



# **Cloud Issues for Federal Leaders & Technologists**

## ***Deciding Which Federal IT Systems to Migrate to Cloud***

**Presented By:**

**Al Mink**

**SRA International**

**October 27, 2011**

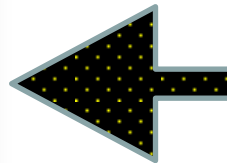
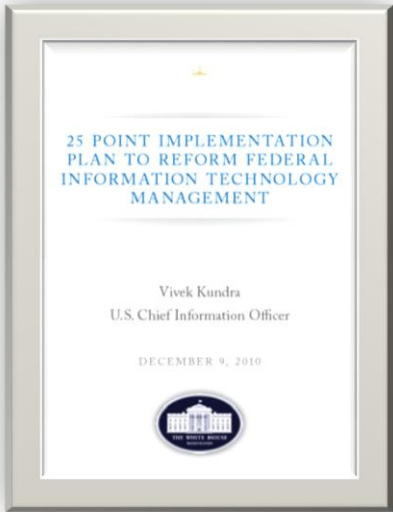


**Significant Work. Extraordinary People. SRA.**

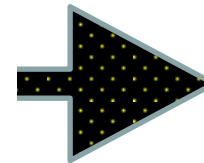
# What Can you Expect Today?

- ✓ **What's Cloud, Really**  
Federal Government Perspective
- ✓ **Federal Guidance & You**  
Mandates have arrived
- ✓ **Cool Insights**  
From Federal Cloud activity
- ✓ **How do you decide?**  
Decision Factors you can trust





**Where I got  
this from!**



# What's Cloud, Really

## Definitions Related to Cloud

### 1. Characteristics

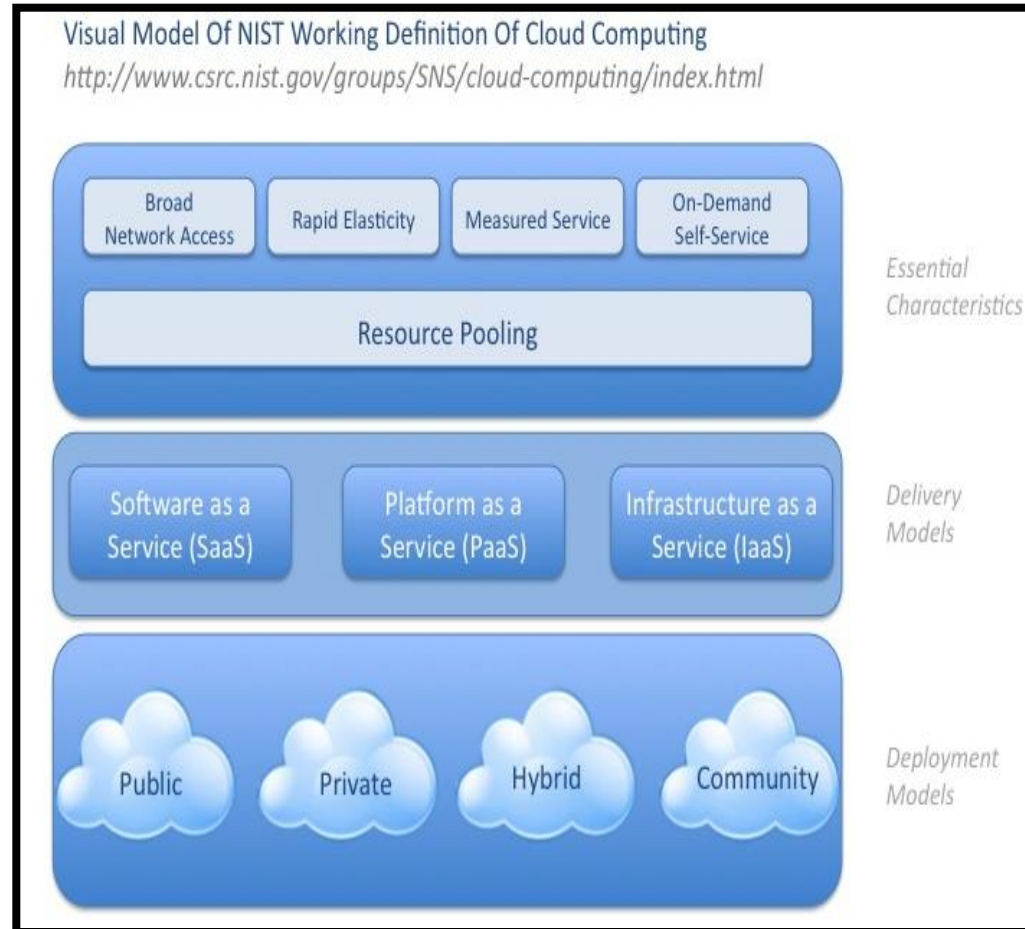
- On demand provisioning
- Elasticity
- Broad Network Access
- Measured service
- Resource Pooling (Multi-tenancy)

