

Cloud Computing ... made better with System z

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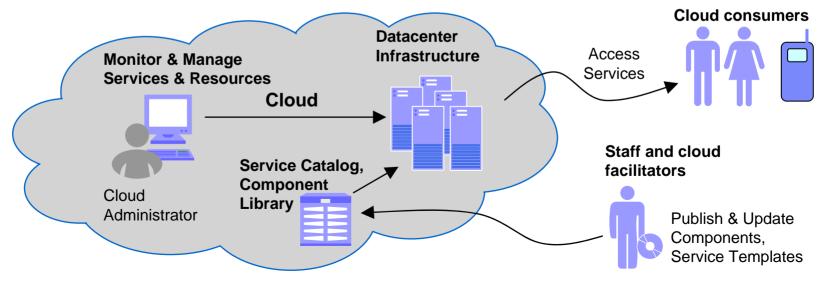
What is cloud computing?

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**.



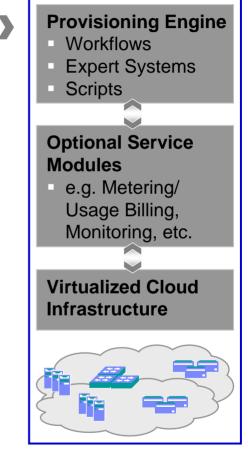


How does cloud computing work?

End Users	Service Portal	

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- 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?

Flexible Delivery Models

Public ...

- Owned and managed by service provider
- Subscription based offering
- Offers standardized business process, application and/or infrastructure services
- Flexible price on utility basis

....Standardization, capital preservation, flexibility and time to deploy

Cloud Services

Cloud Computing Model

Hybrid ...

- Access to client, partner network, and third party resources
- Vertical use cases

Private ...

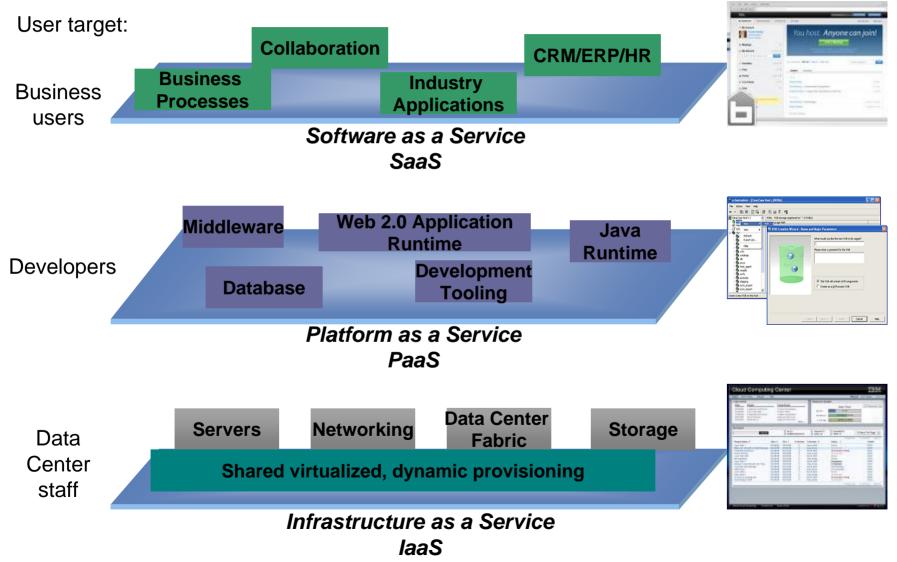
- Privately owned and managed
- Access limited to client and its partner network
- Drives efficiency, standardization and best practices while retaining greater customization and control

.... Customization, efficiency, availability, resiliency, security and privacy

ORGANIZATION ---- CULTURE ----- GOVERNANCE



What services can be delivered?



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

As a traditional Lintel shop, Transzap struggled to:

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



Available • Secure • Elastic

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

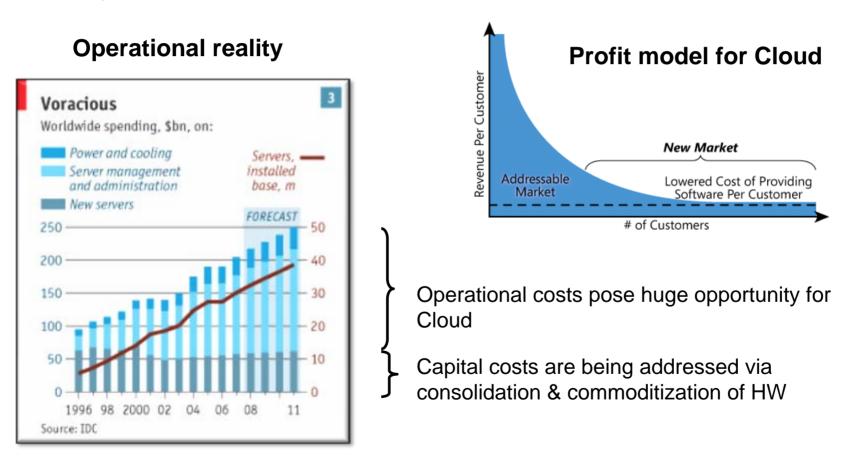
"The IBM z9 provides the stability and scalability needed to accommodate Transzap's triple digit volume growth in a SaaS environment."

