Smashing the Barriers to Adoption of Enterprise Cloud Computing

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Vice President
Global Customer Advisory

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What’s Driving IT to a New Approach?

Market Forces
• The Economy
• Anytime, anywhere IT
• IT as strategic enabler
• Tectonic shift in technology
• The Environment (Green)

Business Forces
• Defer and avoid costs
• Fix the IT bottleneck
• Map supply and demand more effectively
• De-capitalize IT
• Automate Operations

Public Cloud
• Security
• Compliance
• Application Rewrites

Private Cloud
• Existing investments
• Labor intensive, steep learning curve
• Skeptical about results

Perceived barriers to a new approach
What is Cloud Computing?

Cloud computing is an approach that enables organizations to leverage scalable, elastic and secure resources as services with the expected results of simplified operations, significant savings in cost and nearly instant provisioning.

The key attributes “usually” associated with Cloud Computing

1. Multi-tenant – the ability to process the needs of multiple users with shared resources in a dynamic and transparent fashion
2. Elastic and Scalable – resources can expand and contract as needed
3. Metered/Rented – some manner of “pay for only what you use”
4. Self-Provisioned – “self check-in” at least to some degree
5. Internet based – accessible using internet technology, usually over the public Internet
6. X as a Service – the details/concerns of implementation are abstracted for the customer

The seventh attribute sets Secure cloud computing apart

7. Secure – an overall decrease in risk due to greater security protocols and tools from the cloud provider for data in motion, data at rest and data in process.

Why the Sudden Interest?

Gartner’s 10 Strategic Technologies for 2009

1. Virtualization (Ranked No. 5 last year)
2. Cloud computing (New to the list)
3. Computing fabrics (No. 8 last year)
4. Web-oriented architecture (New but similar to “the Web platform” No. 7 last year)
5. Enterprise mashups (No. 6 last year)
6. Specialized systems (New to the list)
7. Social software and social networking (No. 10 last year)
8. Unified communications
9. Business intelligence (New)
10. Green IT (No. 1 last year)

Cloud Computing is generating significant interest due to the confluence of emerging Cloudware technology and the drive to minimize additional capital expenditures on data centers and infrastructure.


The Key Business Driver for Cloud

Agility

- Extreme Automation
- Self-service capability
- Ready-to-go

The Financial Benefits of Cloud Go Beyond Capital Expenditure

<table>
<thead>
<tr>
<th>Financial Perspective</th>
<th>Traditional Data Center</th>
<th>Cloud Computing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expenditure type</td>
<td>Capital expenditure (capex)</td>
<td>Operating expense (opex)</td>
</tr>
<tr>
<td></td>
<td>Operating expense (opex)</td>
<td>Operating expense (opex)</td>
</tr>
<tr>
<td>Cash flow</td>
<td>Servers and software are purchased upfront</td>
<td>Payments are made as the service is provided.</td>
</tr>
<tr>
<td>Financial risk</td>
<td>Entire financial risk is taken upfront, with uncertain return.</td>
<td>Financial risk is taken monthly and is matched to return.</td>
</tr>
<tr>
<td>Income statement</td>
<td>Maintenance and depreciated capital expense</td>
<td>Maintenance expense only</td>
</tr>
<tr>
<td>Balance sheet</td>
<td>Software and hardware are carried as a long-term capital asset.</td>
<td>Nothing appears on the balance sheet.</td>
</tr>
</tbody>
</table>

How Cloud is Typically Used Today

This is relative, not definitive positioning

<table>
<thead>
<tr>
<th>Cloud</th>
<th>Traditional</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Security</td>
</tr>
<tr>
<td>LOW</td>
<td>Business</td>
</tr>
<tr>
<td>Security Requirements</td>
<td>Applications</td>
</tr>
</tbody>
</table>

Conventional business applications with:
- Patient Data
- Employee Information
- Financial Information
- Customer Information
- Government

Mail and Collaboration
Analytics and Reporting
Web
Software Development/Test

Document Management
Financials and Planning
Mission Critical/OLTP

Routine Applications
Business Applications
Critical Applications

Survey #1: What is Your Greatest Concern About Moving Workloads to the Cloud?

- 72% cited SECURITY concerns
- 34% selected Integration issues
- 14% cited TCO
- 8% none of the above

Results from 90 respondents,

More than one choice selected thus total exceeds 100%
Survey #2: What Do You See as Your Greatest Barrier to Moving to Cloud?

