



Education

# Data Center Transformation

Russ Fellows,  
Managing Partner  
Evaluator Group Inc.

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## ➤ Data Center Transformation

- ◆ The data center of the future is possible today for IT environments that are willing to create an architecture that leverages technology where appropriate. This session is designed for storage administrators and storage architects. We will explore how to use existing infrastructure with new technologies to transform your data center. Virtualization, Data de-duplication, Network Consolidation, Green Data-centers and Cloud Storage are all components of future data centers. The most successful organizations will use these technologies and concepts synergistically to lower costs, while meeting service and availability needs. This session will help you create an architecture that leverages technologies to transform your data-center, without risking your IT operations, your company or your job.

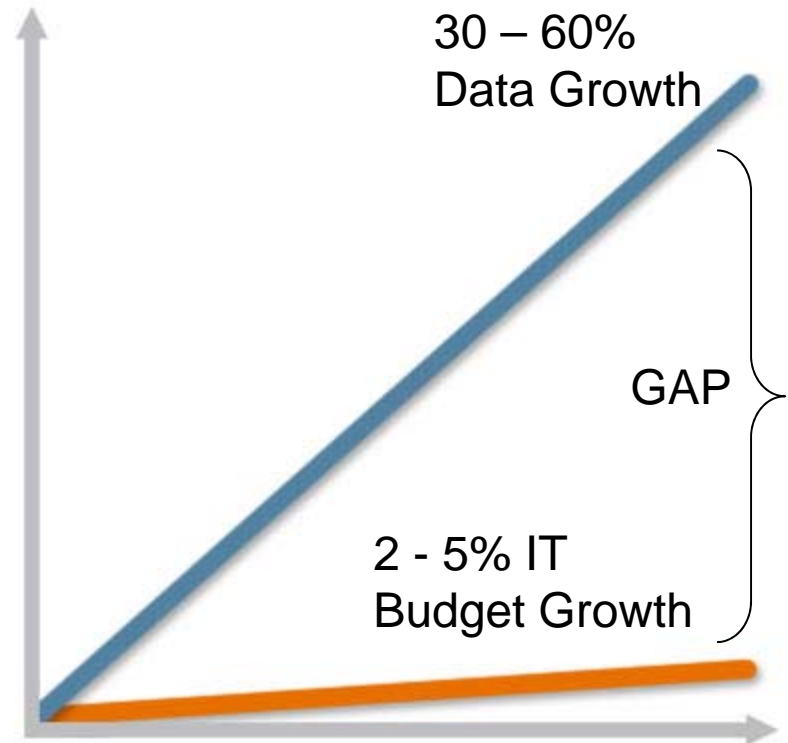
# The Problem with Data Centers

- Limited Resources and Increasing Complexity
- Systems tend to get more complex
- Complex systems cost more to operate than “efficient” systems
  - ◆ More administration & Opportunity for errors
  - ◆ Limits ability to implement new technology
- “Efficiency” requires planning & strategy



# Gap between Data and Budgets

- Data has grown between 30 to 60% per year\*
- IT budgets grow at the rate of the economy – about 3%
- How to accommodate growth with budgets?



\* Growth values from Evaluator Group Model, using Market and Financial Data from 2002 - 2008

# How Did We Get Here?

- Lack of clear IT strategy
- Technology for technologies sake
- Lack of Business alignment
- Adding more storage was easy
- Too few and too many standards



Where do we go?

# WHAT'S NEXT?

- **Businesses are demanding IT costs be justified**
  - ◆ Must have direct line of business justifications
  - ◆ Need for multiple levels of cost, performance and availability
- **Driving the need for visible cost models**
  - ◆ Flat fee and allocation chargeback are not aligned
  - ◆ Usage & SLA based pricing
- **Result – More IT departments operating as P&L center**



## ➤ ITaaS – IT as a Service

- ◆ Many models including Infrastructure, Platform and Software as a service
- ◆ Includes Internal, External and Hybrid models