### 2. Delivery Models

- Infrastructure as a Service (IaaS)
- Platform as a Service (PaaS)
- Software as a Service (SaaS)

### 3. Deployment Modes

- Public
- Private
- Hybrid
- Community



**Cloud – a mix of old & new**

# What's Cloud, Really

## 1. *Essential Characteristics*

**On Demand Self-Service**

**Broad Network Access**

**Rapid Elasticity**

**Resource Pooling**

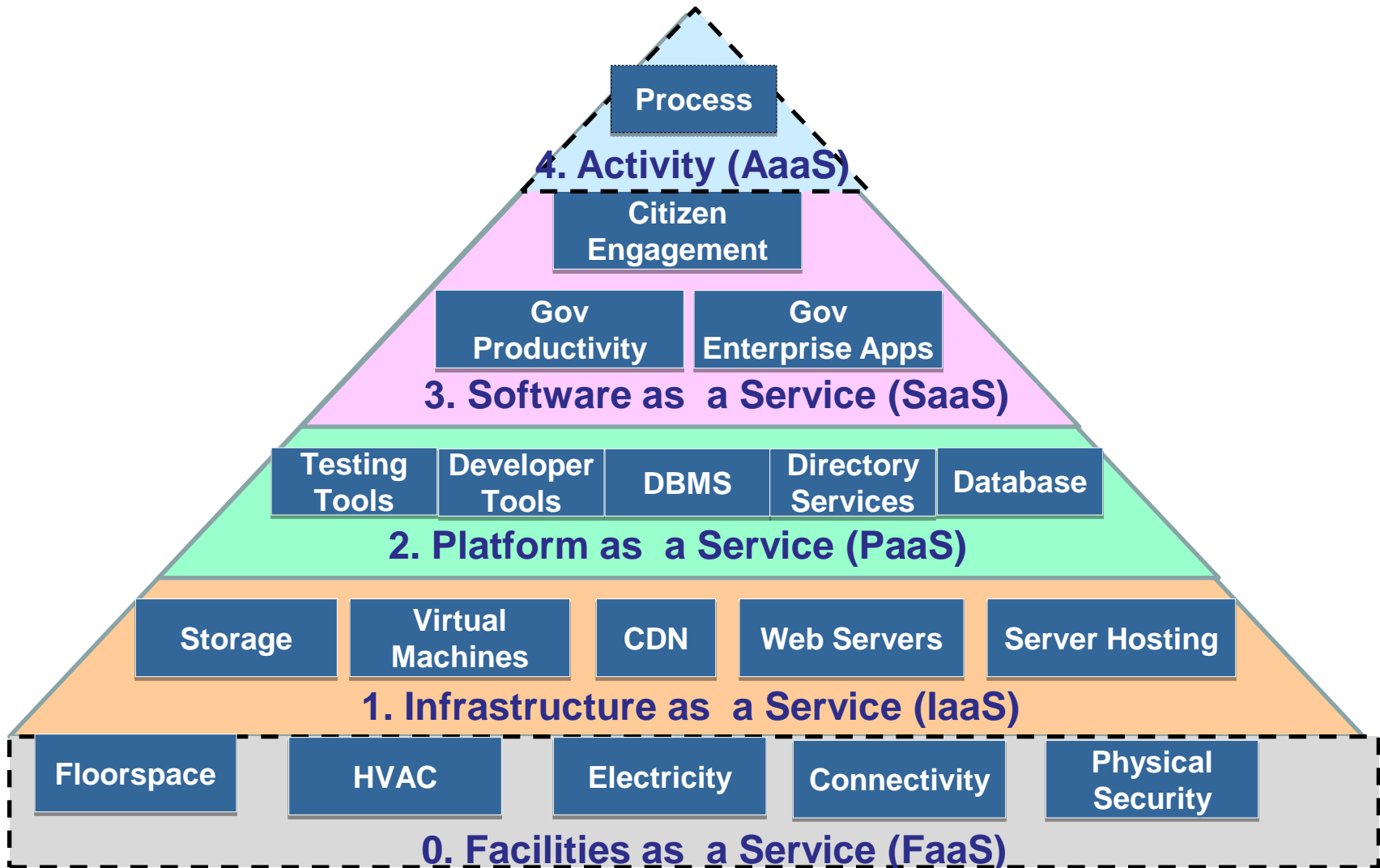
