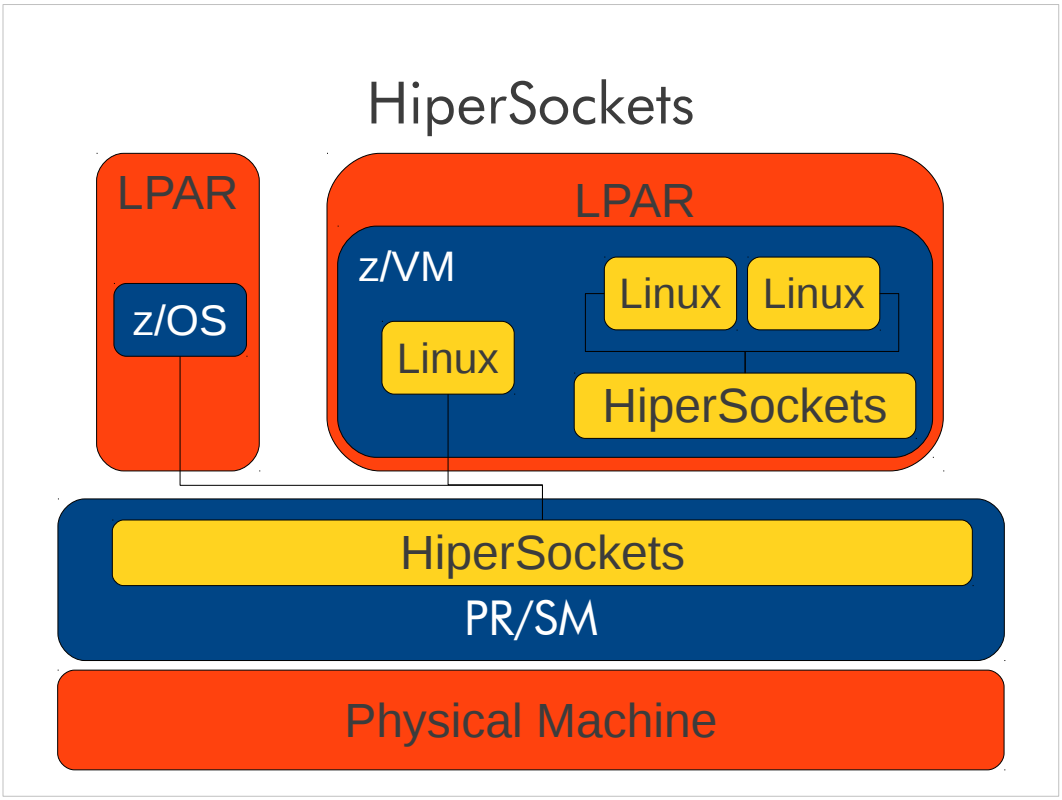
Discontiguous Shared Segment (DCSS)

Memory can be discontiguous to the virtual machine's address space, and a shared copy is loaded at the same address in all virtual machines that load the same DCSS. Can be a saved s above the virtual machine's defined storage size. In a virtual server farm with similar Linux instances there is often a considerable amount of data that is required by all instances.

eXecute In Place (XIP)

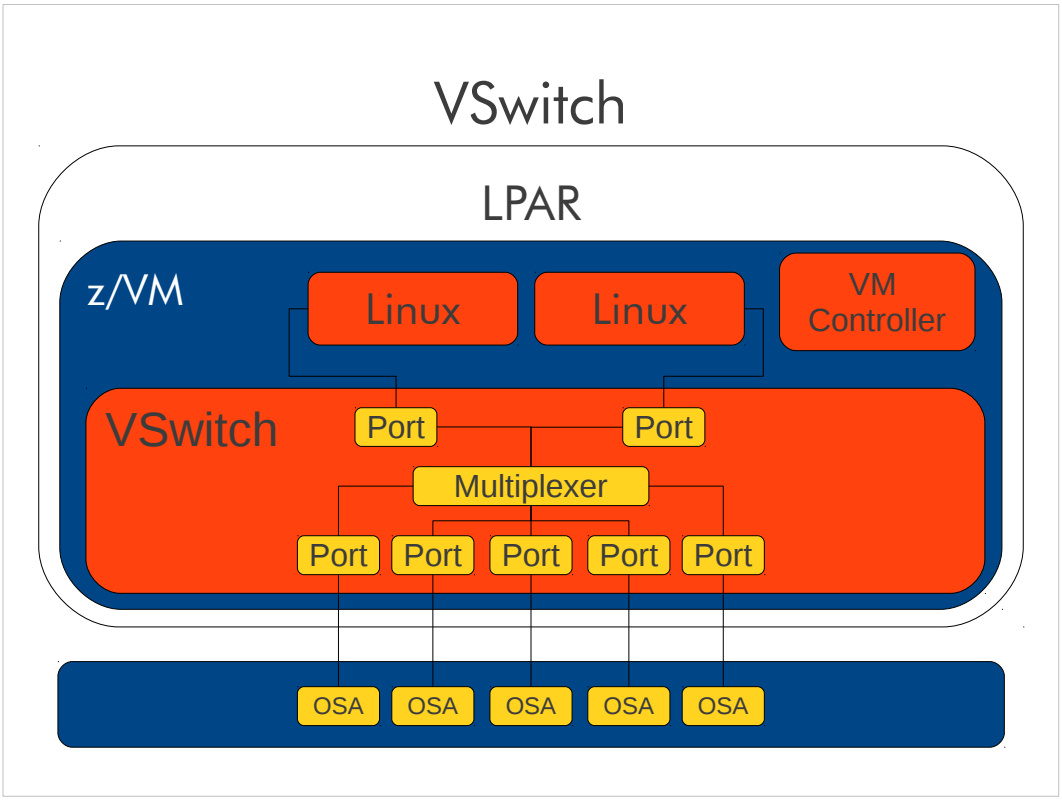
Filesystem the allows Linux to execute a file directly without need to load it into memory.

This is perfect for Linux Server Farms.



Internal only TCPIP stack.
We can mess with the frames so we can send giant datasets and not have the overhead of TCPIP

Down side is that is will not cross CECs


VSwitch
LPAR
z/VM
Linux
Linux
VM
Controller
VSwitch
Port
Port
Multiplexer
Port
Port
Port
Port
Port
OSA
OSA
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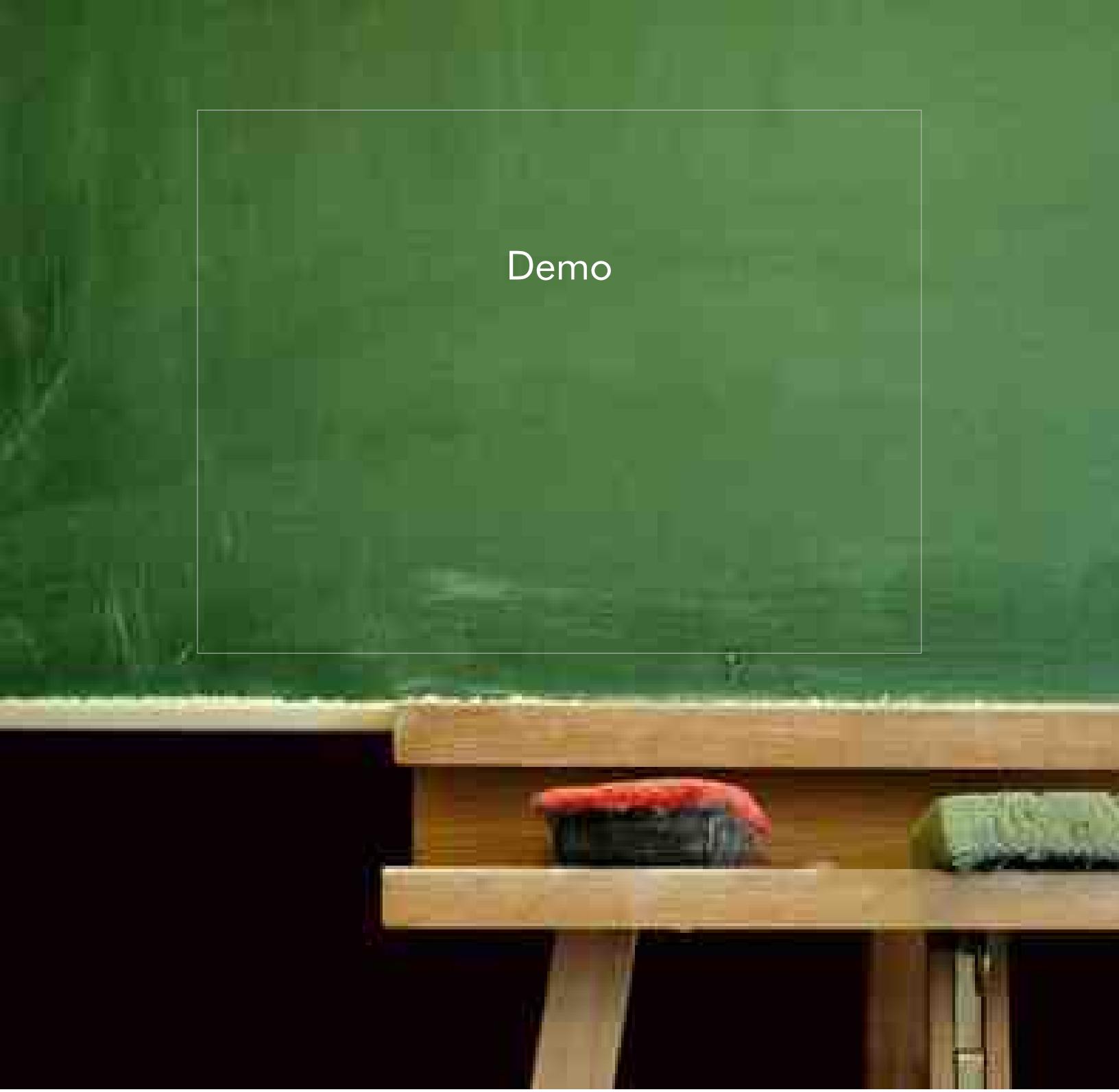
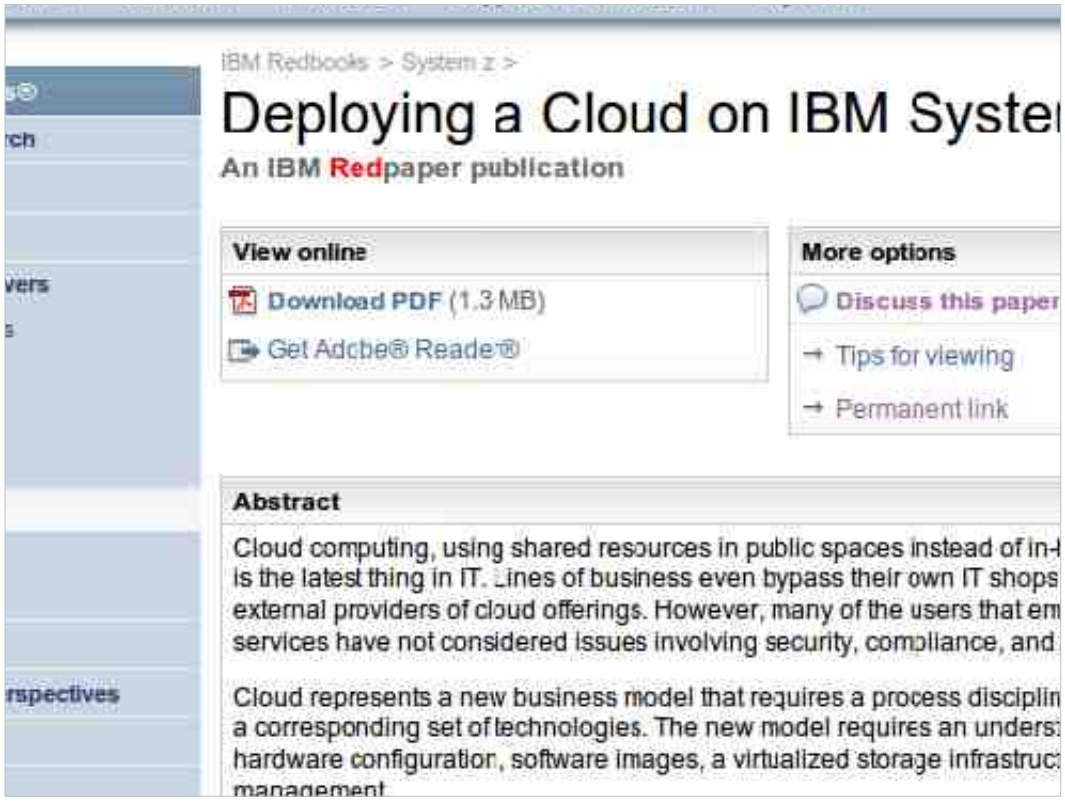
OSA


Demo



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Deploying a Cloud on IBM Syste

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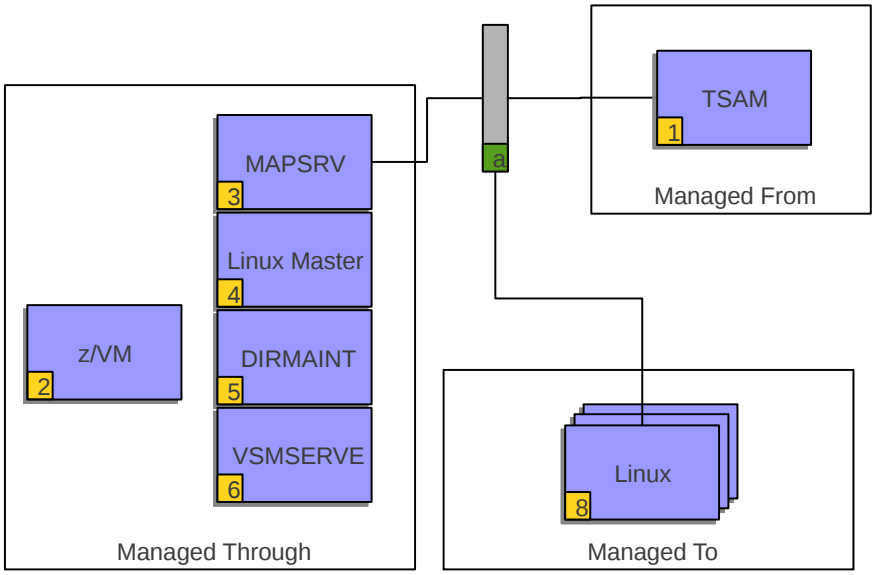
Abstract

