



The Silver Lining in Cloud Computing

Connecting Technology and the Corrections Industry

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2011 CTA Conference, Daytona FL

Defining the Ever Expanding Cloud

The Cloud is an IT architecture built around a set of principles supported by

- Hardware & Software
- Policies & Standards
- Procedures & Guidelines





The National Institute of Standards and Technology (NIST)

Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.





Transforming IT

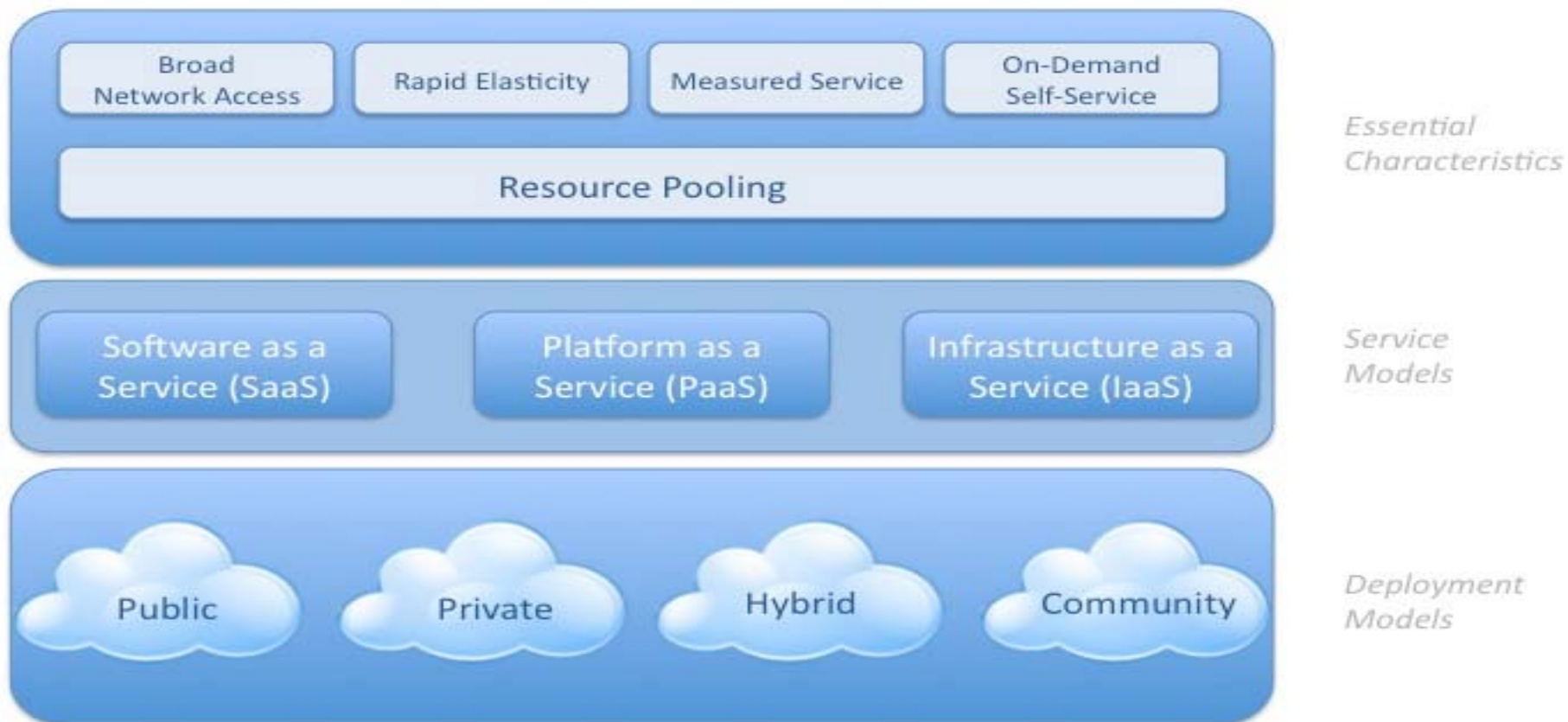
Cloud computing requires a rethinking of the entire IT chain, A **paradigm shift** that's fundamentally different from how we've approached IT over the past 30 years.