**Measured Service**

**Run this checklist -- Not everything new in IT is Cloud...**



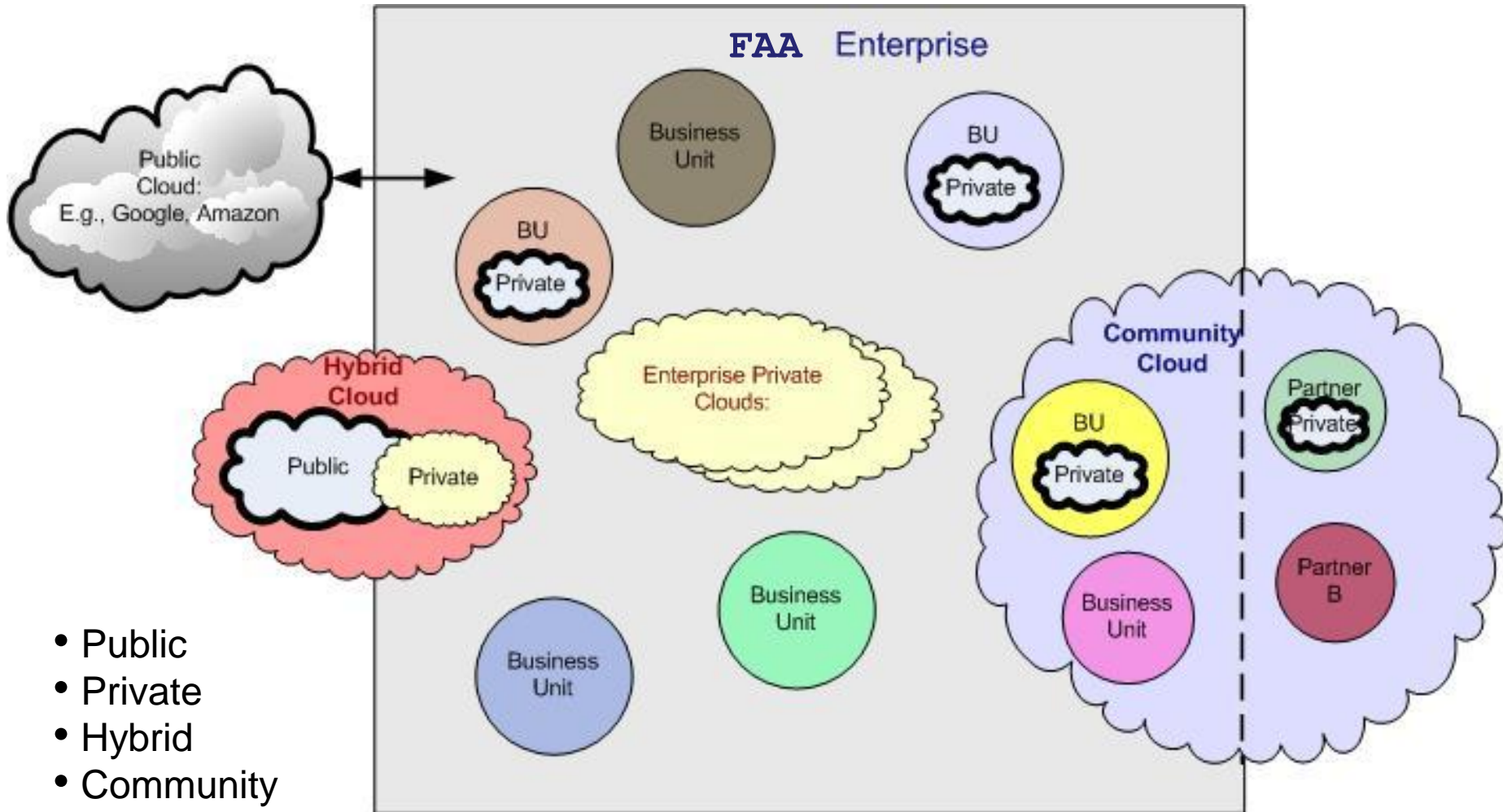
# 2. What's Cloud, Really

## *Delivery Models*



# What's Cloud, Really

## 3. Cloud Deployment (Sourcing) Models



# Federal Guidance & You

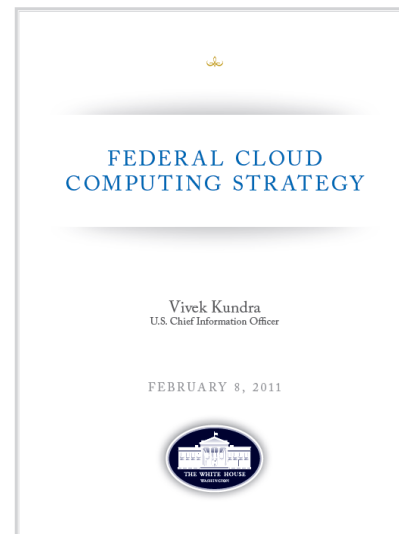
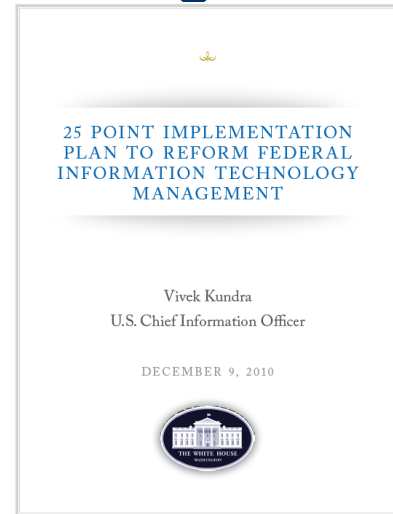
## *Cloud Guidance to Federal Agencies*

### **“Cloud First” Policy (Dec 2010)**

- ...Agencies default to cloud-based solutions
- Each Agency CIO will be required to identify three “must move” services...

### **Roles & Responsibilities (Feb 2011)**

- Agencies will be responsible for evaluating their sourcing strategies to fully consider cloud computing solutions



