COMPUTERWORLD SNIA

SNW

Driving Innovation Through the Information Infrastructure

SPRING 2011

Learning from the Cloud

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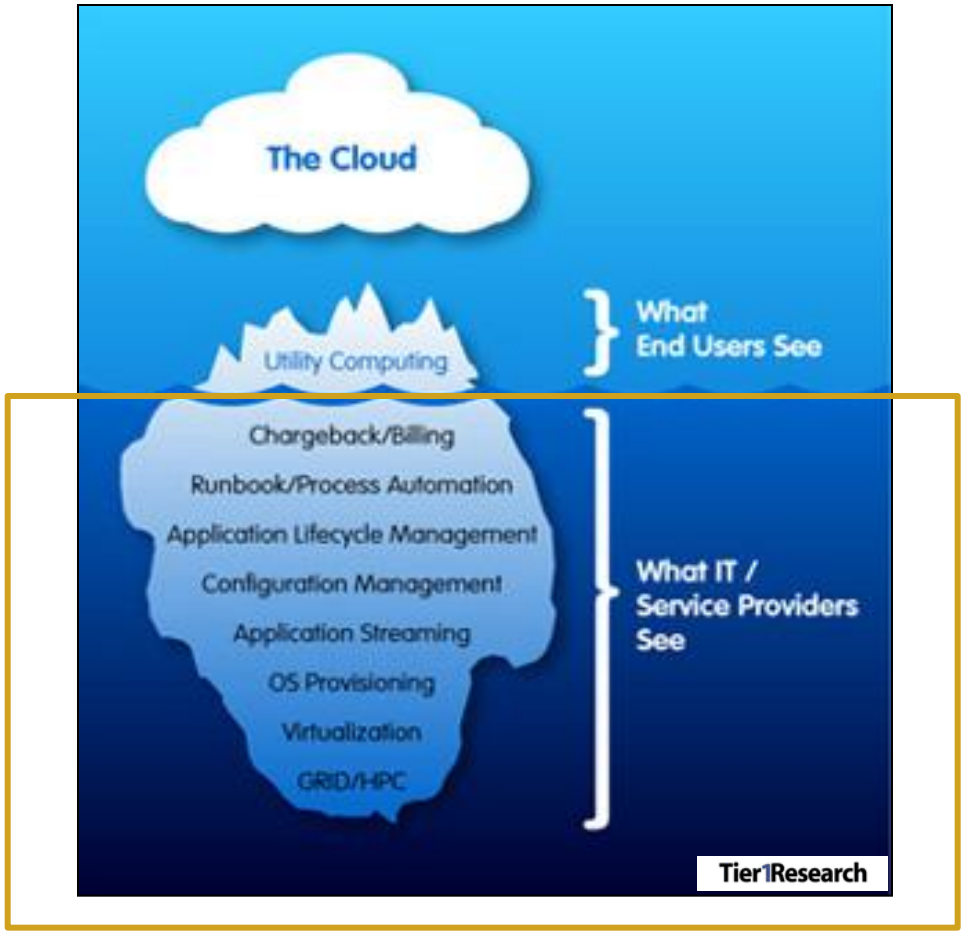
Sample cloud service providers

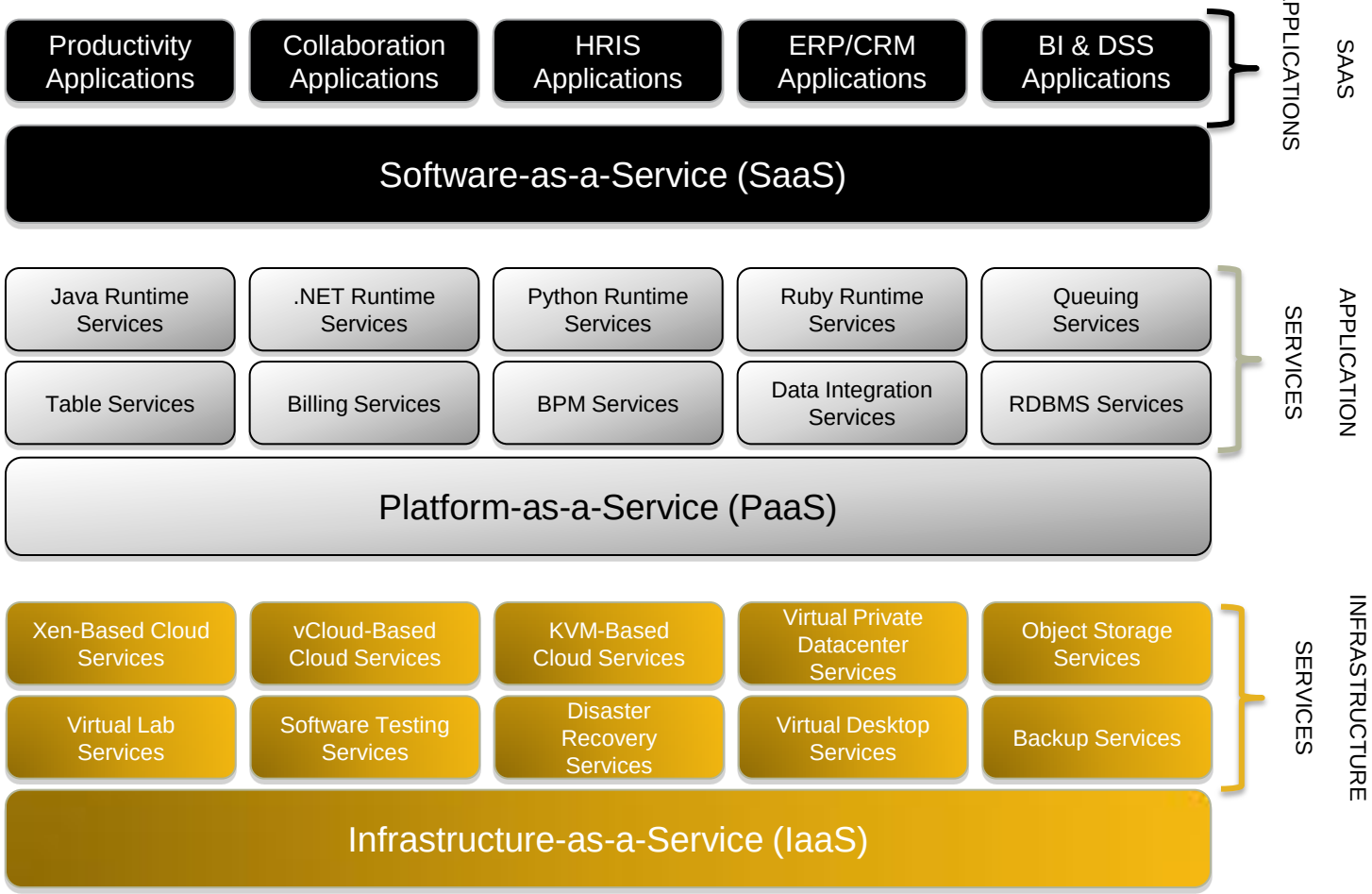
- Amazon
- AT&T
- Carpathia Hosting
- CSC
- Datapipe
- GoGrid
- Hosting.com
- IBM
- Joyent
- Layered Tech
- Media Temple
- NaviSite
- NTT Communications
- OpSource
- Rackspace
- Savvis
- SoftLayer
- SunGard
- Terremark Worldwide
- Verizon Business