## ➤ Seeks to Align IT with Business,

## ➤ Transforms internal IT into a Service

## ➤ Cost Savings from Several Areas

- ◆ Standardization, lower cost of management
- ◆ Increased utilization through standardization and flexibility
- ◆ Deliver only what Business requires and pays for

- ITaaS is about Business, not Technology
- Cloud is a metaphor for IT as a Service
- Implies a shift in how IT services are delivered
  - ◆ Business to IT interface changes, Technology may not
  - ◆ Must deliver an actual service
  - ◆ Services have prices, service and quality levels
- Technology companies are continuing to promote technology solutions
  - ◆ Either re-badging existing products as “Cloud Ready” or –
  - ◆ Attempting to sell new platforms as “Cloud Computing”
- What is needed is new IT principals

# Transformation Principals

## ➤ Simplify & Virtualize

- ◆ Reusable / standard components
- ◆ Physical limitations can't apply
- ◆ Complete virtual systems
- ◆ Provide dynamic IT

## ➤ Align IT with Business

- ◆ Users want multiple choices
- ◆ Requires dynamic IT
- ◆ To provide multiple SLA's
- ◆ Delivers IT as a Service

# Steps for Transformation

1. Understand the Business and Operational Models
2. Attain Executive Buy-in / Approval
3. Create an Implementation and Transition Plan
4. Review SLA offerings and pricing with LOB managers
5. Assess Current Architecture and Technologies
6. Identify new Technologies and Architectures
7. Design a Flexible, Extensible, Reproducible Architecture
8. Implement a POC - pilot
9. Monitor Alignment with Business
10. Refine offerings Where Possible, Refine Technology if Needed

# Components of Transformation

## ➤ Business

- ◆ Multi-level Approval
  - › Senior executives must understand the value
  - › Buy-in from LOB managers
  - › IT department buy-in
- ◆ Provide Visibility and Choice
  - › Must identify costs
  - › Must provide SLA choices
  - › Chargeback optional