- 51% cited SECURITY/Data Privacy concerns
- 21% selected Integration of cloud-based applications with existing systems
- 18% cited Bring systems back in-house
- 10% selected Regulatory/Compliance issues

Results from 312 respondents, Unisys press release, "Unisys Poll Shows Security Concerns as Leading Cause of User Hesitancy in Adopting Cloud Computing", September 15, 2009

Survey #3: What Concerns Do You Have About Moving to the Cloud for IT Service?

- 83% cited SECURITY
- 9% selected What to put in the cloud
- 6% selected How to transform to the cloud
- 2% cited Internal or External cloud

Results from 272 respondents, Unisys survey on sys-con.com; results as of October 13, 2009
Security is #1

Why Security is a Top Concern
Do you worry about...

- Securing your data outside your firewall?
- Unauthorized visibility to your data when in a shared computing environment?
- Unintentional cloud administration errors?
  - Providing unauthorized access/rights to others
  - Causing your data to go to other organizations, customers, or competitors
- Potential breach of the virtualization hypervisor (i.e. virus)?

Data Protection and Privacy

- The cloud provider’s auditing procedures?
- The cloud provider’s ability to help you meet your regulatory and compliance requirements?

What if these concerns were eliminated and your cloud was really secure?
Secure + Private Clouds = More Options

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<table>
<thead>
<tr>
<th>Security Requirements</th>
<th>Secure Cloud</th>
<th>Private Cloud</th>
<th>Traditional</th>
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<tbody>
<tr>
<td>LOW</td>
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<tr>
<td>Web</td>
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<tr>
<td>Software Development/</td>
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<tr>
<td>Test</td>
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Conventional business applications with:
- Patient Data
- Employee Information
- Financial Information
- Customer Information
- Government

Document Management
DR
Financials and Planning
Mission Critical/OLTP

Considerations to Weigh

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<td>Web</td>
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<tr>
<td>Risk Tolerance</td>
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<td>• Patient Data</td>
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<tr>
<td>• Employee Information</td>
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<td>Cyclical Workloads</td>
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<td>• Government</td>
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<tr>
<td>Payment Options</td>
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Routine Applications  Business Applications  Critical Applications

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Assessing the Transformation

1. Business Drivers
   - Modernize?
   - Existing Application?
   - New Application?

2. Key Client Considerations
   - Security & Compliance?
   - Cyclical Workloads?
   - Network Latency?
   - Relative Costs?
   - Will My Applications Run?
   - Business Continuity?

3. Client Deployment Options
   - Traditional IT
   - Private Cloud
   - Public Cloud

How is Unisys Tackling Enterprise Cloud???
We help you transform your data centers and make the right IT sourcing decisions. We do this by leveraging our transformational services and outsourcing capabilities to help you achieve maximum return, and make your operations more agile, secure and efficient while lowering your overall costs.

Unisys has tackled some of the toughest security challenges in the world for both public and private sector clients. We bring an holistic approach to security that spans digital and physical environments, securing your people, places, assets and data.

Unisys Application Services helps you minimize the risk of change by anticipating roadblocks while enabling better alignment to business needs – and creating an efficient interface between your business and IT.

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Unisys Secure Private Cloud Solution
Combining the best of Internal and External Cloud for maximum agility, elasticity and security, at minimum cost
Available Q1 2010

Hybrid Cloud
Combining the best of Internal and External Cloud for maximum agility, elasticity and security, at minimum cost
Available Q1 2010

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Unisys Secure Cloud Solution:
Managed End-to-End, Anytime, Anywhere

Secure Infrastructure as a Service (IaaS)
- c-RIM Service Desk & Server Management
- Provisioning virtual and physical servers, scale-up or scale-out

Secure Platform as a Service (PaaS)
- One click selection of platform, web, application, and database servers
- Automated middleware application management with c-RIM Enterprise Management Service
- Sun Java™ stack

Secure Software as a Service (SaaS)
Secure Document Delivery Service
- Secured documents for electronic delivery directly into clients’ e-mail inbox

Secure Unified Communication as a Service
- Cloud-based e-mail, SharePoint and Office Communication Services

Secure Virtual Office as a Service
- Hosted desktop via Secure Cloud with centralized control and management

My Secure Application as a Service
- Provisioning and de-provisioning of your multi-tiered application on our PaaS platform

Secure Disaster Recovery as a Service
- Database replication: configure the secure cloud environment as a Disaster Recovery Backup

Subscription-based Pricing

Unisys Secure Cloud Solution: What’s New – November 2009

Secure Infrastructure as a Service (IaaS)
- c-RIM Service Desk & Server Management
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Secure Platform as a Service (PaaS)
- One click selection of platform, web, application, and database servers
- Automated middleware application management with c-RIM Enterprise Management Service
- Sun Java™ stack
- Microsoft stack: IIS web server, .Net application server, SQL Server
- Custom stacks (IBM WebSphere, Oracle, etc.)

