Design. Build. Manage. Accelerate.

Track 3

Cloud Computing

April 24-26, 2012

Healthcare Practice Bio-IT World

Michael Cardy, M.Sc., Global Chief Technology Officer

April 23, 2012

Agenda

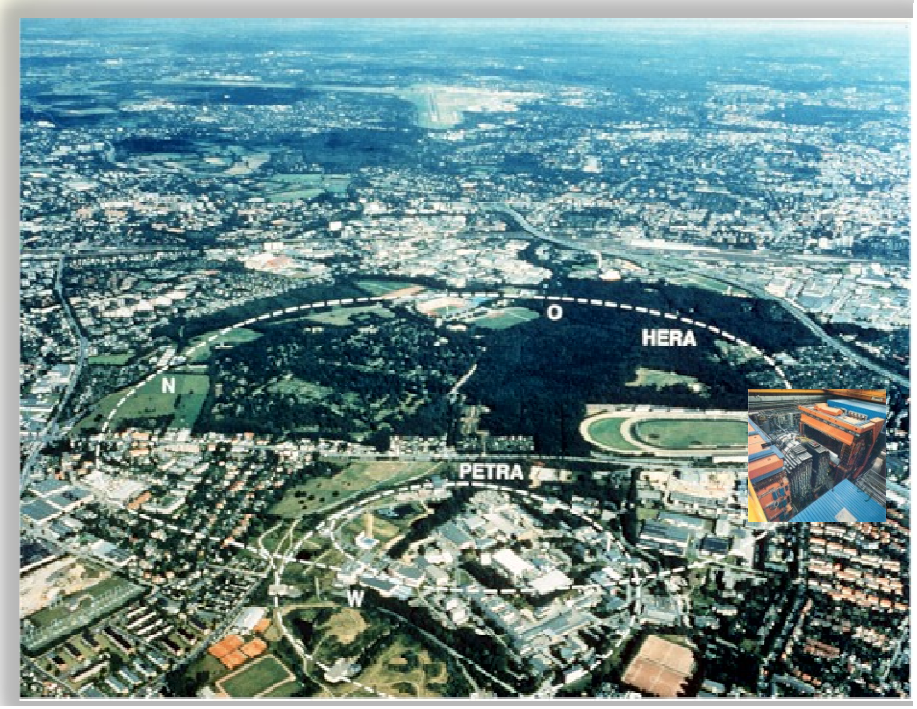
- Lunch!
- Introductions
- About OnX
- Guest Speaker - MD Anderson
- Our Approach Cloud Computing
- Cloud Spectrum
- Design Considerations
- Cloud enablement workshop

Introductions

Michael Cardy MSc.

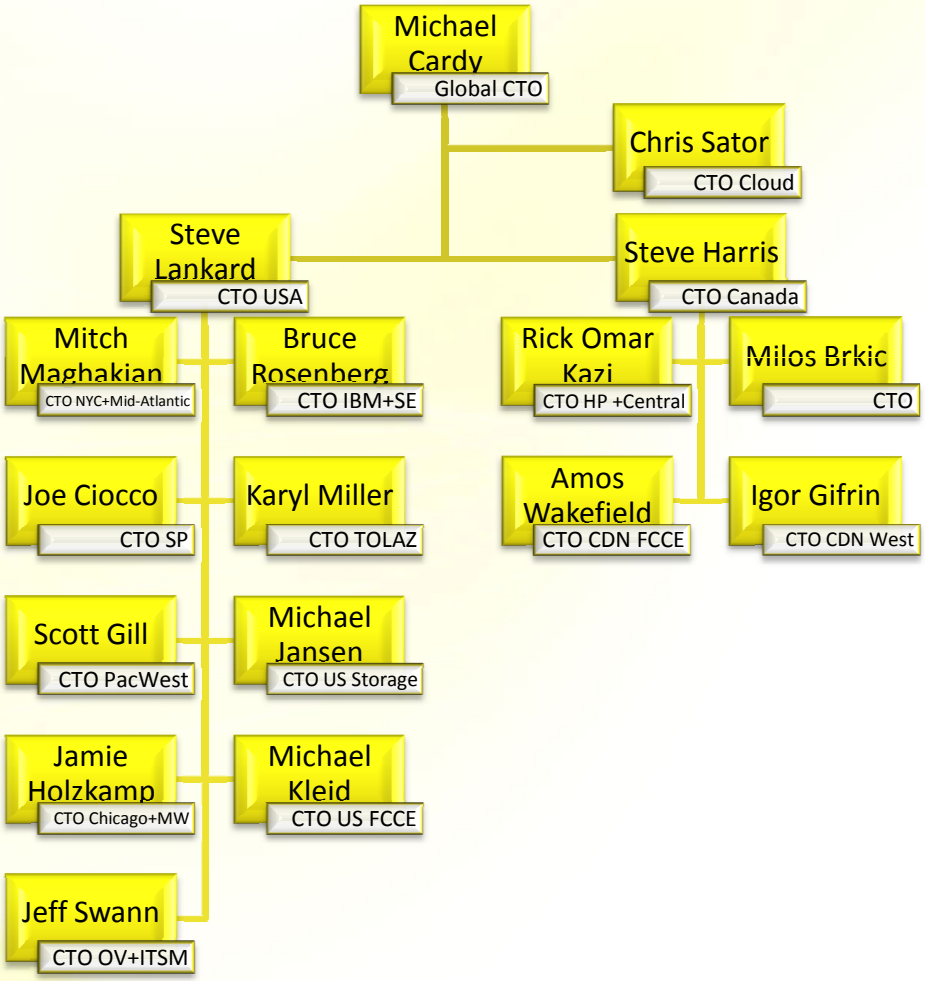
- Global Chief Technology Officer
- OnX Enterprise Solutions
- mike.cardy@onx.com
- High Energy Experimental Physics

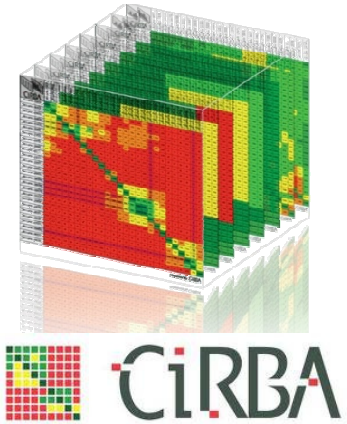
- Researcher in HPC



Information Technology

CTO Office – Direct Membership





BIO IT and Life Sciences

- Research activities
- Clinical trials
- High data storage needs
- High processing – “High-performance computing (HPC) uses supercomputers and computer clusters to solve advanced computation problems.”
- Analytics – Decision Support
- Highly competitive
- Speed to market urgency
- Disaster Recovery critical

OnX Has A Proven Track Record For Over 28 Years.