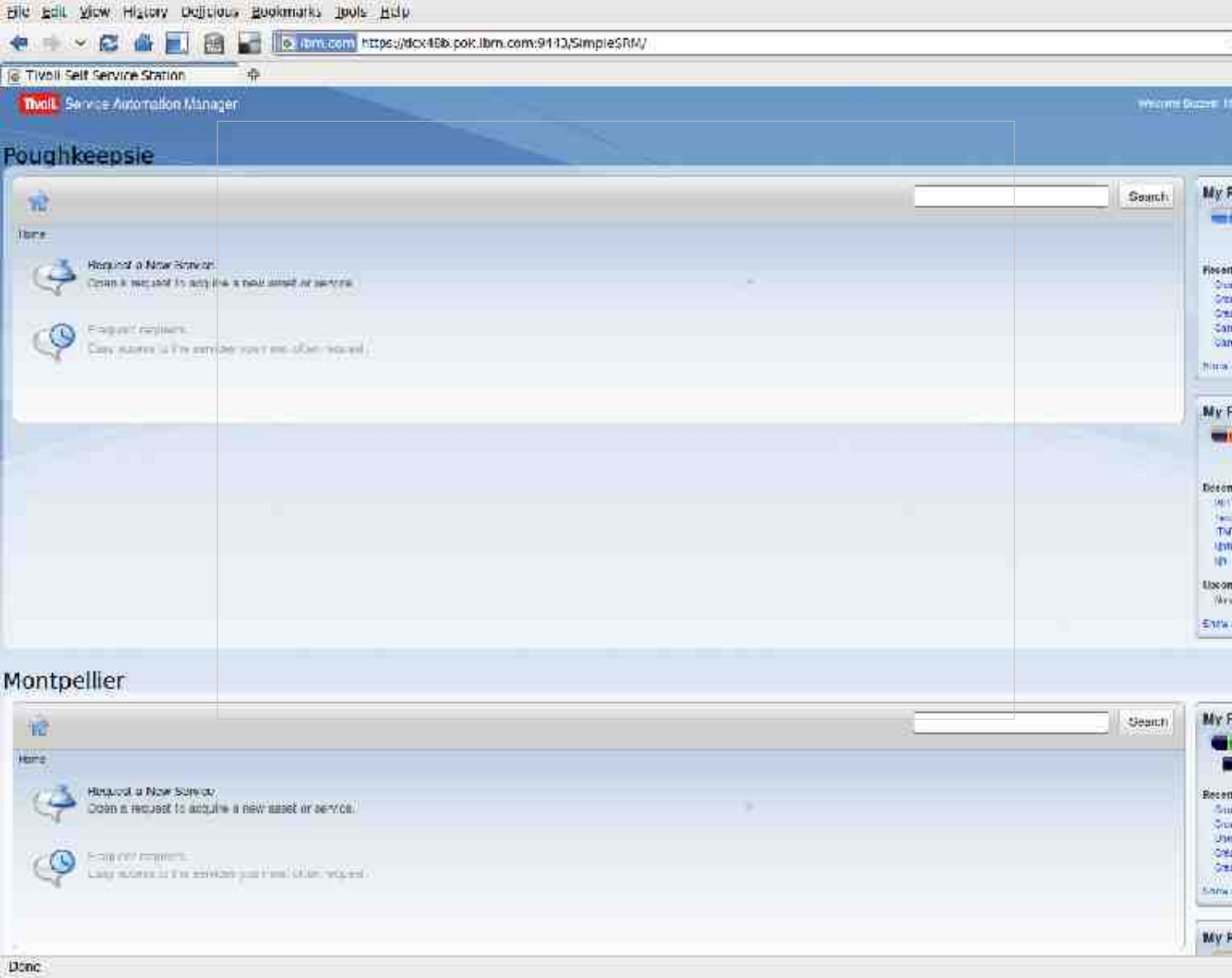
Cloud computing, using shared resources in public spaces instead of in-
is the latest thing in IT. Lines of business even bypass their own IT shops
external providers of cloud offerings. However, many of the users that em
services have not considered issues involving security, compliance, and

Cloud represents a new business model that requires a process disciplin
a corresponding set of technologies. The new model requires an unders
hardware configuration, software images, a virtualized storage infrastruc
management

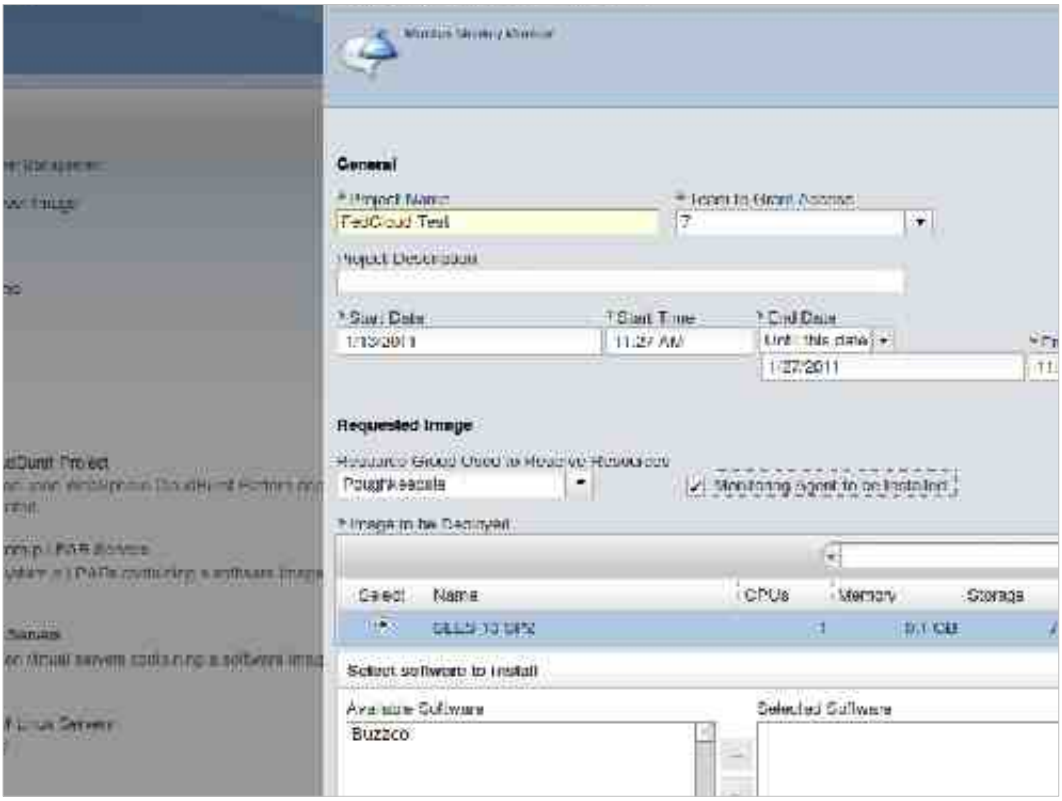


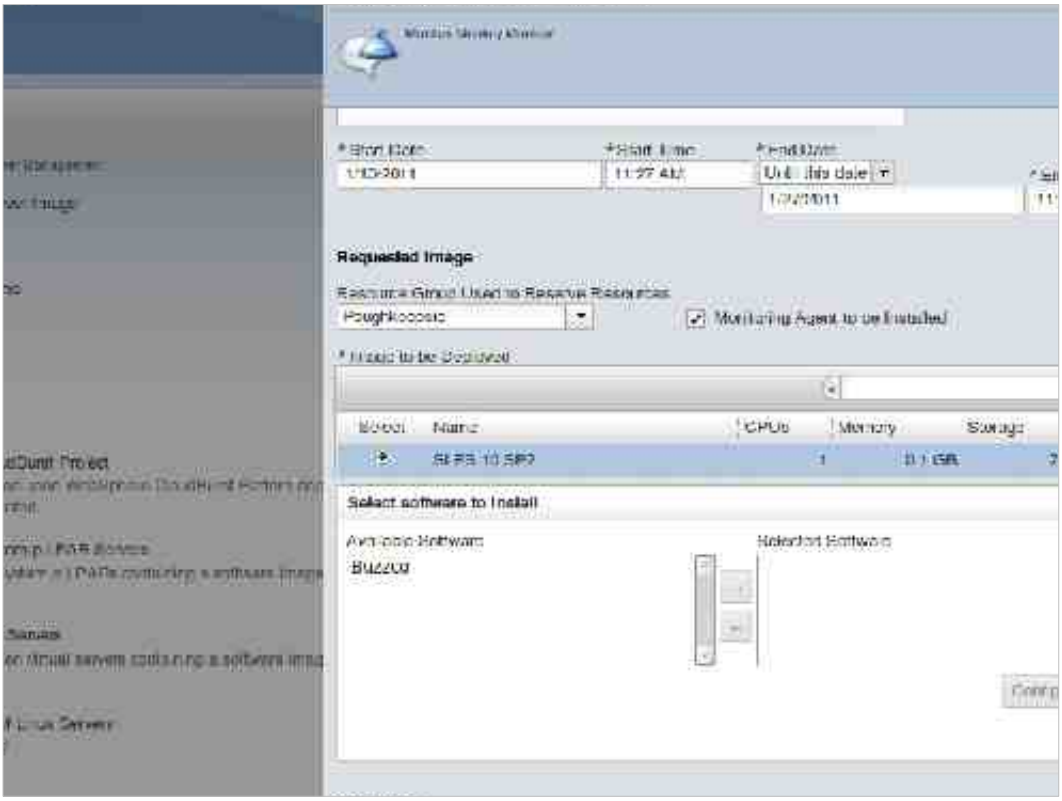
Logical Domains

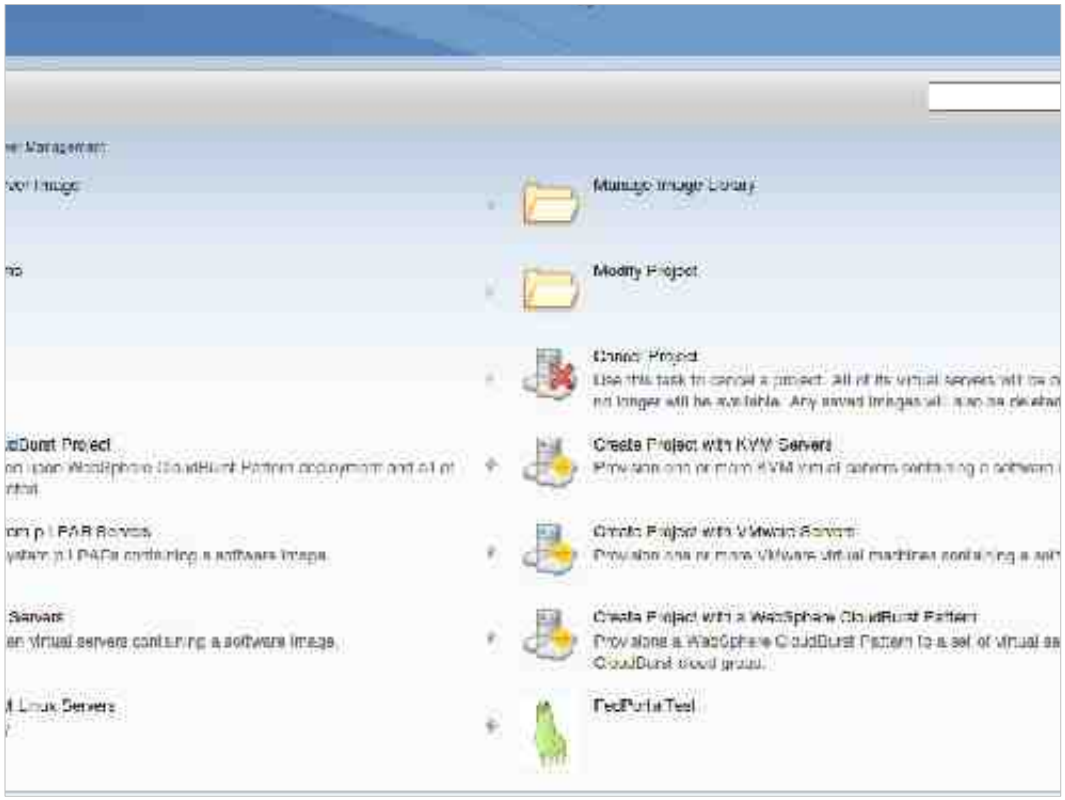

Tivoli.
Service Automation Manager
User Name
buzzetti@us.ibm.com
Password
Login


File Edit View History Delicious Bookmarks Tools Help
https://dcx48b.pok.ibm.com:9443/SimpleSRM/
Tivoli Self Service Station
Service Automation Manager
Poughkeepsie
Search
Home
Request a New Service
Open a request to acquire a new asset or service.
Montpellier
Search
Home
Request a New Service
Open a request to acquire a new asset or service.
Done