Gartner Magic Quadrant for North American Hosting and On Demand Infrastructure, Dec 2010

Service provider point of view



Cloud services model



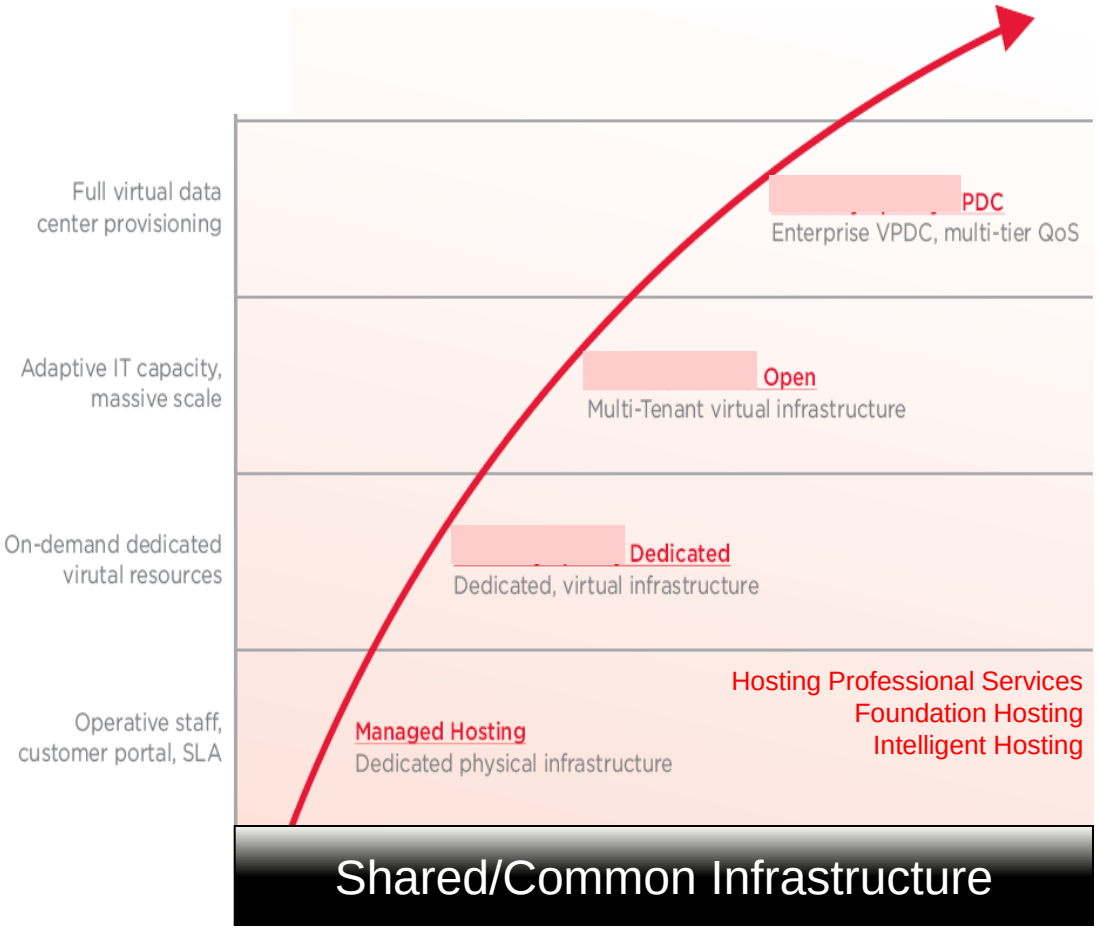
Adapted From:TechRadarTM For Infrastructure & Operations Professionals: Cloud Computing, Q3 2009 (by James Staten, Oct 2, 2009)

Service provider requirements

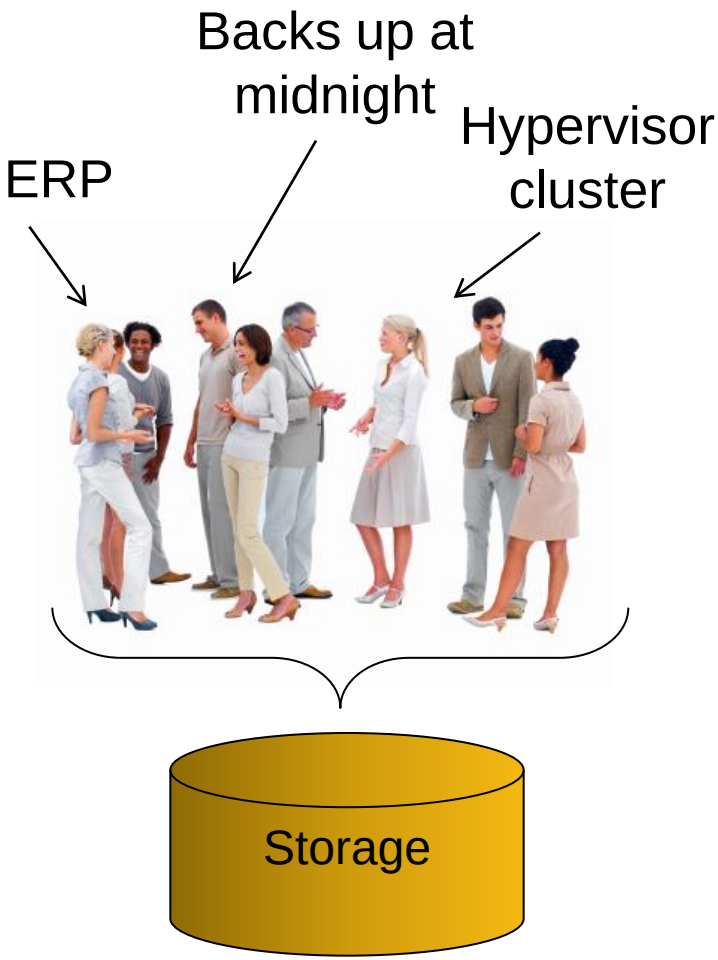
- Assure service levels
- Accelerate book-to-bill cycles
- Manage unpredictable growth
- Align costs with MRR*
- Enable value-add, high margin services

