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FalconStor[®]

The Data Mobility Platform

The Cloud and Big Data

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CLOUD COMPUTING

Revolutionizing Entertainment & Media
The Impact of Mobile Cloud Computing & Big Data

WEST 2013

OCTOBER 27-29, 2013
The Cosmopolitan
Las Vegas, NV

US Cloud Commission

Commission on the Leadership Opportunity in U.S. Deployment of the Cloud (CLOUD²)



Full Report Text Available online at: www.techamericafoundation.org/cloud2

Commission Goals

The commission's mandate is to provide the Obama Administration with recommendations for how government should deploy cloud technologies and for public policies that will help drive U.S. innovation in the cloud.

- **Determine roadblocks**
- **Recommend solutions**
- **Initiate standards**
- **Validate strategy**
- **Enable adoption**



Cloud Commission Leaders

The Commission is comprised of 71 experts from industry and academia.

Commission reports to U.S. CIO (Vivek Kundra and now Steven VanRoekel)

[Marc Benioff](#), *Co-Chairman*
Chairman and CEO
salesforce.com

[Michael Capellas](#), *Co-Chairman*
Chairman
VCE, The Virtual Computing Environment

[Dan Reed](#), *Vice-Chairman*
Corporate Vice President
Technology Policy and Strategy
Microsoft

[Jim Sheaffer](#), *Vice-Chairman*
President
North American Public Sector
CSC

[Michael Nelson](#), *Academic Representative*
Visiting Professor of
Internet Studies
Georgetown University

[John C. Mallery](#), *Academic Representative*
Research Scientist, Computer Science and
Artificial Intelligence Laboratory (CSAIL)
Massachusetts Institute of Technology (MIT)

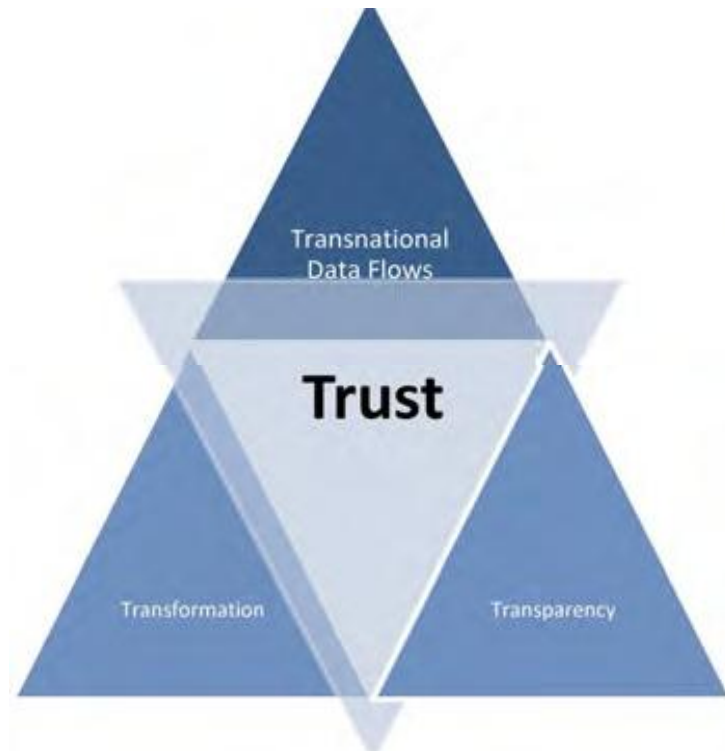
Commission Report and Area of focus

The report provides recommendations for how the US government, including the White House and key federal agencies, in cooperation with industry, academia, and other nations can:

- (1) Adopt policies that will foster development and growth of the cloud.
- (2) Deploy the cloud effectively, making government work better, cheaper, and smarter.