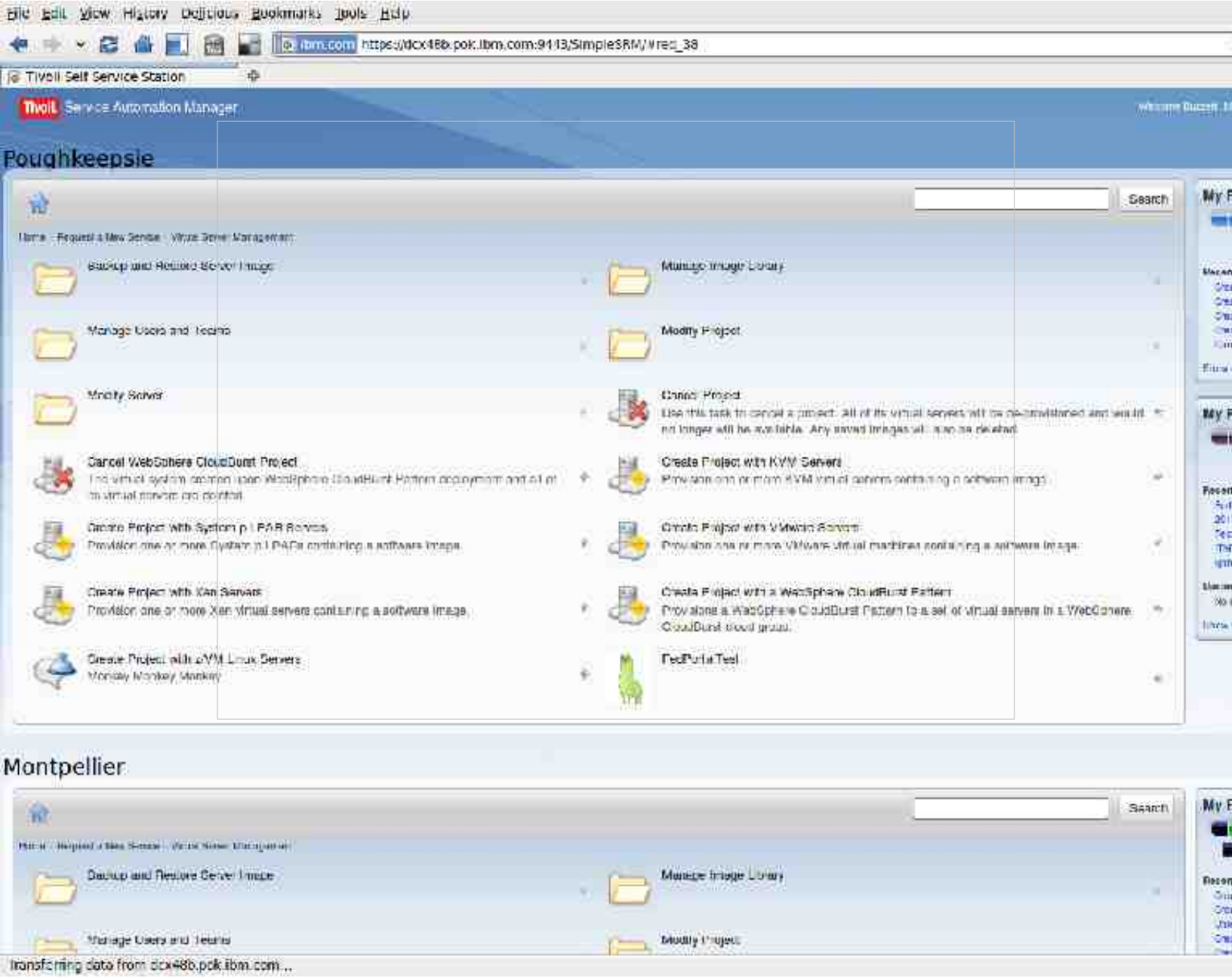

Manage Image Library
Modify Project
Create Project
Use this task to cancel a project. All of its virtual servers will be
no longer will be available. Any saved images will also be dele
Create Project with KVM Servers
Provision one or more KVM virtual servers containing a software
Create Project with VMware Servers
Provision one or more VMware virtual machines containing a soft
Create Project with a WebSphere CloudBurst Pattern
FedPorta Test


General
Project Name
FedCloud Test
Hours to Grant Access
7
Project Description
Start Date
1/13/2011
Start Time
11:27 AM
End Date
Until this date
1/27/2011
Requested Image
Roughkeeala
Monitoring agent to be installed
Image to be Deployed
Select
Name
CPUs
Memory
Storage
Select software to install
Available Software
Buzzco
Selected Software


Requested Image
Monitoring Agent to be Installed
Name
CPUs
Memory
Storage
Select software to Install
Buzzoo


Manage Image Library
Modify Project
Delete Project
Use this task to cancel a project. All of its virtual servers will be d
no longer will be available. Any saved images will also be deleted
Create Project with KVM Servers
Create Project with VMware Servers
Create Project with a WebSphere CloudBurst Pattern
Provisions a WebSphere CloudBurst Pattern to a set of virtual se
CloudBurst cloud group.
FedPortalTest


Manage Image Library
Modify Project
Delete Project
Use this task to cancel a project. All of its virtual servers will be d
no longer will be available. Any saved images will also be delete
Create Project with KVM Servers
Create Project with VMware Servers
Create Project with a WebSphere CloudBurst Pattern
Provisions a WebSphere CloudBurst Pattern to a set of virtual se
CloudBurst cloud group.
FedPortalTest


File Edit View History Delicious Bookmarks Tools Help
https://dcx48b.pok.ibm.com:9443/SimpleSRM/
Tivoli Self Service Station
Tivoli Service Automation Manager
Poughkeepsie
Search
Backup and Restore Server Image
Manage Image Library
Manage Users and Teams
Modify Project
Modify Server
Cancel Project
Cancel WebSphere CloudBurst Project
Create Project with KVM Servers
Create Project with System p LPAR Servers
Create Project with VMware Servers
Create Project with Xen Servers
Create Project with a WebSphere CloudBurst Pattern
Create Project with zVM Linux Servers
FedPortalTest
Montpellier
Search
Backup and Restore Server Image
Manage Image Library
Manage Users and Teams
Modify Project
Transferring data from dcx48b.pok.ibm.com ...

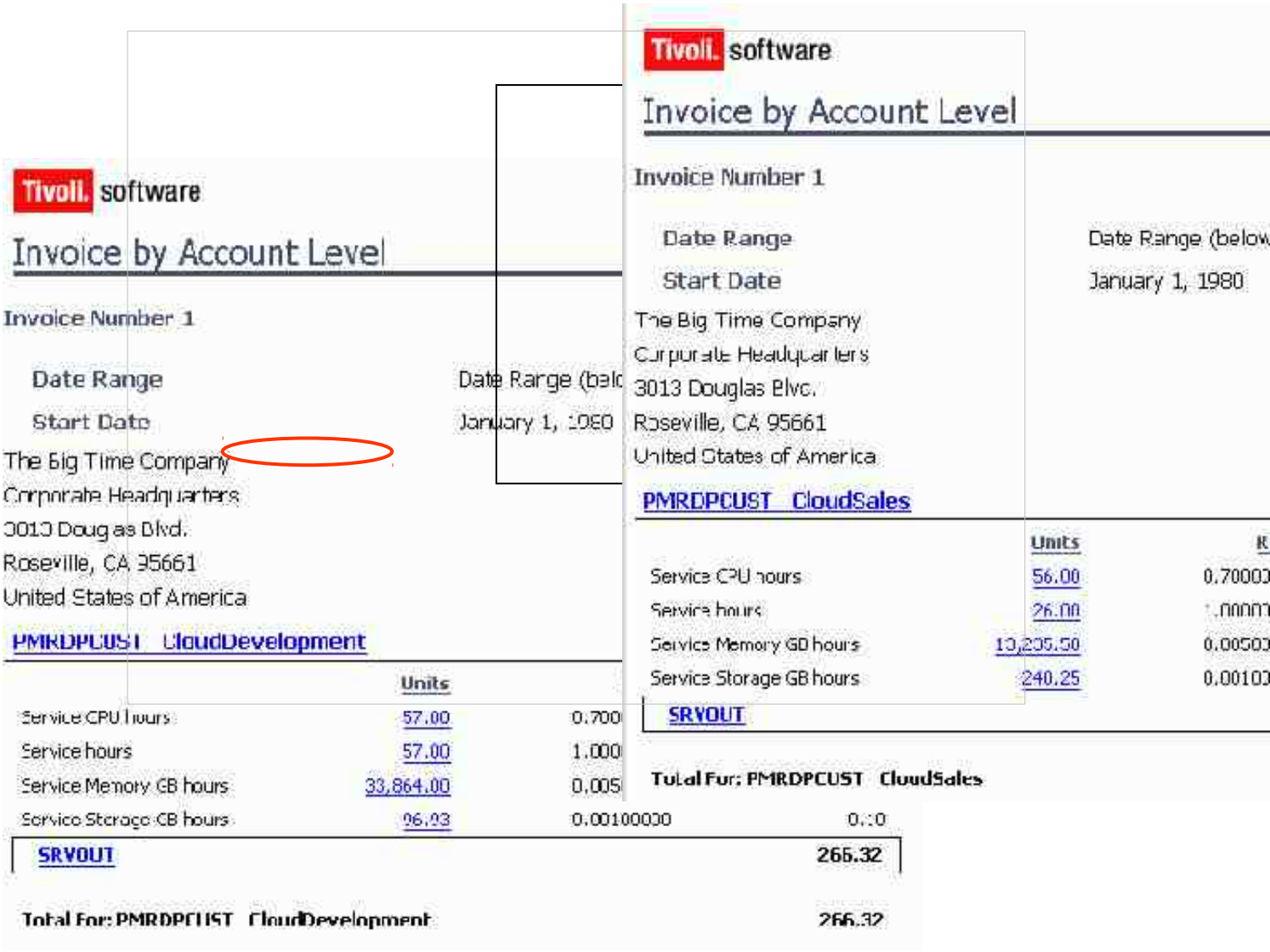
Default custom expiration date: 01/13/2012

Dear Michael C. Buzzetti

You have started a new Project FedCloud Test with the following

The server zlnx03 has been added with the following parameters:
  Hostname of Server: zlnx03
  Number of CPU(s): 1
  Number of tenths of physical CPUs: 1
  Amount of Memory: 128 MB
  Swap Size: 0 GB
  Disk Space Size: 7
  Admin Password:TUjDODI?

The server zlnx02 has been added with the following parameters:
  Hostname of Server: zlnx02
  Number of CPU(s): 1
  Number of tenths of physical CPUs: 1
  Amount of Memory: 128 MB
  Swap Size: 0 GB



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Invoice by Account Level

Invoice Number 1

Date Range — Date Range (below)

Start Date — January 1, 1980

The Big Time Company
Corporate Headquarters
3013 Douglas Blvd.
Roseville, CA 95661
United States of America

PMRDPCUST CloudSales

	Units	
Service CPU hours	56.00	0.70003
Service hours	26.00	.00001
Service Memory GB hours	10,235.50	0.00503
Service Storage GB hours	240.25	0.00103

SRVOUT

Total For: PMRDPCUST CloudSales

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Invoice by Account Level

Invoice Number 1

Date Range — Date Range (below)

Start Date — January 1, 1980

The Big Time Company
Corporate Headquarters
3013 Douglas Blvd.
Roseville, CA 95661
United States of America

PMRDPCUST CloudDevelopment

	Units		
Service CPU hours	57.00	0.700	
Service hours	57.00	1.000	
Service Memory GB hours	33,864.00	0.005	
Service Storage GB hours	96.03	0.00100000	0.10

SRVOUT — 265.32

Total For: PMRDPCUST CloudDevelopment — 266.32

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Invoice Detail

SRVOUT for PMRDPCUST CloudSales by DEPLOYMENT_INSTANCE

Start Date January 1, 1980 End D

DEPLOYMENT_INSTANCE		805 - Service hours	806 - Service CPU hours	807 - Service Memory GB hours	808 - Se
Big Splash Campaign Appservers	11/14/2011	24.00	48.00	12,288.00	
	Total	**24.00**	**48.00**	**12,288.00**	
Client Demo	11/14/2011	2.00	8.00	947.50	
	Total	**2.00**	**8.00**	**947.50**	
Total		**26.00**	**56.00**	**13,235.50**	