* – Monthly Recurring Revenue

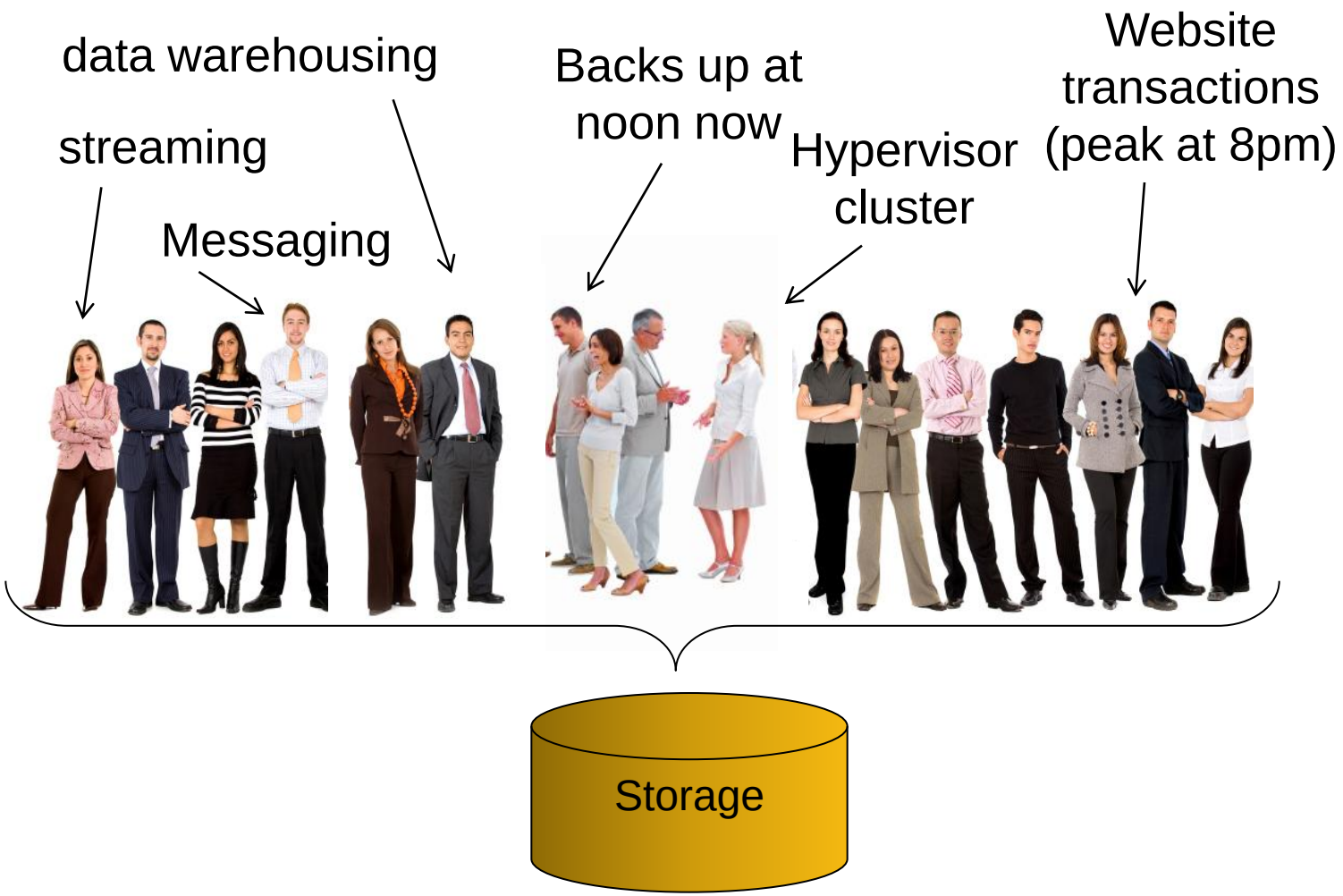
Sample services



Workload today



Workload tomorrow



Resiliency and SLAs

Loss of…	The traditional "HA Question"	The Resiliency Question
Disk Drive	How many global spares?	How fast is RAID rebuilt, if needed?
Drive Enclosure	How many volumes will go offline?	How is complete data access maintained?
Array Controller	How long before we are out of write-thru mode?	How is write-cache mirroring sustained?
Power	How quickly must power be restored in order to preserve data?	How is data preserved if power remains off indefinitely?

Compliance to consolidation

Using dedicated arrays

- Cost – 100x (single QoS)

Using virtual private arrays

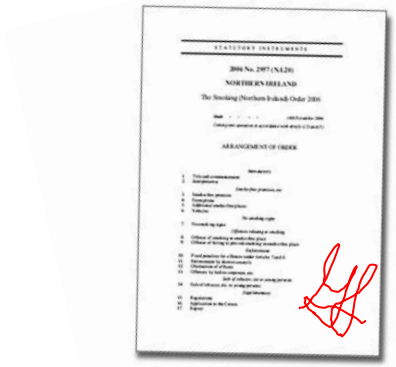
- Silver Cost – 14.4x
- Gold Cost – 24x
- Platinum Cost - 27.4x
- Double Platinum Cost – 45.8x

Assure service levels

- Handle diverse and unpredictable workloads
- Performance resiliency under maintenance and failure conditions
- Secure administrative and application segregation

Time and money

Test & Dev



Booking

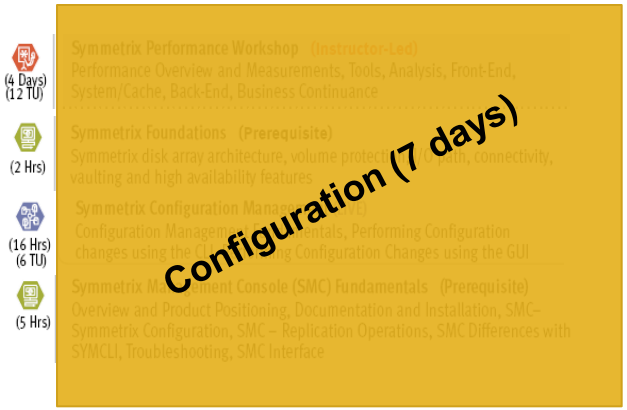
$$

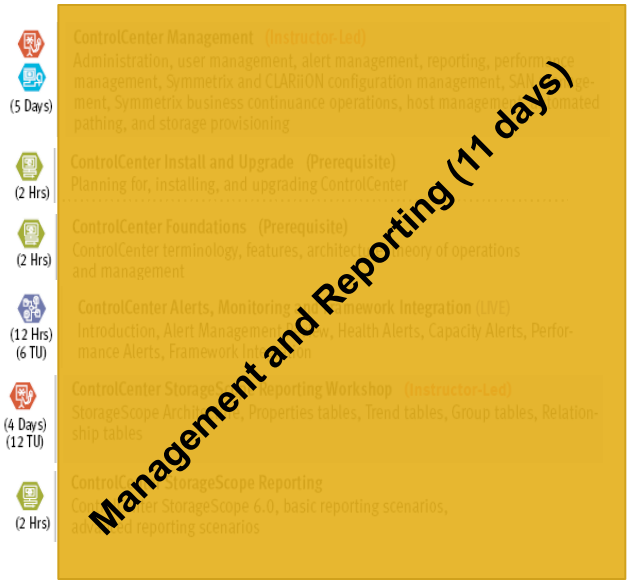
Production

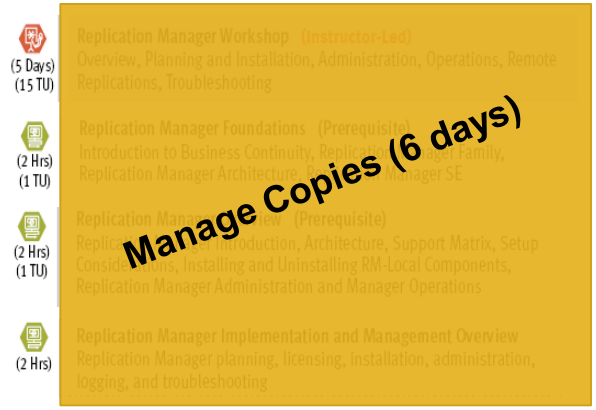
Billing

$$

Cloud speed ahead?



