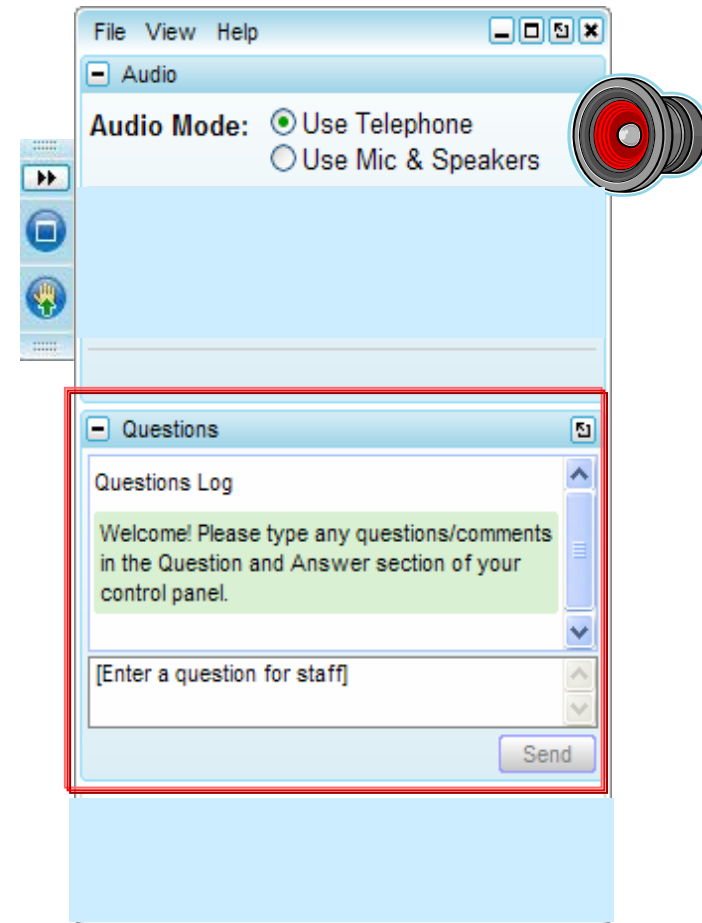# Case Studies in Cloud Computing

David Cearley and Gene Phifer

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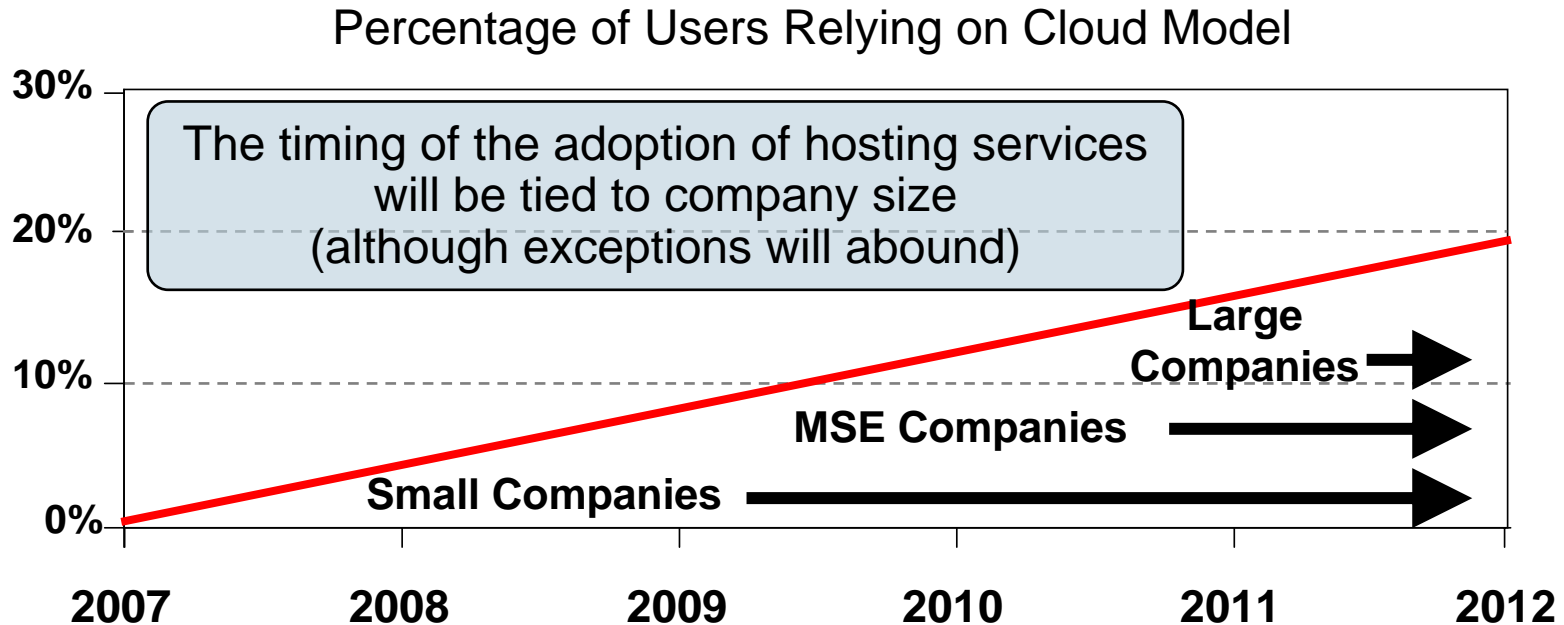- Please note you may be polled during the webinar; only aggregate answers will appear.