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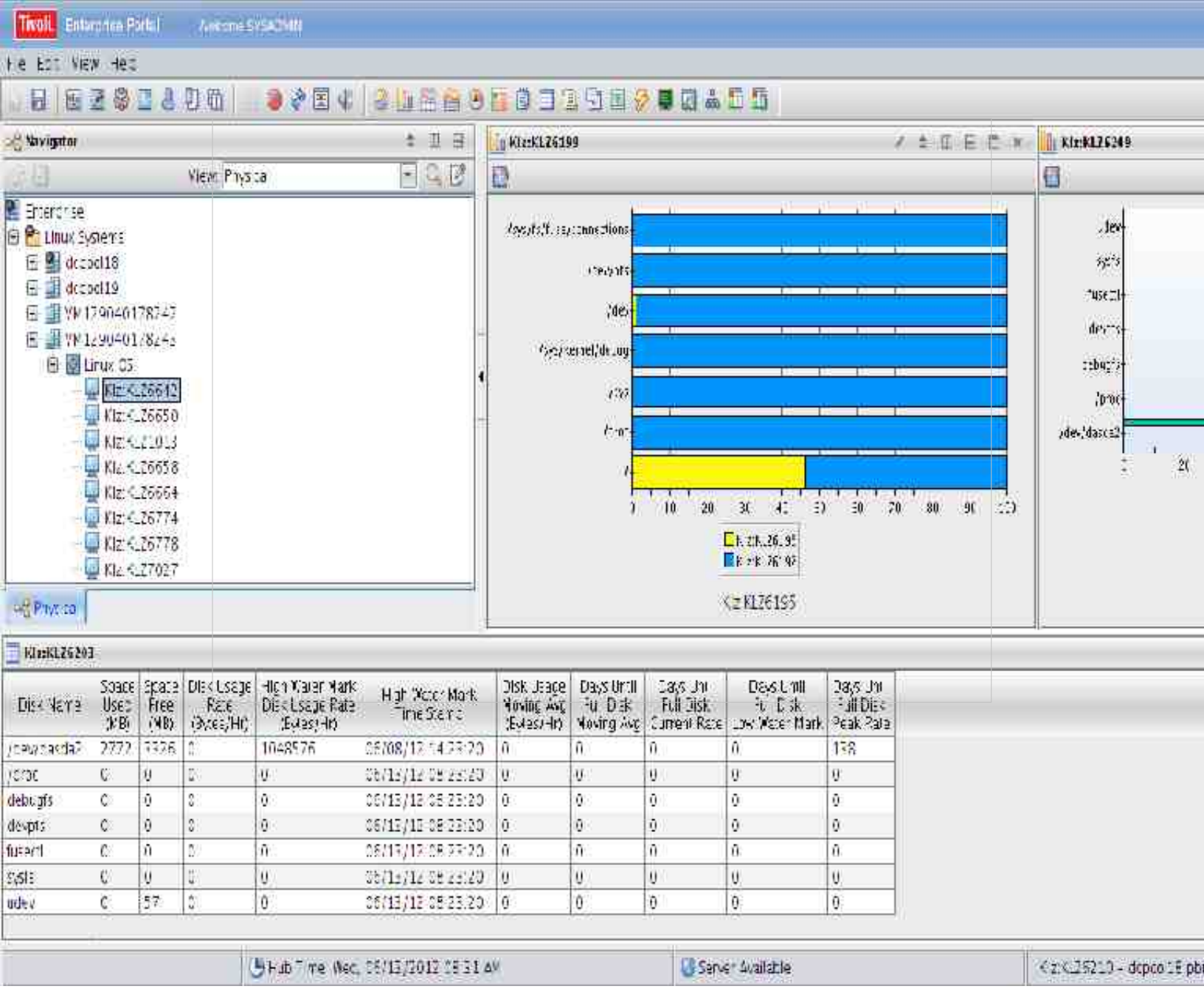
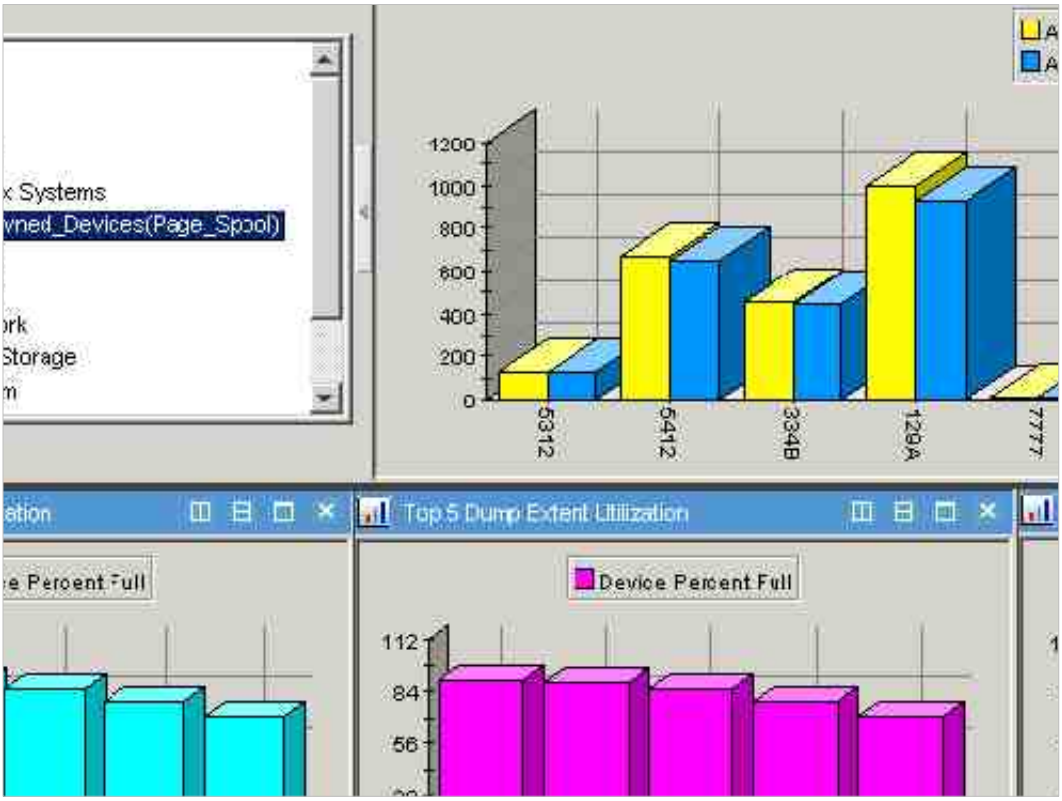
Top 10 Cost

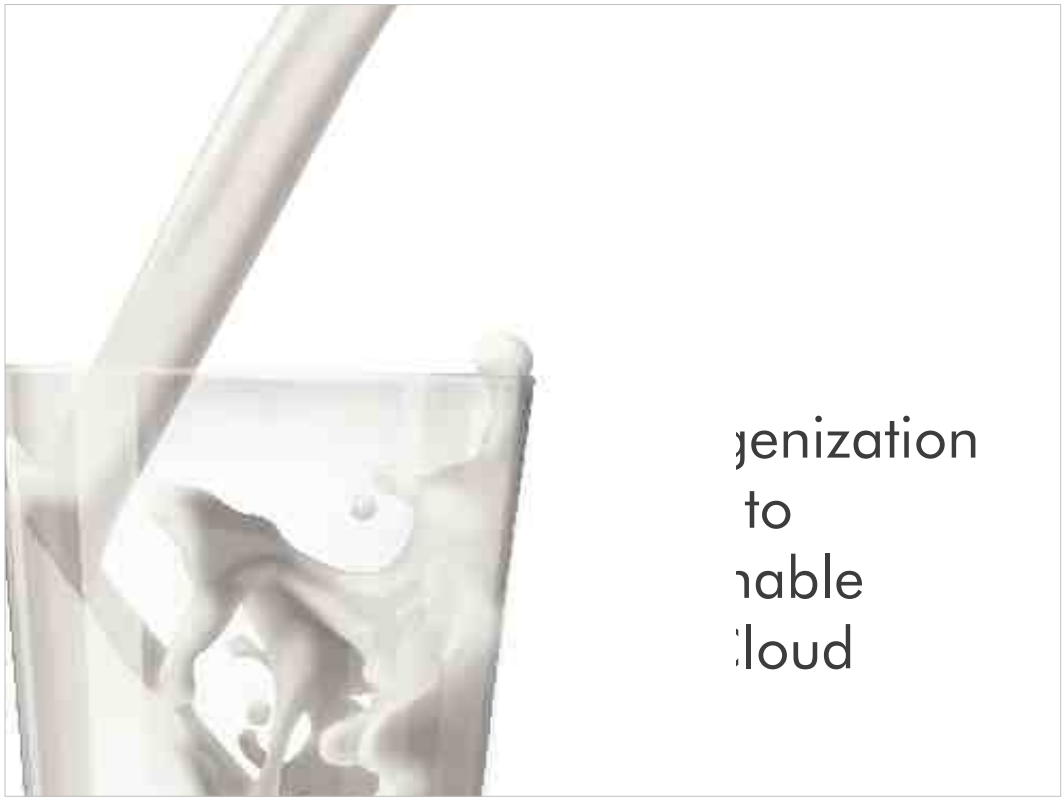
Lowest Possible Account - Highest Possible Account

Date Range	Date Range (below)		
Start Date	January 1, 1980	End Date	

Account Code		Percentage	Charges	
⊟ PMRDPCUST CloudDevelopment		34.27%	266.32	PMRDP CloudDe
	Service Memory GB hours	63.58%	169.32	
	Service hours	21.40%	57.00	
	Service CPU hours	14.98%	39.90	
	Service Storage GB hours	0.04%	0.10	
⊞ PMRDPCUST CloudFinance		18.33%	142.42	PMRDP CloudFi
⊞ PMRDPCUST - PMRDPCUST Account Code		17.31%	134.50	PMRDP
⊞ PMRDPCUST CloudSales		16.94%	131.62	PMRDP CloudSa
⊞ PMRDPCUST CloudMarketing		13.16%	102.28	PMRDP CloudMa
Run Total			**777.14**	


Tivoli Enterprise Portal
Navigator
View: Physical
Enterprise
Linux Systems
dcpcol18
dcpcol19
Linux OS
KlzKLZ6199
KlzKLZ6249
KlzKLZ6203
Disk Name
Space Used (MB)
Space Free (MB)
Disk Usage Rate (Bytes/Hr)
High Water Mark Disk Usage Rate (Bytes/Hr)
High Water Mark Time Stamp
Disk Usage Moving Avg (Bytes/Hr)
Days Until Full Disk Moving Avg
Days Until Full Disk Current Rate
Days Until Full Disk Low Water Mark
Days Until Full Disk Peak Rate
/dev/shm 0 0 0 0 06/13/12 08:23:20 0 0 0 0 0
/proc 0 0 0 0 06/13/12 08:23:20 0 0 0 0 0
debugfs 0 0 0 0 06/13/12 08:23:20 0 0 0 0 0
devpts 0 0 0 0 06/13/12 08:23:20 0 0 0 0 0
fusectl 0 0 0 0 06/13/12 08:23:20 0 0 0 0 0
sysfs 0 0 0 0 06/13/12 08:23:20 0 0 0 0 0
udev 0 57 0 0 06/13/12 08:23:20 0 0 0 0 0
Server Available


x Systems
wned_Devices(Page_Spool)
ork
Storage
m
1200
1000
800
600
400
200
0
5312
5412
334B
129A
7777
Top 5 Dump Extent Utilization
Device Percent Full
112
84
56


genization
to
nable
loud

Reduce

- Number of supported Operating Systems
- Number of configuration for patch and change management
- Number of supported middleware versions

Chargeback and Process

Are enterprise IT consumers customers of the IT Dept?

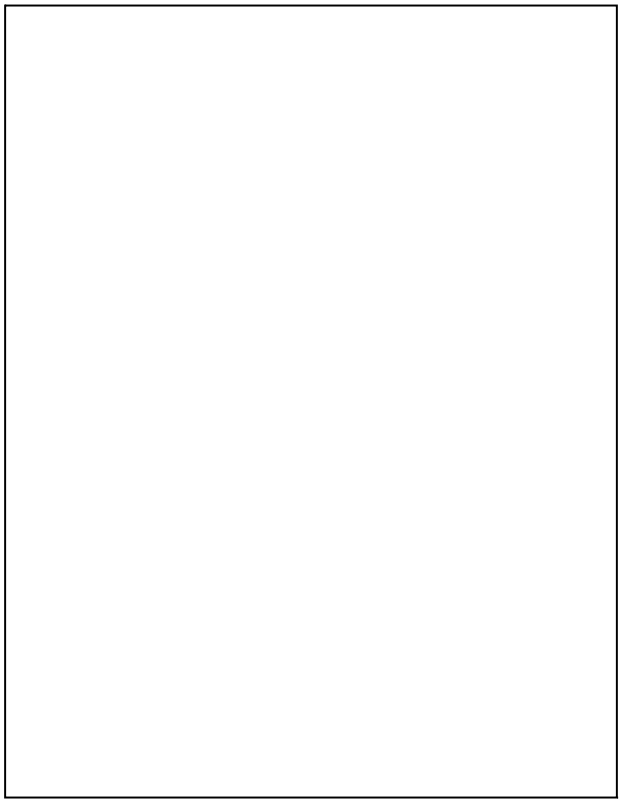
Is procurement done on individual machines?

How is procurement and charging done on multi-tenant machines?

Support model: often full access is allowed on cloud servers. This is a security and process constraint.

Is there a multi-tenant utilization model?

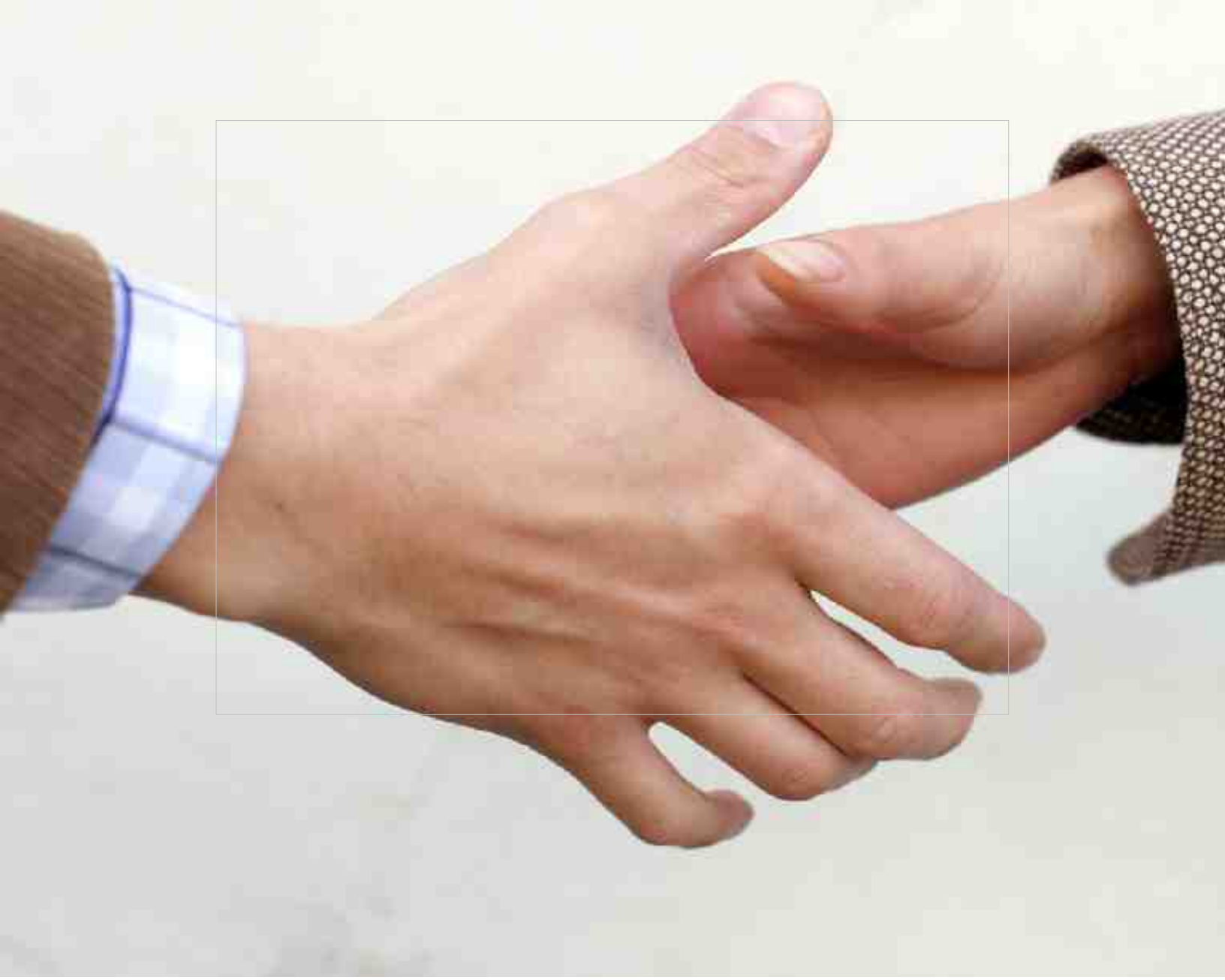
How is procurement and charging done on multi-tenant machines?