Visual Model Of NIST Working Definition Of Cloud Computing

<http://www.csrc.nist.gov/groups/SNS/cloud-computing/index.html>





3 Standard Service Models

Cloud Computing = **Software as a Service**
+ Platform as a Service
+ Infrastructure as a Service

Software as a Service (SaaS)

- Applications delivered to end-users through a Web browser
- Applications are located in the cloud
- Software experiences are delivered through the Internet



3 Standard Service Models

Cloud Computing = Software as a Service
+ **Platform as a Service**
+ Infrastructure as a Service

Platform as a Service (PaaS)

- Application development and deployment platform
- Includes databases, middleware, development software
- Used to build, deploy and manage SaaS applications



3 Standard Service Models

Cloud Computing = Software as a Service
+ Platform as a Service
+ Infrastructure as a Service

Infrastructure as a Service(IaaS)

- Datacenter as a service
- Computer servers, storage and networking hardware delivered as a service
- Cloud providers manage scalability and services for cloud users (Pay-as-you-go or Grow)



2 Basic Cloud Deployment Models

1. Private Cloud – Exclusively used by a single organization. Managed and controlled in a private data center.
2. Public Cloud – Used by multiple organizations that share the hosted services that's managed by a third party service provider.

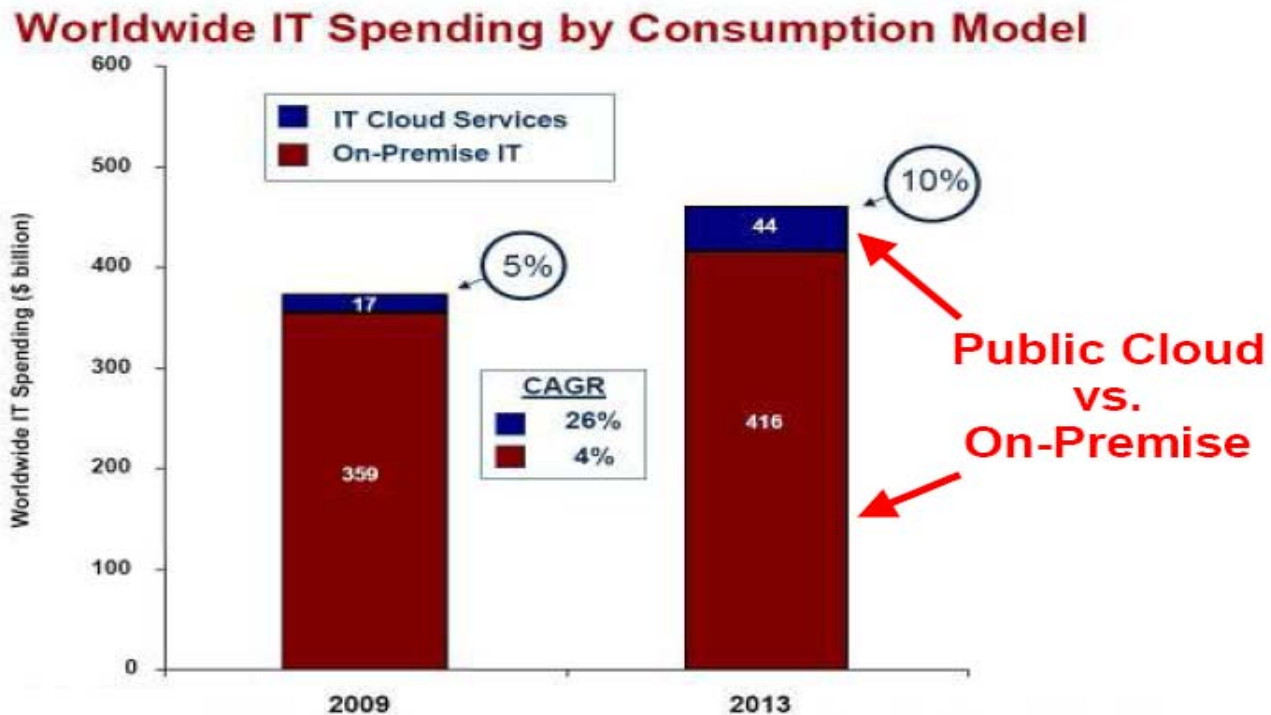


Other Common Cloud Deployment Models