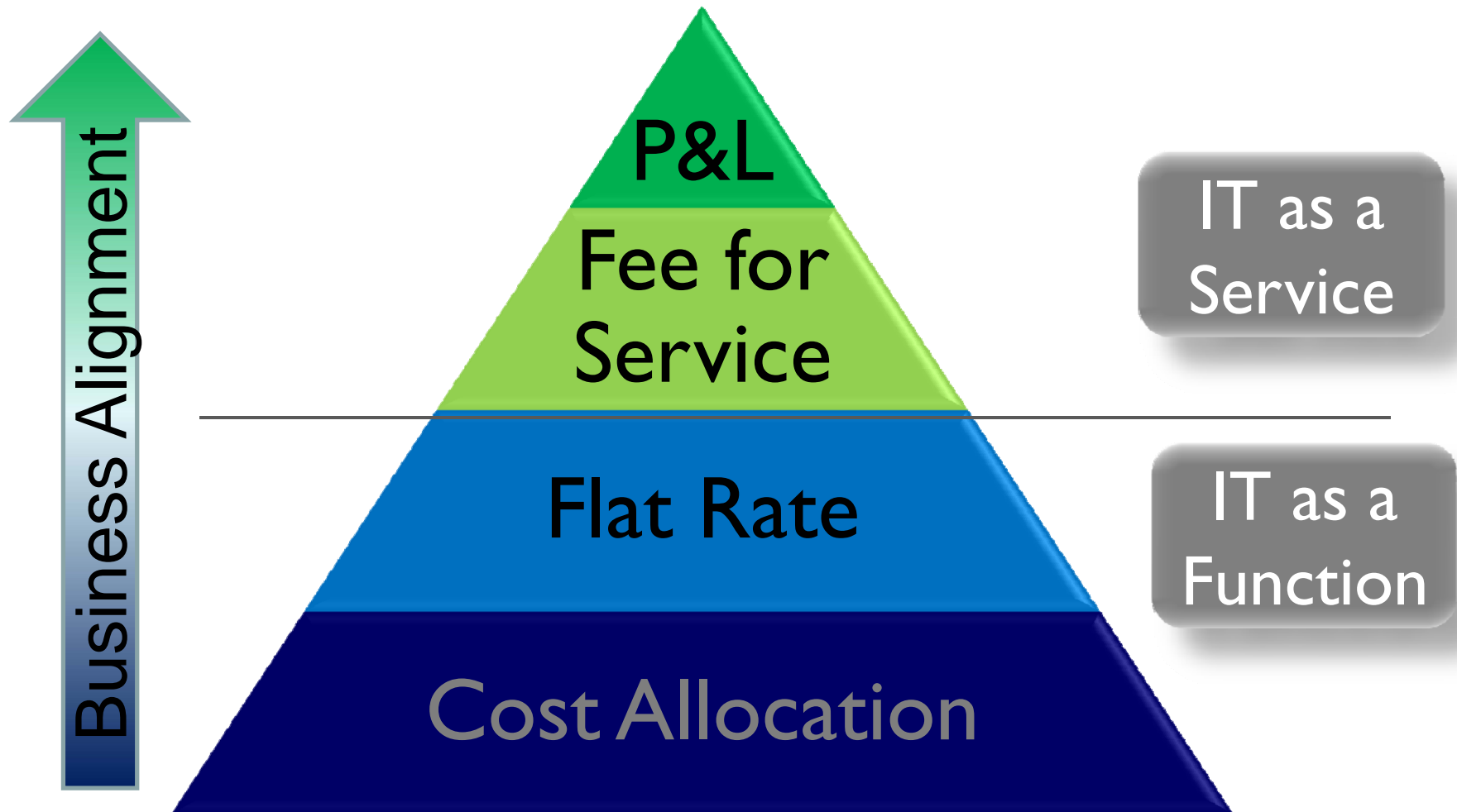
## ➤ Technology

- ◆ Create Standard IT Stacks
  - › Servers and OS
  - › Storage, networks, etc
  - › Middleware and Apps
- ◆ Virtualize IT Components
  - › Virtual servers
  - › Virtual storage
  - › Virtual networks

# TRANSFORMING THE BUSINESS MODEL

# Delivering SLA's

- Part I of the Equation
  - ◆ Delivering the required Service – Profitably
- Provide only what the SLA requires
  - ◆ If customers receive Platinum service at Gold price, they won't upgrade, and feel cheated when performance drops
- SLA provides “What, When, Where and How much” specifics
- SLA is a Business Contract
- Technology is the “How”
- A “One size fits all” approach will not succeed