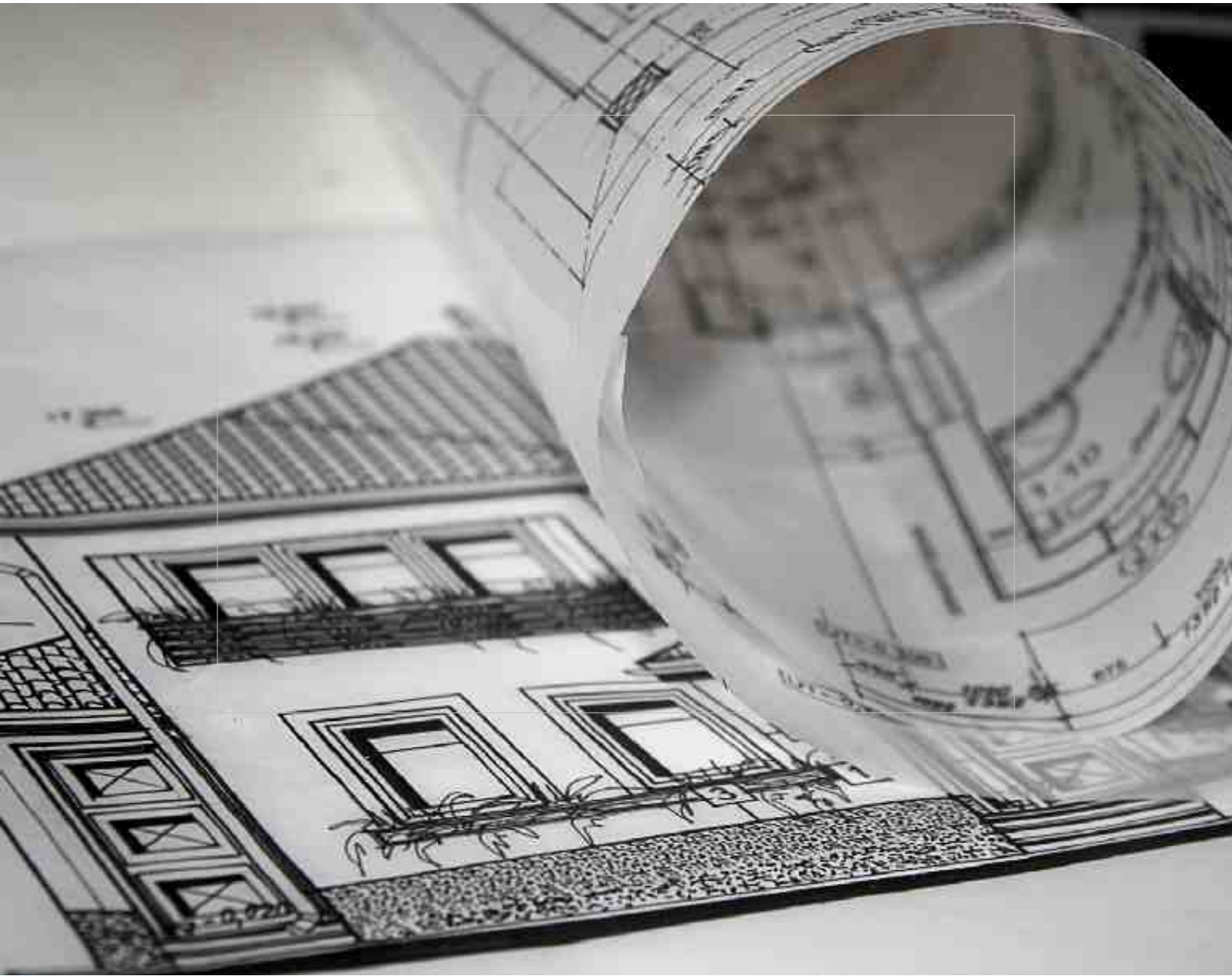


Optimal environments for Cloud

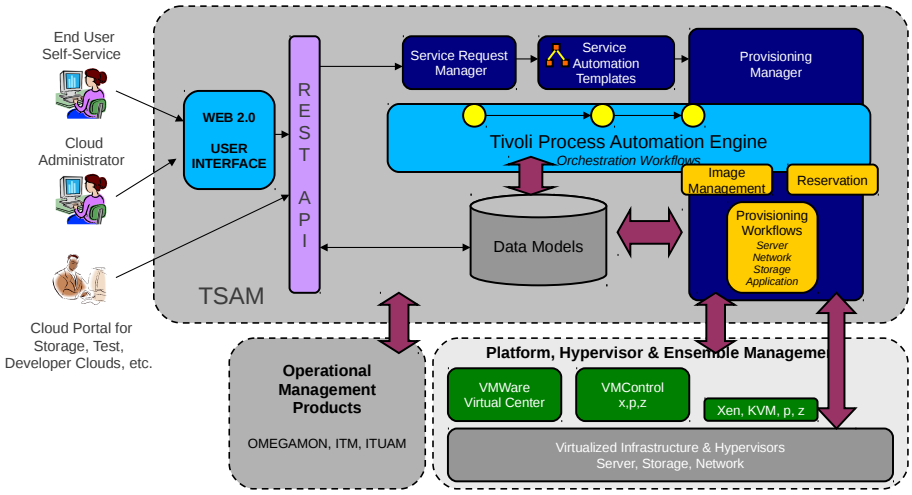
- Development, Test, and QA
- Hadoop / Map Reduce nodes
- On the production side:
  - Software as a Service
  - SOA Applications
- Lightweight Internally supported applications
  - Wiki
  - Blogs
  - Etc.

Buy or build ?

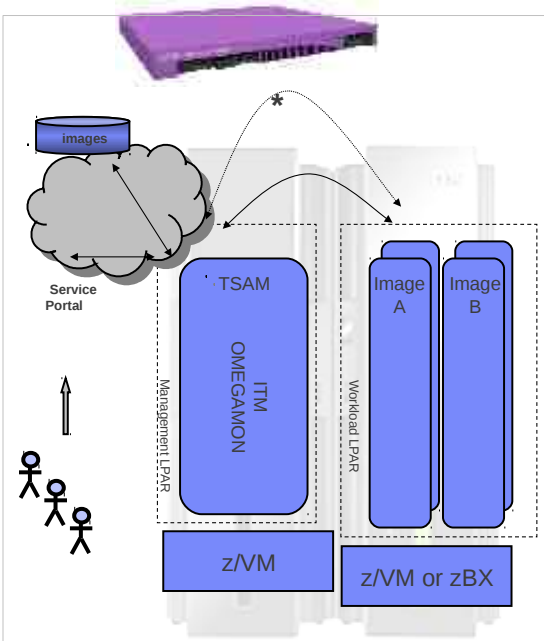




Converged service delivery platform for cloud computing



The management services from Tivoli

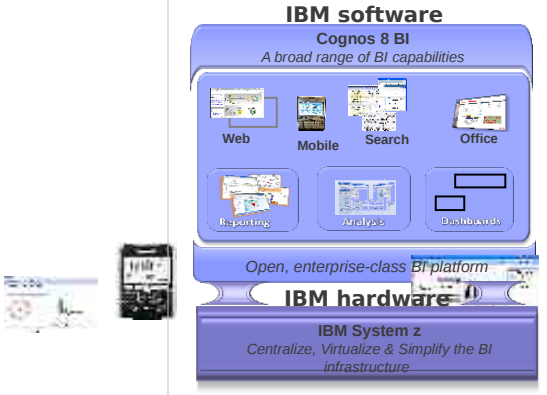


- Management from LPAR for rapid provisioning/de-provisioning and services lifecycle management
- The workload LPAR supports the customer defined cloud images
  - Linux & z/OS support under z/VM
  - A sample workload is provided
- WS Cloudburst appliance can be used for rapid provisioning of best practice WebSphere workloads

Architecture overview

A private cloud optimized for analytic services in large enterprises

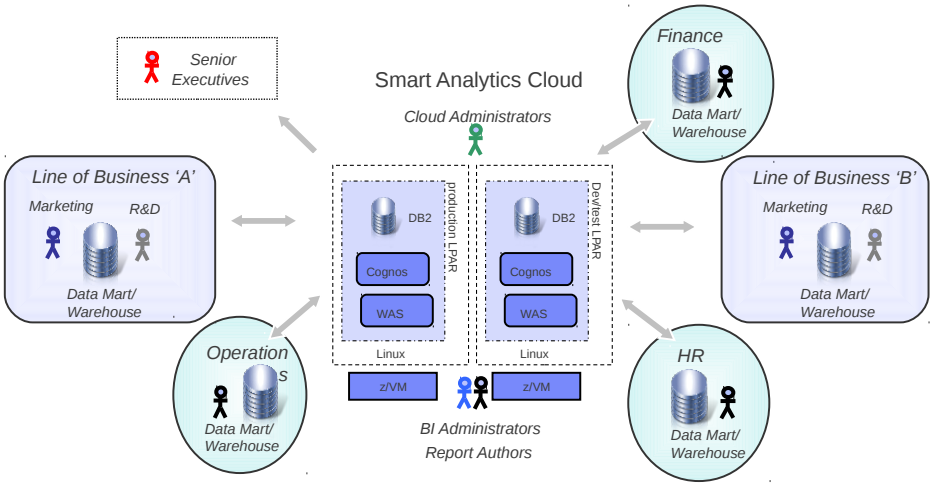
	Defined as …	To create…	That delivers …
Smart Analytics Cloud	IBM Smart Business - services with industry leading hardware & software	A private cloud computing solution for business intelligence (BI) & analytics	A services solution for delivering business intelligence to the entire organization



IBM Services

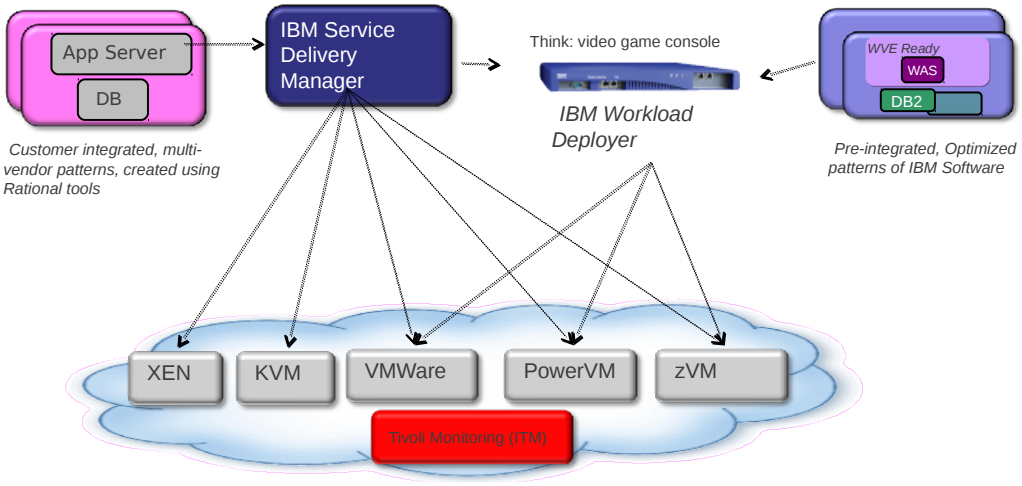
- Create awareness of BI and understand the needs for a BI strategy across the organization
- Complete a readiness assessment to define the scope and priorities for the solution
- Deploy Cognos 8 BI for Linux on System z as a private cloud
- Provide the skills for the on going management & expansion of their BI private cloud deployment

Smart Analytics Cloud



This offering transforms the delivery of business intelligence and performance management into a service that is readily available and affordable to corporate users.

Smart Analytics Cloud



• IBM Service Delivery Manager (ISDM) provides service automation management across the enterprise

• ISDM provides automation and standardization for multi-vendor solutions across major hypervisors

• IBM Workload Deployer delivers pre-integrated & optimized middleware patterns deployable to VMware (Linux), System p (AIX), and System z (z/Linux)

Standardization & Automation

ISDM uses vmware it does not provide a virtualizatio engine. It offers the orchestration workflow to roll service out.

VMWARE announced vcloud orchestrator that performs similar functions but lesser functionality then ISDM.