Areas of Focus:

- Trust
- Transnational Data Flows
- Transparency
- Transformation



14 Recommendations for Cloud Adoption

Trust

- **Recommendation 1 (Security & Assurance Frameworks): Develop infrastructure standards**
- **Recommendation 2 (Identity Management): Develop strong authentication standards**
- Recommendation 3 (Responses to Data Breaches) Enact data breach and cyber security laws
- Recommendation 4 (Research) Leverage NSF and DARPA and academia which invented internet

Transnational Data Flows

- Recommendation 5 (Privacy) Develop commonly accepted privacy frameworks and standards
- Recommendation 6 (Government/Law Enforcement Access to Data) Fix international access laws
- **Recommendation 7 (E-Discovery and Forensics) Data access for compliance and litigation**
- Recommendation 8 (Lead by Example) Show trust by using other countries clouds

Transparency

- Recommendation 9 (Transparency) Publicize information about operational aspects of the service
- Recommendation 10 (Data Portability) Develop standards and best practices

Transformation

- Recommendation 11 (Federal Acquisition and Budgeting) Adapt current procurement models
- Recommendation 12 (Incentives) Reward and support cloud adoption by agencies
- **Recommendation 13 (Improve Infrastructure) Move to IPv6 and improve nations bandwidth**
- Recommendation 14 (Education/Training) Incentives to adopt new cloud skills for IT workforce

Full Report: <http://www.techamericafoundation.org/cloud-commission>

Back to the Basics: Understanding Cloud Concepts

NIST: Working Definition of Cloud Computing



“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”

This cloud model promotes availability and is composed of three **service models**, four **deployment models** with five **essential characteristics**.

NIST= National Institute of Standards and technology

NIST: The 3 Cloud Service Models

- **Cloud Software as a Service (SaaS)**
 - Use provider's applications over a network
- **Cloud Platform as a Service (PaaS)**
 - Deploy customer-created applications to a cloud
- **Cloud Infrastructure as a Service (IaaS)**
 - Rent processing, storage, network capacity, and other fundamental computing resources

Gartner is forecasting that service-led solutions – software as a service (SaaS), infrastructure as a service (IaaS), platform as a service (PaaS) and so forth – will displace more traditional sourcing methods by 2015.

NIST: 4 Cloud Deployment Models

- **Private cloud**
 - Enterprise owned or leased
- **Community cloud**
 - Shared infrastructure for specific community
- **Public cloud**
 - Sold to the public, mega-scale infrastructure
- **Hybrid cloud**
 - Composition of two or more clouds