My Secure Application as a Service
- Provisioning and de-provisioning of your multi-tiered application on our PaaS platform

Secure Software as a Service (SaaS)
Secure Document Delivery Service
- Secured documents for electronic delivery directly into clients’ e-mail inbox

Secure Unified Communication as a Service
- Cloud-based e-mail, SharePoint and Office Communication Services

Secure Virtual Office as a Service
- Hosted desktop via Secure Cloud with centralized control and management
- Qualified client-supplied devices now supported

Secure Disaster Recovery as a Service
- Database replication: configure the secure cloud environment as a Disaster Recovery Backup
Addressing Your Global Compliance Requirements

Comprehensive Security Enables You to Confidently Make the Move

The Unisys Difference

Patent-pending Stealth technology that allows private communities of interest based on FIPS 140-2, 256-bit AES* encryption and cloaks the data with proprietary “bit splitting”.

Security Best Practices

Layered multi-vendor approach to security with Intrusion Detection and Prevention Services (IDPS), firewall management, 24x7 security monitoring, advanced correlation and analytics, auditable logs…

Operational Maturity

Secure Cloud services team operates ISO 20000-certified delivery processes that are ITIL V3-compliant.

Independently Certified Security Program

Secure Cloud services are provided from ISO 27001-certified delivery centers.

Independently Audited and Certified Services Centers

SAS-70 Type II-certified data centers.

* Advanced Encryption Standard
Securing Your Cloud:
Unisys Stealth Security

Unisys Stealth Solution for Network secures data-in-motion for LAN, WAN and wireless networks – available now
• Stealth technology:
  • “cloaks” data and devices from unauthorized access, e.g. sniffers
  • secures data within client-defined community of interest

Stealth solution for storage secures SAN data-at-rest – planned Q1 2010
• Stealth technology:
  • goes beyond encryption, dispersing storage across virtual disk, local or remote
  • secures data within client-defined community of interest

Benefits:
• Protects the confidentiality and integrity of data-in-motion and data-at-rest
• Eliminates the need to modify applications, or to web-enable them for the cloud
• Easily deployed, dramatically simplifies IT infrastructure, resulting in lower costs
• Establishes verifiable chain of custody for your data

Today’s Challenges with Securing a Cloud Service

Must web-enable applications

Bottom Line
• More expensive: For client and Cloud provider
• In-elastic: Unique solution for each application / client
• Impractical: Takes significant time and cost to set up and maintain
In Contrast:
Stealth Secures and Simplifies

No need to change the application

Bottom Line
- More secure and less expensive, multi-tenant
- Simpler, standardized, and much more elastic

Unisys Stealth Security Overview
Unisys Stealth Bit-Splitting Overview

Foundation for Building a Cost-effective Secure Cloud

- Provide self-service access to software and server provisioning and ITSM support
- Implement Stealth DIM* and DAR* security to provide effective isolation
- Implement robust ITIL-based service management through automation
- Fully automate provisioning (virtual, physical), configuration and compliance management of virtual software and "personas"
- Fully virtualize the server and storage resources to provide flexibility and scalability
- A server/storage farm populated with both scale-up and scale-out servers.

*Data in Motion (DIM); Data at Rest (DAR)
A Secure Stack for Multi-Tiered Applications: Dynamic Scalability, Rapid Repurposing, and Process Automation

Secure Cloudware Stack:

- **Security**: Unisys Stealth Solution for Network; Unisys Stealth solution for storage.
- **Service Management**: Unisys Converged Remote Infrastructure Management (C-RIM); Unisys uChargeback™ software; Unisys uGovern™ software*
- **Provisioning**: Unisys uOrchestrate™ software; predefined Runbooks; Unisys uProvision™ software
- **Virtualization**: VMware®, Windows®, Unisys uAdapt™ software
- **Virtualization**: Unisys Enterprise Servers using Intel® Xeon® 7400 series processors, EMC® storage, etc.

*Available Q1 2010

What is Private Cloud Computing?

Cloud computing is an approach that enables organizations to leverage scalable, elastic and secure resources as services with the expected results of simplified operations, significant savings in cost and nearly instant provisioning.