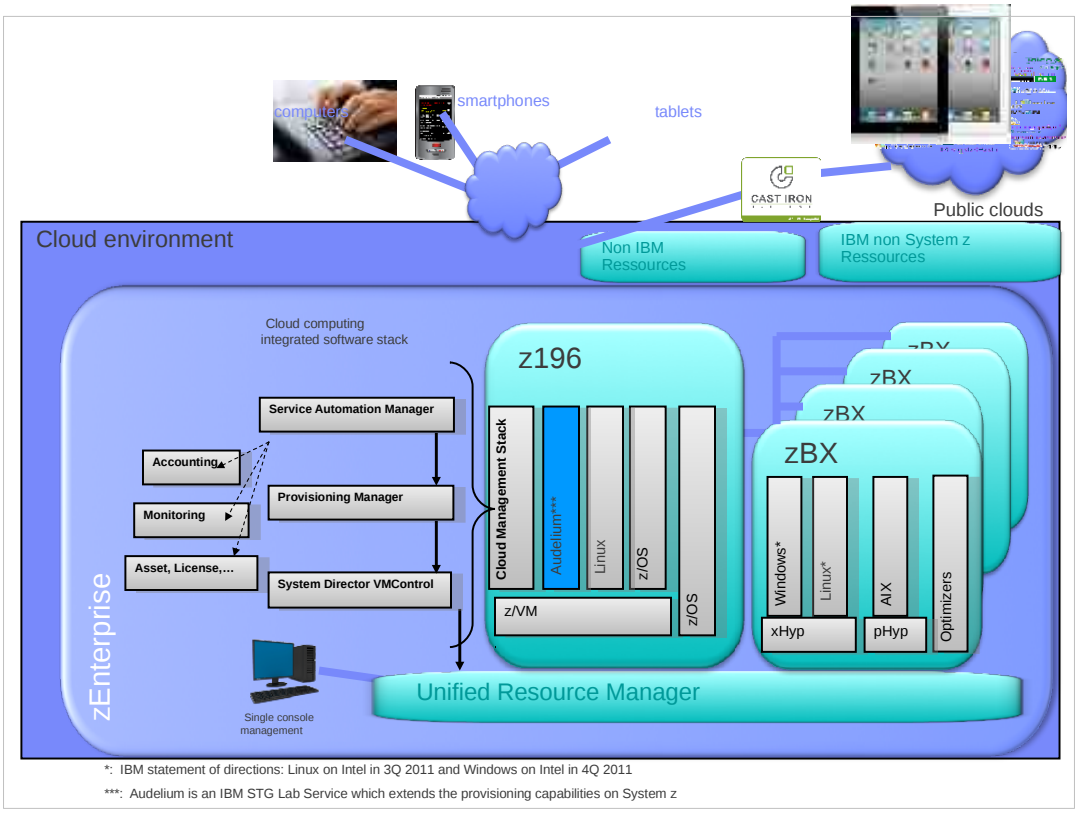
On other reply:
I won't say we are OS or hypervisor agnostic. ISDM supports five virtualization technologies today. vmware, Xen, KVM, PowerVM and Z/Vm. Hyper-V is in the plan I dont know the date of announcement.

On comp. side:

HP can do vmware, HyperV and Xen
CISCO can only do VMWARE
Oracle uses Java VM - pretty much of its own

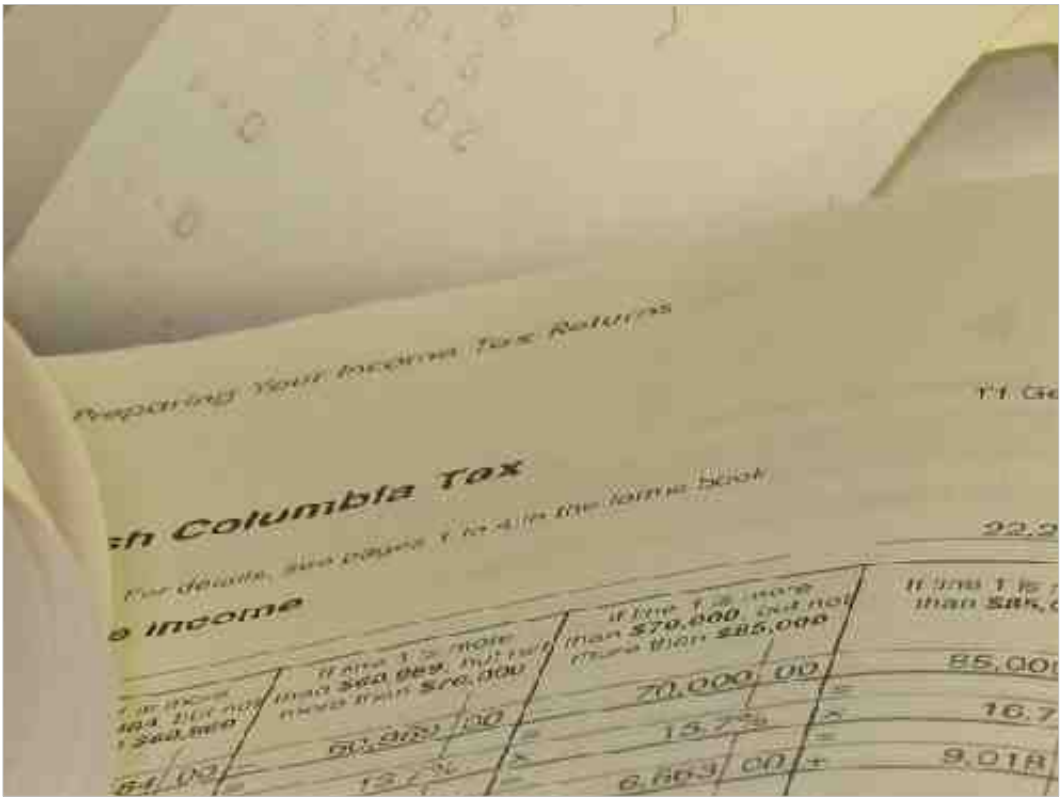
ISDM software stack run on SUSE LINUX and it supports Windows, RedHat and SUSE, AIX. I am not too sure about z/vm.

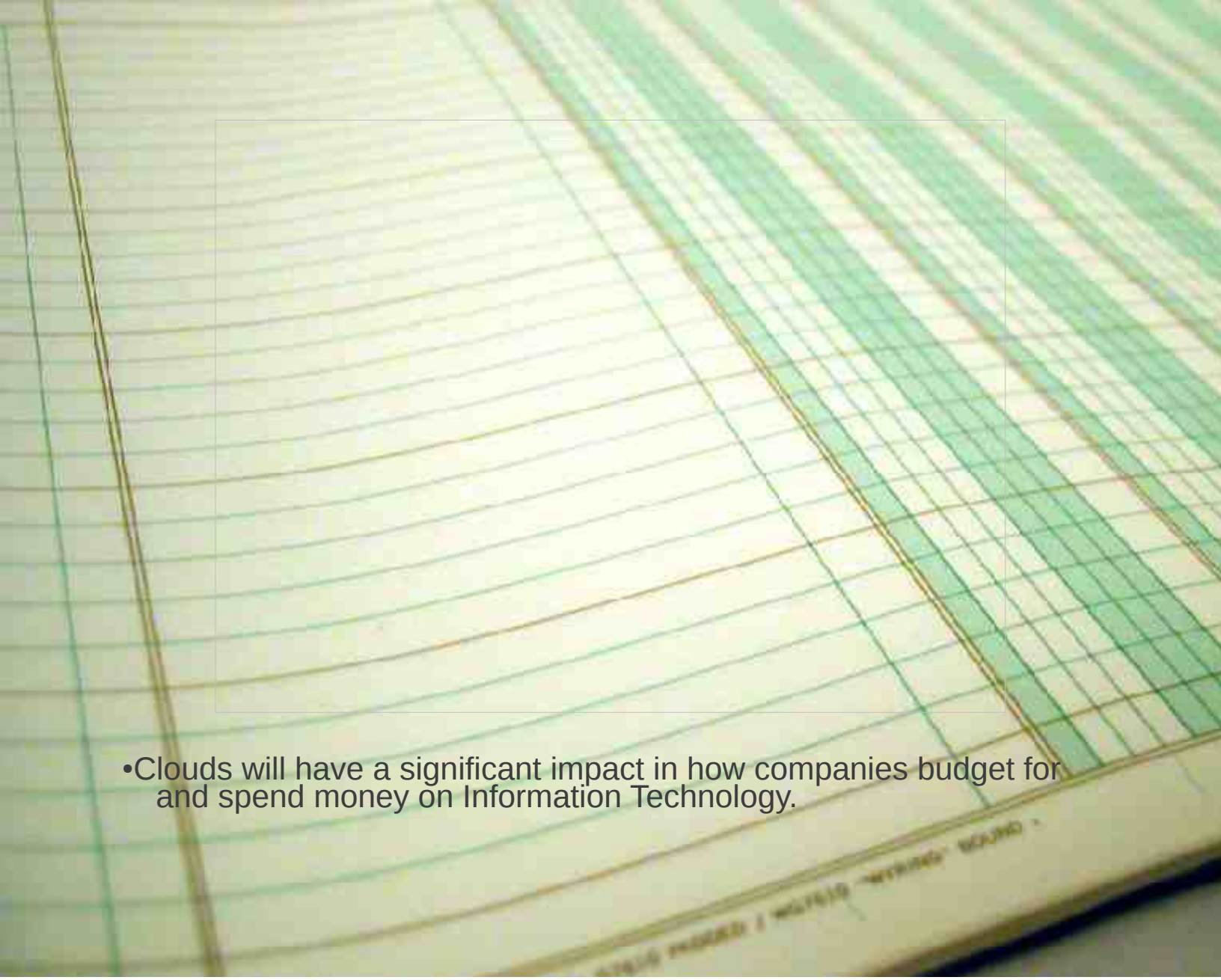
72



S.LL. Comment: this slide is designed to show the zEnterprise capabilities for cloud computing “management from” and “management to” environment. Some component from our IBM Cloud computing reference architecture are highlighted here.

Questions??


Preparing Your Income Tax Returns
h Columbia Tax
e Income



- Clouds will have a significant impact in how companies budget for and spend money on Information Technology.


Security

http://en.wikipedia.org/wiki/Clarke%E2%80%99s_three_laws

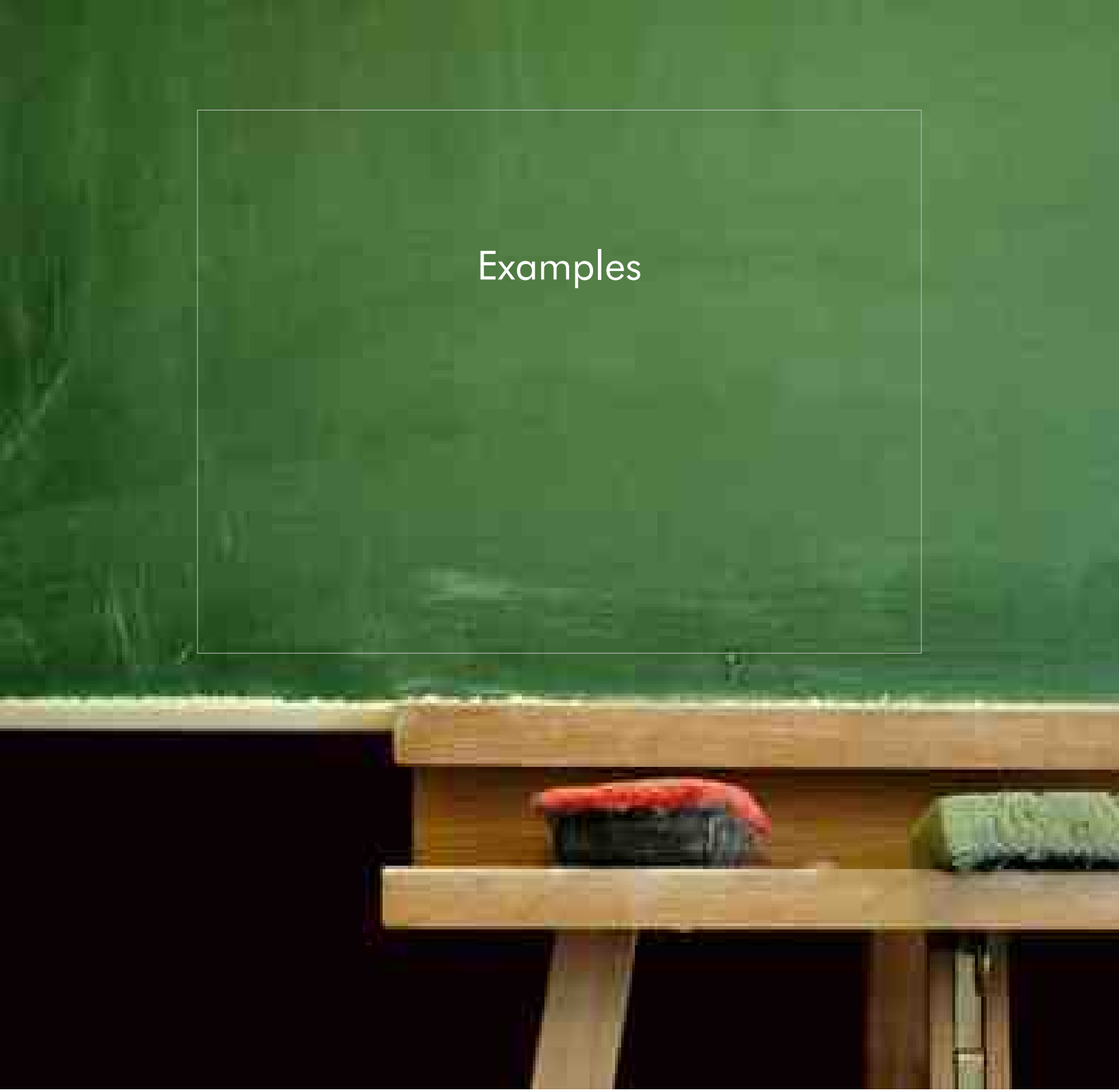
Any sufficiently advanced technology is indistinguishable from magic.

