

# Cloud Computing *... made better with System z*

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Cloud Computing Strategy, System z

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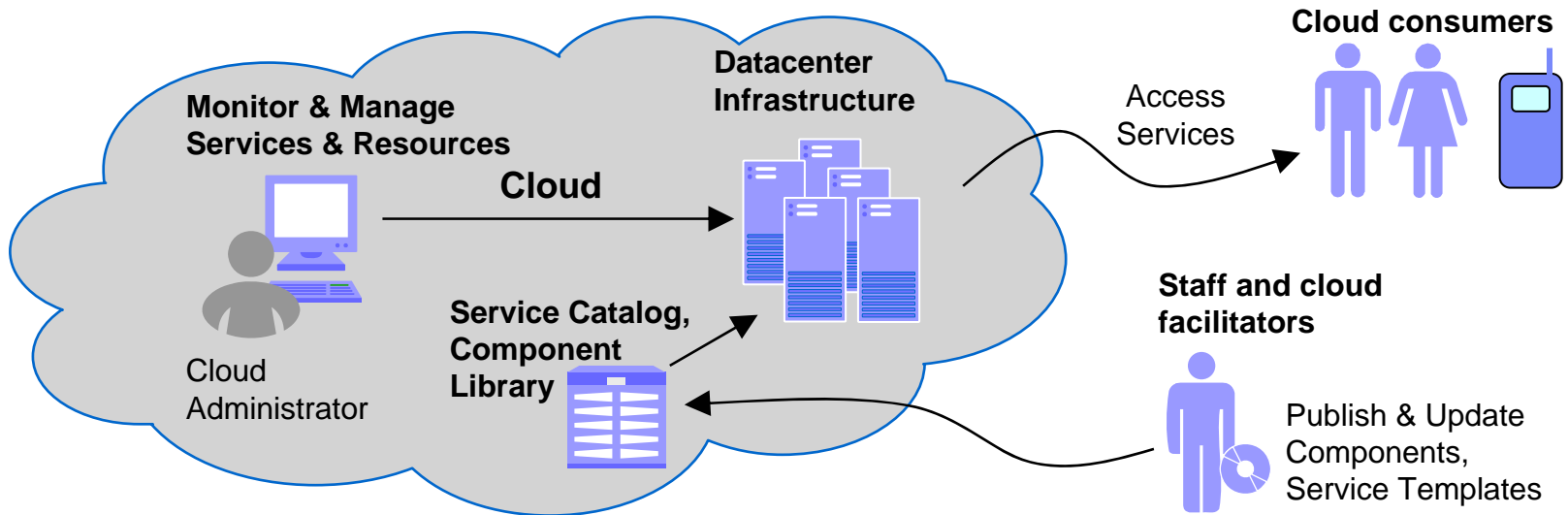
# What is cloud computing?

## A user experience and a business model

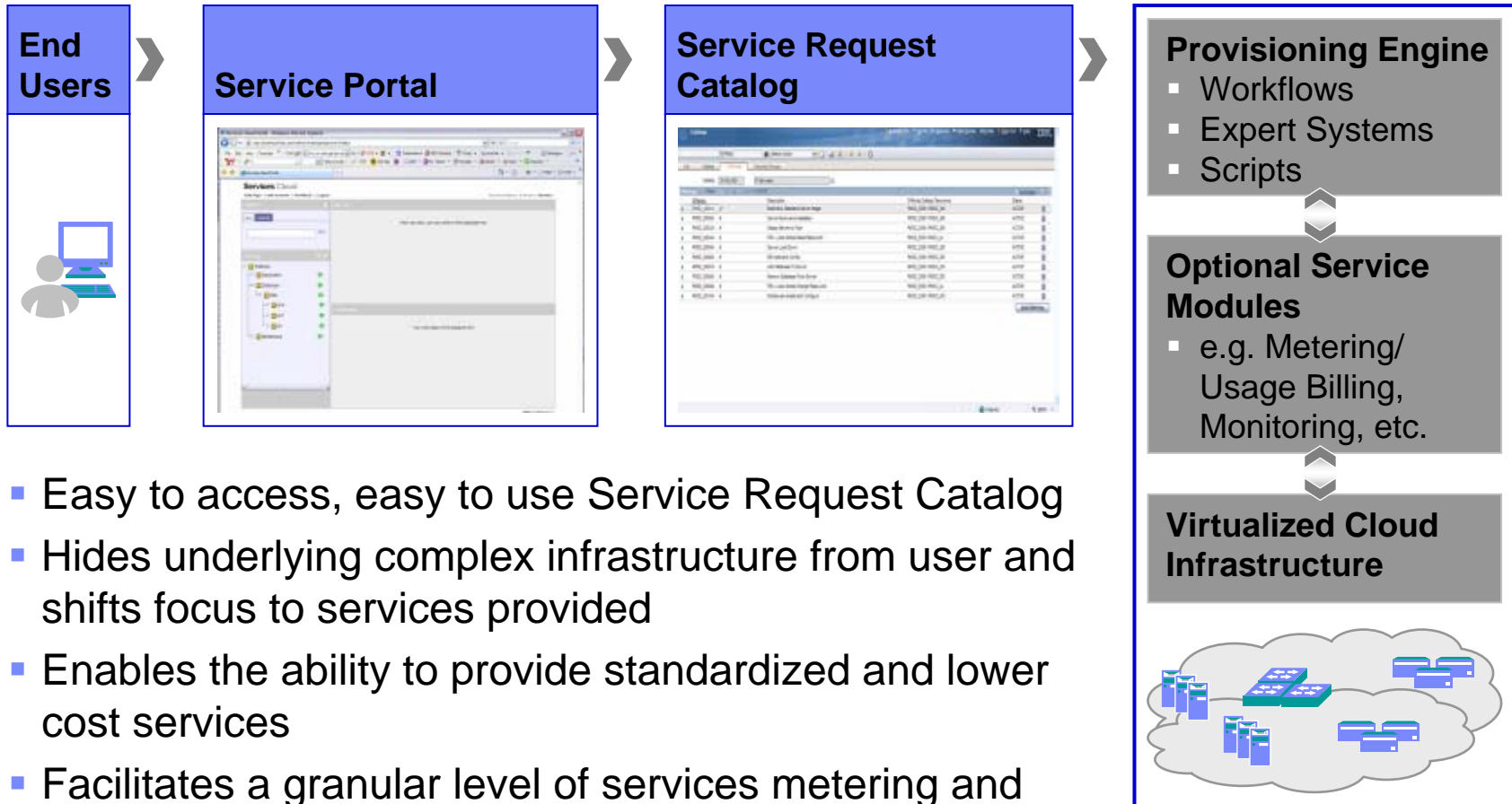
Cloud computing is an emerging style of IT delivery in which applications, data, and IT resources are **rapidly provisioned** and provided as **standardized offerings** to users over the web in a **flexible pricing model**.