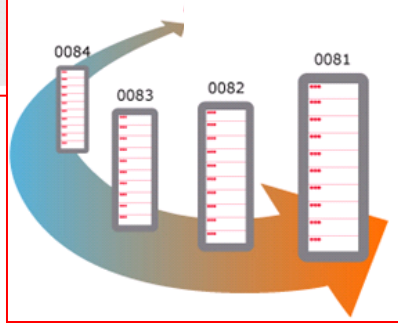




Provisioning agility

Utility Storage QoS Levels

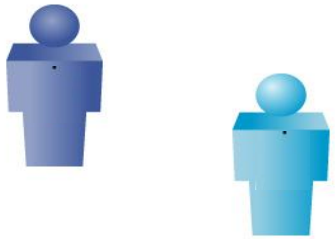
QoS Level	RAID Protection	Relative Performance	Price	I/O Intensive Applications	Recommended Uses
QoS 1	FC DISK, RAID 10 (Mirrored)	******	$$$$$	Yes	Provides write-intensive applications
QoS 2	FC DISK, RAID 50 (3D+1P)	*****	$$$$	Yes	Provides balance of performance and protection .
QoS 3	FC DISK, RAID 50 (7D+1P)	****	$$$	Yes	The value choice and great match for nearly all applications.
QoS 4†	SATA DISK, RAID 50 (7D+1P)				



Features / Standard Offering

- No disruption migration between QoS levels
- One-time charge to migrate between QoS levels.
- Migration occurs online without service disruption to the LUN
- Notification at migration commencement and completion
- 24/7 monitoring, management and customer support
- Monitor migration process

Manageability matters



Role-based Access

SMI-S

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Programmatic Access

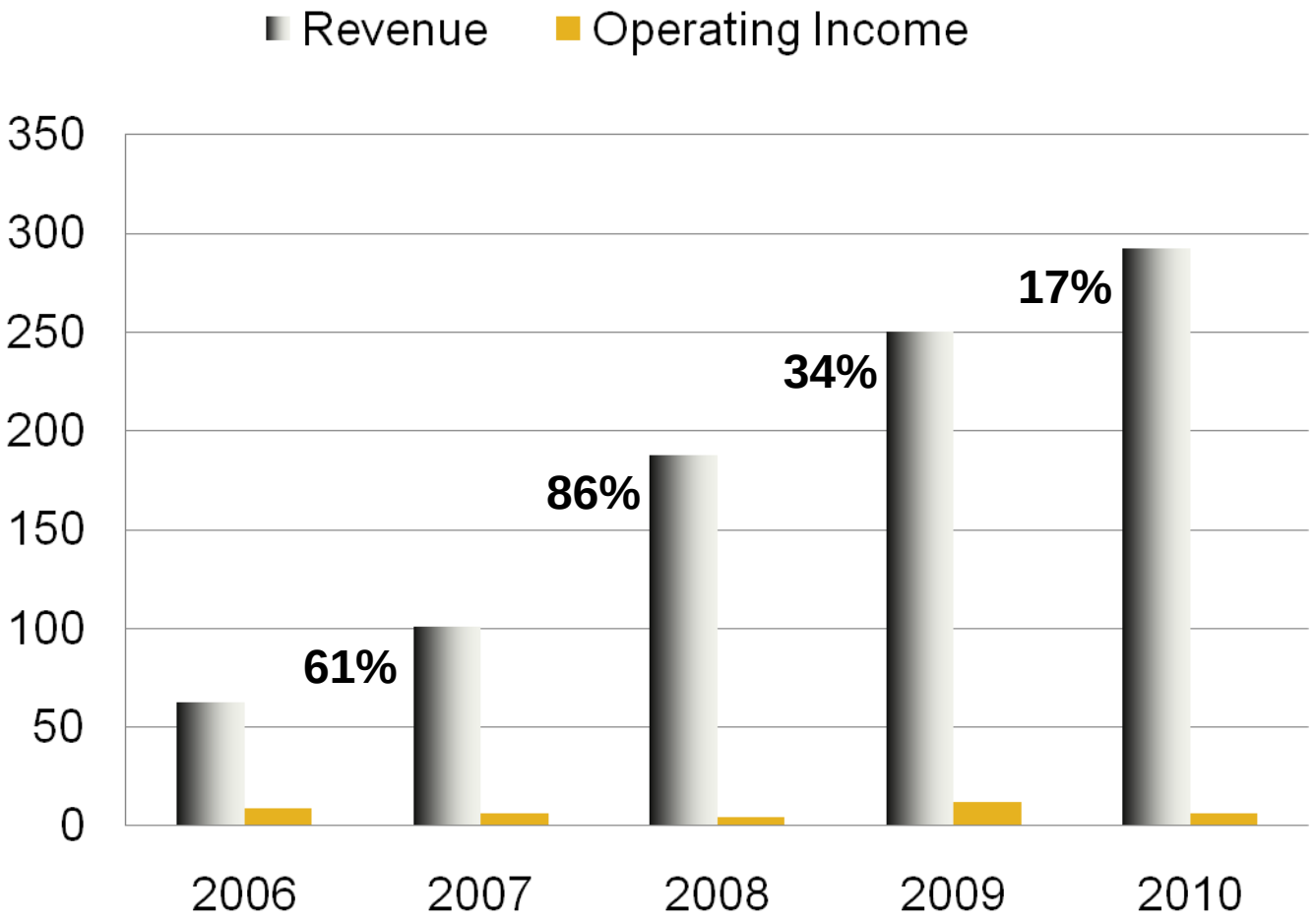
- Hypervisor management systems
- BSS & OSS systems
- Cloud automation software

Simple, Powerful
CLI / API

Accelerate book-to-bill cycles

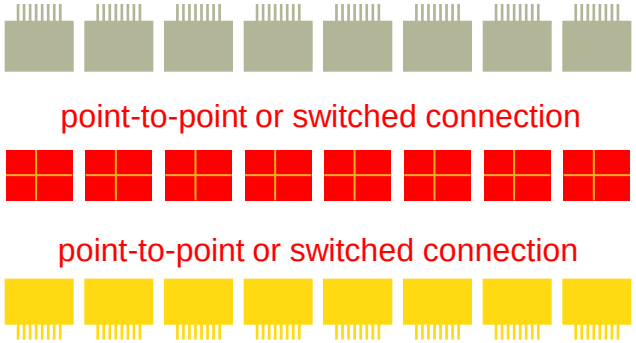
- Rapid application-tailored provisioning and re-provisioning
- Rich, easily-accessed system information for planning, reporting and chargeback
- Broad programmatic access
- Broad role-based access