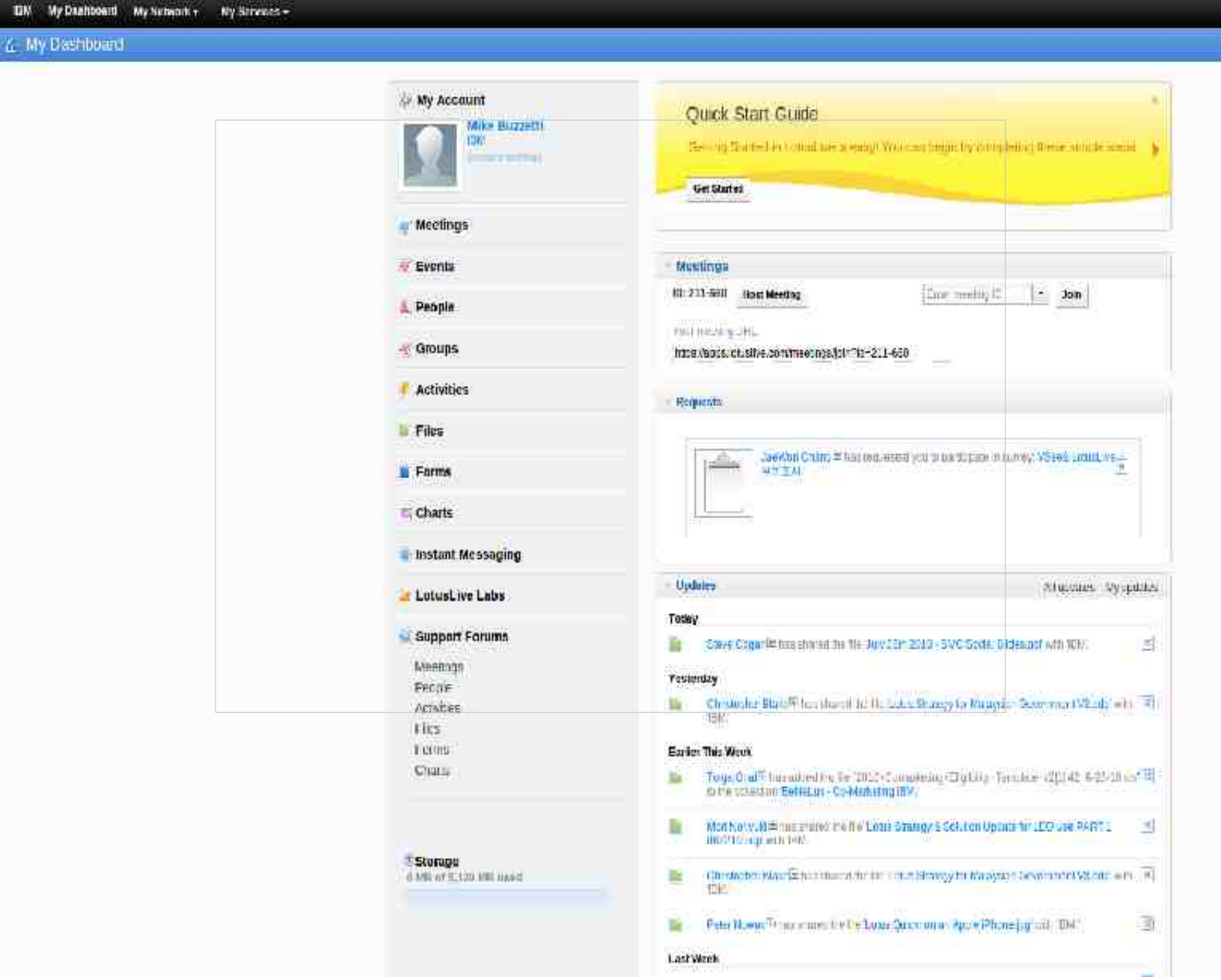
- Cloud computing lets companies focus in on what is core to them making money.
-

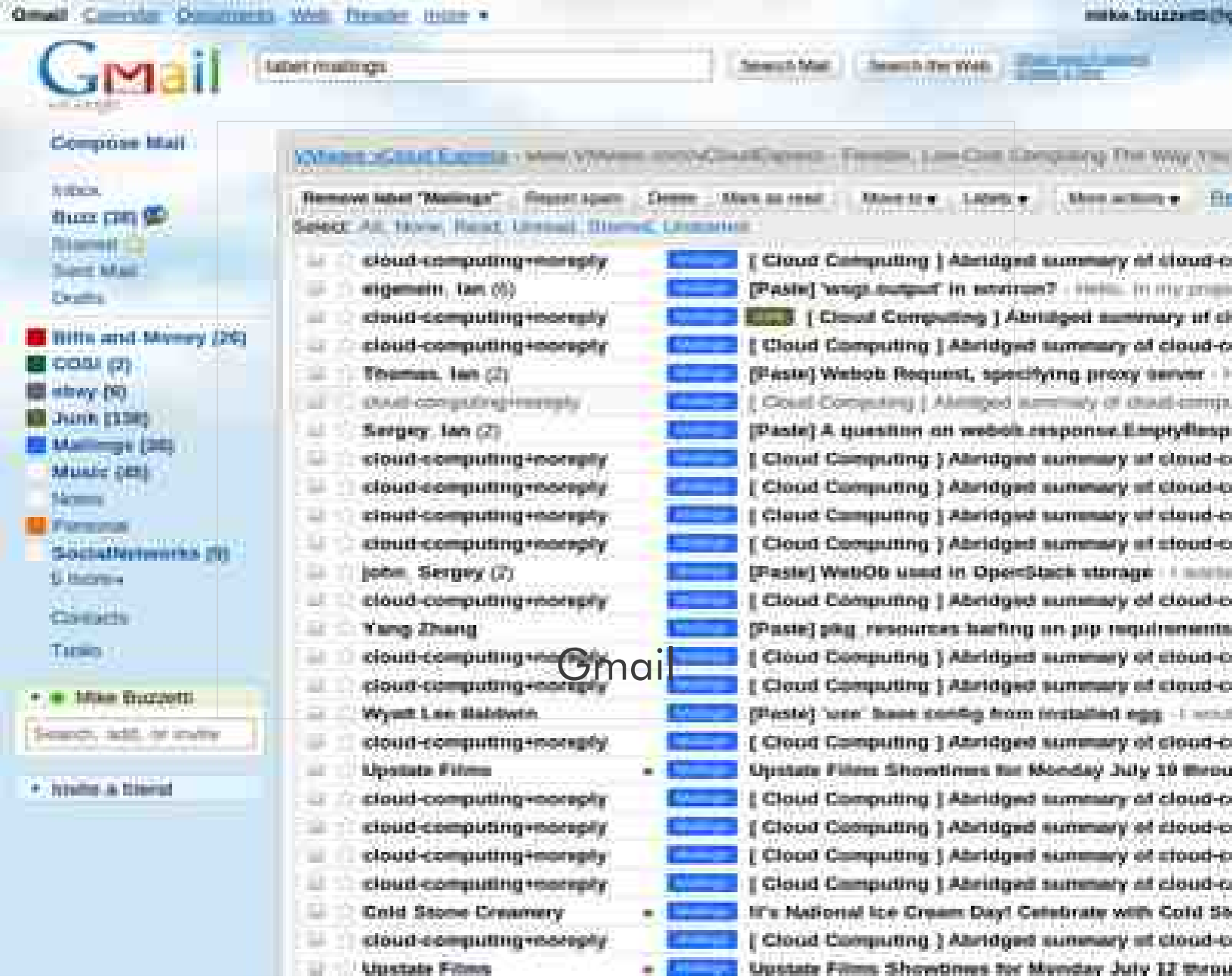
Example:

- Does running an email server make you money ?
  - If not why not let some one else do it ?