## An infrastructure management and services delivery methodology

Cloud computing is a way of **managing** large numbers of highly **virtualized resources** such that, from a management perspective, they resemble a single large resource. This can then be used to deliver services with **elastic scaling**.

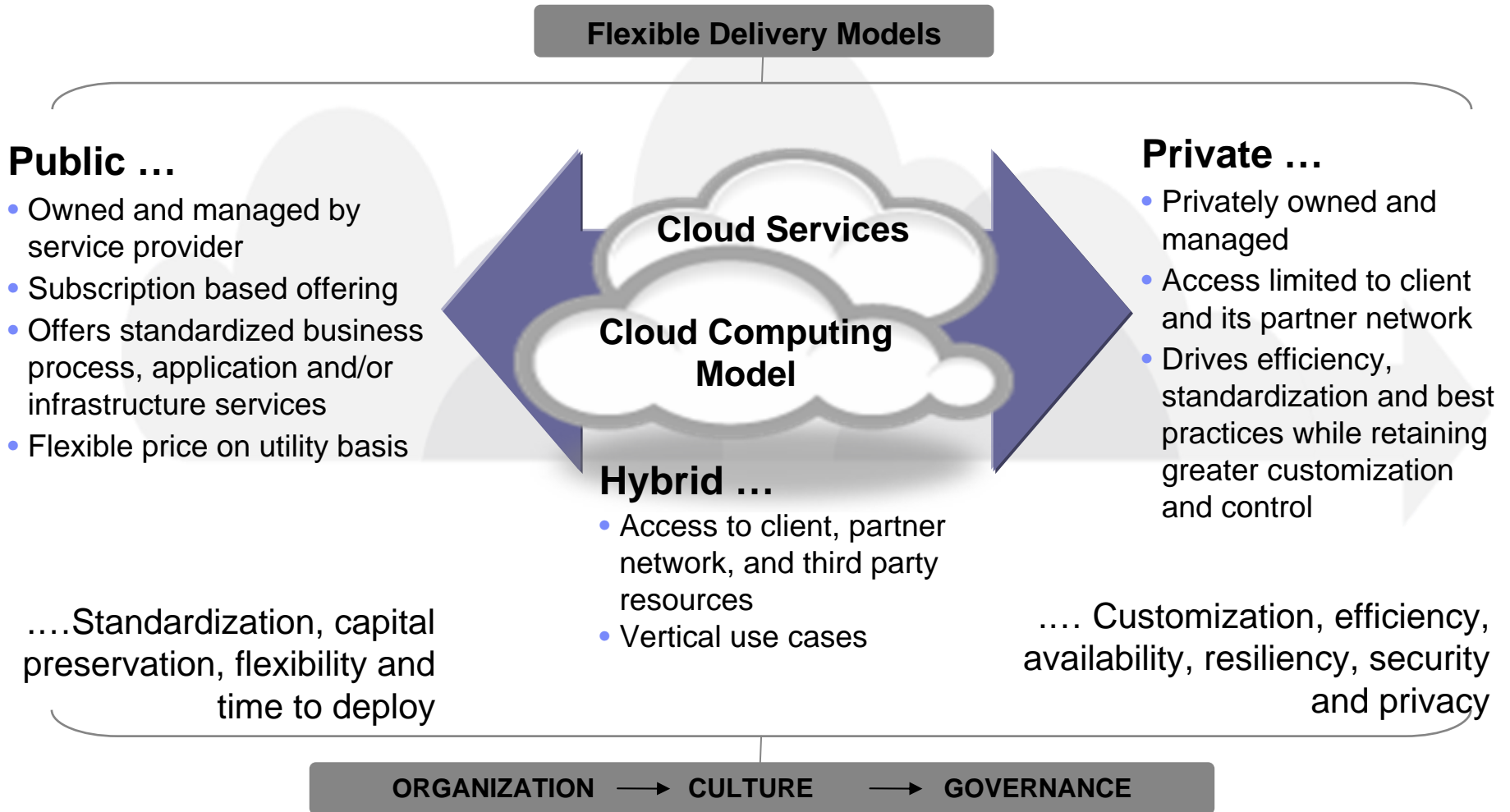


# How does cloud computing work?



- Easy to access, easy to use Service Request Catalog
- Hides underlying complex infrastructure from user and shifts focus to services provided
- Enables the ability to provide standardized and lower cost services
- Facilitates a granular level of services metering and billing
- Workload standardization eases complexity

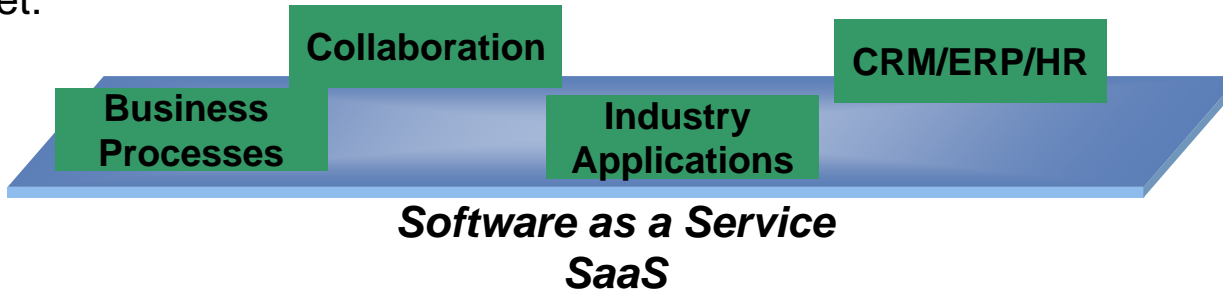
# What are the delivery models for cloud?