- **Global reach - USA, Canada, Europe and Asia Pacific** Over 600 full time associates and 150+ of specialized consultants
- **3 OnX Owned / Operated / Managed Data Centres**
- **Data Centre capacity across the U.S.**
- **Federated Cloud Center of Excellence** Lab and Briefing Centers
- **$750+M** annual revenue (includes **$150+M** Healthcare)
- **Largest Enterprise Solutions Provider in North America**
- **49% Ownership** of a minority and aboriginal company, **Foxwise Technologies Inc.**
- **Focused on delivering value to our clients around the globe**
- **CDN Channel Elite Award 2011 in** Best Cloud Computing

momentum

FOXWISE TECHNOLOGIES INC.

We provide Cloud and Managed Services, Digital Services, Professional Services, and integrated Hardware and Software Solutions

Design. Build. Manage. Accelerate.

We have three business divisions that align technology solutions to business outcomes.

On-Premise Technology Solutions & Services

- Leading provider of integrated multi-vendor data center solutions
- Top vendor partnerships with over 800+ certifications
- Faster time to value with less deployment/migration risk

Physical and Virtualized Solutions

Enterprise Software Services

IT Business Management Software

Technology Solutions &PS

Off-Premise Managed Solutions and Services

- Two SAS 70 DC's - Type II and III
- Partner DC's in LA, NYC, Chicago and Calgary
- PCI compliant with >$1B client revenues
- Manage over 4000+ workloads

Managed Hosting & Co-location

Remote IT Management (NOC)

Private & Shared Clouds

Support& Maintenance Services

Digital Business Application Solutions and Services

momentum

- Digital strategy and e-marketing services with optimized search
- integrating web portals and mobile devices leveraging social media reach
- End to end application support

Interactive Marketing Services

Web/Mobile Application Development

Legacy Application Integration

Managed Application Services

Bio Life Sciences and Healthcare

Special Guest!

THE UNIVERSITY OF TEXAS
MD Anderson Cancer Center
Making Cancer History®

Krishna Sankhavaram

Director Research Information Systems and Technology Development at MD Anderson Cancer Center

OnX provides extensive cross industry Client Experience across HPC vertical markets

Tulane University

ST. MARY'S UNIVERSITY

YALE

HARVARD

THE UNIVERSITY OF OKLAHOMA
1890

NORTHEASTERN STATE UNIVERSITY

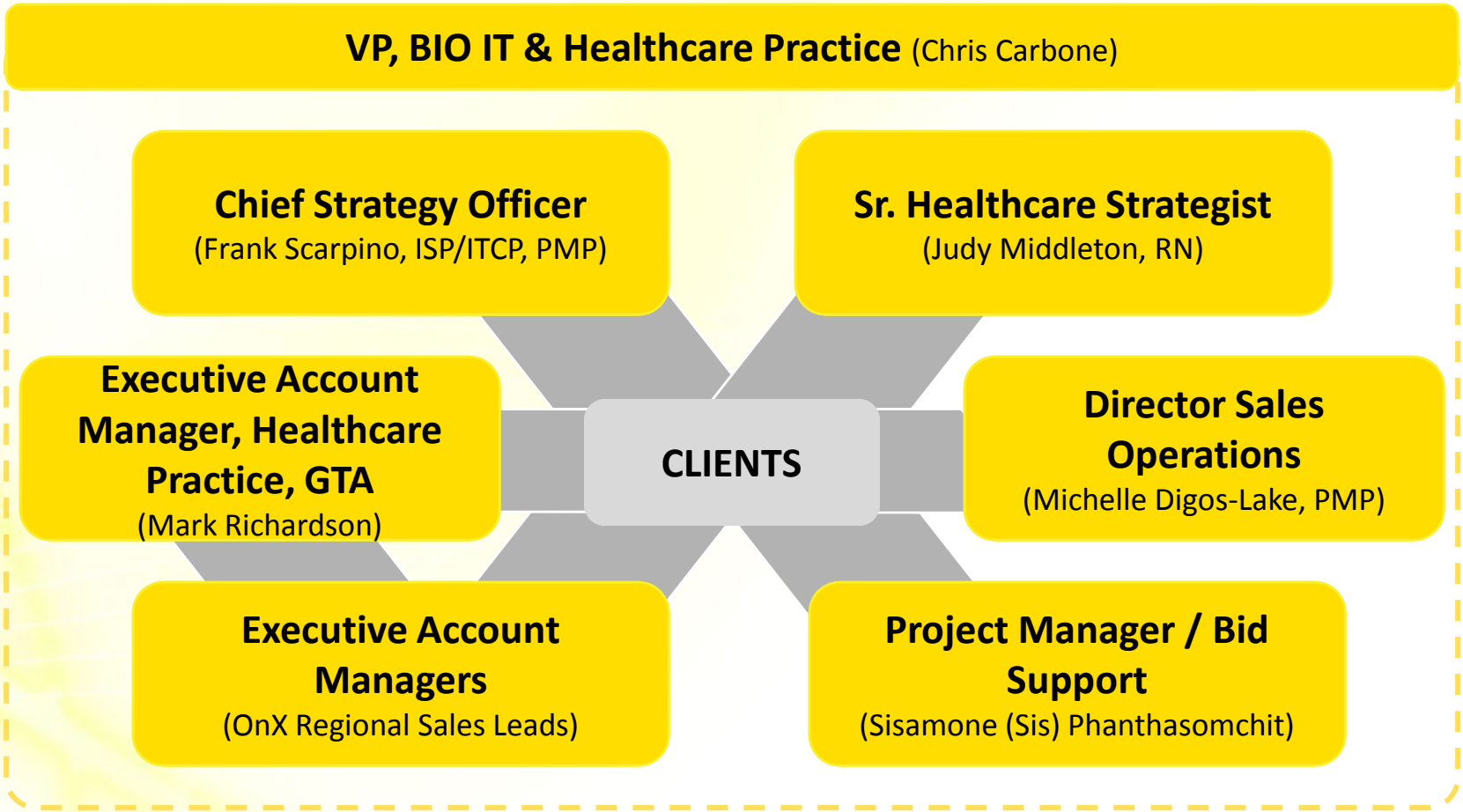
Tulsa Community College

LSU SHREVEPORT

BlackBerry

verizon wireless

Life Sciences and Healthcare Team



OnX *mHealth* through to the *Cloud*

Consumers

Patients

Clinicians

Access (Secure & Reliable)

Local | Regional | National | International

E.g. Integrated Electronic Health Record, Social Networking

People

Processes

Evidence Based Methods / Best Practices

Technology

ITIL/ITSM

PMO

DECISIONS

INFORMATION

RECORDS

APPLICATIONS

SERVERS

INFRASTRUCTURE

SLC




Hardware & Software Solutions

OnX provides a full range of hardware and software services with key technology partners