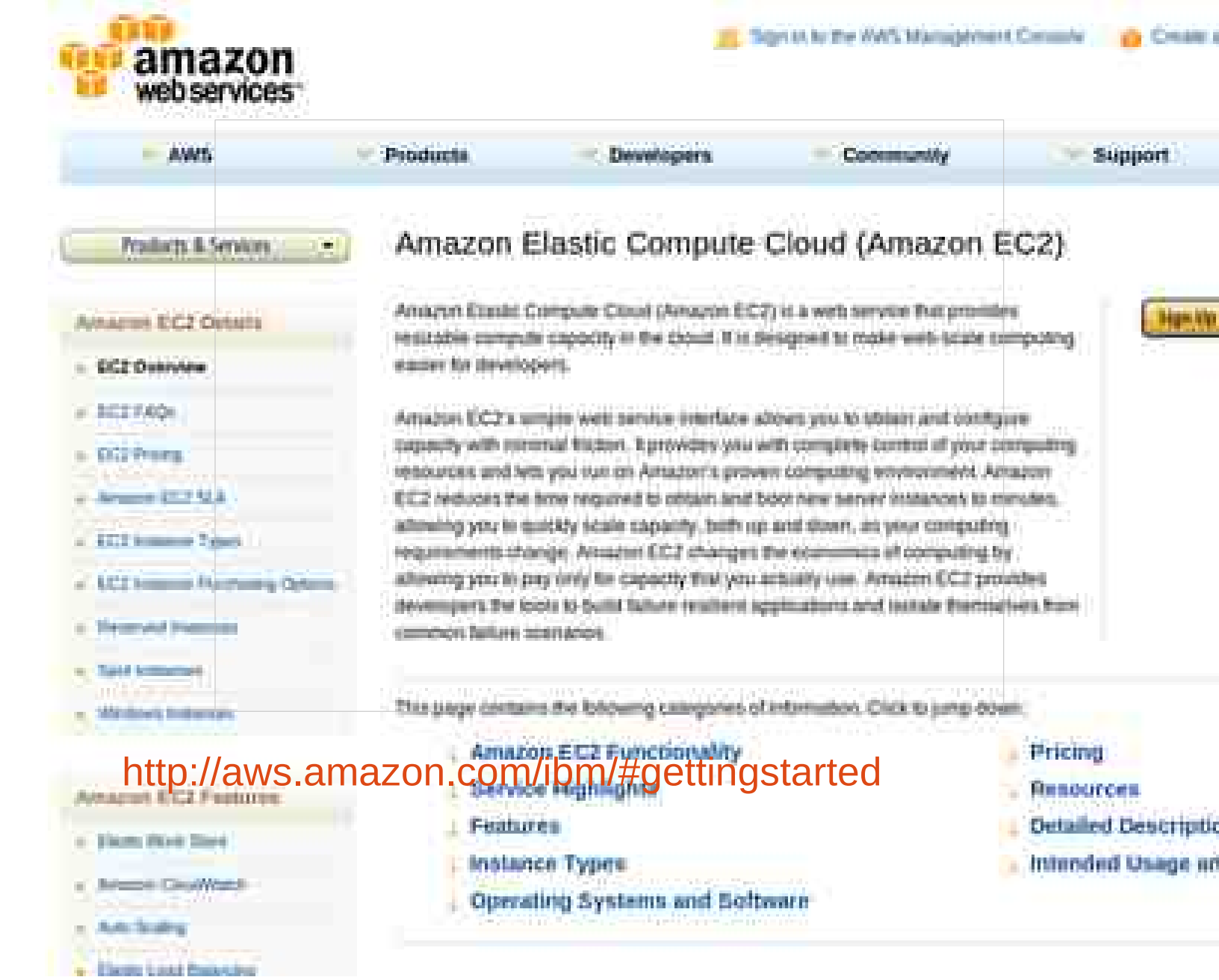

Backup

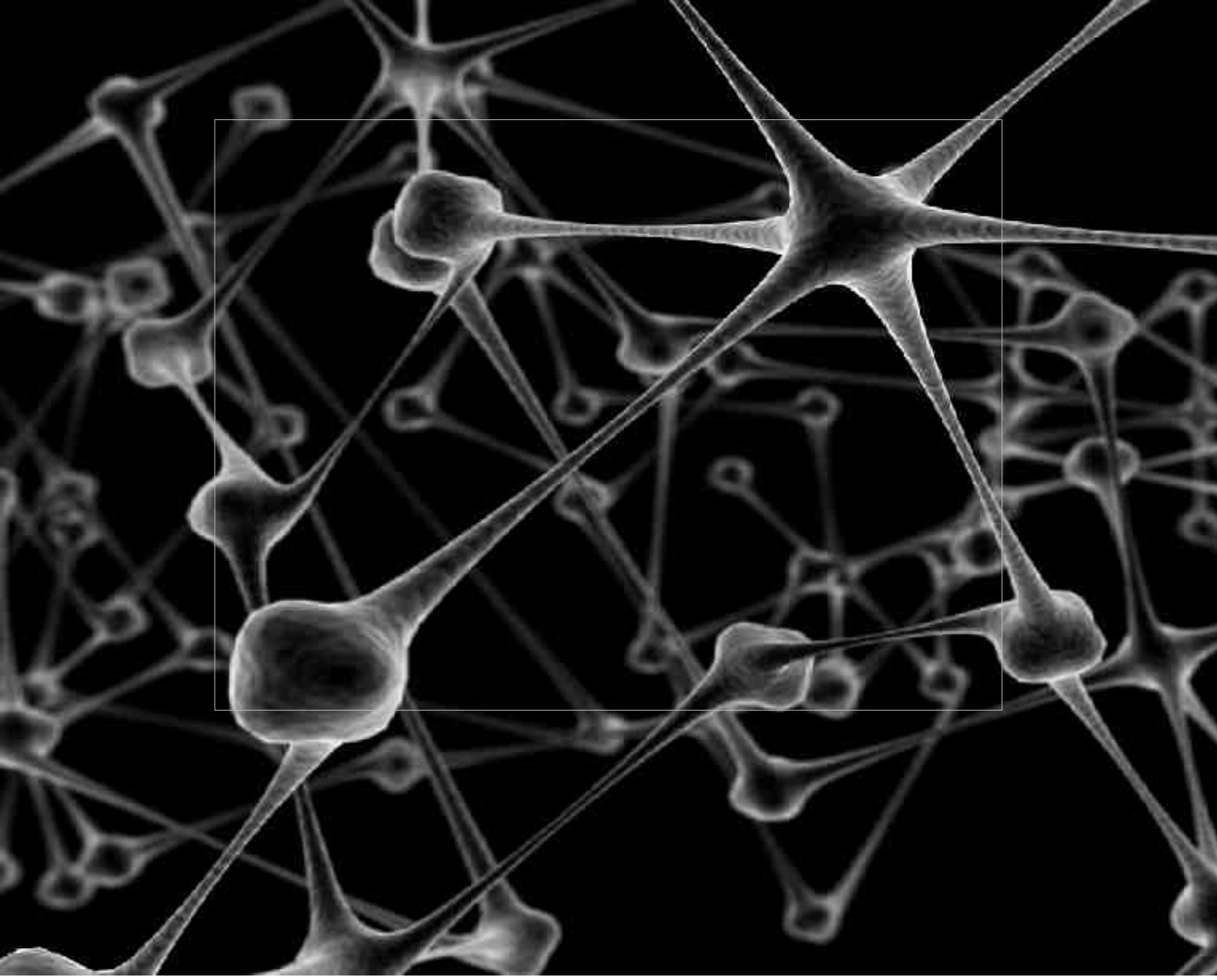

Examples

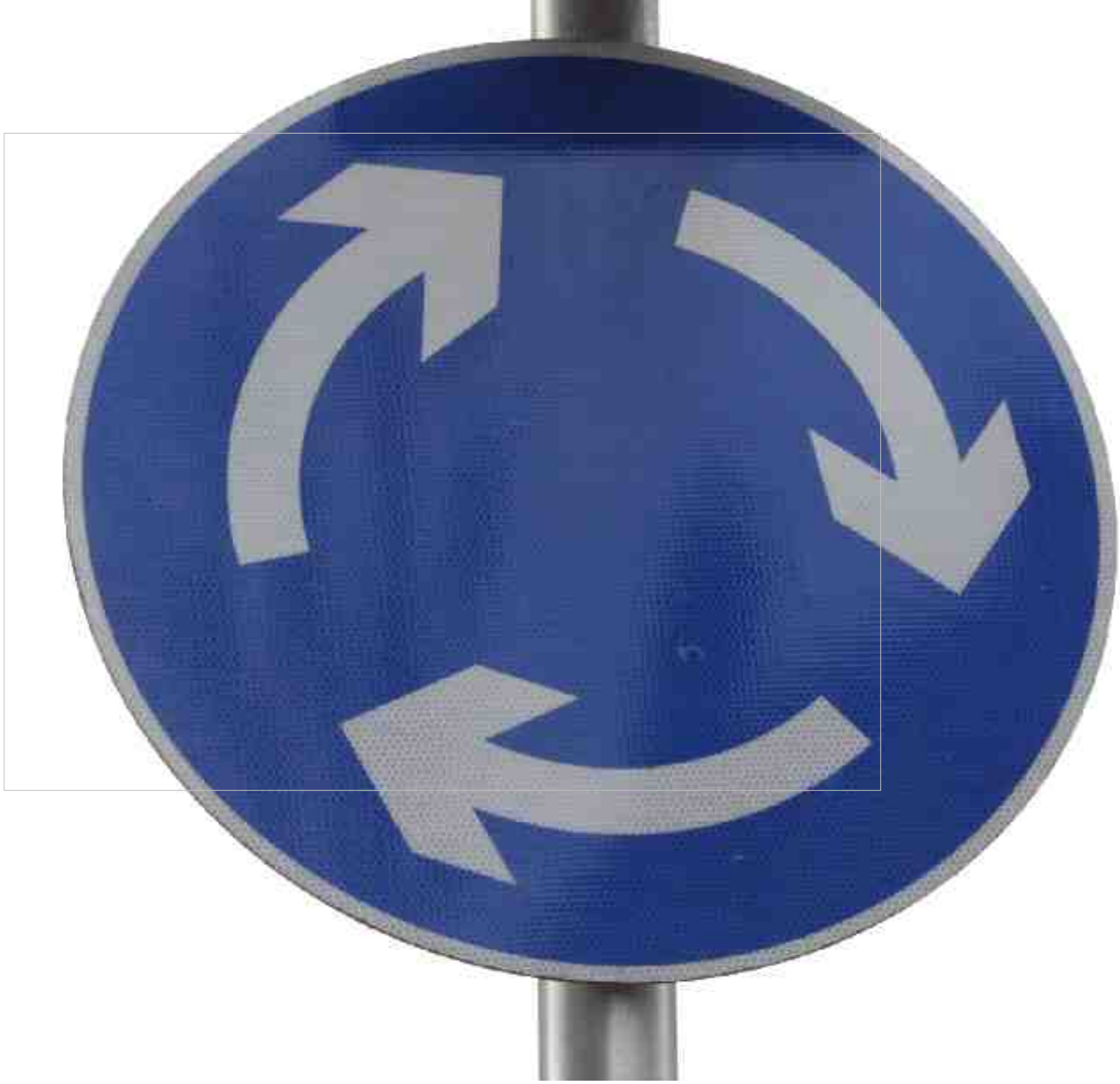

IBM
My Dashboard
My Network
My Services
My Dashboard
My Account
Mike Buzzetti
IBM
Meetings
Events
People
Groups
Activities
Files
Forms
Charts
Instant Messaging
LotusLive Labs
Support Forums
Meetings
People
Activities
Files
Forms
Charts
Storage
Quick Start Guide
Get Started
Meetings
Join
Requests
Updates
All updates
My updates
Today
Yesterday
Earlier This Week
Last Week


Gmail
Compose Mail
Inbox
Buzz (28)
Starred
Sent Mail
Drafts
Bills and Money (26)
CGSI (2)
ebay (9)
Junk (338)
Mailings (36)
Music (48)
News
Personal
SocialNetworks (9)
5 more
Contacts
Tasks
Mike Buzzetti
Invite a friend
Remove label "Mailings"
Report spam
Delete
Mark as read
Move to
Labels
More actions
Select: All, None, Read, Unread, Starred, Unstarred
cloud-computing+noreply
[Cloud Computing] Abridged summary of cloud-c
eigenein, Ian (5)
[Paste] 'wsgi.output' in environ?
[Cloud Computing] Abridged summary of cl
Thomas, Ian (2)
[Paste] Webob Request, specifying proxy server
Sergey, Ian (2)
[Paste] A question on webob.response.EmptyResp
John, Sergey (2)
[Paste] WebOb used in OpenStack storage
Yang Zhang
[Paste] pkg_resources barfing on pip requirements
Wyatt Lee Baldwin
[Paste] 'use_base_config from installed egg
Upstate Films
Upstate Films Showtimes for Monday July 19 throu
Cold Stone Creamery
It's National Ice Cream Day! Celebrate with Cold St
Upstate Films Showtimes for Monday July 12 throu

Facebook







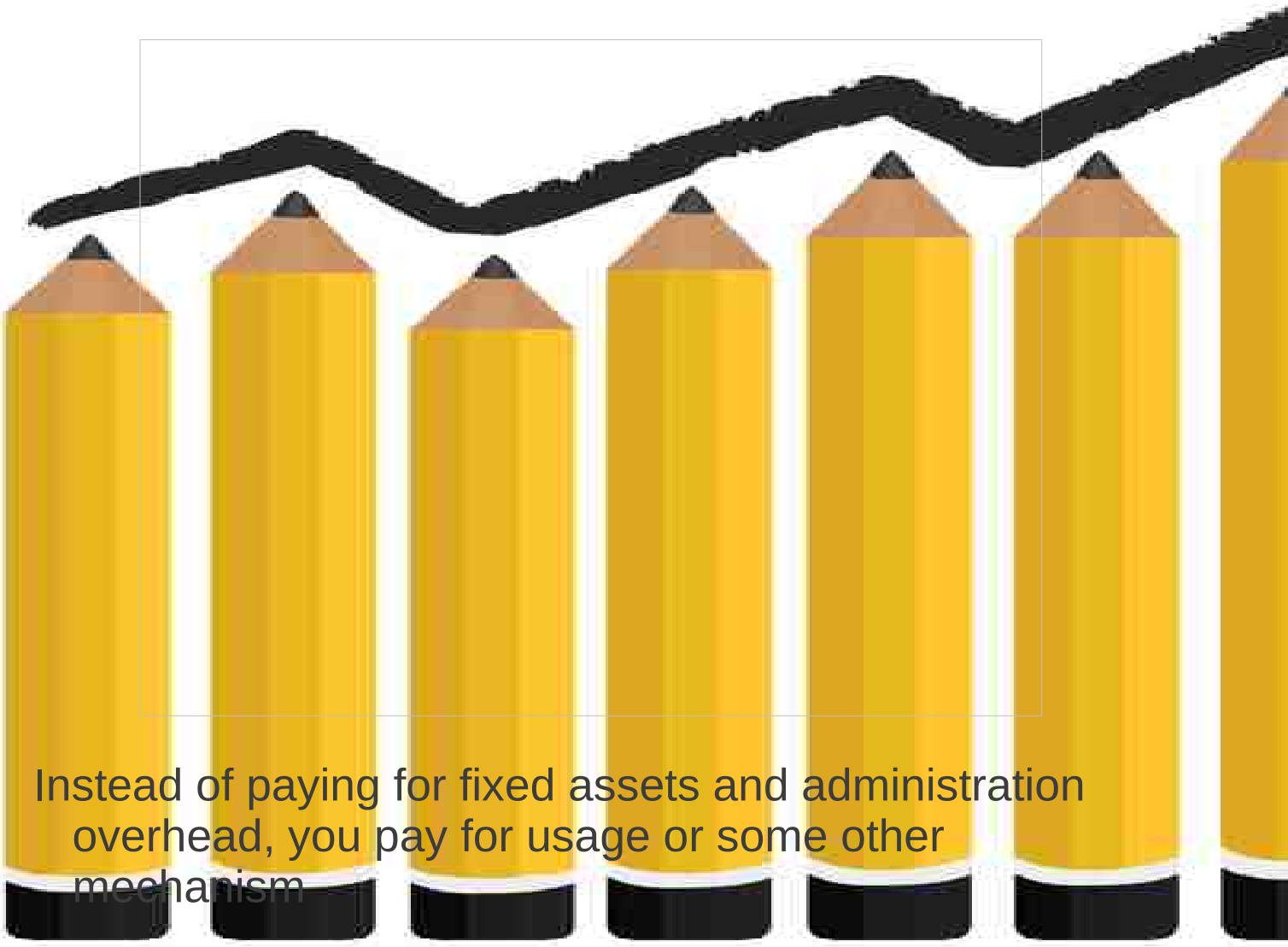
The next few charts describe how cloud computing differs from how services are delivered today.

You no longer have to buy assets and build delivery architecture

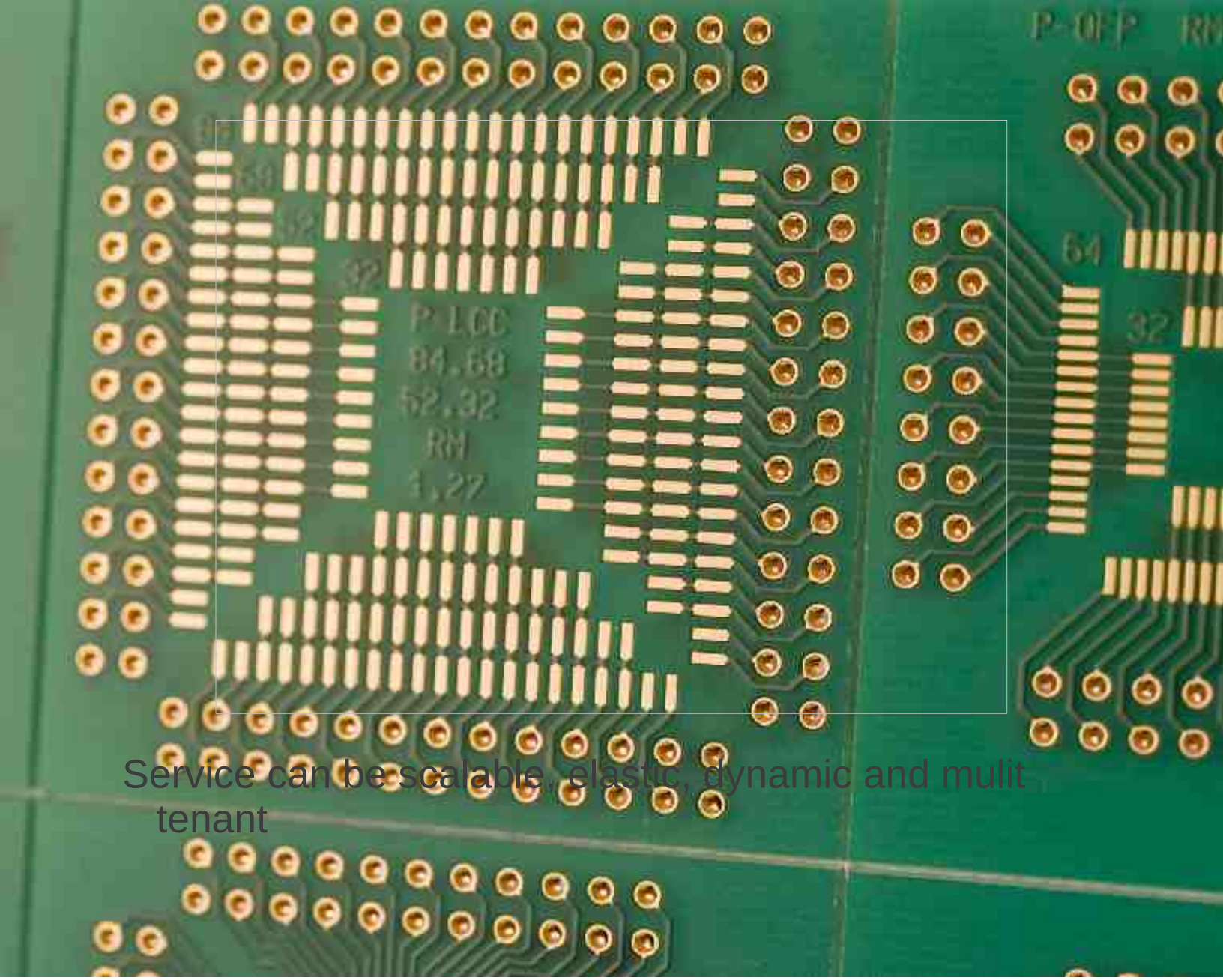
buy an external service

nterface Model

Instead of using an internal network and home grown connections, now you can interface using the internet and normal standards like HTML HTTP ReST etc



Instead of paying for fixed assets and administration overhead, you pay for usage or some other mechanism



Service can be scalable, elastic, dynamic and mulit tenant