The key attributes “usually” associated with Cloud Computing

1. Multi-tenant – the ability to process the needs of multiple users with shared resources in a dynamic and transparent fashion
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6. X as a Service – the details/concerns of implementation are abstracted for the customer

A seventh attribute sets Secure cloud computing apart

7. Secure – an overall decrease in risk due to greater security protocols and tools from the cloud provider for data in motion, data at rest and data in process.

Private cloud computing delivers self-provisioned and automated IT capabilities as services to internal users on an immediate and as-needed basis.
Unisys Secure Cloud Solution Now Available for the Private Cloud

Self-service portal speeds provisioning

Secure Cloudware Stack

Security
  Optional Stealth security solution provides effective, multi-tenant isolation

Service Management
  Greatest number of management options – in-house or by Unisys – enabling visibility to your Cloud resources

Provisioning
  Fully automated provisioning frees up IT resources

Virtualization
  Fully virtualizes the server and storage resources to provide flexibility and scalability

A server/storage farm populated with both scale-up and scale-out servers: clients or Unisys.

Unisys Secure Private Cloud Solution Innovation for Your Internal Data Centers

Self-Service Portal

Secure Cloudware Stack

Security

Unisys Secure Private Cloud Appliance

Benefits

- Automated Provisioning
- Metering & Usage
- Service Management and Operations

Your Cloud Infrastructure
Your qualified assets or Unisys hardware (IaaS & PaaS) Virtualized & Non-Virtualized / Scale Up & Scale Out

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### Unisys “Walks the Walk”

<table>
<thead>
<tr>
<th>Request Type</th>
<th># per Year</th>
<th>Before Provisioning Time</th>
<th>After Provisioning Time</th>
<th>Before Resources</th>
<th>After Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server &amp; Desktop Virtualization</td>
<td>~700/’200</td>
<td>10+ Days</td>
<td>5 minutes</td>
<td>3 with projection of doubling every year</td>
<td>95% of requests require 0 people resources, other 5% is 2 Offshore</td>
</tr>
<tr>
<td>Standard Physical Configurations</td>
<td>~250</td>
<td>15+ Days</td>
<td>20 minutes</td>
<td>9 with projection of doubling next year</td>
<td>2 Offshore</td>
</tr>
<tr>
<td>Custom Physical Configurations</td>
<td>~200</td>
<td>20+ Days</td>
<td>2-3 days</td>
<td>Same resources as above</td>
<td>5 with flat future head count</td>
</tr>
</tbody>
</table>

### Taking Your First Step into the Cloud

#### Advisory and Assessment

**Strategic**
- Understand strategic implications that cloud might have for your business.
- Explore alternatives such as internal or private, external or public, or hybrid clouds and how a client might gain value from internally optimizing their processes and infrastructure based on the Unisys vision for a Real-Time Infrastructure (RTI).

**Cloud Feasibility & Workload Assessment**
- Examines the characteristics of business services that have sub-components with the potential to be moved to the cloud, and what positive impacts would be realized.
- Assesses the readiness of the client’s infrastructure to support the consumption of a cloud IT delivery model.
Balance Efficiency and Effectiveness
The Performance Zone

IT Waste And Overspending
Point Solution Delivery

Business Effectiveness

Cost

Value

Performance Zone
Silo Delivery
Missed Business Expectations

Standardized Infrastructure Footprints
The Current Environment

- Many Current Datacenters are built around the concept of standardizing 3 levels of infrastructure footprints
  - This leads to missed SLAs and Wasted Resources.
- Since all of the resources are co-located in the datacenter the connections are also standardized.
**Fit-for-Purpose℠ Design**

**Understanding Workloads**

- Workloads fit in to a number of architectural patterns. Each pattern has optimized hardware and software solutions that support it.
- Running solutions on optimized hardware allows for optimal costs, increased consumer experience, and minimal resource waste.

**Transforming the Delivery Model**

**Identifying Workloads**

- Identification of workloads needs to come from an understanding of the business.
  - Break the Business in to its Value Chain Functions and Sub-Functions.
  - Understand the workloads that each Sub-Function utilizes to be effective.
  - Model these workloads and the requirements placed on them.
Legacy Approach
IT Waste & Overspending

Demand Driven Approach
Fit-for-Purpose™ Tailored Infrastructure Services
Using Patterns for Cloud Computing
Understand the Workload

- There are three ways to optimize the cloud architecture.
  - **Internal Deployment** – An application with an internal deployment has all of its component workloads in the datacenter.
  - **External Deployment** – An application with an external deployment has all of its component workloads in an external cloud.
  - **Hybrid Deployment** – An application with some workloads in the datacenter and some in the external cloud.