Unpredictable growth

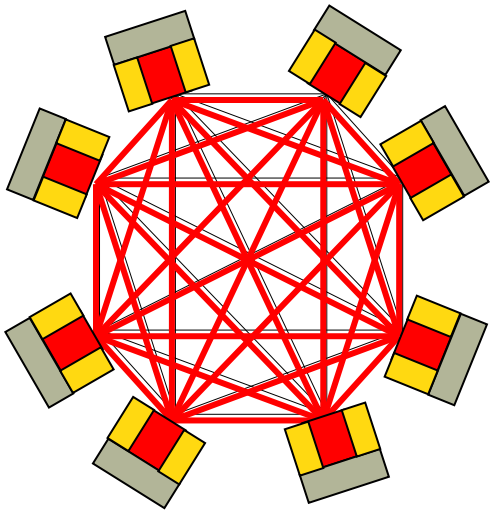


Architectural choices

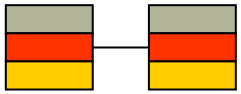
Sample
Monolithic Architecture



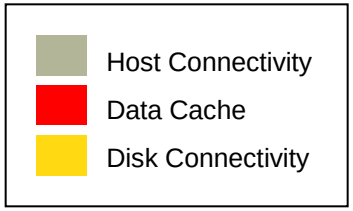
Sample
Scale-Out Architecture



Sample
Modular Architecture



Legend



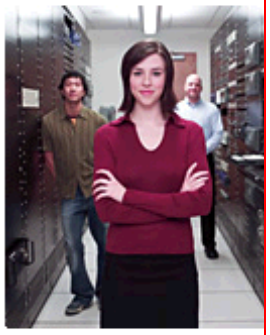
Shared and dedicated

IT Solutions and Hosting

Prepare Your Business for Tomorrow's IT Challenges

New economic challenges. New business realities. And still, data remains at the core of your enterprise. Success or failure depends largely on the reliability and speed of your systems and the data it carries. You can do great things with technology -- but only if that technology supports the goals of your enterprise. In the end, it's business performance that matters.

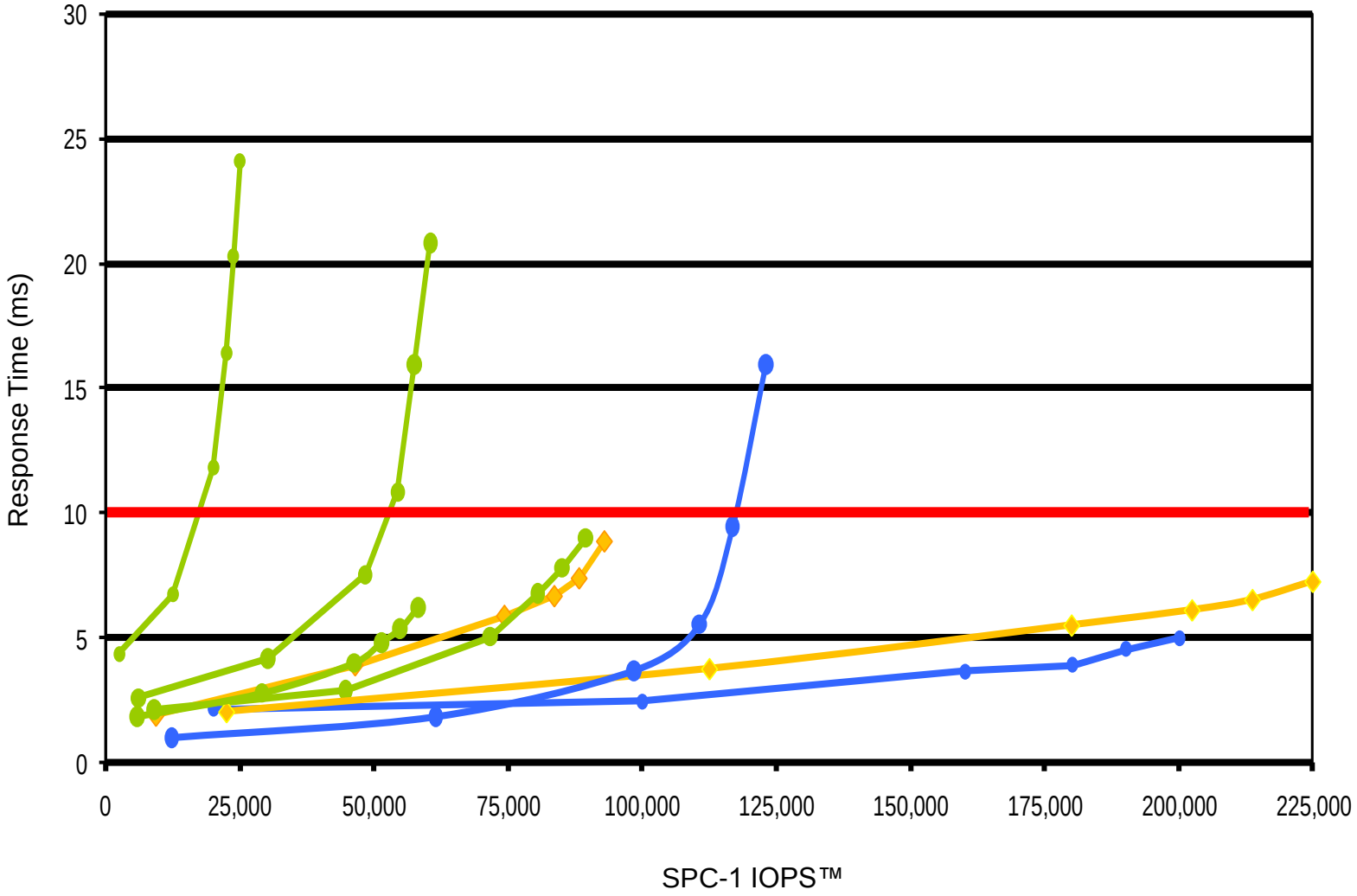
- Application performance that helps improve productivity and delivers a better customer experience
- Infrastructure performance that addresses risk and security compliance issues, and controls costs



View Products and Services

- Cloud Computing
- Cloud Storage
- IP Application Hosting
  - Platforms
  - Storage
  - Network Performance
  - Account Management and Server Support
  - High Availability Services
  - Managed Applications
  - Hosting Professional Services
- Remote IP Application Management
- SAP Application Management
- Data Center Services
- Virtualization
- Backup and Restore Services
- IT Service Desk
- Akamai Services
- Hosted E-mail and Instant Messaging
  - Hosted or Managed E-mail Services
  - Notification Services