- Community Cloud – Specializing and containing services only for specific industry such as hospitals, corrections or financial providers (banks, credit unions, etc).
- Hybrid Cloud – Utilizing the benefits of both public and private clouds for a single application. Built as a private model but has ability to scale to a public Cloud as resources are needed.



Why is 10% of IT industry moving toward a Public Cloud?





Three top reasons the industry is moving toward Cloud Computing

1





Three top reasons the industry is moving toward Cloud Computing

2





Three top reasons the industry is moving toward Cloud Computing

3





Karl Fisch
Did You Know? - Shift Happens



2008 vs. 2010

- 200 Million registered users on Myspace
Vs
400 Million registered users on Face Book
- 1 Billion internet devices
Vs
5 Billion internet devices



2008 vs. 2011

- A single strand of fiber optics pushed 14 terabytes per second.
Vs
- 100 terabytes achieved in Japan – download a 700MB movie in 1 second. That's a 70% increase in 3 years.



Cloud Computing is an Evolution in IT

Grid Computing

- Solving large problems with parallel computing
- Made mainstream by Globus Alliance



Utility Computing

- Offering computing resources as a metered service
- Introduced in late 1990s



Software as a Service

Network-based subscriptions to applications

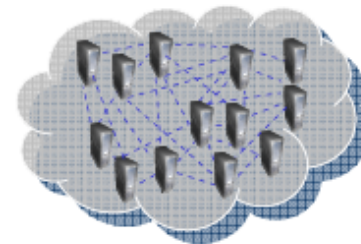
Gained momentum in 2001



Cloud Computing

Next-Generation Internet computing

Next-Generation Data Centers





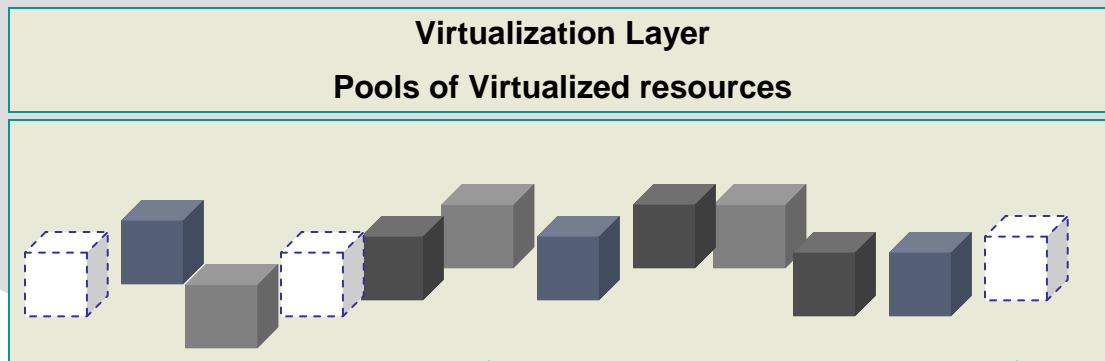
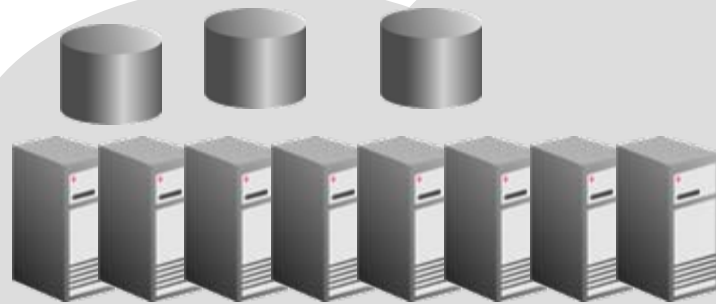
Forces Driving the Cloud Shift