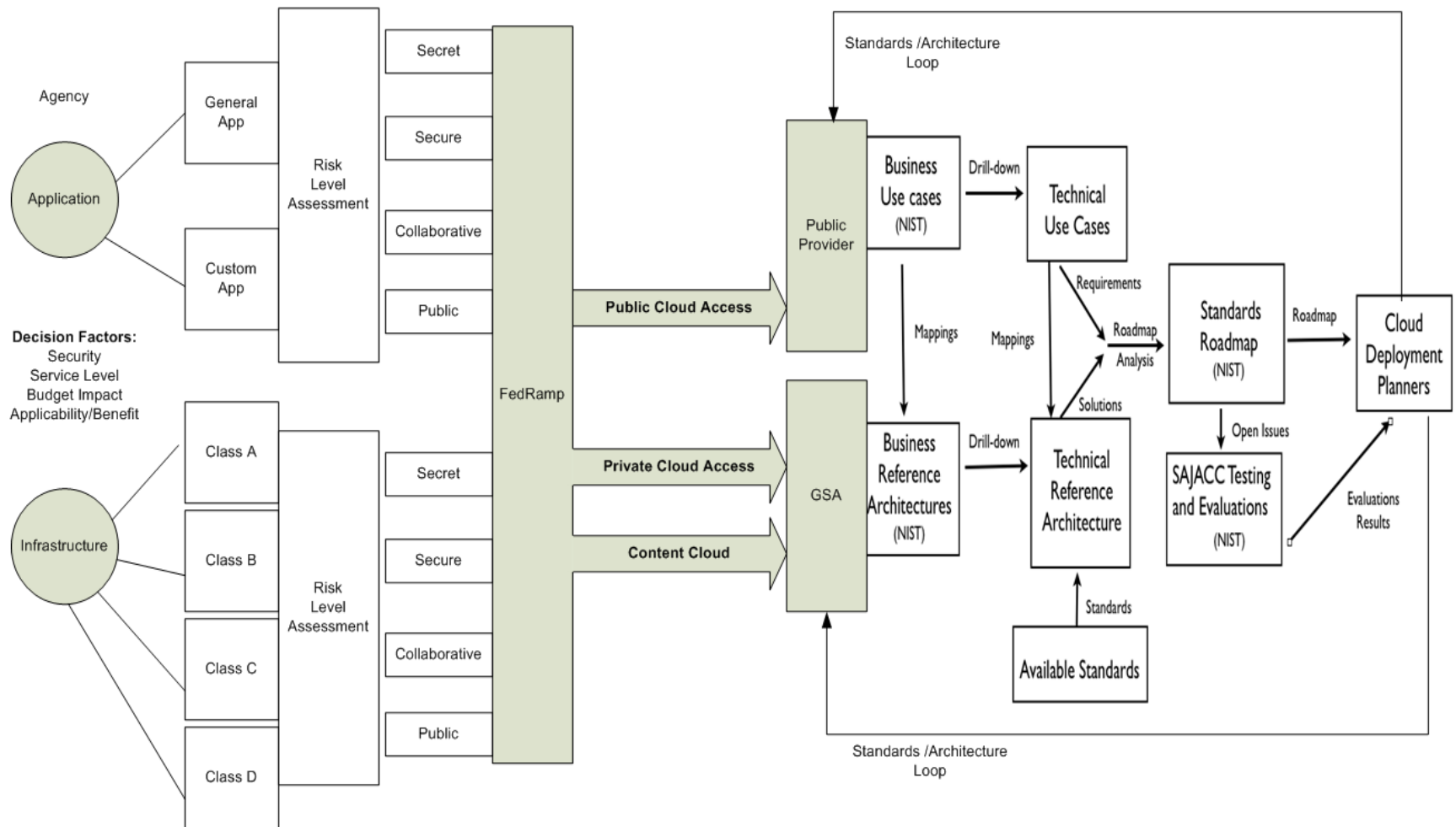
To be considered “cloud” it must be deployed on infrastructure that has five key characteristics