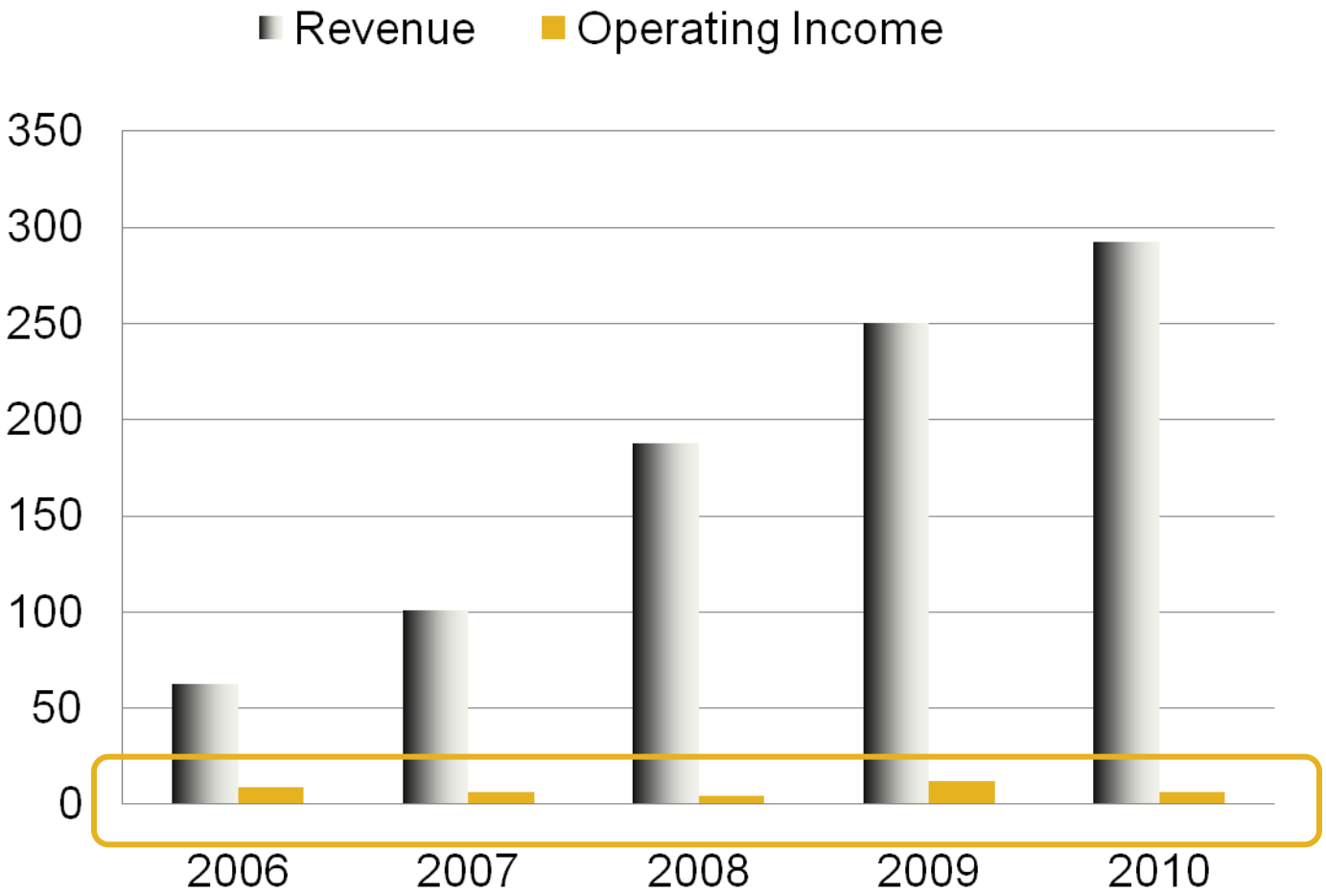
Performance considerations



Manage unpredictable growth

- Start and scale in small increments
- Scale predictably and massively
- Common manageability across systems

Align costs or fail

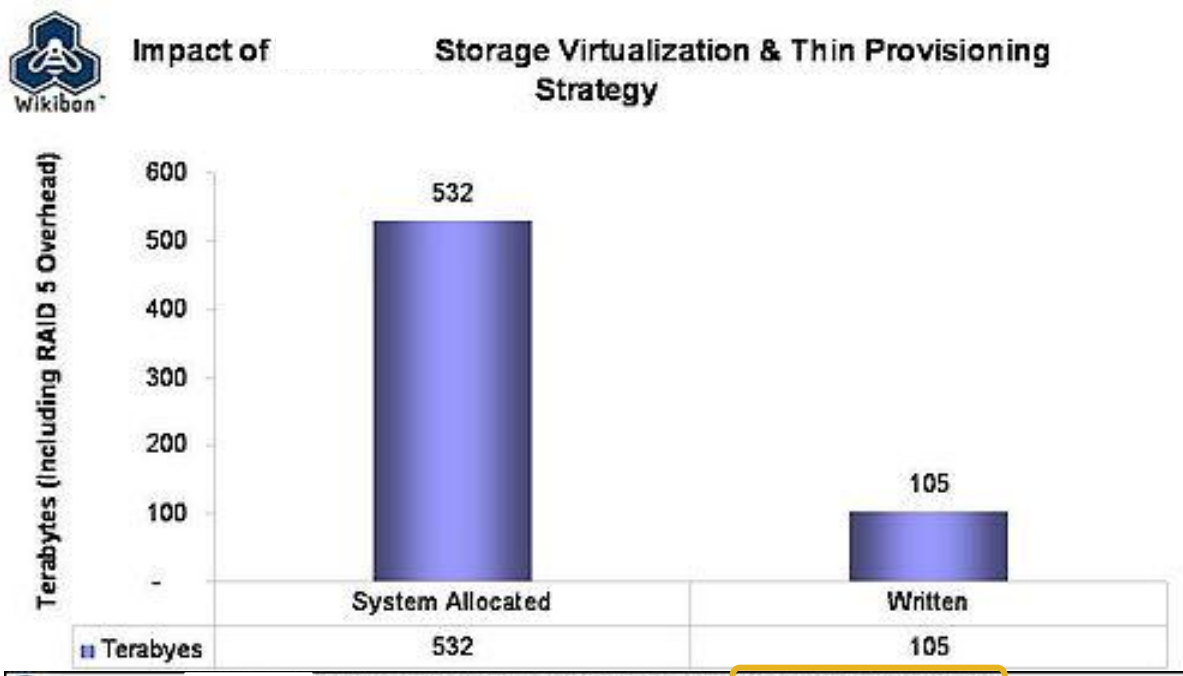


Thin Provisioning: CapEx

City	TP-UserMB	TP-SnapMB
	0	0
	9,570,304	2,674,688
	6,595,584	5,603,840
	9,534,464	6,062,080
	14,624,768	5,299,200
	1,536,000	384,000
	768,000	6,656
	43,109,376	13,815,808
	48,421,888	6,439,936
	273,358,848	76,126,208
	8,529,920	1,261,568
	18,447,360	9,407,488
	1,024,000	568,320
	4,913,152	226,304
TOTAL	440,433,664	127,876,096
	written utilization	29%

If “fat” provisioned primary storage were to cost an estimated $5.00 per useable GB (all-in), then thin provisioning would effectively cost just $1.45 per useable GB.