- Economics
 - Soaring IT and Energy costs
 - Servers
 - Software
 - Infrastructure
- Social
 - Staying connected
 - Mobile communication
- Technological
 - Data Intensive applications
 - Deployment of new and upgraded applications
 - Datacenter support and shared services
- Environmental
 - Power Savings
 - Local outages
 - Green solution

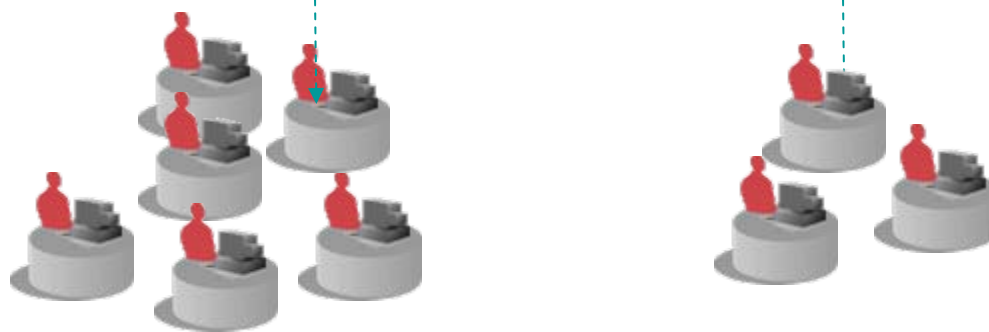
It should come as no surprise that the leading industry analyst firm Gartner, predicts spending on cloud computing **applications** to increase at an annual rate of 20 percent, growing to a market of \$150 billion by 2013.

Organizations from [The Brookings Institution](#) to [MITRE](#) to the [GSA](#) are exploring and promoting the topic, and Vivek Kundra, the first federal Chief Information Officer, recently implemented a ["cloud first" policy](#) for the federal government. Understanding and embracing cloud computing has become an imperative.

Cloud Computing Architecture



- Database
- Applications
- Email





Virtual Machines (VM's) Driving Force

Virtualization is “separating the computing workload from the hardware.”* Once computers have become more or less **disembodied**, all sorts of possibilities open up. Virtual machines ... can be moved around while running, perhaps to concentrate them on one server to save energy. They can have an identical twin which takes over should the original fail. And they can be sold prepackaged as “virtual appliances” ... eventually to turn a data centre—or even several of them—into a **single pool of computing**, storage and networking resources that can be allocated as needed.

Source - The Economist: Special Report – *Where the Cloud Meets the Ground*; Oct 23, 2008

*Quoting Paul Maritz of VMware



Virtual Machines (VM's) Driving Force

Virtualization is a seismic change in how servers are provisioned. There are no longer a one-to-one mapping of server to hardware component. Plus, virtualization ripples through all the elements of a datacenter, from power allocation to network cables.