NIST: 5 Essential Cloud Characteristics

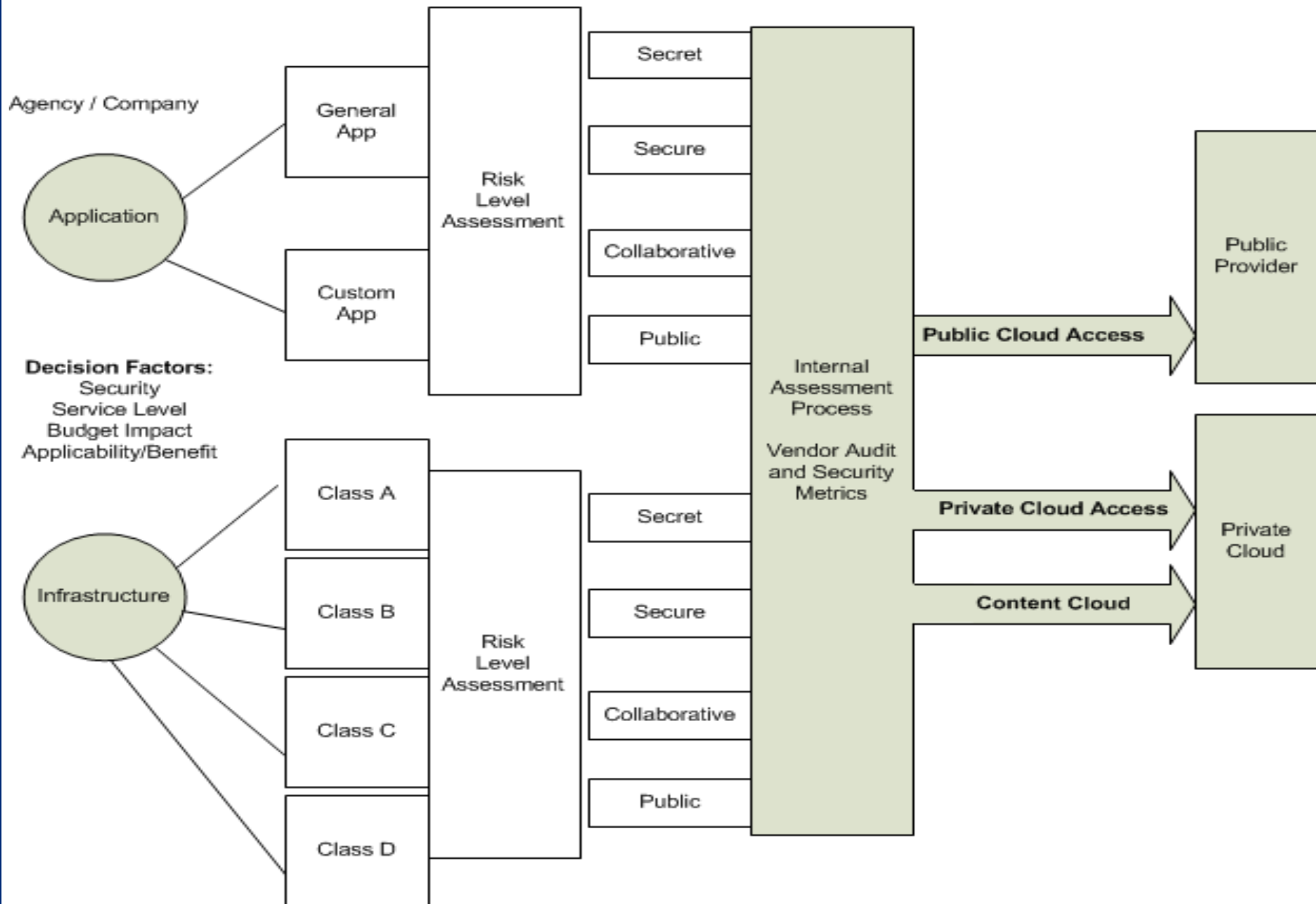
- On-demand self-service
- Broad network access
- Resource pooling with location independence
- Rapid elasticity
- Measured service use