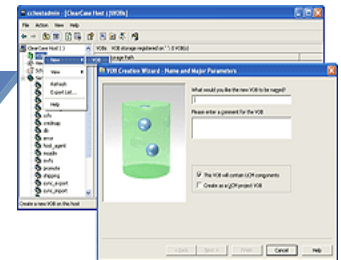
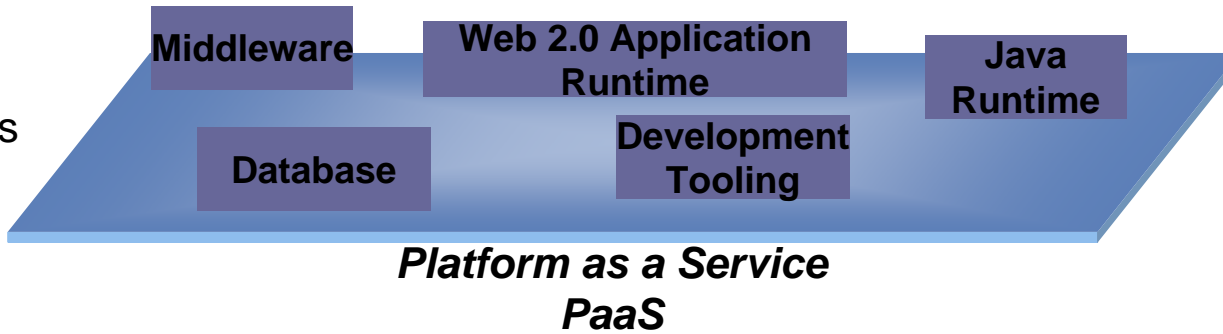
# What services can be delivered?

User target:

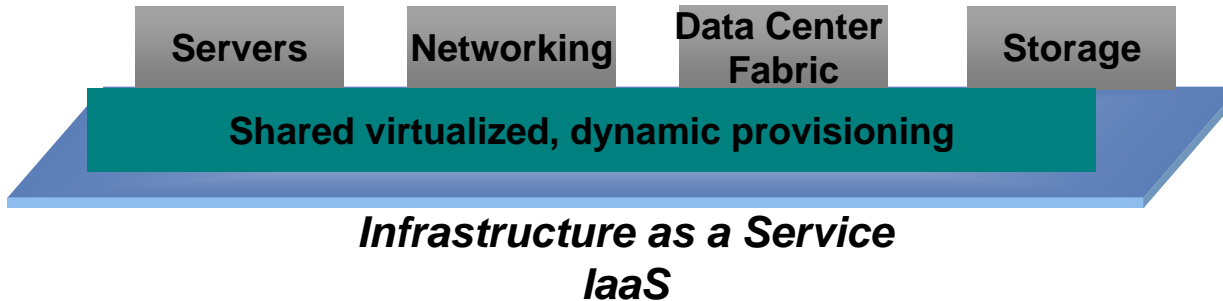
Business users



Developers



Data Center staff



# TRANSZAP using System z for SaaS

Leading SaaS provider of ePayable, digital data, and spend analysis solutions

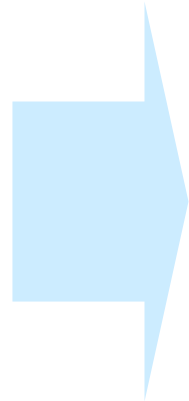
- 44,000+ users
- 4,200 companies
- \$80 B in transaction detail, processed



- Available • Secure • Elastic

As a traditional Intel shop,  
Transzap struggled to:

- Scale, manage, secure
- Reduce complexity
- Grow at a reasonable cost



As a new z9 Business Class shop,  
Transzap has been able to:

- Meet demand (triple digit growth)
- Centrally manage & secure (1 box)
- Incrementally grow at a low cost

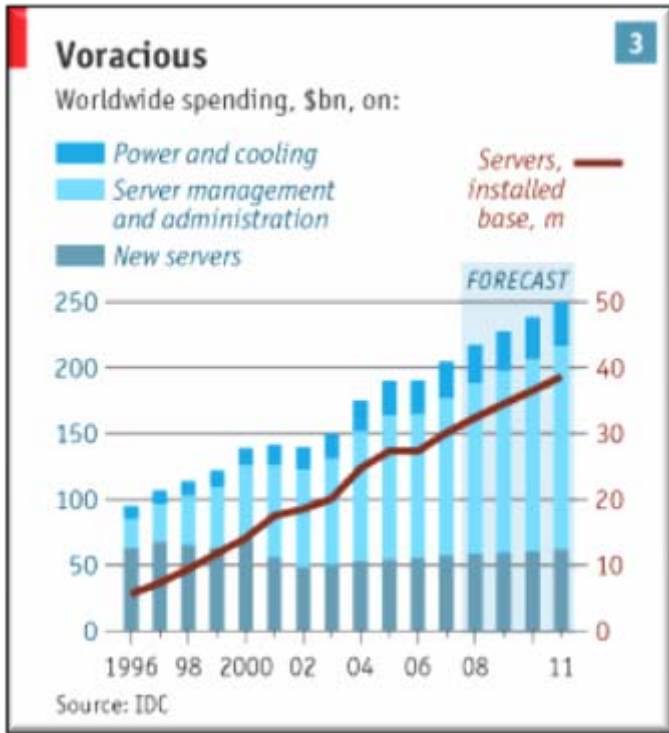
***“The IBM z9 provides the stability and scalability needed to accommodate Transzap’s triple digit volume growth in a SaaS environment.”***

*– Peter Flanagan, President*

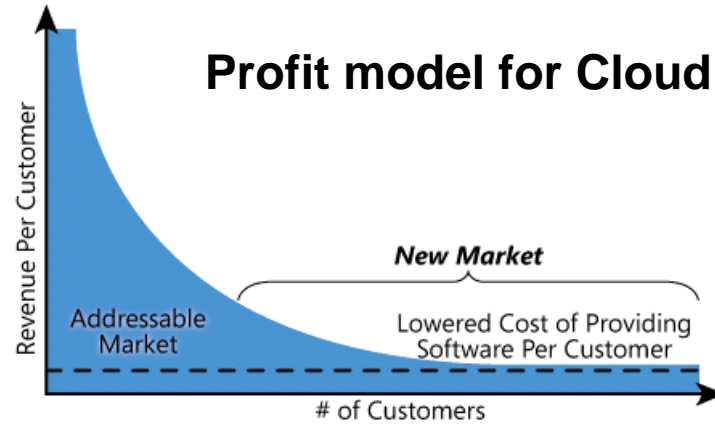
# Cloud profitability and cost profile

The Cloud model can be truly disruptive if it can reduce the IT *operational expenses* of enterprises