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- 60+ Conferences
- 65% of Fortune 1000; 85% of Global 500
- 5,500 Benchmarks

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Case Studies in Cloud Computing

David Cearley and Gene Phifer

Cloud Adoption: Rapid Growth Predicted

Percentage of Users Relying on Cloud Model

The timing of the adoption of hosting services will be tied to company size (although exceptions will abound)

Large Companies

MSE Companies

Small Companies

30% 20% 10% 0%
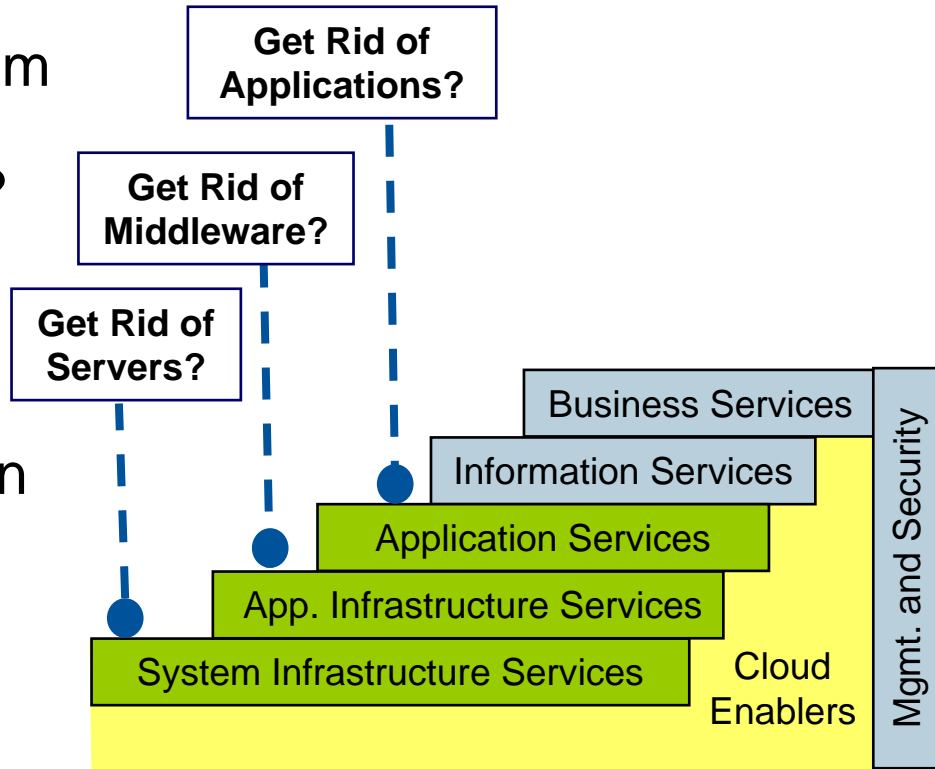
2007   2008   2009   2010   2011   2012

- ## Why Now?