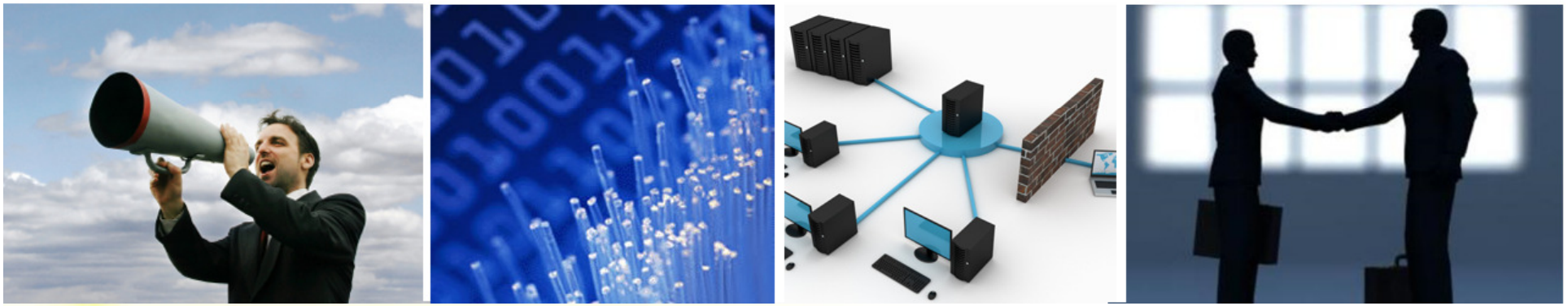
Licensing & Procurement

- Licensing Baselines, Compliance and Utilization
- Asset Tracking, Streamlined Billing and Online Reporting
- Financial Justification and Business Case Development
- Enterprise Contract Agreement Customization and Negotiations
- Customized Procurement Models
- Hardware Asset Tagging and Imaging
- Pre-system Builds and Burn-In services

Integrated Solutions

- Federated Cloud Solutions – Private and Public
- Virtualization – servers, desktops, networks and applications
- Storage Management - SAN, NAS, Virtualization and Archiving
- Data Protection - Backup, CDP, Virtual Tape and Disaster Recovery
- High Availability and Business Continuance
- Converged Networking – SAN, NAS, LAN and WAAS
- Unified Communications , Video and Collaboration
- Secure Communications and Data Encryption
- Enterprise Systems Management, Business Service Management Reporting and Monitoring

Strategic Partners



Technology Solutions and Professional Services

OnX's professional services' practice provides the foundation for innovation.

Strategy Roadmaps & Architectures

- Cloud Strategic Assessment
- Cloud Reference Architectures
- Server and Desktop Virtualization Assessments
- Data Management Storage Strategy
- Disaster Recovery Planning
- Converged Network Strategy
- End User Services Strategies
- Unified Communications and Collaboration
- Technology Cost Management

Validation - Deployment - Migrations

- Pilot / Proof of Concept Lab (FCCoE)
- Testing – Functional, Stress & Performance
- IT Infrastructure Planning and Design
- Implementation and Integration
- Custom Training and Mentoring
- Migrations - Data Centres, Servers/P2V & Data
- Enterprise Systems Management and Business Service Management

Project Management

- Fixed Fee or Time Based Delivery
- Project Management Methodology
- Process Improvement

OnDemand Resourcing

- Enhanced Staff Augmentation
- Resource Management

OnX Enterprise Solutions

Design. Build. Manage. Accelerate.

OnX Cloud Computing . . .

Concerns and Opportunities

What Is Causing IT To Transform?

IT organizations must now learn to compete for their internal customers

The Big Ideas

- During the next 5 years, most IT organizations will have to fundamentally re-engineer how they deliver user services.
- Motivations will be more about value generation vs. cost savings
- It's more complex for IT than meets the eye
  - New business model
  - New operational model
  - New technology model
- These projects will be precursors of even larger – and more interesting – IT projects.

Key “People” Discussions

- The new IT career tracks
- Roles, skills, alignment, automation, governance and measurement
- New IT organizational structure
- Training and certification pathways

OnX Cloud Experience

OnX's natural evolution of our Co-Lo & Hosting

- 11+ years of providing full Managed Services
- Multiple data centers managing over 4000 workloads
- Customer Assistance Center with ITIL based Runbooks
- Remote management and monitoring

OnX has been doing Cloud for 6+ years

- Over 2000 existing client workloads (UltraHosting.com)
- VMware Condo model cloud (since 2007)

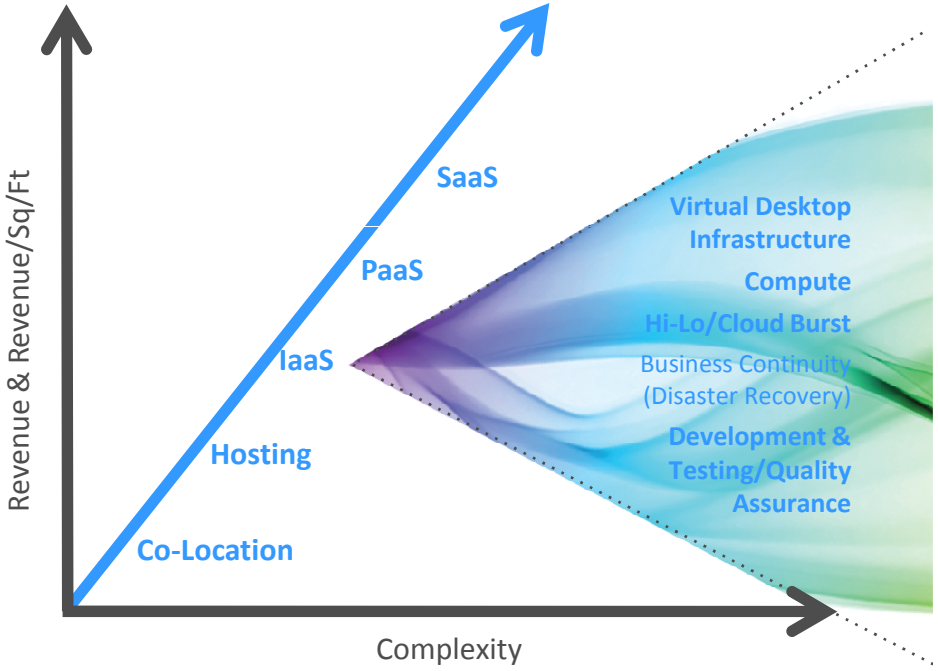
Launched Semi-Private Cloud in 2010

- Secure self service—add/modify/remove
- Usage based hourly billing
- Template & snapshot management included
- Secure network connectivity (dedicated VPN/Firewall)
- Hybrid to existing managed hosting offering