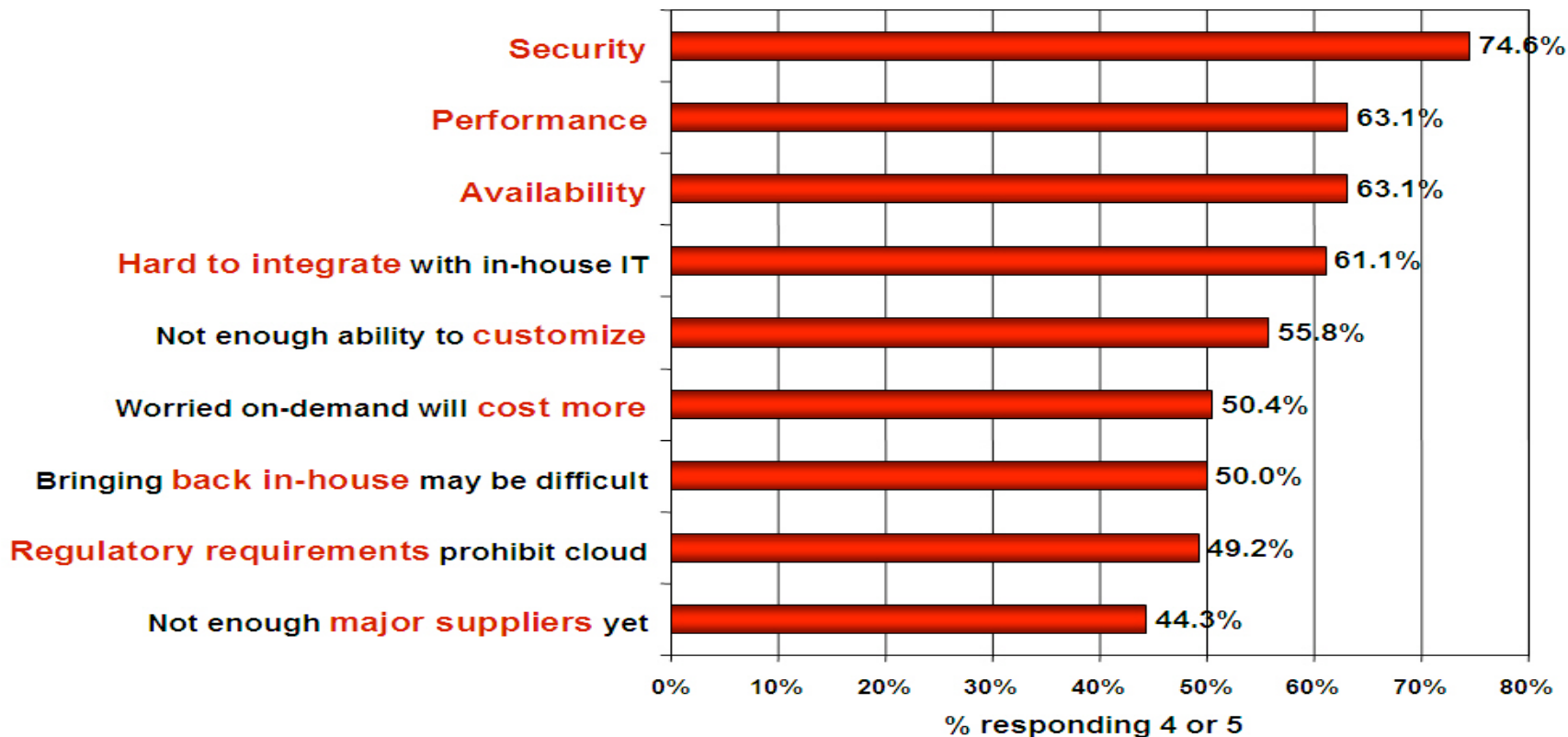


What are the Top Concerns for IT Departments?