  - Exploitation of cloud economics, especially in response to global recession

  - Acceptance of SaaS models

  - Offerings and vendors at every turn

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Key Issues

1. How have companies successfully used cloud system infrastructure services, and what lessons can be learned?

2. How have companies successfully used cloud application infrastructure services and what lessons can be learned?

3. How have companies successfully used cloud application services and what lessons can be learned?

Get Rid of Applications?

Get Rid of Middleware?

Get Rid of Servers?

Business Services

Information Services

Application Services

App. Infrastructure Services

System Infrastructure Services

Cloud Enablers

Mgmt. and Security

Cloud computing is a style of computing in which scalable and elastic IT-related capabilities are provided "as a service" to customers using Internet technologies.

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Eli Lilly

Less-expensive, rapid, seamless access in/outside

- Drivers to cloud
  - Traditional infrastructure deployment was inhibiting business
  - Desire to move from fixed to variable cost model

- Solution
  - Multiple cloud providers
  - Google for consumerization

- Benefits
  - Reduced provisioning cycle time
    - New server: 7.5 weeks to 3 minutes
    - New collaboration environment: 8 weeks to 5 minutes
    - 64-node Linux cluster: 12 weeks to 5 minutes

- **Key Lesson:** Time to delivery is paramount

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Large Energy Company — Experimenting

Wiki & Blog Site

- Driver/Challenge

  - Team needed to provision a blog and wiki to support a business unit.
  - Project team was told to wait for 3 months for server availability on internal systems

- Process/Solution

  - Provisioned a Fedora image on Amazon in one afternoon.
  - Two months later system went into production following a detailed security review and penetration testing

- Result/Benefit

  - Agility — respond rapidly to new business needs

Product Evaluation

- Driver/Challenge

  - Wanted to evaluate open-source content mgmt. system, but internal capacity was not available

- Process/Solution

  - Summer intern provisioned and installed Alfresco on Fedora in 1 day
  - Evaluation done, and system shut down after 2 months
  - AMI available for future use if needed

- Result/Benefit

  - Agility, low cost, no capital outlay

- **Key Lesson:** The cloud excels for temporary environments. **Gartner**

Large Energy Company — Ideal Workloads

Internet Facing Application

- Driver/Challenge
    - Analysis of experiments across multiple labs
    - Internal systems push data to this system
    - Available to company and third parties involved in research
- Process/Solution
    - Created parallel development and production environments
    - Started with a hardened Red Hat Linux build certified by security team.
    - Common sign-on and backup to S3
- Result/Benefit
    - Agility, low cost

Development and Testing

- Driver/Challenge
    - Numerous large SAP projects — Dev/Test constrained by internal resources
    - Projects typically 6-18 months with need for additional short-lived environments at short notice
- Process/Solution
    - Built Dev/Test environment on Amazon with large Amazon instances and permanent IP addresses
    - All traffic is encrypted and local authentication used
- Result/Benefit
    - Agility, Cost, easier process

- **Key Lesson:** The cloud is an excellent environment for AD. **Gartner**

Razorfish — An Easy Move

- Background/Driver
  - Needed to improve their ability to respond quickly to customer demands to support highly visible web campaigns
  - Support high volume short run campaigns more cost effectively
- Process/Solution
  - Using Rackspace as a cloud infrastructure platform.
  - Build Blogs, Microsites, campaign-related pages for large companies, such as Southwest Airlines, H&R Block
- Result/Benefit
  - From 4-6 weeks and tens of thousands of dollars to set up to 24 to 48 hours and 3K-5K … on average 25% of cost
- **Key Lesson:** Look at your process models first. If you are moving web-centric applications with solid security and management practices, you can move them with little deviation to cloud infrastructure

Wipro — Private First, Public Later?