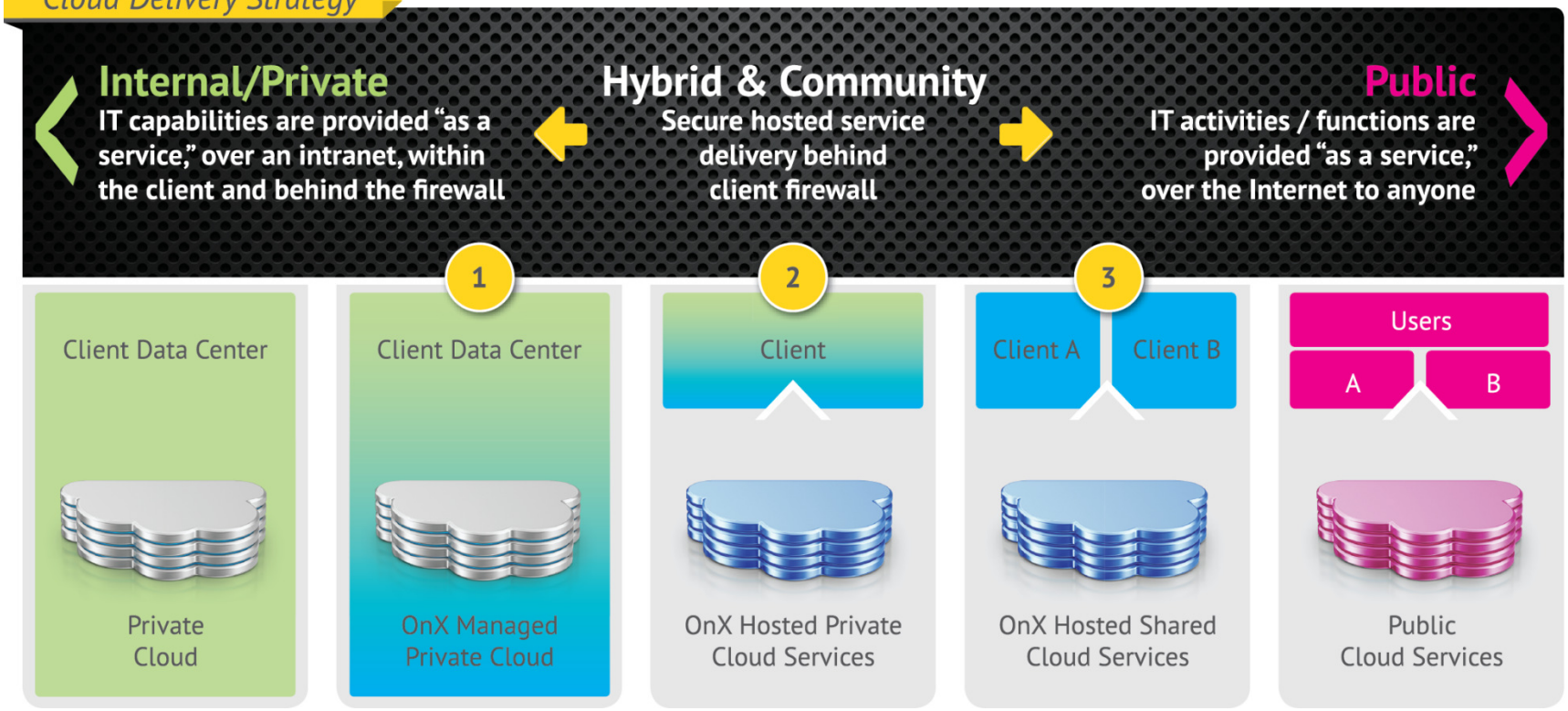
Launched Federated Cloud in early 2012

- Enterprise Grade: Vblock based, Tier 3 Data Centers
- Highly Scalable—can expand 20x in less than 60 days
- Tiered storage option—performance vs capacity
- Tailoring abilities for specific SLA's
- Metered resources
- Self service portal and programmable API's
- Available now for quick time to market

Evolution of Service Provider Services: SPI Model



Cloud Delivery Strategy



OnX Federated Cloud

- Avoids islands and silos
- federates client and OnX via security, burst, disaster recovery, service desk and API
- Cloud to cloud or vSphere or physical

Why Converged Infrastructure

Build it all your self

Physical & logical build

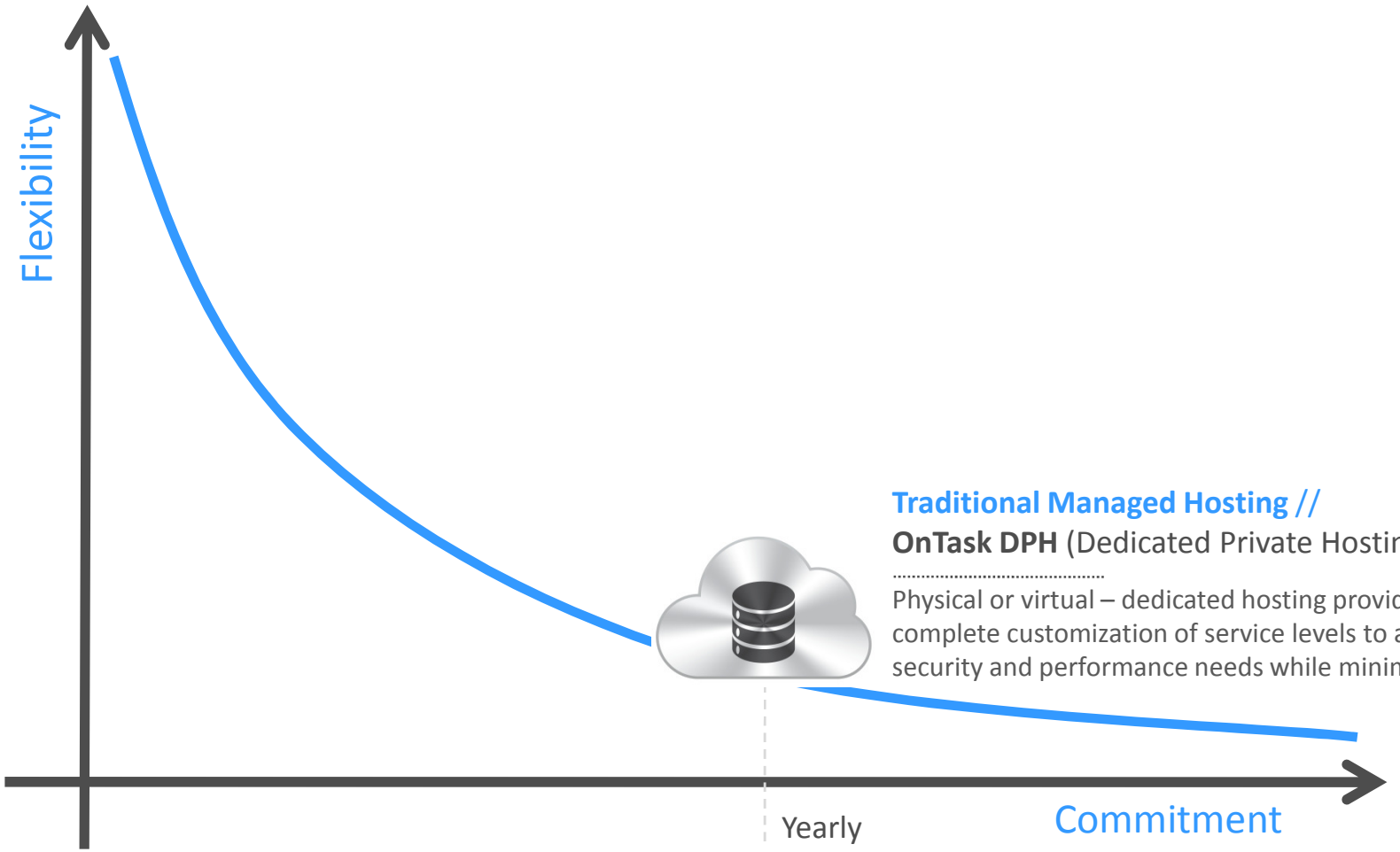
- This is how solutions ***previously*** shipped
- Getting complete Bill of ALL Materials is challenging
- Cabling alone can be a nightmare and waste time
- High availability design discipline required
- Performance/scale challenges in future planning