<http://www.nist.gov/itl/cloud/index.cfm#>

Commission Infrastructure Working Group: Choosing Applications for the Cloud



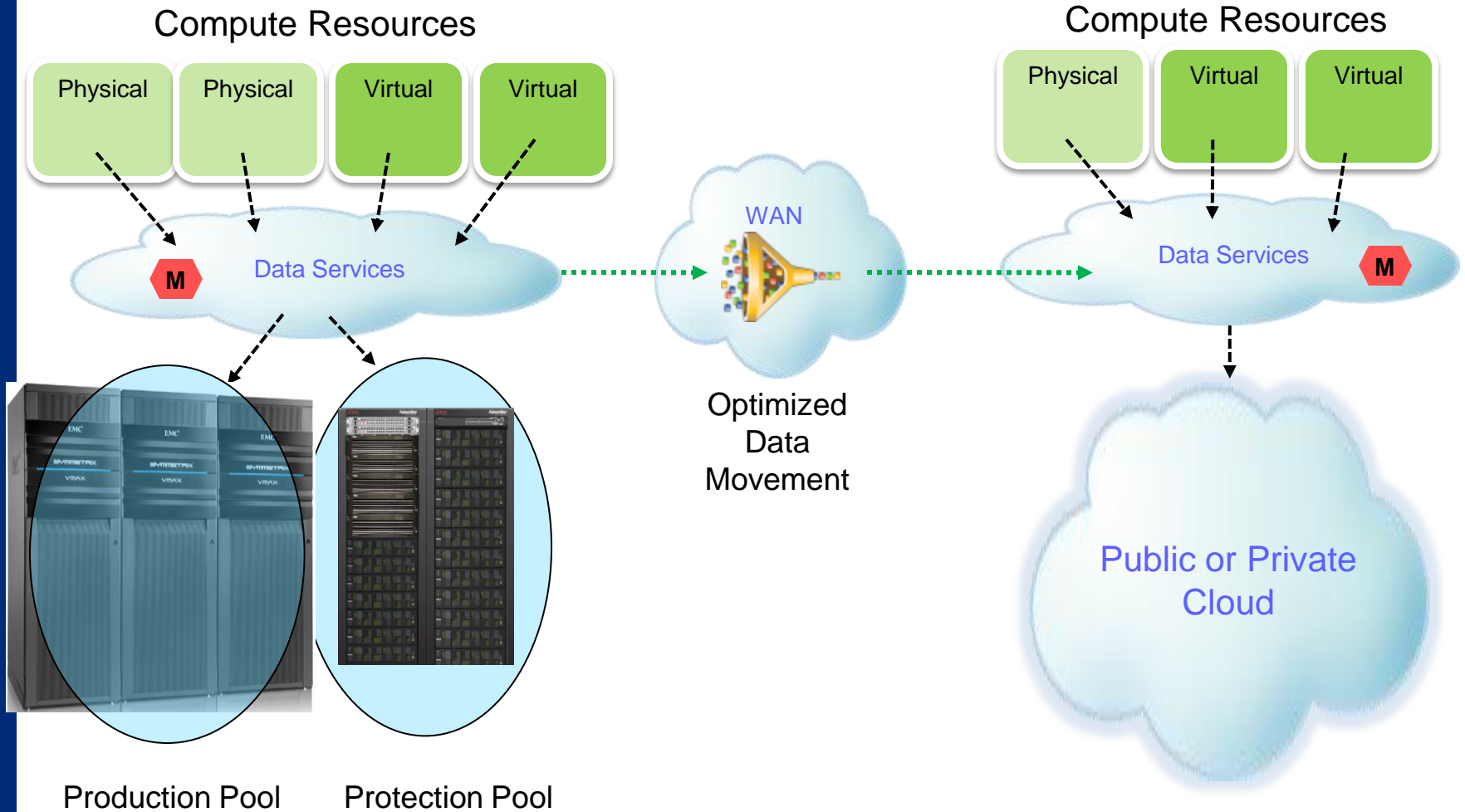
Commercial Cloud Formation Chart



Becoming Cloud Ready

- 1- Enable mobility by virtualizing servers, storage and applications
- 2- Audit applications to assess areas where cloud would be beneficial
- 3- Embrace encryption at rest and robust key management guidelines
- 4- **Assess utilization / costs of existing infrastructure and operations**
- 5- Determine data growth trends and dedupe or delete where required
- 6- Audit data assets by capacity and access metrics and assign classes
- 7- Create data storage tiers for structured and unstructured data classes
- 8- Consolidate infrastructure and minimize complexity (Policies / Automate)
- 9- Perform detailed analysis of application interdependencies
- 10- Outsource where appropriate