Reduced provisioning time for projects and COEs

- **Driver to cloud** — Traditional provisioning for new projects and COEs was excessive

- **Solution** — Private cloud
  - Self-service portal for automation of server provisioning

- **Benefits**
  - Internal server provisioning: 46 days to 35 minutes
  - Utilization: <10% to 40%
  - Reprovisioning of assets: nil to reduced capex 30%
  - Average server cost from $2,000 to $800
  - Improved license management, network bandwidth utilization and energy costs

- **Key Lesson:** Time to delivery can be improved while utilizing assets more effectively.

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Japan Post — Business-Critical Cloud

**Background:** Massive recently privatized organization (20,000+ branches)

Process/Solution
- Applications developed internally with guidance from external consultancy
- Seven custom applications in production, with five more under development
- One large project encompassed 57,000 users, with up to 25,000 concurrent requests.
- Optimizing internal development process to match PaaS

Results:
- Live nationwide since October 2007
- Average development time of 3-4 months (3 to 4 times faster than traditional development)
- High user satisfaction (functional, performance)
- No performance or security issues so far

Key Lesson: Rapid deployment;. early stage prototypes generate user buy-in

Source: Japan Post

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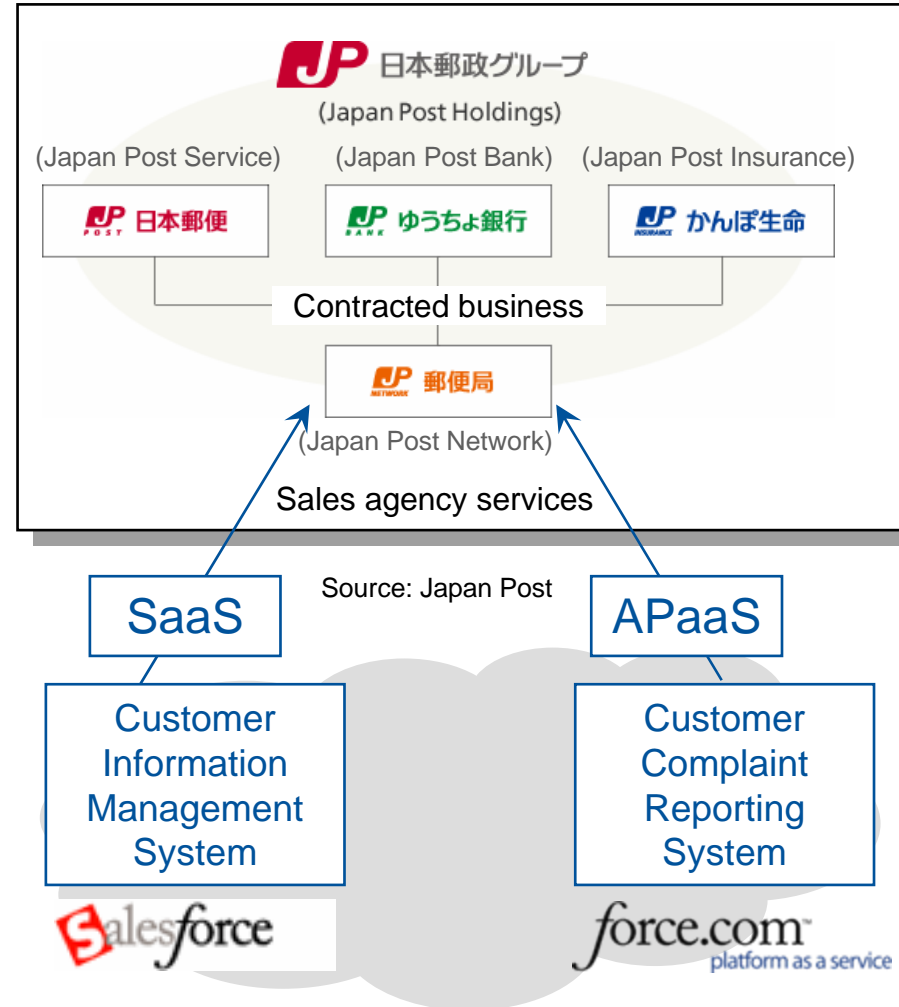
Japan Ministry of Economy, Trade and Industry — Consumer Site