## Operational reality



## Profit model for Cloud

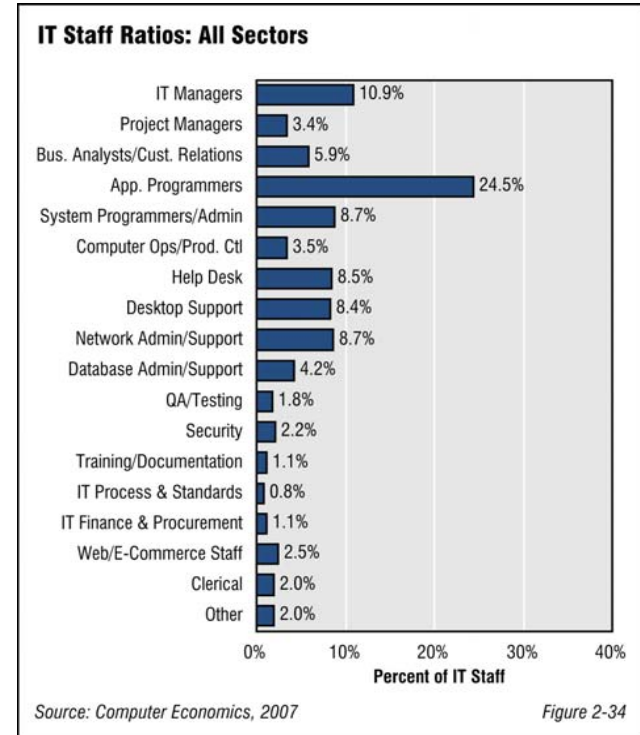
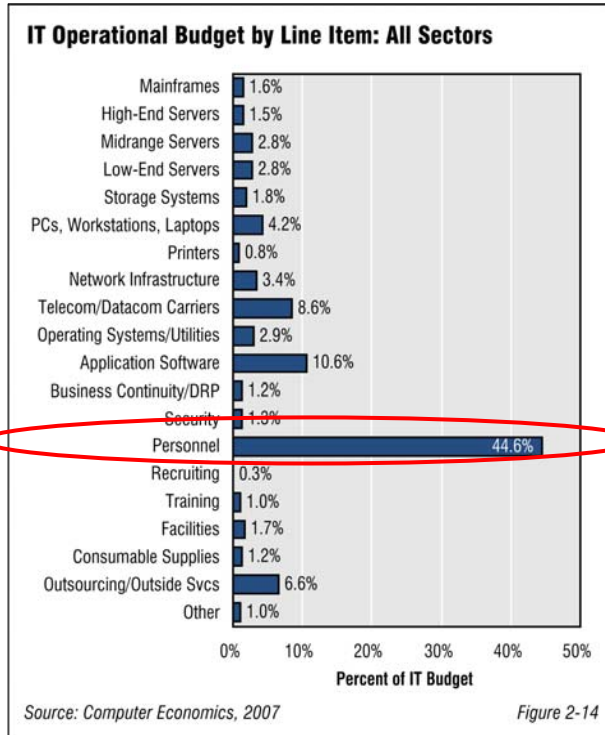


Operational costs pose huge opportunity for Cloud

Capital costs are being addressed via consolidation & commoditization of HW



# The costs of IT operations



Personnel represents the largest percentage of operational costs in the enterprise



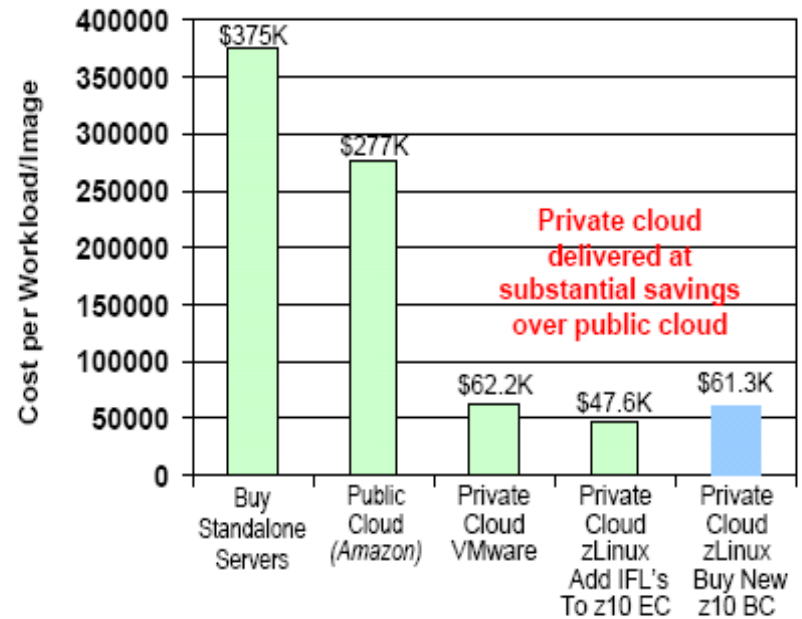
# System z clouds achieve operational efficiency

**Clouds built on mainframes can deliver economies of scale by using less resources while delivering more workload capability**

## Dramatic Simplification through Virtualization - The mainframe consolidation project

Unit	Distributed	System z Linux	% Reduction
Software Licenses	26,700	1,800	93%
Ports	31,300	960	97%
Cables	19,500	700	96%
Physical Network Connections	15,700	7,000	55%