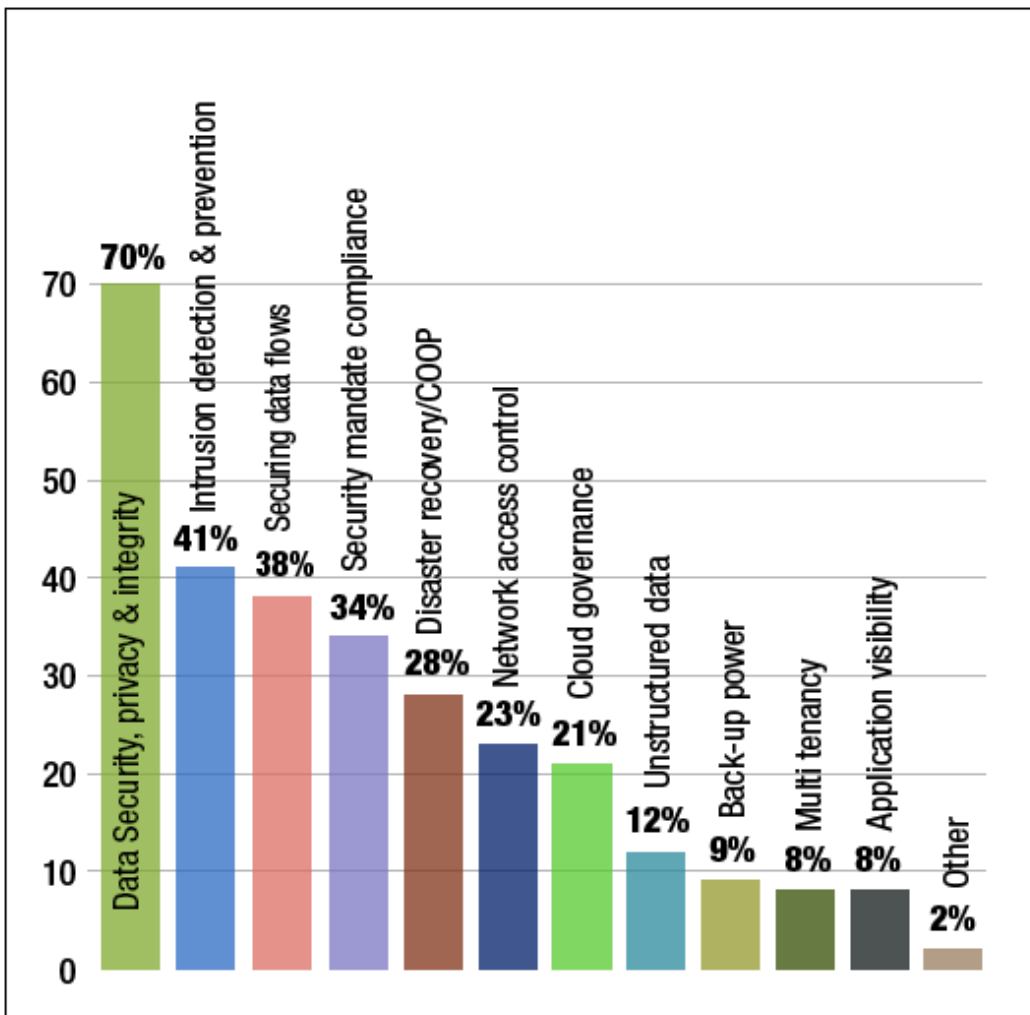
Number 1 Concern for IT Directors

Q: Rate the **challenges/issues** ascribed to the 'cloud'/on-demand model
(1=not significant, 5=very significant)



Source: IDC Enterprise Panel, August 2008 n=244

NIST: National Institute for Standards and Technology



Cloud Computing Security Concerns

Source: Lockheed Martin Cyber Security Alliance *“Awareness, Trust and Security to Shape Government Cloud Adoption”* Paper



Security & Compliance

- Confidentiality - Your data is not accessible by unauthorized systems or hackers
- Integrity - Your data or system is not corrupted
- Availability - Your system keeps running
- Compliance - Your data adheres to i.e. FISMA, HIPAA, and PCI guidelines and regulations.



Recent High Profile Cloud Security Breaches

Amazon - Security researchers spotted Zeus botnet running an unauthorized command and control center on Amazon's EC2 cloud computing infrastructure. This is a password stealing malware.

Sony PlayStation – April 19th hackers had obtained personal data, and possibly credit card information, of tens of millions of people who have registered for PlayStation Network.



High Profile Non-Cloud Security Breaches

2003 Thru 2005 - Data Processors International, Cardsystems, and Clearinghouse 100 + million CC #'s and personal information obtained.

2002 Thru 2009 – FAA Hack identified themselves "The Deceptive Duo," the hackers publicly defaced FAA server screens. In 2009 hackers breached the network and gained access to 45,000 personnel files.



So, when it comes to security what can you do?

You need to “Trust, but verify” when selecting the right IT applications and vendors for your facility.



So what is another concern when it comes to cloud computing and your IT department?



Outsourcing





Risks and Rewards





Keep You Head in the Cloud