経済産業省
Ministry of Economy, Trade and Industry
METI

- Driver/Challenge
  - Need to build an application to support a new government program targeting Japanese consumers in a short time.
  - Must be available to public via the Web and support potentially large and highly volatile transaction volumes

- Process/Solution
  - Built a consumer exchange Web application on Force.com and salesforce.com sites
  - Consumers can exchange old appliances for credits toward new appliances and merchandise
  - Simple interface for public use

- Result/Benefits
  - Built in only 3 weeks
  - 40 million consumers expected to access site at peak times
  - Expected to support more than 20 million transactions … 510,000 transactions first month
  - Has helped boost sales of flat panel TVs and refrigerators

- **Key Lesson:** Cloud computing works well for high-scalability requirements.

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Presidio Health — Move it All to the Cloud

presidiohealth
peak performance for healthcare

- Driver to cloud — Rapid business growth restricted by infrastructure

- Solution

  - Appistry for software; GoGrid for platform

  - Homegrown apps. for physician performance management and point-of-service collections

  - No rearchitecting of on-premises apps. facilitated by front-ending apps. with message broker

  - Transient data in cloud; sensitive permanent data in traditional database

- Benefits

  - PCI & HIPAA compliance

  - No unscheduled downtime

  - Flat costs for 50% more capacity

- **Key Lesson:** The cloud is ready for apps but perhaps not for sensitive data.

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Packaged Shipping Company — Just the Private Cloud, Please

- **Driver/Challenge**
  - Support complex algorithms with lots of computing power to process large, complex data streams from multiple sources
  - Break large integrated batch processes into more discrete-linked processes that can execute in parallel to improve response time
- **Solution**
  - Implemented Appistry grid computing environment on internal systems to create a private cloud grid infrastructure service initially for a single application
  - Opportunistically migrate new or existing batch and transactional applications
- **Benefits**
  - Able to develop new analytical application that was not economically feasible using earlier infrastructure models
    - Considering other areas where HPC and "scatter/gather" offers value
  - 4 hour batch now runs in 20 minutes. Developing applications in 60% less time
- **Lessons Learned**
  - Easy to break down existing batch jobs
  - Need to change the mindset of developers & their approach to development
    - From monolithic application all to use of core shared services in the cloud
    - From batch/linear to parallel execution and scatter/gather

Author Solutions — Running the Business in the Cloud

- Requirements/Challenge
  - Automate self-publishing workflow for authors and publishers
  - Integrate disparate back- and front-office systems into a complete solution
- Process/Solution
  - Created an end-to-end self publishing application using salesforce sites, force.com and Amazon services
  - Integrates with existing on-premises systems including crystal reports, Microsoft Dynamics, Great Plains
- Result/Benefit
  - Developed application in significantly less time and for lower cost than that estimated for a traditional custom in-house application
  - Lower ongoing operational costs
  - 50%-75% reduction in time and cost to modify workflow and add products
- **Key Lesson:** Hybrid cloud/on-premises solutions are complex, but they work.

AUTHOR SOLUTIONS

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David Allen Company — Business Critical Cloud Services

- Background/Driver
  - Needed to build a more unified CRM system to process complex projects
  - Replace numerous disparate legacy systems including a notes-based CRM element
  - Needed to be able to adapt system quickly and easily
  - Did not start with a desire to move external

- Process/Solution
  - Provided operational specifications to a variety of APaaS vendors to develop proof of concepts. Selected a Longjump based system
  - Running the business on a cloud-based CRM application with customizations for all groups that touch customers.