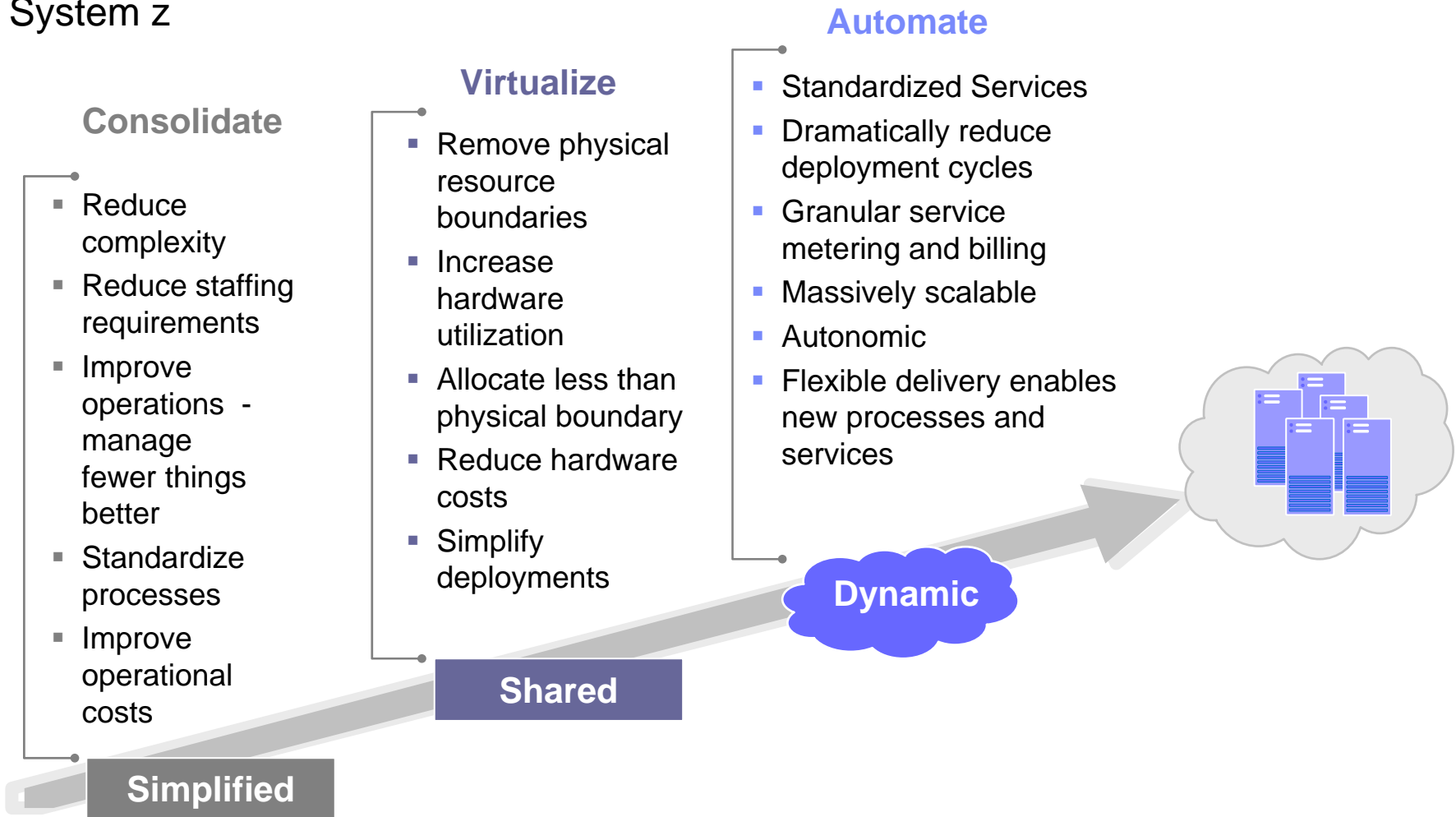
## Cost Per Image for Linux Workloads (5 Yr TCO)



**60-75% gross cost savings over 5 yrs**

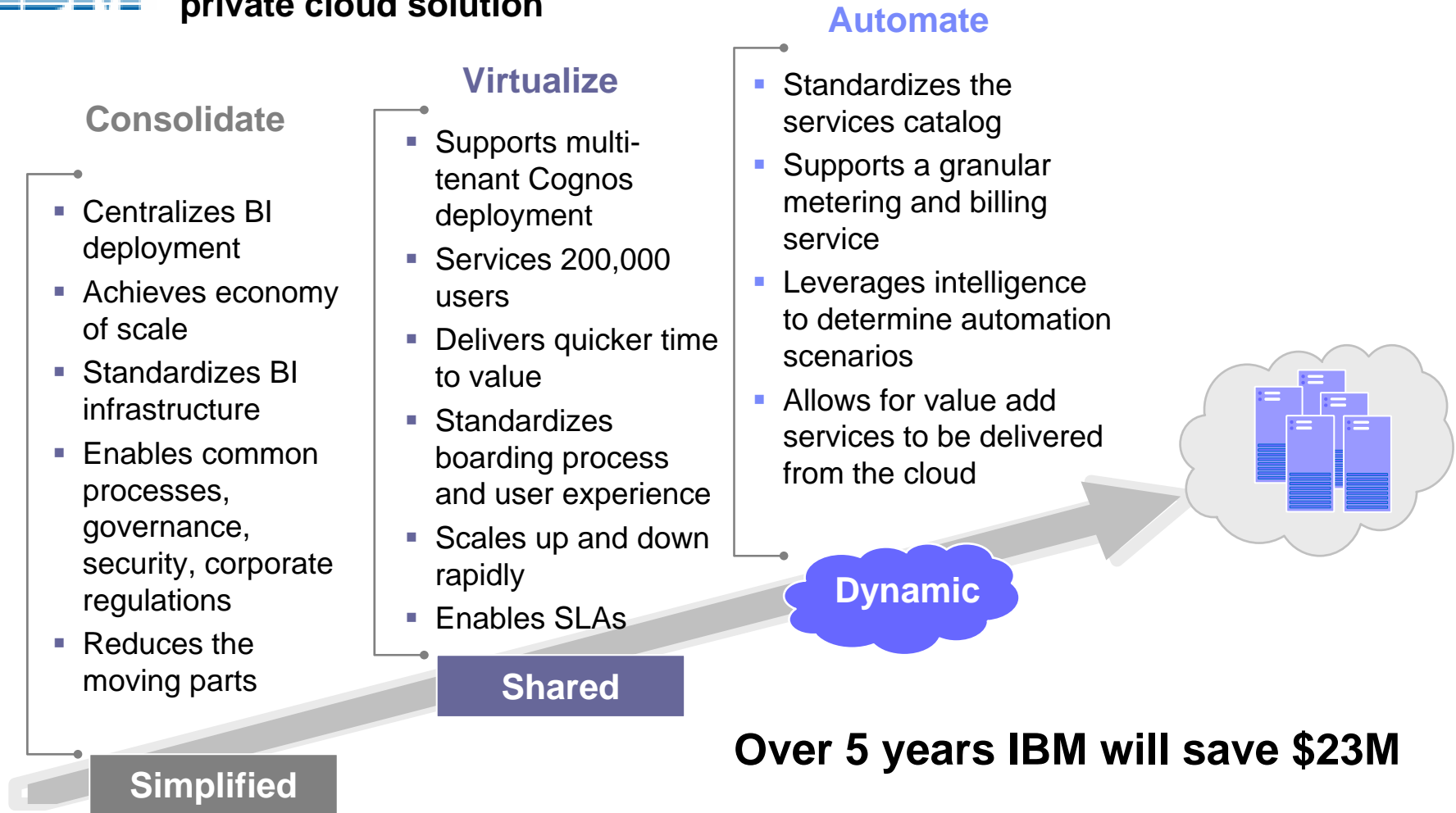
# The IT transformation roadmap for cloud computing