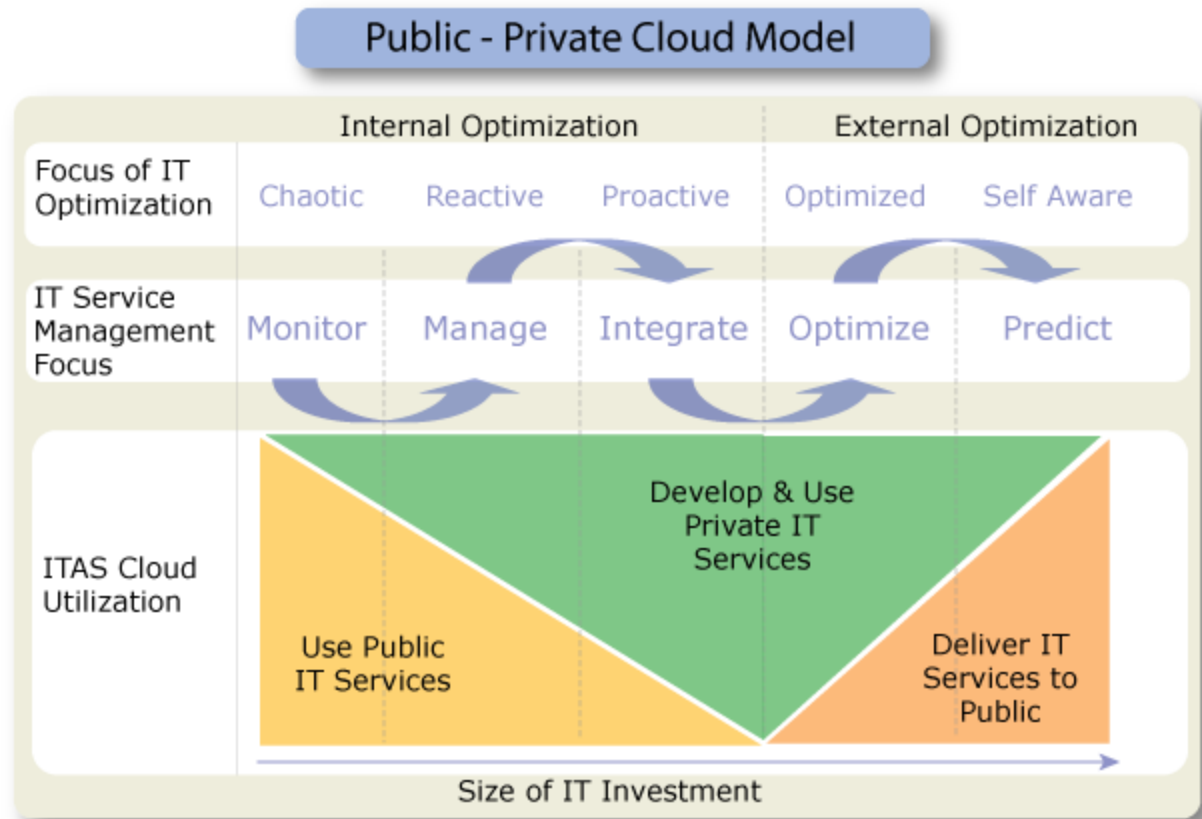
# Managing Costs

- Part II of the Equation
- CAPEX and OPEX are equally important
  - ◆ A higher purchase price may lower overall costs through improved management efficiency
- Optimize resources
  - ◆ Over provisioning is not cost effective
- Example:
  - ◆ Maintaining all data on tier I storage is not cost effective for a “free” email service
  - ◆ Data management more important than ever
    - DLM, ILM, HSM, whatever the term, move the data

- How are Clouds Different from Past xSP models?
  - ◆ Most prior efforts at service provider models failed
  - ◆ They lacked the 4 Tenants outlined
- Is the Cloud model Viable?
  - ◆ In limited forms, “Yes”
  - ◆ The critical aspects have been enhanced over past decade
    - Virtualization has been greatly improved
    - Security and management somewhat improved
    - Metering, monitoring and billing – still needs work
- Clouds are a Delivery Mechanism for ITaaS
  - ◆ Internal, External and Hybrid Cloud models

# ITaaS – aka Cloud Computing

- Data Centers will include Public & Private Clouds
- Proportion depends upon IT Investment
- Highly Specialized Companies will become IT service providers



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- Must attain executive approval for ITaaS
- Selling ITaaS down to IT departments
  - ◆ Show IT department why to adopt ITaaS
  - ◆ Will highlight where IT is most valuable
    - > Will show which services are better as internally delivered
    - > Which services can be purchased as an external service
- Selling ITaaS up to the CIO
  - ◆ Show executives how ITaaS provides better alignment of IT and business
  - ◆ Costs will naturally match business objectives when alternative Service Levels are available

# TECHNOLOGIES FOR TRANSFORMATION

- Internal IT as a Service requires the same technologies as ITaaS providers
- Core Technologies:
  - ◆ Infrastructure: Flexible, standardized components
  - ◆ Virtualization: Server, Storage, Networks and Mgmt.
  - ◆ Security: Multi-layer, providing multi-tenancy
  - ◆ Management: Device and service level management
  - ◆ Billing & Chargeback: Required for all services
- Cost Reduction
  - ◆ Tiering and ILM: Needed to reduce costs

# Technology Tenets of ITaaS

- Flexible & Multi-tenancy = Virtualization
- Secure = Encryption / Key Mgmt.
- Controlled = Portal Management
- Cost Effective = Optimized SLA's
- Billable = Metering & Chargeback capabilities