- Result/Benefit
  - Significant development savings compared to traditional development.
  - Lower operational cost compared to internal systems
  - Developed and deployed system in a few weeks. Ongoing updates can be implemented rapidly. More flexibility to match the system to changing needs

- **Key Lesson:** Its not always feasible to pick up existing infrastructure and applications and simply drop them into the cloud. **Gartner.**

SaaS Vendors Use the Cloud

- Driver/Challenge
  - Business identified need to deliver a number of HRIS applications in a SaaS model, but a traditional approach would take 24 months to deliver

- Process/Solution
  - Private implementation of Longjump APaaS
  - Built cloud application services for HR to be delivered through their partner channel.

- Result/Benefit
  - Developed in 4½ months vs. 24 months
  - Able to provide a highly customizable service to their customers
  - Focus development on application design instead of infrastructure, database and security model design

- **Key Lesson:** The cloud can be used to deliver highly customizable services.

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Fulcrum Saves Money Using Packaged Integration for salesforce.com

QuickBooks ↔ PERVASIVE ↔ salesforce.com

Account Opportunities Products
Customers Sales Orders
Invoices Inventory Items

fulcrum biometrics

Challenge

- Fulcrum needed to synchronize data between QuickBooks, saleforce.com

- Did not want to do any custom integration development work

- Was price-sensitive and preferred a SaaS solution versus owning software

Solution

- Pervasive DataSynch for salesforce.com (a multienterprise packaged integrating process)

- Leverages salesforce.com's APEX Web-services-based APIs

- Includes prebuilt adapters, maps, and so on, and is paid for on a subscription basis

Results: + Two-way synchronization of business data (e.g., customer)

+ No data re-keying (and salesforce.com became master record)

+ No integration development work required

Key Lesson: PIPs can reduce deployment time and cost, and help companies reduce custom integration efforts.

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JohnsonDiversey —
Public + Private = JD Cloud

- Background/Driver
  - Legacy on-premise systems were clumsy. Sharing documentation and collaboration was painful.
  - Storage limitations created inefficiencies

- Process/Solution
  - Adopted Google apps – gmail replaced in-house e-mail and docs augments Microsoft Office environment
  - Using Google sites for internal for simple team and project collaboration
  - Google app. engine used to build an internal talent review application
  - Oracle CRM On Demand used for remote sales force.

- Result/Benefit
  - Rapid rollout and adoption of applications across
    - 3 ½ month for complete total project — Google docs rollout over a weekend.
  - Bandwidth consumption for messaging and collaboration reduced by 20%
  - Total investment pays back in 14 months. Reduced operating cost of email/collaboration environment by 70%
  - User satisfaction and use up more than 25%

- **Key Lesson:** At least two credible vendors must be available, must reduce operating costs, must be extensible and there must be an exit strategy.

Avago Migrates to Google Apps.

Background

- 3,800 users
- Bleeding-edge IT profile
- Company facing 2007 migration

Results

- Migration took two weeks after six months of planning/piloting
- Migration help from Appirio
- No synchronization with AD; GAPE directory manually maintained
- Since December 2008, Avago has called the Google help desk four times
- Users employing adjacent collaboration services differently
- Google meeting 99.9% uptime SLA

Key Concerns

- Who at Google would be able to view the mailboxes?
- When a court issues a discovery request, how would Google respond?
- How is non-Avago device access protected? What about orphan files?