The roadmap caters to the strengths of System z



# Enterprise workloads don't drop into the cloud, they transform

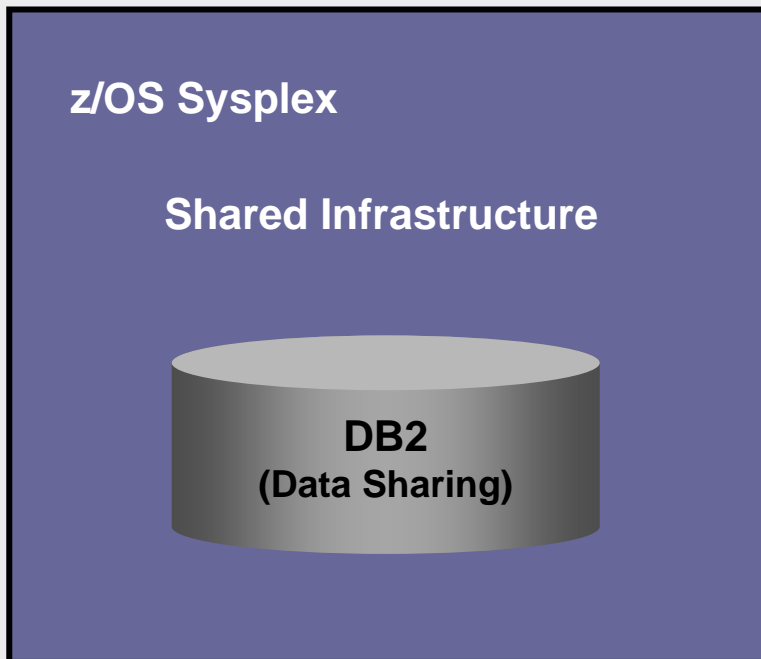
## IBM® CIO business intelligence private cloud solution



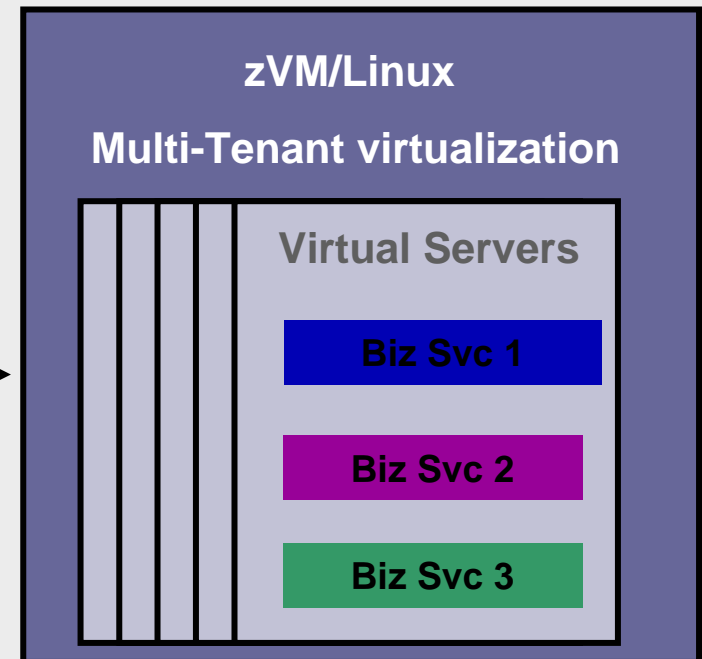
## System z provides a hybrid hosting environment

The core infrastructure of System z is multi-tenant by nature and highly efficient, resources (HW and SW) are shared and virtualized to ensure max utilization enabling you to deploy workload where it fits