Thin Provisioning: OpEx



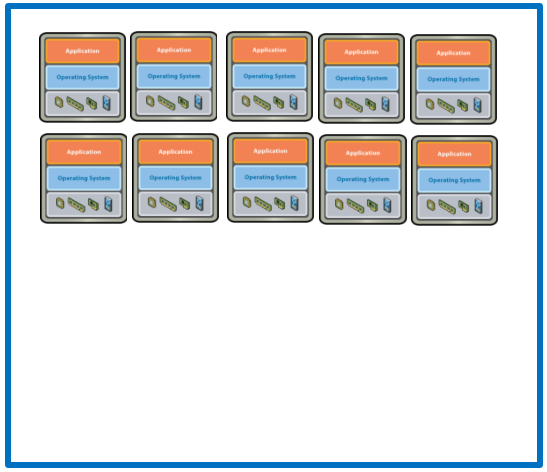
Data Center Cloud Storage Virtualization Power & Cooling Savings

a	b = a x 10	c	d	e = b x d x .025 / 1000	f = a x d x .025 / 1000	g = e - f	h = e x 1000 x 365 x 24	i = f x 1000 x 365 x 24	k = h - i
# Virtualized Storage Drives (25 Watts / Drive)	# Traditional Physical Drives (25 Watts / Drive)	Cost of Power / kWhr	Original PUE	Cloud Storage Power without non-Virtualized (MW)	Cloud Storage Power Virtualized (MW)	Cloud Storage Virtualization Power Savings (MW)	Annual Power Budget for Cloud Storage non-Virtualized	Annual Power Budget for Cloud Storage Virtualized	Annual Power Budget Savings
2.613	13.287	$0.10	2.16	0.718	0.141	0.577	$ 628.761	$ 123.643	$ 505.119
% Annual Budget Saving = 80%							Four Year Net Present Value (NPV, 5%) = $1.791.126		

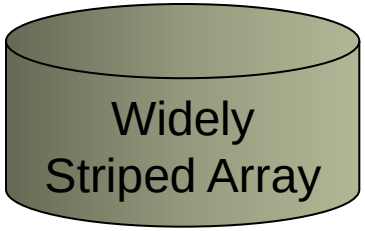
"the four year NPV is $1.8 million"

Parallelism benefit #1

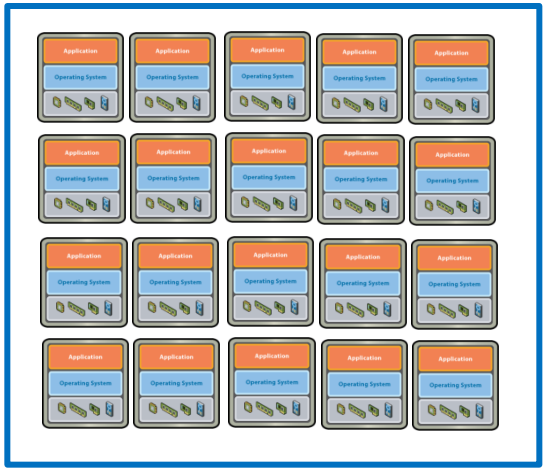
Before



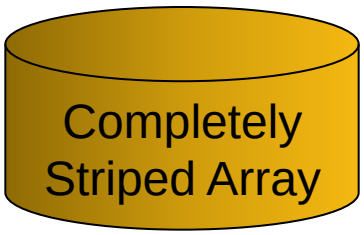
Server



After



Server



Parallelism benefit #2

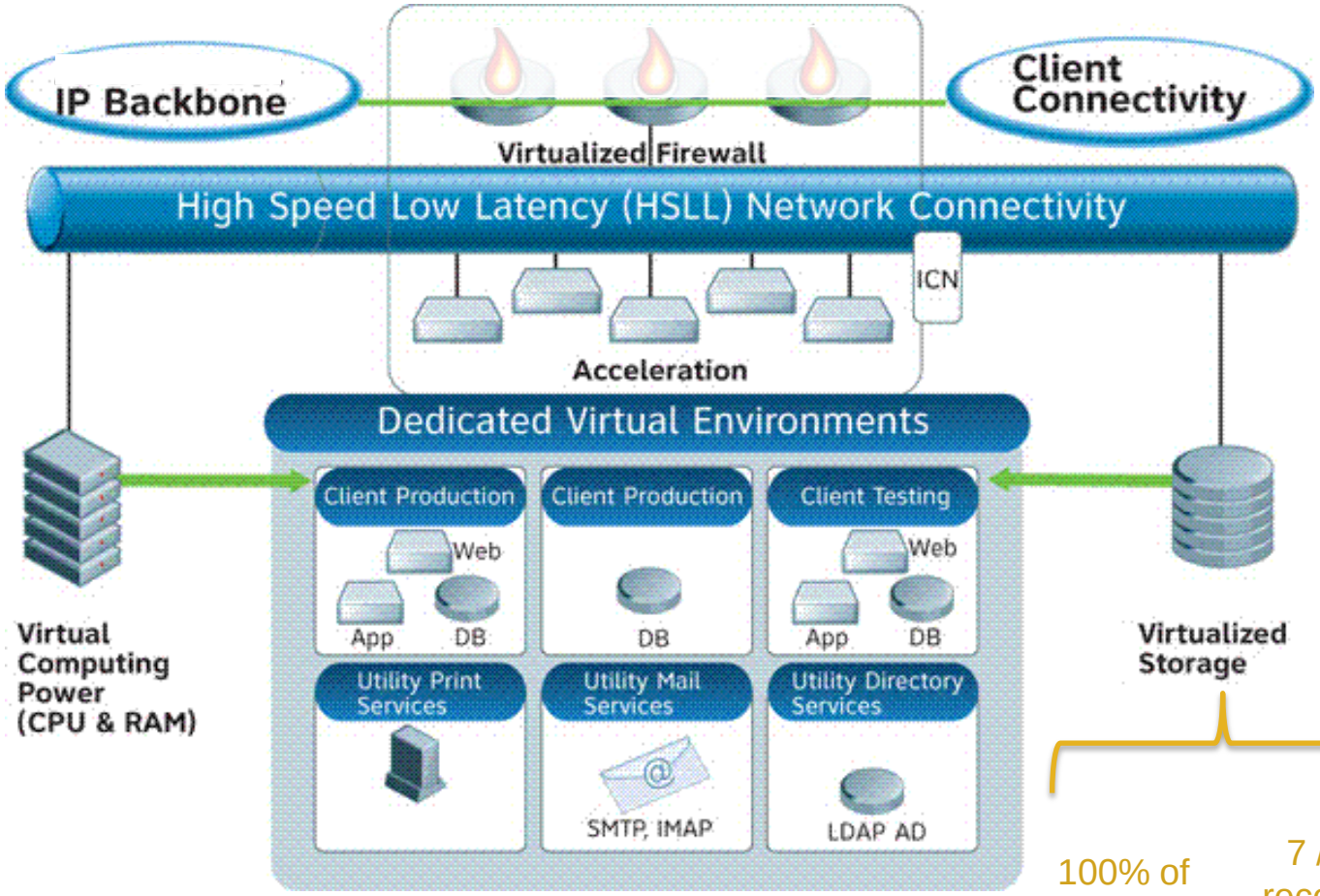
underlying storage is massively parallel storage architecture with 100% SATA technology