Pre-build Vblock

Focus on logical build only

- Speed time to value with best of breed converged infrastructure
- High availability design included
- Performance/scale planning in modular form to scale up and scale out
- Focus time on value of logical layers
- Enables standardization & remote management

Self Service and Fully Managed Clouds



Traditional Managed Hosting //
OnTask DPH (Dedicated Private Hosting)

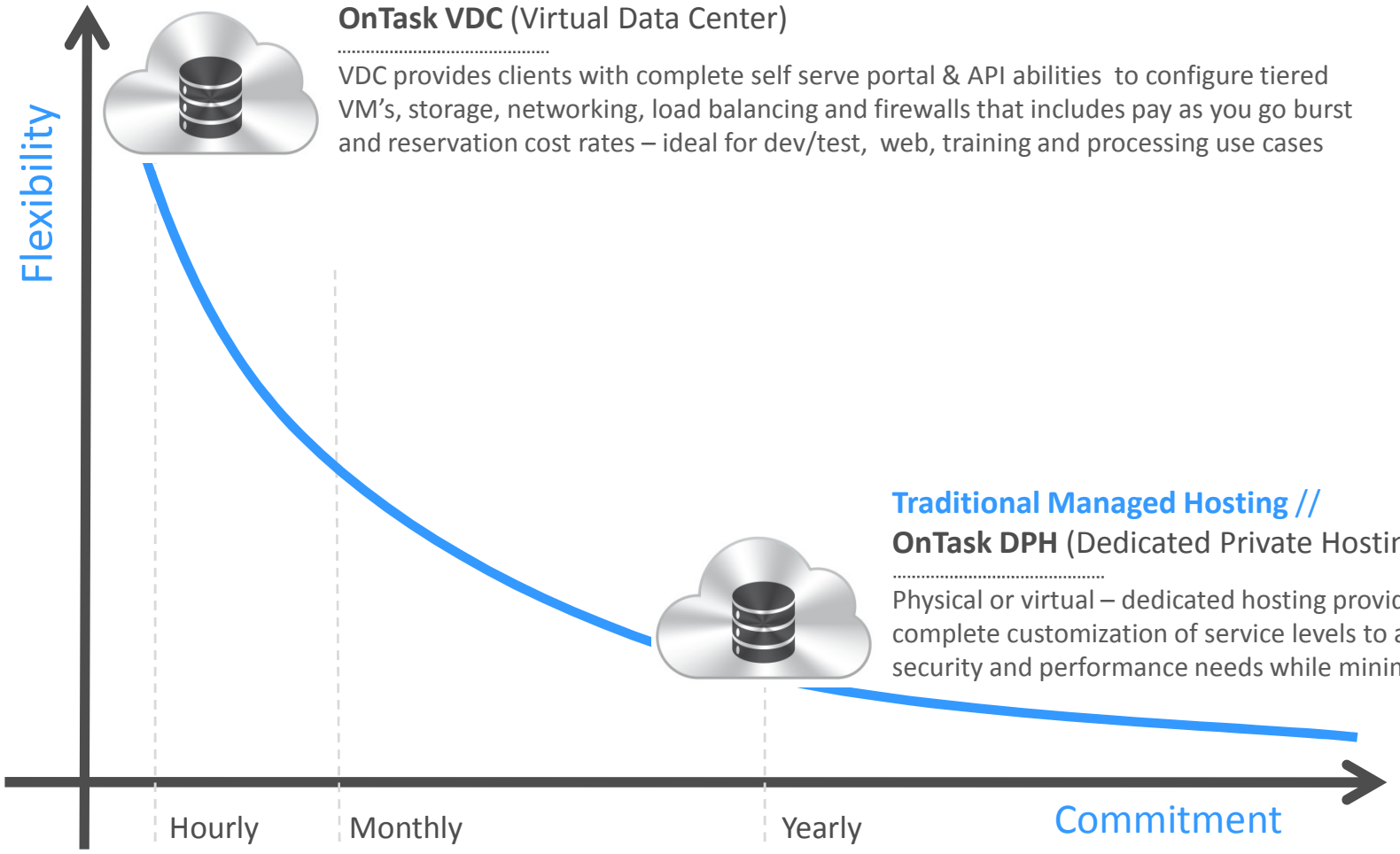
Physical or virtual – dedicated hosting provides clients with complete customization of service levels to address specific security and performance needs while minimizing flexibility

Self Service and Fully Managed Clouds

Self Serve Cloud //

OnTask VDC (Virtual Data Center)

VDC provides clients with complete self serve portal & API abilities to configure tiered VM's, storage, networking, load balancing and firewalls that includes pay as you go burst and reservation cost rates – ideal for dev/test, web, training and processing use cases