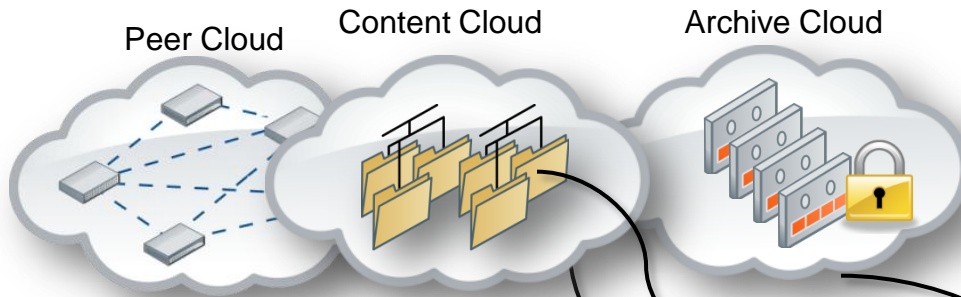
Cloud Enabled Infrastructure



Production Pool

Protection Pool

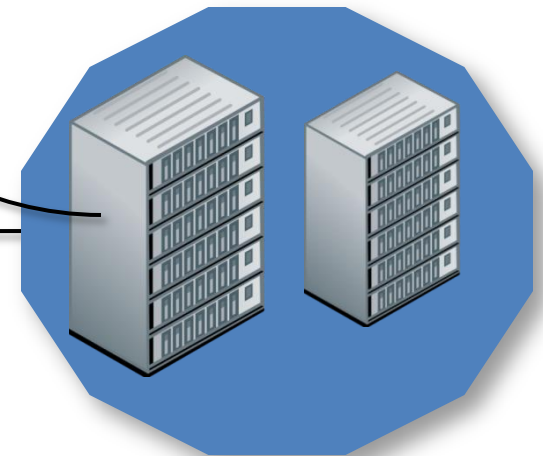
The Goal: A Global Vision



Content is distributed across the Cloud

Federated access to services with integrated security, protection, and mobility

Global Mobile Service Access



Content access moves from PUSH to Everywhere to PULL from Anywhere

Advertising is focused to the individual, not the group

Impact of Cloud on Media and Entertainment

Gartner



“Nexus of forces” impacting the industry: Mobile, Social, Cloud, Information

- **Brand becomes less important as content moves to the cloud**
- **Content and Access (Devices) are becoming more important (User Experience)**
- **Streaming is a big data problem, and strategic data placement in the cloud can fix it.**

iCloud Mystery: Is Apple Using Azure & Amazon?

June 16th, 2011 By: Rich Miller

On June 7 the **Infinite Apple** blog [published screen shots](#) of iCloud HTTP traffic analysis that indicate the use of the Windows Azure OS and images being called from Amazon’s S3 cloud storage service

Cloud Impact Examples

Unbundling: The breaking up of pay TV providers

- **Aereo:** Over the air for 8 bucks a month enables cutting the cord. No re-transmission fees
- Users want to build their personal library, and may possibly pay MORE for selectivity
- Consumers want flexible options. Possible new business models for content providers
- Service providers need to provide the best WAY to access media, the best experience
- Media Licensing models need to change with the times.
- Content needs to have rich metadata so it can be searched and found!
- Catalogs will be sharable and licensing will be automated in a connected world
- Good Cloud Example: Kindle is more of an order entry system than a mobile device!

Cloud Use Cases for Content Providers

Transcoding and Rendering farms (for DR purposes, or to augment production in case of a burst in workload)

Content archive (like Glacier) for long term content archiving (put it in a cloud, probably never touch it, maybe once in a while bring something back, just-in-case storage)

Content distribution (like for HBO-GO) using regional/global repositories, (but may become too expensive to transfer stuff "out" of the cloud -- putting things "in" is almost free.

Security is a #1 concern -- basically put all our family jewels out on the "web" -- very dangerous. Don't want the NSA getting the scoop on the ending of Game of Thrones.

Where to go to learn more about Cloud

- **(NIST) National Institute of Standards and Technology** <http://www.nist.gov/itl/cloud/index.cfm#>
- **(DCIA) Distributed Computing Industry Association** <http://www.dcia.info/>
- **(CCA) Cloud Computing Association** <http://www.cloudcomputingassn.org/>
- **(SMI) Service Measurement Index: A method for calculating the performance and quality of cloud-based services from Carnegie Mellon University** <http://csmic.org/understanding-smi/>
- **(CRF) Cloud Reference Framework: Internet engineering task force (IETF) draft for cloud service providers.** <http://tools.ietf.org/html/draft-khasnabish-cloud-reference-framework-02#page-6>
- **CIO Council: Cloud Computing.** <https://cio.gov/building-a-21st-century-government/cloud/>
- **Gartner: CIO Symposium 2013** <http://www.gartner.com/technology/symposium/orlando/>
- **Cloud Commission site: Includes a buyers guide and the final report** <http://www.techamericafoundation.org/cloud-commission>



proudly present:



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FalconStor Vision

Continuous Access to Information ...Anywhere



Thank You

FalconStor Mission

Optimize Data Services...Everywhere

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