Critical Steps to achieve “elastic datacenters in the cloud”

- **Educate & Energize the Enterprise**
  - Enterprise Cloud Awareness
  - Modernization Benchmark

- **Determine how the Cloud can be used**
  - Enterprise Cloud Feasibility Analysis
  - Business Workload Decomposition Service

- **Build a Strategy & Design**
  - Enterprise Cloud Business Case and Value Engineering Service
  - Total Cost of Ownership Modeling Exercise
  - Cloud Readiness & Strategic Roadmap Service

- **Enterprise Adoption Service**
  - Cloud Adoption Services
  - Cloud Transition Services
  - Enterprise Cloud PoC Services
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Additional Material
Unisys Announces Cloud Strategy and Offerings

Unisys Can Help You With Your Journey

From Data Center Transformation to Cloud Service Offerings

Business Impact
Ability of IT function to help create business process advantage

Process and Cultural Changes

Manage Service Levels

Secure “IT as a Service”

Low

High

Reduce Costs

Improve Delivery

Support with Standardized, Integrated Global Delivery

Standardize, Consolidate, Virtualize

Automate technology to improve delivery and meet service levels

Business “performance-enabled” applications

Location-independent secure operations

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Cloud Computing Options

Public Cloud
- Rented services
- Multi-tenancy
- Self-service

Private Cloud
- Automation
- Virtualization
- Traditional data center

Optimized Workloads

Hybrid Cloud

Typical Cloud Services Delivered

Accessing the cloud is about renting X as a Service (XaaS)

SaaS Software as a Service
Renting execution of software solutions over the Internet (e.g., salesforce.com)

PaaS Platform as a Service
Renting use of an application environment over the Internet (e.g., Google App Engine)

IaaS Infrastructure as a Service
Renting use of computing power or storage over the Internet (e.g., Amazon’s EC2 & S3)

Each successive service delivers a greater portion of the overall solution as part of the “rented” bundle.
Data Center Transformation and Outsourcing Experience and Innovation

Experience

• Decades of experience and expertise
• Large-scale, high availability, high transaction volume – our heritage

Innovation

• Unisys Real-time Infrastructure technology: powers the cloud
• Time to value, unique visibility
  • tools to assess, plan, model, and select the best transformation projects
  • long-term view and quick, high value, low risk projects with defined cost/risk

• Thousands of Outsourcing clients in 100+ countries
• Industry-recognized leader in IT Outsourcing

• Scalable, integrated, repeatable, global delivery model
• Robust portfolio and roadmap tracks to the client’s IT maturity
• Optimized support model with end-to-end view
  ➢ ITIL-based processes linking all support levels: self-help and levels 1, 2, 3

Unisys Stealth – transformational security

Element Virtualization

Element Virtualization plus Real-Time Infrastructure

Build & Manage

Automated Policy Enforcement

Orchestration/Workflow

Re-purposing

Resource Utilization

Client Virtualization

Server Virtualization

Network Virtualization

Application Virtualization

Storage Virtualization

Servers

Network

Storage

Apps

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Real-Time Infrastructure
plus Secure Cloud

X as a Service

Automated Policy Enforcement
Unisys uGovern

Orchestration/Workflow
Unisys uOrchestrate

Re-purposing
Unisys uAdapt

Build & Manage
Unisys uProvision

Resource Utilization
Unisys uChargeback

IT Framework (e.g., ITIL)

Client Virtualization

Element Virtualization

Server Virtualization

Application Virtualization

Network Virtualization

Storage Virtualization

Servers

Network

Storage

Apps

Unisys Cloud Transformation Services

Advisory and Assessment Services

• Create awareness
• Analyze feasibility
• Create business case and value model
• Create alignment with current technology, operations, and security
• Fast track the adoption
• Identify candidate transformation areas based on application workload

Planning and Design Services

• Create design for the transformed infrastructure including technologies, operations, and security
• Develop transformation plans for infrastructure deployment and application migration

Implementation Services

• Deploy and configure cloud technologies
• Integrate existing infrastructure with cloud
• Integrate operations with cloud (e.g., c-RIM)

Migration Services

• Migrate and consolidate applications on cloud infrastructure
• Transform existing infrastructure into cloud infrastructure