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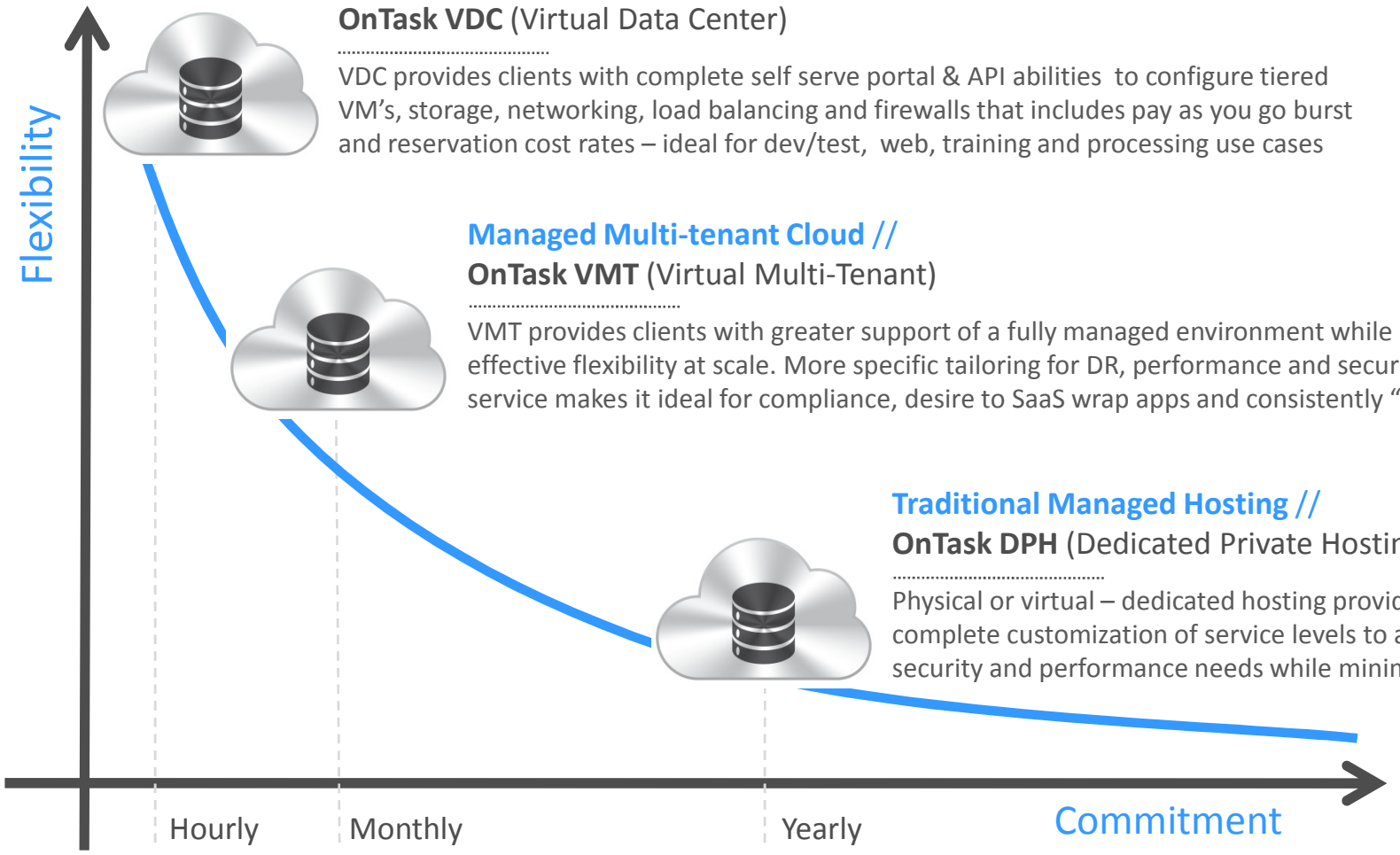

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Managed Multi-tenant Cloud //

OnTask VMT (Virtual Multi-Tenant)

VMT provides clients with greater support of a fully managed environment while still enabling cost effective flexibility at scale. More specific tailoring for DR, performance and security SLA's over self service makes it ideal for compliance, desire to SaaS wrap apps and consistently "on" workloads

Traditional Managed Hosting //

OnTask DPH (Dedicated Private Hosting)

Physical or virtual – dedicated hosting provides clients with complete customization of service levels to address specific security and performance needs while minimizing flexibility

Journey to the Cloud

SLA

Cost

- *CapEx*
- *OpEx*

Cloud Readiness Workshop

Detailed Cloud Assessment and Strategy

Detailed Design

Implementation and Migration Services

Operations Management

Input: Questionnaire

Output: Cloud Definition CIMM Gap

Federated Cloud Maturity Model

	Traditional	Virtualized	Abstracted	Flexible	Optimized
Infra		✓			
Apps		✓			
IT BP	✓	Gap			
$		✓			

OnX Federated Cloud Maturity Model©

Initial

- Physical Focus
- Servers, Storage , Network
- Traditional IT Department
- App to Equipment relationship

Virtualized

- Virtualization Focus
- Servers, Storage, Network
- Technology focus
- Technical allocation management

Abstracted

- Virtualization management and provisioning
- Virtualization metrics drive business processes
- Test / Dev environments
- Specific projects experiment with cloud delivery

Flexible

- Primary integration of private and federated cloud
- SLA based vendor management model
- Default business and technology model
- Auto provisioning of IT from cloud sources

Optimized

- Compute as a service
- Interoperable
- Multi-cloud
- Dynamic
- Financial models include capacity on demand and reservation

Federated Cloud Maturity Model© Mapping

	Traditional	Virtualized	Abstracted	Flexible	Optimized
Infrastructure	- Physical focus - Characterized by dedicated servers, storage and network	- Mix of Physical and Virtual infrastructure. - Characterized by implementations of VMware, Hyper-V, Citrix. - Possibly storage virtualization. - Technology Focused	- Virtual is the primary goal - Pools of resources - Unable to "point and identify" infrastructure for specific applications or projects - Highly standardized	- Some workloads are moved to shared or hybrid cloud - Cloud services used for non-core - Actively engaged in IaaS, PaaS, and SaaS offerings	- Infrastructure is standardized - Auto-provisioning of services - Shared, federated and private cloud intermixed - Open cloud markeplace
Applications	- Tied to physical resources - May have hard-coded IP addresses - No elasticity - High demand for disk	- Virtualized hosts - May have physical Database or DMZ characteristics - Limited elasticity	- Major migrations underway or targeted - Selected cloud adoptions - Beginning use of PaaS or SaaS offerings	- Selected cloud delivery of applications - All components are abstracted - Thin or web delivery	- Multi cloud vendor - Shared, federated and private cloud intermixed - Mixture of SaaS, PaaS and IaaS - Open cloud marketplace - Cloud based applications can auto-provision required infrastructure
IT Business Processes	- Focus is on the uptime of infrastructure - Traditional 80% budget on operations	- Focus on technology as a means of efficiency - Capacity utilization - Virtualization is a layer on ITSM operations management	- Technology is a business model - Shift in focus to vendor and SLA management	- IT is auto-provisioned internally or with cloud supplier - IT operations is relationship based - Cloud is the business model	- IT is auto-provisioned as the application requires capacity - Business processes bridge internal IT and cloud suppliers - IT operations is SLA and relationship based - Capacity is managed elastically
Financial Model	- Traditional 80% budget on operations - Major expenses for staff, H/W, S/W and Maintenance - Capital intensive	- Virtual infrastructure is treated similar to physical infrastructure - Some elements of capacity planning - IT economies of scale focus	- Funded by capacity requirements - Operations metrics are SLA's - Business cases are ROI driven, including productivity and growth targets	- Components are usage based - Cloud metered financials - Departmental chargeback models	- Usage based - Billing and metrics on availability of cloud services - SLA's are risk-reward shared with cloud provider - Variety of payment methods; pay as you go, partial and full reservation