– Peter Flanagan, President

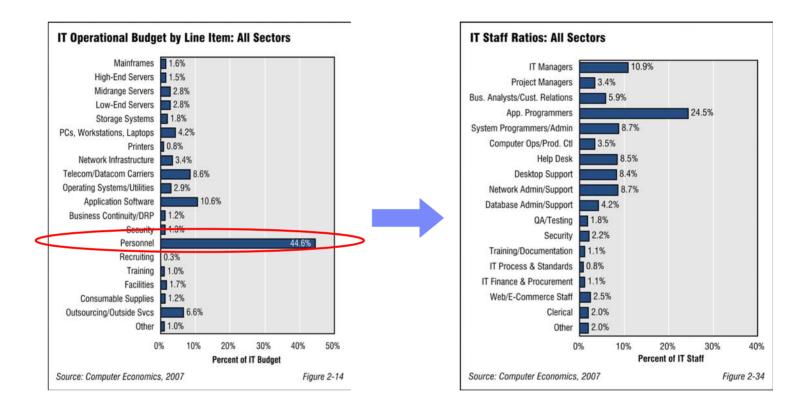


Cloud profitability and cost profile

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



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

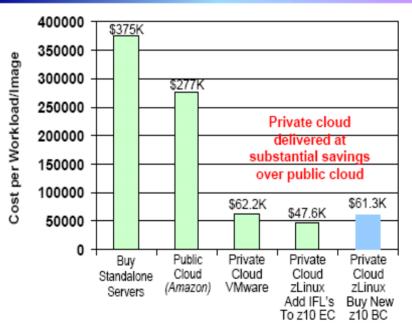
Dramatic Simplification through Virtualization

-	The	mainframe	consolidation	project	
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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%

60-75% gross cost savings over 5 yrs

Cost Per Image for Linux Workloads (5 Yr TCO)



The IT transformation roadmap for cloud computing

The roadmap caters to the strengths of System z

Consolidate

- Reduce complexity
- Reduce staffing requirements
- Improve operations manage fewer things better
- Standardize processes
- Improve operational costs

Simplified

Virtualize

- Remove physical resource boundaries
- Increase hardware utilization
- Allocate less than physical boundary
- Reduce hardware costs
- Simplify deployments

Shared

Automate

- Standardized Services
- Dramatically reduce deployment cycles
- Granular service metering and billing
- Massively scalable
- Autonomic
- Flexible delivery enables new processes and services

Dynamic

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



CIO business intelligence private cloud solution

- Centralizes BI deployment
- Achieves economy of scale
- Standardizes BI infrastructure
- Enables common processes, governance, security, corporate regulations
- Reduces the moving parts

Virtualize

- Supports multitenant Cognos deployment
- Services 200,000 users
- Delivers quicker time to value
- Standardizes boarding process and user experience
- Scales up and down rapidly
- Enables SLAs

Shared

Automate

- Standardizes the services catalog
- Supports a granular metering and billing service
- Leverages intelligence to determine automation scenarios
- Allows for value add services to be delivered from the cloud