## SaaS

## PaaS

## IaaS

## Core IT

A  
p  
p  
1

A  
p  
p  
2

API

GUI

GUI

Virtualization

Security

Management

Billing &  
Chargeback



Compute



Network



Storage





- **Virtualized Components**
  - ◆ Compute, Storage, Network
- **Secure, Authenticated Access**
  - ◆ Certificates, encryption, key management
- **Multi-level Management**
  - ◆ Support for multi-tenant management
- **Service Delivery Infrastructure**
  - ◆ Metering Monitoring & Billing
  - ◆ Ability to measure use of resources
  - ◆ Remote monitoring and management
  - ◆ Chargeback or billing for commercial deployments

## ➤ Server / OS

- ◆ Space power and cooling are primary concern
- ◆ Highly virtualized containers are required

## ➤ Storage Network

- ◆ DAS, NAS or SAN can all work
- ◆ Ethernet is becoming layer 2 network of choice
- ◆ DCB will support FCoE, iSCSI, NFS and CIFS

## ➤ Storage Systems

- ◆ Space, power and cooling are considerations
- ◆ Must support secure separation of data and management
- ◆ Secure multi-tenancy not required, but very desirable

- Can be the most challenging aspect
- Private Cloud, and Internal IT has an advantage
- Leverage emerging Key Management Standards
  - ◆ OASIS KMIP / IEEE P1619.3
- Encrypt all data transmitted over public networks
- Encrypt all data stored in public access locations
  - ◆ Includes Secure Vaults, Co-lo data-centers, etc