Cloud Readiness Assessment Workshop - Overview

- Interactive half-day to day long workshop session
- Key technology and business owners within the organization
- Review cloud concepts and identify potential cloud targets for further investigation
- Understanding of existing baseline:
  - Infrastructure
  - Applications
  - Business Processes
  - Business and Technology Drivers
- Refine target infrastructures, applications and processes
- Define cloud organizational architectures
- Pricing varies based on complexity
  - Typically $5,000 - $10,000 for workshop

Cloud is a process and not a one time event . . .

- Leverage educational resources and cloud readiness workshops to map your journey to the cloud with experts who have done it before
- Conduct a Capacity Planning Assessment to understand how to transition to cloud, gain the "low hanging fruit" and lower risk of change
- Test and Trial your path to the cloud to determine how your applications will run in the cloud
- Partner with experts who build and manage federated clouds for your site or theirs to enable your organization to successfully transform business strategy with optimized operations

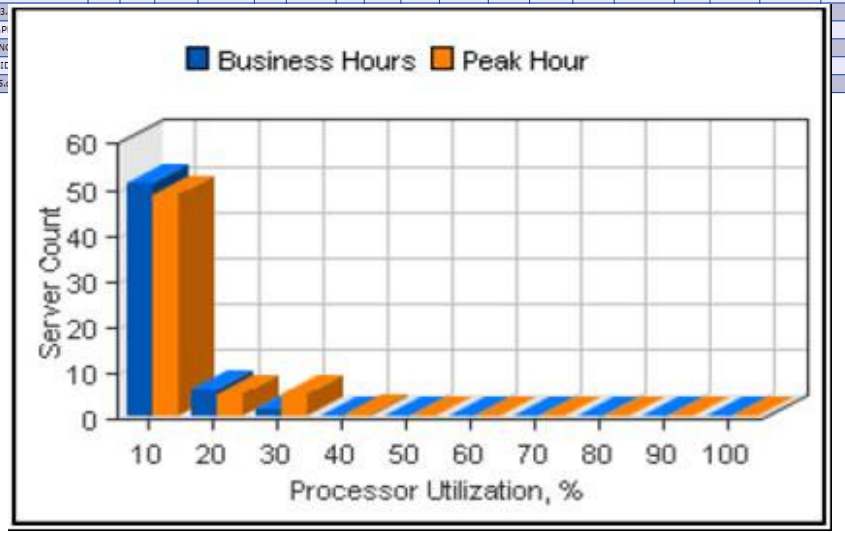
Average IT organization dedicates 66 percent of its budget to day-to-day operations leaving little room for transformation of business strategy

Cloud Capacity Planning Assessment – transition to cloud with confidence

Overview

- Monitors a monthly window
  - Compare to a global standard deviation
- Identifies cloud candidates
  - CPU and memory utilization
  - Network and storage i/o and bandwidth
- Model aggressive & conservative scenarios
- Map to a future state of
  - OnTask DPH managed services
  - OnTask VMT managed cloud
  - OnTask VDC self serve cloud
  - Can be leveraged for other clouds and virtualization too
- Takes the risk out of sizing a cloud environment too small or too large
- Identify migration considerations (optional add-on)