### Data warehouse



### Virtual server warehouse

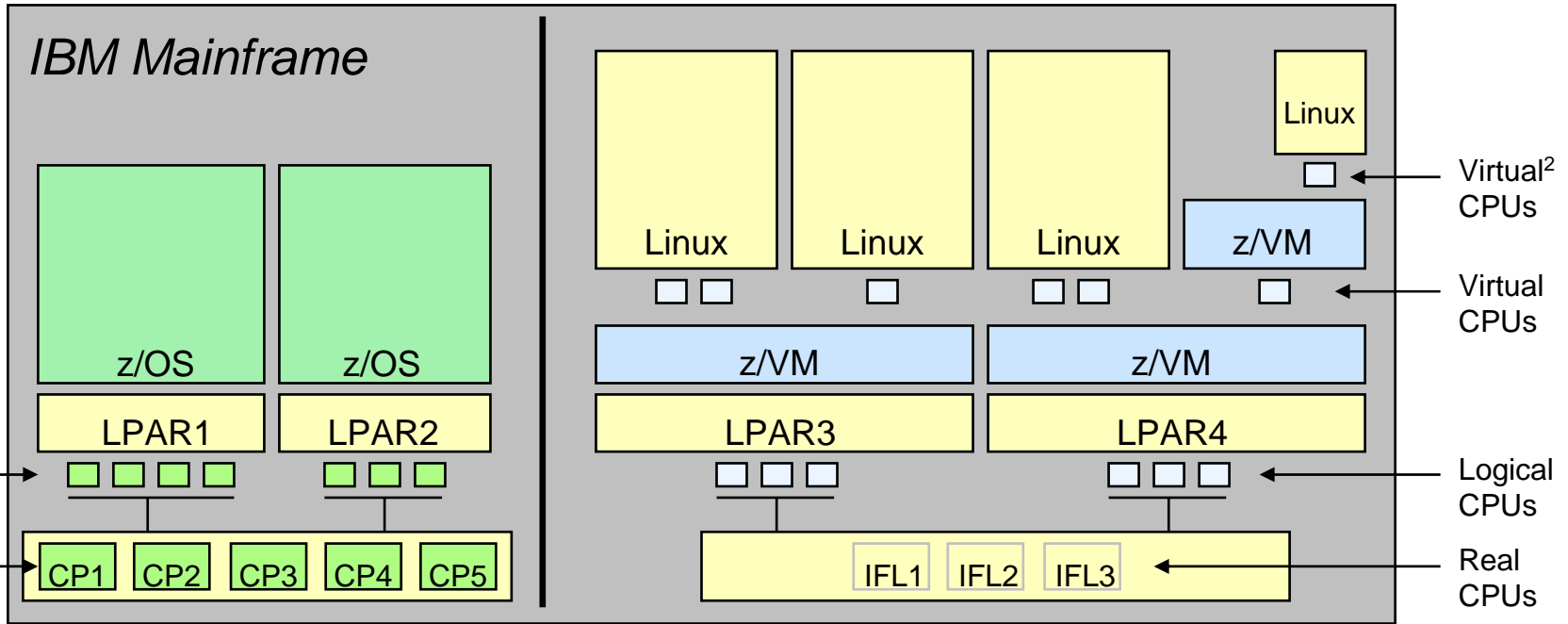


HyperSockets



# Virtualized from the silicon to the app

The core infrastructure of System z is multi-tenant by nature and highly efficient, resources (HW and SW) are shared and virtualized to ensure utilization up to 100% without degradation.



*"... new z/VM virtualization product release can host more than 1,000 virtual images on a single hypervisor - topping any virtualization solution in the industry."*

- Charles King, PUND-IT

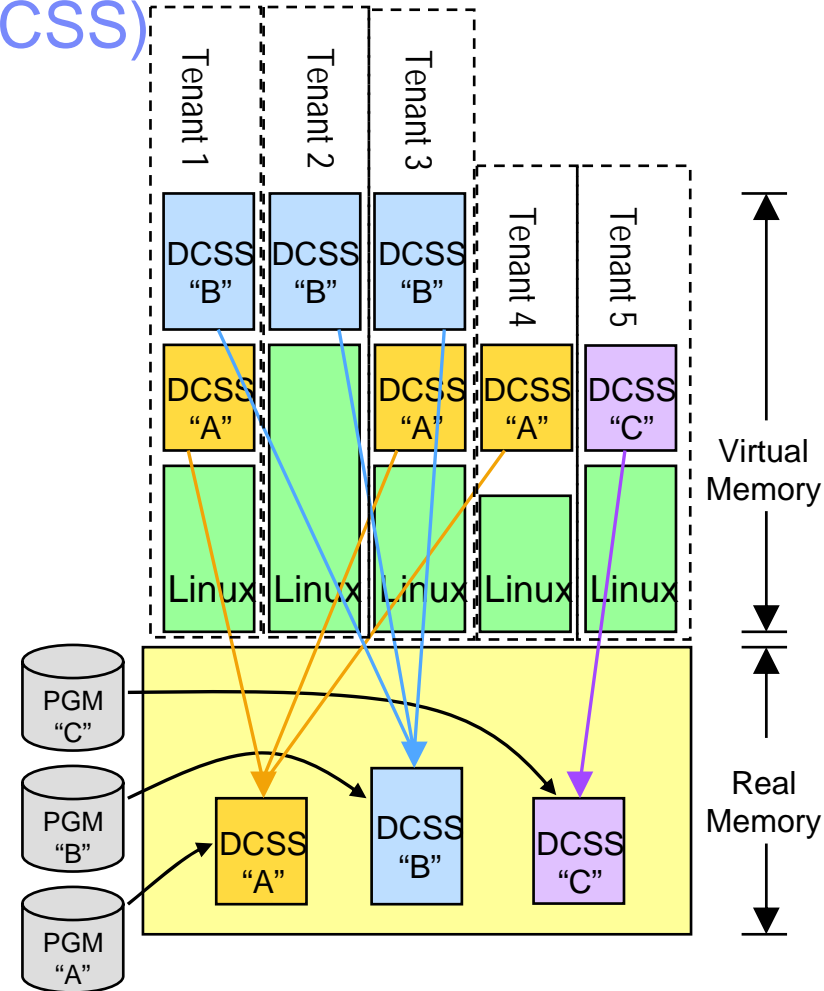
# Enabling transparent multi-tenancy of applications with Discontiguous Saved Segments (DCSS)

## Data-in-Memory technology

- Share a single, real memory location among multiple virtual machines
- High-performance data access

## Shared program executables

- Program executables are stored in an execute-in-place file system, then loaded into a DCSS
- DCSS memory locations can reside outside the defined virtual machine configuration
- Access to file system is at memory speeds; executables are invoked directly out of the file system (no data movement required)
- Avoids duplication of virtual memory and data stored on disks
- Helps enhance overall system performance and scalability