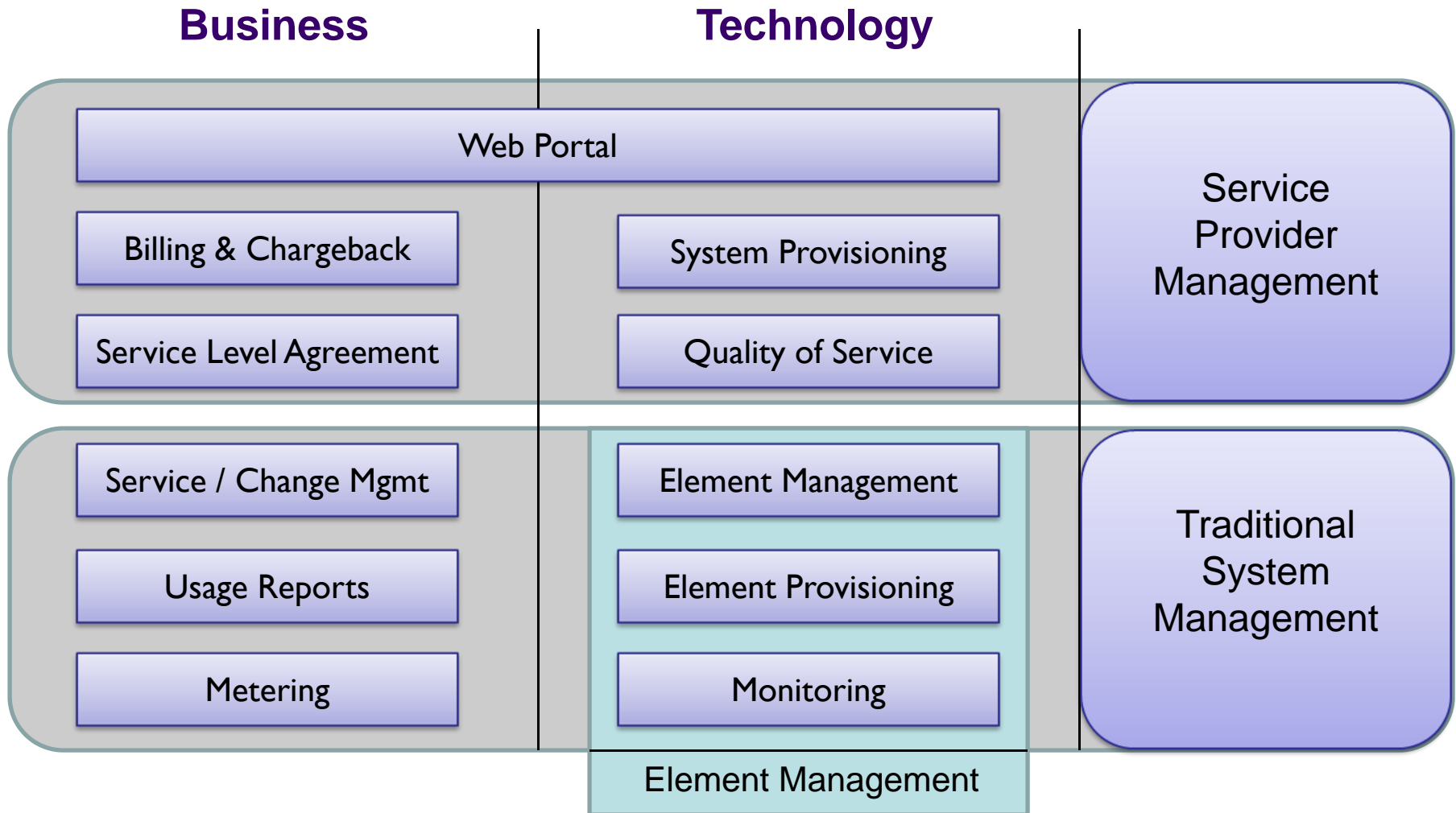
# Emerging Technology Trends

- Green – Power Efficient
  - ◆ Only if the power efficiencies save \$\$\$
- SSD
  - ◆ If the SLA calls for it – can be cost effective
- Point products, dubbed “Cloud”
  - ◆ Maybe – only if features meet needs
- Bottom Line – Only implement a product or feature if it is proven, and is the most cost effective way of meeting an SLA

# So – What's Missing?

- Most of the technology exists
- Not well integrated currently
- Most common aspect forgotten is Service Provider Management
  - ◆ Metering, monitoring and chargeback – Provides usage information
  - ◆ QoS and SLA management
  - ◆ Billing – The forgotten aspect
- ITaaS is not a service without chargeback

# Complete ITaaS Management



# ITaaS – What it is and is not

- ITaaS does not require new hardware
  - ◆ New products being sold as the solution for ITaaS
  - ◆ Requires technology and operational changes
- ITaaS is a change in how IT is delivered
  - ◆ Create flexible virtual infrastructure
  - ◆ Then add Service Provider Management
- Service Provider Management is the forgotten piece
  - ◆ Few commercial choices available
  - ◆ Service Providers, SI's and Telco's have these capabilities

# FINAL CONCLUSIONS



# Is Transformation Realistic?

- Yes, but it will be difficult
- The Business issues are likely to be the hardest
  - ◆ Transforming the business model of IT
  - ◆ Understanding the right mix of internal vs. external
  - ◆ Learning how to manage to the lowest cost SLA will take time
- The Technology will be difficult, but it is possible
  - ◆ Most of the technology required currently exists
  - ◆ Delivering mash-ups between internal and external services will take time

- Use the right mix of Internal vs. External services
- Transform the IT Business Model for Internal services
  - ◆ IT values and costs must be aligned with business
  - ◆ Transform from IT cost center
  - ◆ Must provide competitive services at competitive prices



# Recommendations – Part 2

## ➤ Sell the Value

- ◆ Communicate the differences between failure to meet an SLA vs. public IaaS, PaaS and SaaS providers

## ➤ Transform The Infrastructure

- ◆ Use standardized components
- ◆ Leverage technologies that provide flexibility
- ◆ Create building blocks that can be redeployed
- ◆ Look for automated management
- ◆ Implement Billing & Chargeback mechanisms

## ➤ Leverage External Resources

## ➤ Benchmark Against Leaders

# Summary – Why Transform?

- Survival – IT will continue to be out-sourced in various formats if internal IT is viewed as a cost
- IT must show it delivers value through superior Service Levels
- Internal IT does not have to match costs of other options – but (\$ / SLA) value must be greater

➤ Please send any questions or comments on this presentation to SNIA:

[trackvirtualizationapplications@snia.org](mailto:trackvirtualizationapplications@snia.org)

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