Dynamic

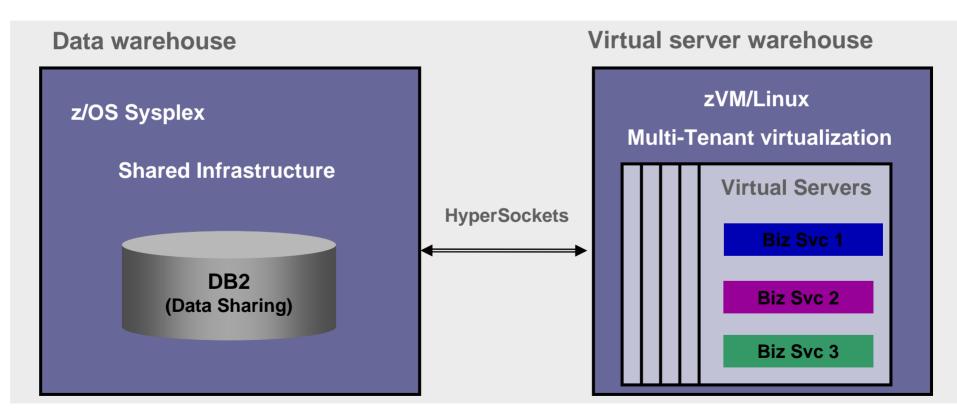
Over 5 years IBM will save \$23M

Simplified



System z provides a hybrid hosting environment

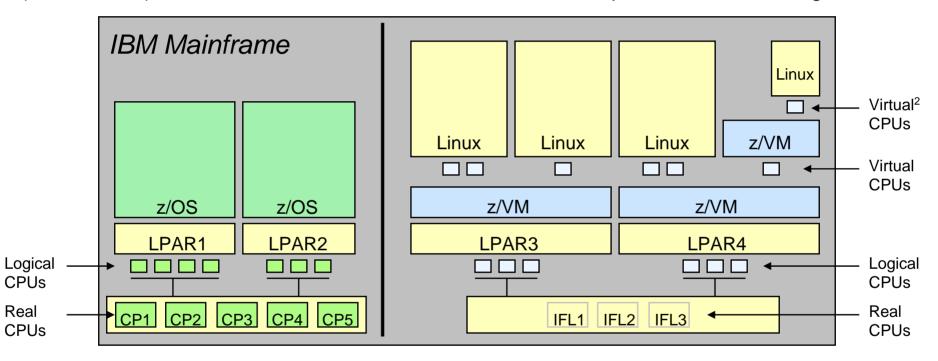
The core infrastructure of System z is multi-tenant by nature and highly efficient, resources (HW and SW) are shared and virtualized to ensure max utilization enabling you to deploy workload where it fits





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 then 1,000 virtual images on a singe hypervisor - topping any virtualization solution in the industry."

- Charles King, PUND-IT



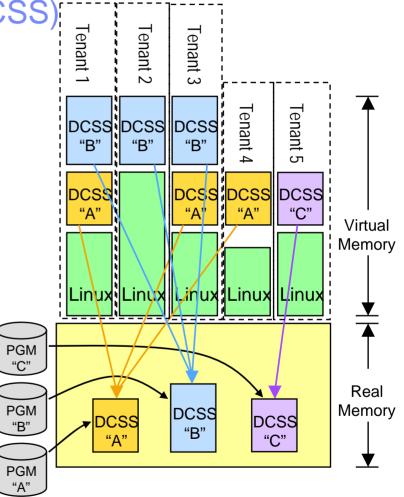
Enabling transparent multi-tenancy of applications with Discontiguous Saved Segments (DCSS)

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 executein-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



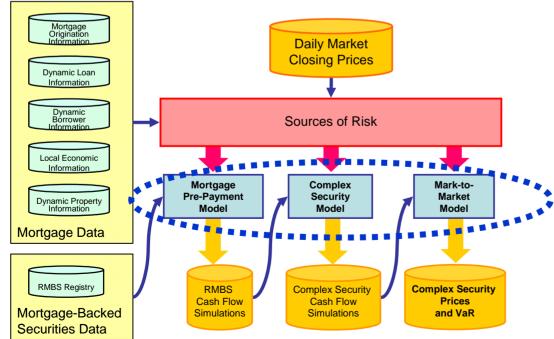
Read the Redbook: http://www.redbooks.ibm.com/redbooks/pdfs/sg247285.pdf

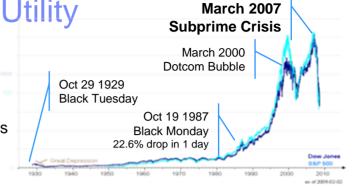
IBM Research creates Smarter Risk Utility

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".

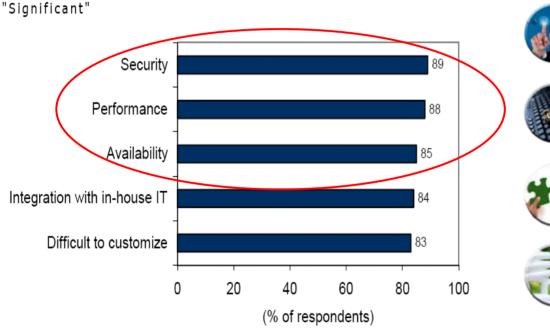


System z is the natural platform for services in the cloud

IBM is helping customers overcome the challenges posed by cloud computing

Cloud Computing Implementation Challenges Described as

...and System z can help.



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





For more information, please contact me at: agreggo@us.ibm.com



Canadianan 75 Commemorating 45 Years of Market Leadership Mainframe: The World's Most Trusted Server