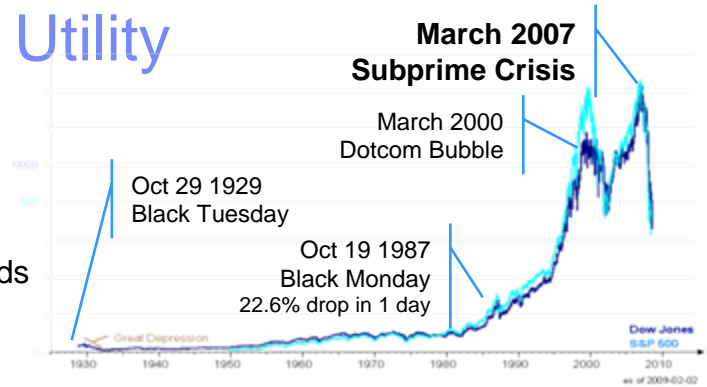


Read the Redbook: <http://www.redbooks.ibm.com/redbooks/pdfs/sg247285.pdf>

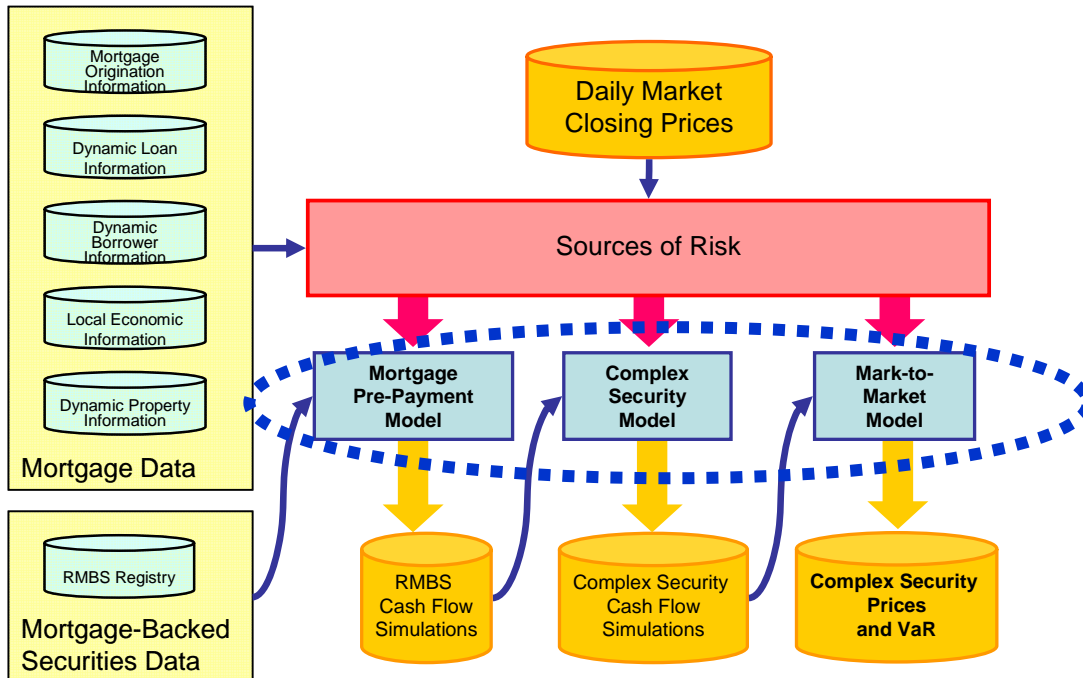
# IBM Research creates Smarter Risk Utility

## The Financial Crisis

- Regulatory analysis is manual and uses summarized data
- Data exists in silos in regulatory structure
- Separate models to analyze different types of risk
- Models form a complex system with massive compute & storage needs
- FSS need to interact with regulatory agencies for buy and sell
- No single entity controls regulation



**The Systemic Risk Utility is an innovative approach to bring transparency to the financial system as a whole, by applying advanced mathematical modeling on high performance computing platforms.**



**Pluggable “Models” produce cash flows from “standardized” risk inputs**

*Users subscribe to models.*

*Ratings agencies qualify models and track them.*

*Systemic Risk Utility hosts risk data and models – for downloading, or to run in a private “cloud”.*

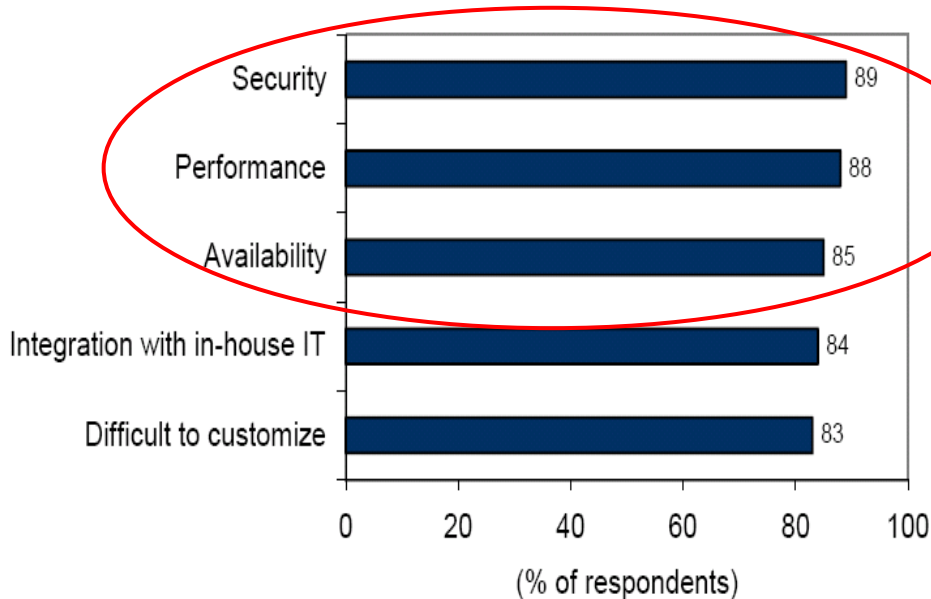


# System z is the natural platform for services in the cloud

## IBM is helping customers overcome the challenges posed by cloud computing

...and System z can help.

Cloud Computing Implementation Challenges Described as "Significant"



**Virtual** – a “share all” approach to system resources for efficiency



**Secure** - a multi-tenant design point with EAL 5 certification



**Available** - 24x7x365 operations with zero data loss recovery



**Efficient** - consuming 80% less energy than distributed solutions



**Scale** - ability to meet massive demands from users and data

Note: Multiple responses were allowed.

Source: IDC's Enterprise Panel, 2008



**Thank you!**

**For more information, please  
contact me at:  
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