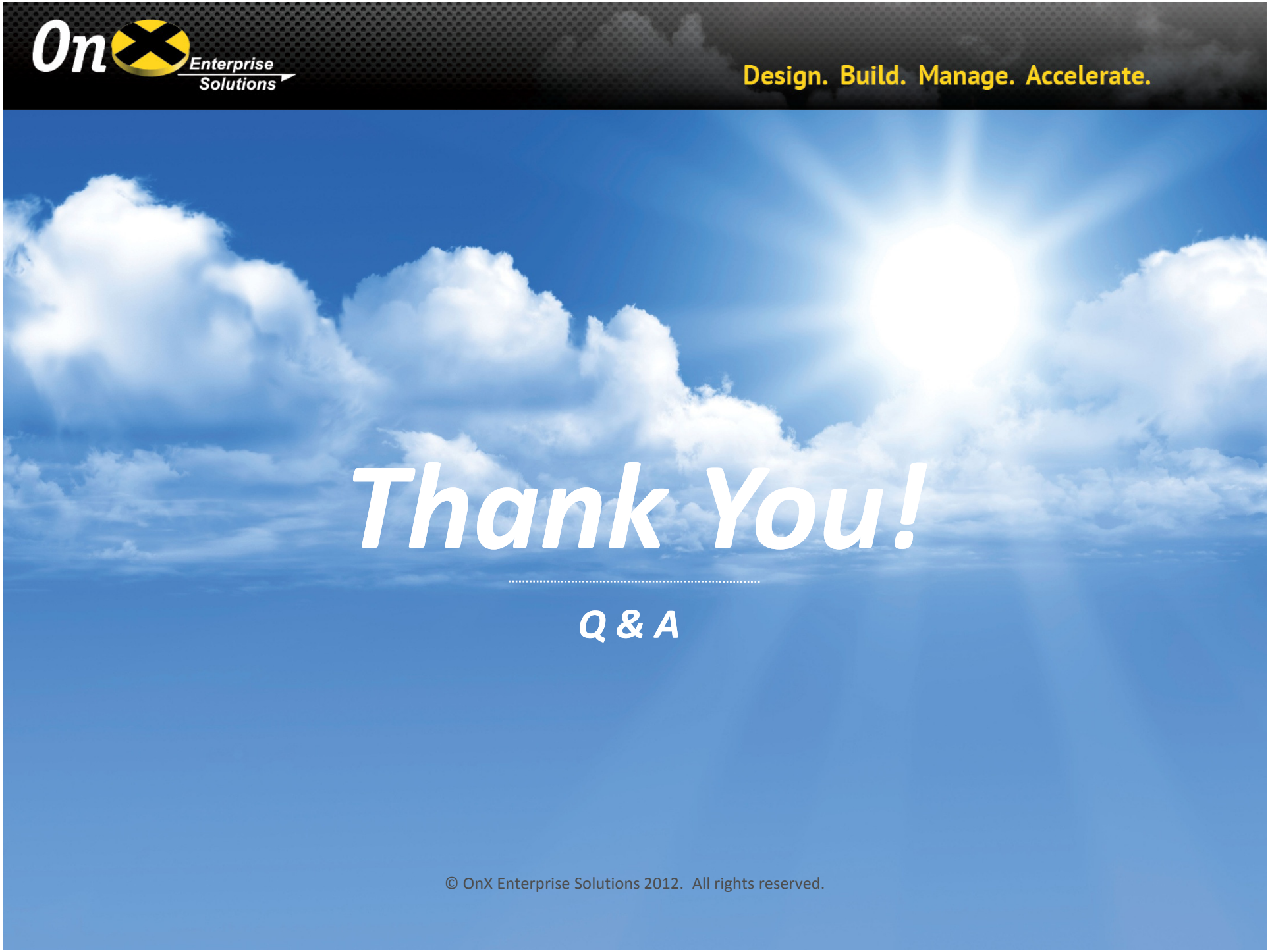
			Capacity										Estimated New Utilization								
			Processors		Memory	Disk	Network		Physical				Processor		Memory				Disk		Network
	Target System Name	Source System Name(s)	Count	Speed (MHz)	Size (MB)	Size (GB)	Count	Speed (MB/sec)	Rack Units	Weight (lbs)	Power (W)	Thermal (BTU/hr)	% Used	Queue per CPU	% Used	File Sys Cache (MB)	Page File %	Paging (Pg/sec)	I/O (Trans/sec)	I/O (MB/sec)	Speed (MB/sec)
Reused Systems - None																					
Systems with Exceptions																					
	EMRBNAS2		1	2,399	1,536	500.11	5	3,000.00					23.78	2.28	57.72	157.71	16.18	642.92	905.77	12.40	0.58
	eds		2	1,600	8,180	248.96		0.00					4.45	0.55	99.45	0.00	78.57	1.53	113.94	4.03	17.13
	EMRBSDE1		2	3,200	2,304		2	0.00					13.88	0.04	70.63	171.59	2.70	2.49	254.91	125.13	0.00
	MOERRDBPROD2		2	2,392	6,144	293.09	1	1,000.00	5	90	542	1,848	20.32	0.03	43.58	83.72	0.68	499.42	410.01	13.11	0.00
	lims		2	1,600	8,180			0.00					7.15	0.60	99.48	0.00	36.45	39.74	478.59	6.39	15.52
	emris3.dbman		1	3,196	2,025	163.93		0.00					0.39	0.04	83.94	0.47	0.00	0.00	0.00	0.00	16.29
All Systems			22.3 GHz		28.4 GB	1.206 TB	8	4.0 GB	5	90	0.5 KW	0.2 Tons	12.12	0.42	81.65	413.48	22.43	1,186.11	2,163.22	161.07	49.51
New Systems																					
	Phantom1-1	(Totals)	2	3,200	16,384	1,800.00	4	4,000.00	2	65	835	3,308	44.23	0.71	89.53	1,833.56	19.63	195.14	91.82	5.47	1.02
		LRCPTORRWHWS001	1	300	2,048			10.00					1.30	0.00	10.76	180.82	9.91	10.02	6.32	0.05	0.00
		DEV-IMS	1	100	512			10.00					0.26	0.00	2.76	113.07	0.06	0.04	0.68	0.13	0.00
		MOEBIDEVTEST001	1	100	1,024			10.00					0.28	0.07	5.60	160.10	0.06	0.02	1.27	0.01	0.00
		DBDC2	1	2,100	768			10.00					30.70	0.08	3.59	156.79	2.93	0.55	3.71	0.02	0.00
		GISDATA1	1	100	512			10.00					0.18	0.00	2.71	284.28	0.37	30.17	13.31	1.26	0.26
		EMRBIMS2	1	100	1,536			10.00					0.94	0.00	7.70	139.23	0.95	153.09	54.24	0.05	0.70
		DEV-ORION	1	200	768			10.00					1.82	0.01	4.15	191.51	0.22	1.03	1.56	0.20	0.00
		LRCTTORRWH00001	1	100	512			10.00					0.20	0.51	2.35	171.97	0.04	0.16	2.02	0.02	0.00
		emrisb.dbman	1	100	2,048			10.00					0.18	0.01	10.39	0.32	0.00	0.00	0.00	0.00	0.04
		EMCDB	1	500	1,792			10.00					7.58	0.01	9.64	234.14	1.10	0.00	5.98	3.73	0.00
		dbprod5.dbman	1	100	4,352			10.00					0.18	0.00	23.66	2.74	3.37	0.00	0.00	0.00	0.01
		EMRISC	1	100	1,280			10.00					0.59	0.01	6.21	198.58	0.61	0.05	2.74	0.01	0.00
	Phantom2-1	(Totals)	2	3,200	16,384	1,800.00	4	4,000.00	2	65	835	3,308	8.31	0.93	89.00	907.78	15.51	130.60	46.47	1.56	0.43
		MOEEDWISREP01	1	100	256			10.00					0.01	0.00	1.10	50.99	0.07	0.01	1.44	0.01	0.00
		MOEWASSSTAGING	1	400	2,560			10.00					4.55	0.00	13.15	219.65	4.03	1.26	2.29	0.04	0.00
		dbprod3																		0.00	0.00
		LIMSAP																		0.04	0.00
		FWSYN																		0.01	0.00
		MOEBID																		1.47	0.00
		dbdev5																		0.00	0.42

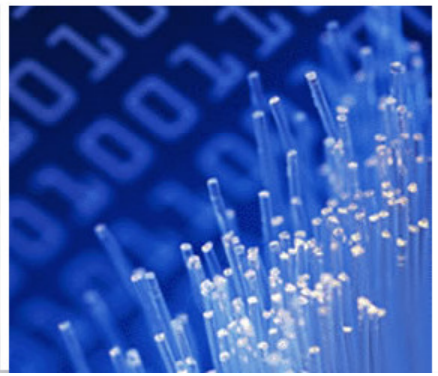


Call to Action

- Contact me: mike.cardy@onx.com
- Consider a Cloud Workshop or Assessment
- Consider a FCCE discussion or visit
- Visit our Booth – Contest!

- www.onx.com



Thank You