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-capitalise IT
• Automate Operations

CLOUD COMPUTING

Perceived barriers to a new approach

Public Cloud
• Security
• Compliance
• Application Rewrites

Private Cloud
• Existing investments
• Labor intensive, steep learning curve
• Skeptical about results
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. **Computing fabrics** *(No. 8 last year)*
3. **Web-oriented architecture** *(New but similar to “the Web platform” No. 7 last year)*
4. **Enterprise mashups** *(No. 6 last year)*
5. **Specialized systems** *(New to the list)*
6. **Social software and social networking** *(No. 10 last year)*
7. **Unified communications**
8. **Business intelligence** *(New)*
9. **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.


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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) 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

Cloud

Traditional

Security Requirements

HIGH

Low

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

Document Management

Financials and Planning

Mission Critical/OLTP

Web

Analytics and Reporting

Mail and Collaboration

Software Development/Test

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
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,

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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...

Data Protection and Privacy
- 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)?

Compliance
- 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

This is relative, not definitive positioning

<table>
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<tr>
<th>Security Requirements</th>
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<tr>
<td>HIGH</td>
</tr>
<tr>
<td>Secure Cloud</td>
</tr>
<tr>
<td>Private Cloud</td>
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<tr>
<td>Traditional</td>
</tr>
</tbody>
</table>

- Mail and Collaboration
- Analytics and Reporting
- Web
- Software Development/Test
- Conventional business applications with:
  - Patient Data
  - Employee Information
  - Financial Information
  - Customer Information
  - Government
- Document Management
- Financials and Planning
- DR
- Mission Critical/OLTP

Routine Applications <-> Business Applications <-> Critical Applications

Considerations to Weigh

This is relative, not definitive positioning

<table>
<thead>
<tr>
<th>Security Requirements</th>
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<tr>
<td>LOW</td>
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<tr>
<td>Secure Cloud</td>
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<tr>
<td>Private Cloud</td>
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<tr>
<td>Traditional</td>
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</tbody>
</table>

- Risk Tolerance
  - Patient Data
  - Employee Information
- Cyclical Workloads
- Payment Options

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?
- Cyclic Workloads?
- Network Latency?
- Relative Costs?
- Will My Applications Run?
- Business Continuity?

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

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## 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 Areas of Strength Play to a New Approach to IT

End User Outsourcing and Support Services
Anywhere, anytime secure support for your hardware and software needs with measurable cost reductions, improved satisfaction and faster incident resolution. With 31 ITO Operations Centers with multi-language capabilities and global ITIL-based Resolution Optimization Model, ISO-certified global logistics network and remote infrastructure management with last mile delivery capabilities in over 100 countries.

Security
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.

Application Modernization and Outsourcing
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.

Unisys Plan for Delivering Secure IT Services in the Cloud

1. Data Center Transformation
Delivering profound business results through Data Center transformation
Available now

2. Unisys Secure Cloud Solution
Extremely Secure Cloud Computing
Available now
- Secure IaaS
- Secure PaaS
- Secure SaaS
- My Secure AaaS
- Secure DRaaS

3. Unisys Secure Private Cloud Solution
All the advantages of Cloud Computing -- internally
Available December 2009

4. 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
- 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
  - Microsoft stack: IIS web server, .Net application server, SQL Server
  - Custom stacks (IBM WebSphere, Oracle, etc.)

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

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

Comprehensive Security Enables You to Confidently Make the Move

The Unisys Difference

Security Best Practices

Operational Maturity

Independently Certified Security Program

Independently Audited and Certified Services 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

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Today’s Challenges with Securing a Cloud Service

**Typical Cloud Facility**

**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
Foundation for Building a Cost-effective Secure Cloud

**Secure Cloudware Stack**

- **Security**: Implement Stealth DIM* and DAR* security to provide effective isolation.
- **Service Management**: Implement robust ITIL-based service management through automation.
- **Provisioning**: Fully automate provisioning (virtual, physical), configuration and compliance management of virtual software and "personas".
- **Virtualization**: 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.

*DIM = Data in Motion; DAR = Data at Rest*
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
- Unisys Enterprise Servers using Intel® Xeon® 7400 series
  processors, EMC® storage, etc.

Provide self-service access to software and server provisioning and ITSM support

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
2. Elastic and Scalable – resources can expand and contract as needed
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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

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

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*

![Diagram](image)

**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

Service Levels and Work

- 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.

Missed Expectations & Resource Waste

Service Executed / Waste Minimized

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”
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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

Reduce Costs
Manage Service Levels
Process and Cultural Changes

High

Low

Time

Location-independent secure operations

Supported with Standardized, Integrated Global Delivery
Cloud Computing Options

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

**Private Cloud**
- Automation
- Virtualization
- Traditional data center

**Hybrid Cloud**

Optimized Workloads

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

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
- 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
- Storage Virtualization
- Application Virtualization

Servers

Network

Storage

Apps
Real-Time Infrastructure plus Secure Cloud

X as a Service

Build & Manage
Unisys uProvision

Automated Policy Enforcement
Unisys uGovern

Orchestration/Workflow
Unisys uOrchestrate

Re-purposing
Unisys uAdapt

Resource Utilization
Unisys uChargeback

IT Framework (e.g., ITIL)

Client Virtualization

Element Virtualization

Server Virtualization

Application Virtualization

Network Virtualization

Storage Virtualization

Web Platform

Application Platform

Database Platform

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