Lessons Learned

- GAPE has proven to be a stable and functionally rich platform
- 1 person managing 4,100 mailboxes
- E-mail costs were cut with a move to GAPE and storage woes alleviated
- Network capacity had to be altered to support a cloud e-mail deployment

Lessons Learned and Best Practices

- **Today's Cloud Computing Environment is Best For**
  - Applications that do not have much interaction with back-end systems
  - Web servers
  - Apps. where demand varies dramatically over a cycle (periodic peaks)
  - Short-term use (AD, QA, campaigns)
  - Rapid ramp up required (minutes/hours vs. days/weeks)
- **Principles for early-adopter environments**
  - Use a risk-based approach for security
  - Reuse existing processes/policies/learnings
  - Automate where practical
  - Consider differentiated support options
  - Keep it simple for the user/customer
  - Consider managing risk by with hybrid architectures that spread load across multiple providers with a layer of abstraction.
- **Issues Remain**
  - Security
  - Data location, privacy, potential loss, portability abilities
  - Management/governance
  - Vendors

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Your Action Plan

- **Today (Monday Morning)**

  - Understand the benefits of cloud computing and look for short-term opportunities.

  - Assess your current risk profile and compare that against the risks of the offerings and vendors, identifying where benefits outweigh risks.

- **Near Future (Next 12 Months)**

  - Track maturization of cloud computing and its vendors and reassess opportunities/risks at least quarterly.

  - Build cloud computing into your IT strategies planning: buy vs. build vs. outsource vs. cloud.

  - Align with the business to assure that any cloud computing efforts are coordinated with IT.

- **Longer Term (1-3 Years)**

  - Look to move selective mission critical workloads into the cloud.

  - Plan for selective implementations of private clouds.

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Related Gartner Research

➜ ***The What, Why and When of Cloud Computing***
David Mitchell Smith, Daryl C. Plummer, David W. Cearley (G00168582)

➜ ***Top Five Cloud-Computing Adoption Inhibitors***
Bruce Robertson (G00167920)

➜ ***What You Need to Know About Cloud Computing Security and Compliance***
Jay Heiser (G00168345)

➜ ***Cloud Engineering: Somebody Has to Do It***
David Mitchell Smith, Valentin T. Sribar (G00169095)

➜ ***Hype Cycle for Cloud Computing, 2009***
David Mitchell Smith et al (G00168780)

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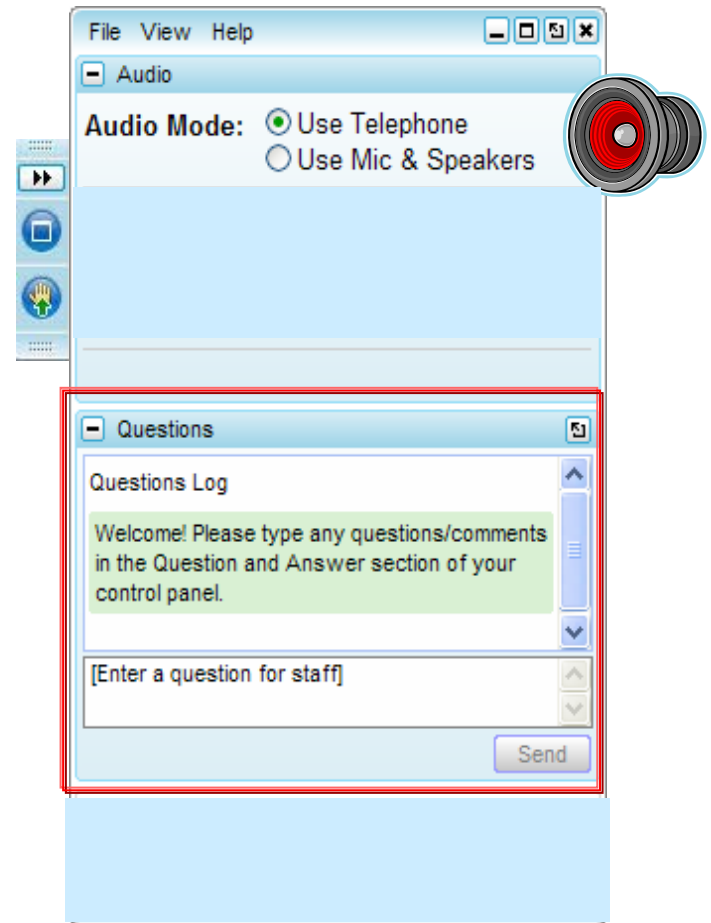
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