Align costs with MRR*

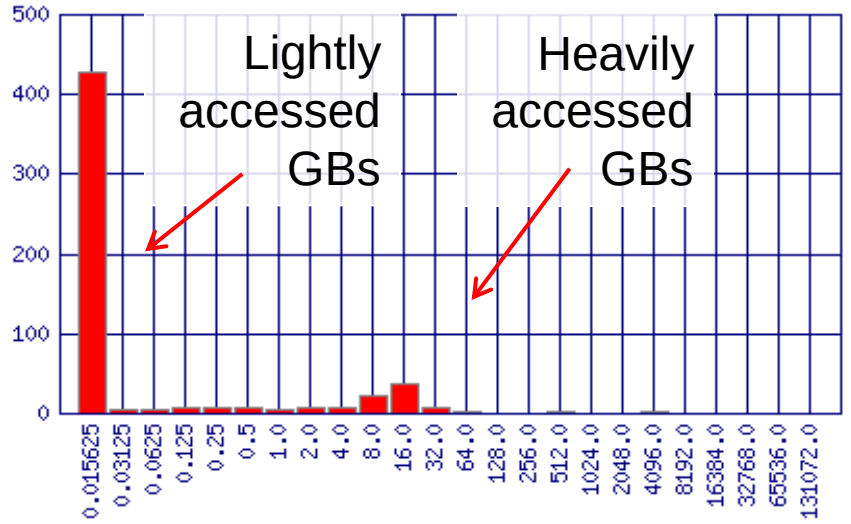
- Leverage massively parallel architecure
- Robust, scalable thin provisioning for primary storage
  - CapEx
  - OpEx

* – Monthly Recurring Revenue

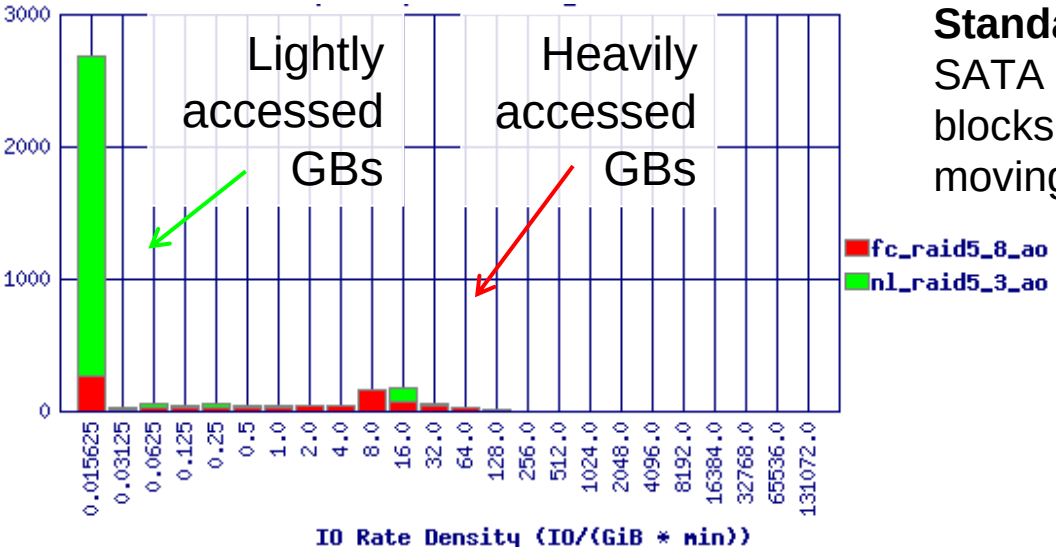
Sample data recovery services



Sample value-added tiering



Premium : FC disks guaranteed

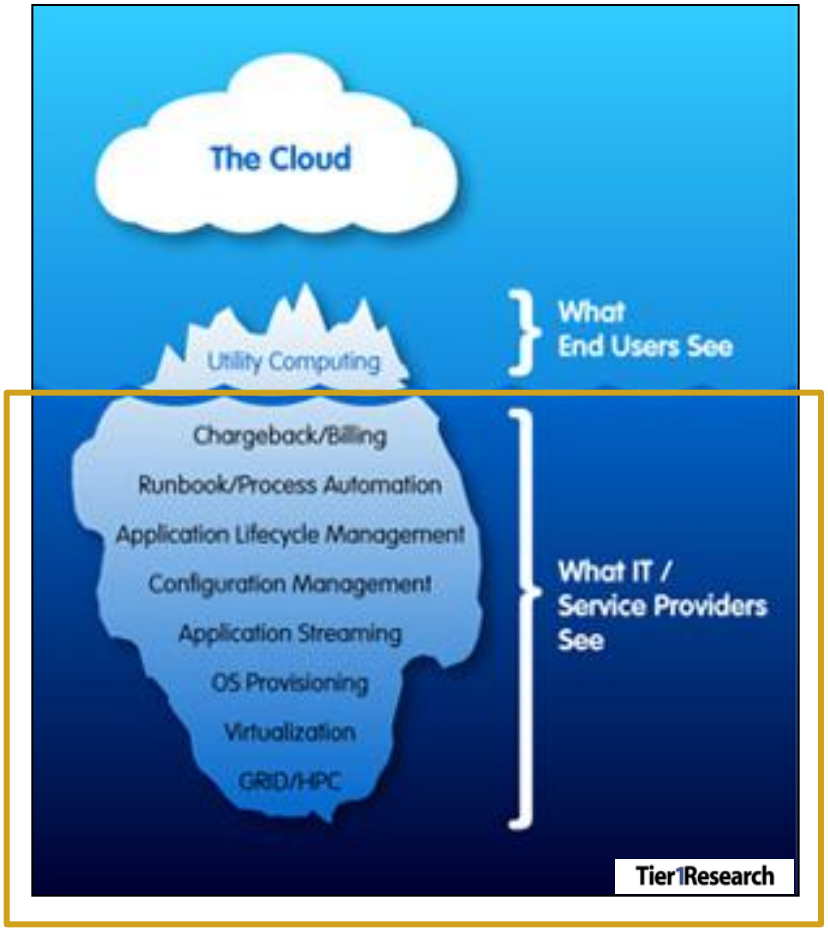


Standard : FC & SATA disks with blocks dynamically moving between them

Enable value-add, high margin services

- Efficient, flexible remote copy services
- Efficient, flexible local copy services
- Intelligent, flexible tiering

IaaS Requirements



- Assure service levels
- Accelerate book-to-bill cycles
- Manage unpredictable growth
- Align costs with MRR
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Thank You

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