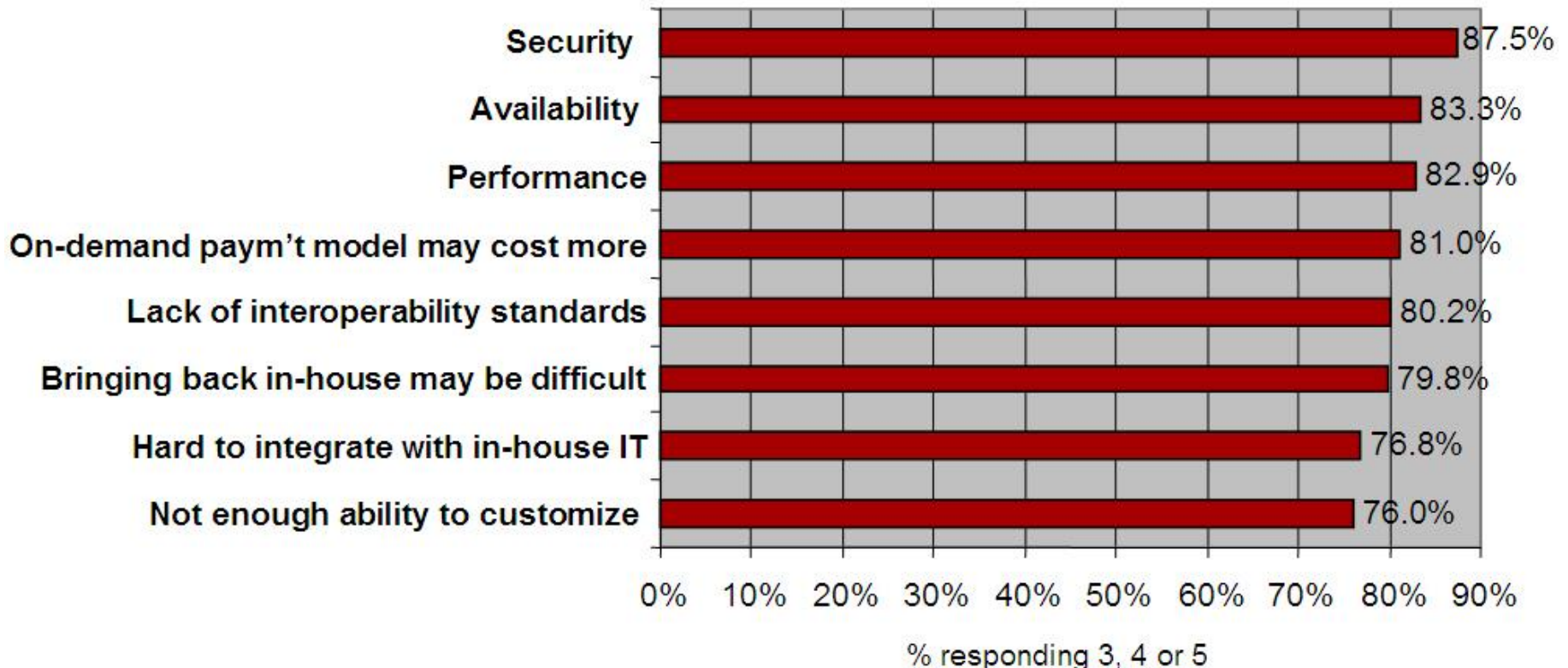


# Cool Insights

## Concerns of Commercial Organizations

**Q: Rate the *challenges/issues* of the 'cloud'/on-demand model**

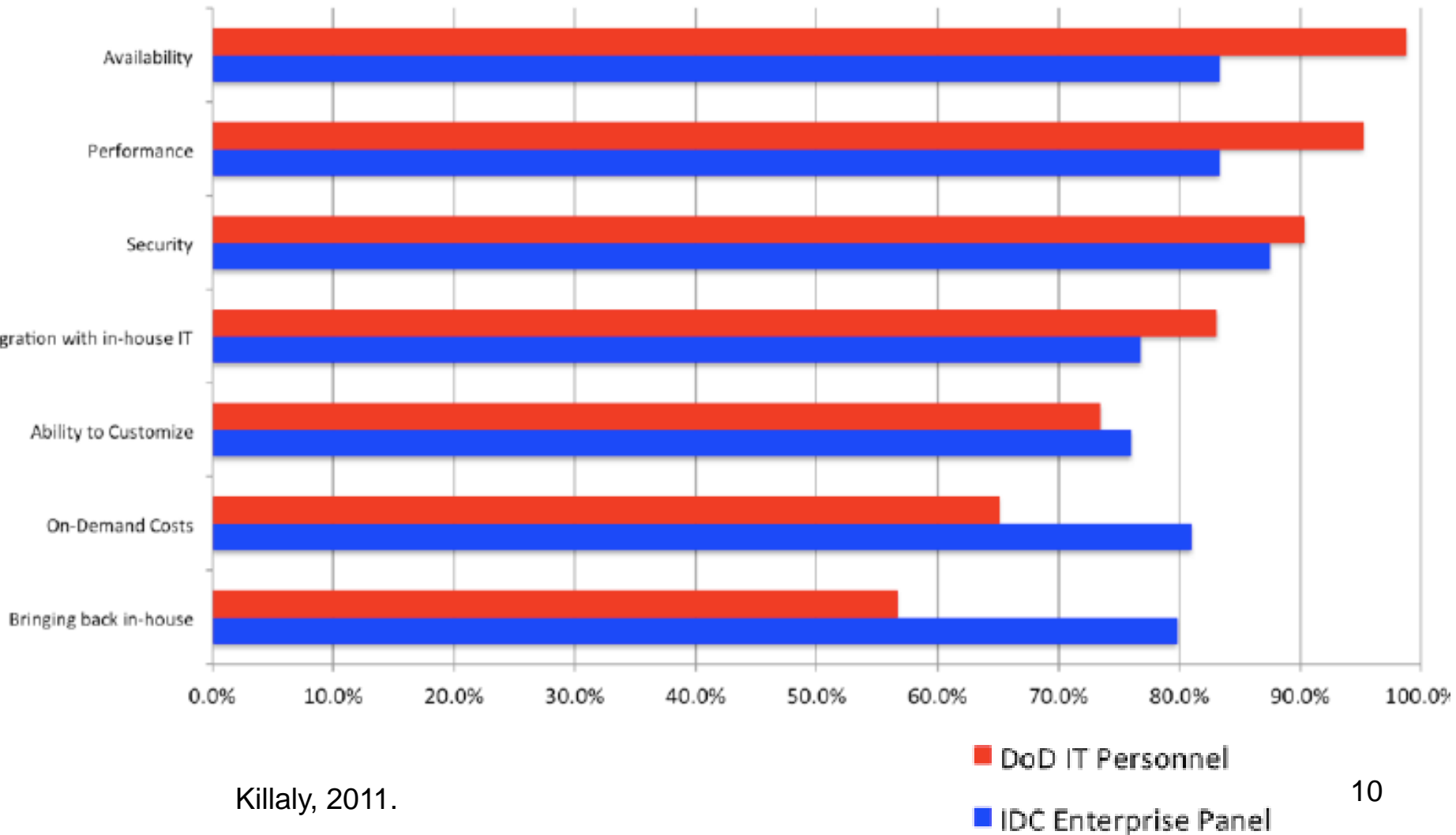
(Scale: 1 = Not at all concerned 5 = Very concerned)



IT executives and their line-of-business (LOB) colleagues.

# Cool Insights

## Concerns of Federal (DoD) IT Leaders



Killaly, 2011.

# Cool Insights *FedRAMP for Security*

## Today



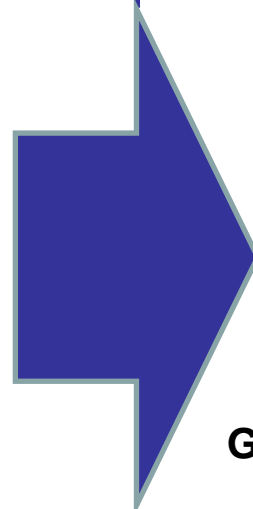
**Large costs**



**Slower acquisition**



**Significant effort**



## With FedRAMP



**Greatly reduced costs**



**Enables rapid acquisition**



**Reduced effort**

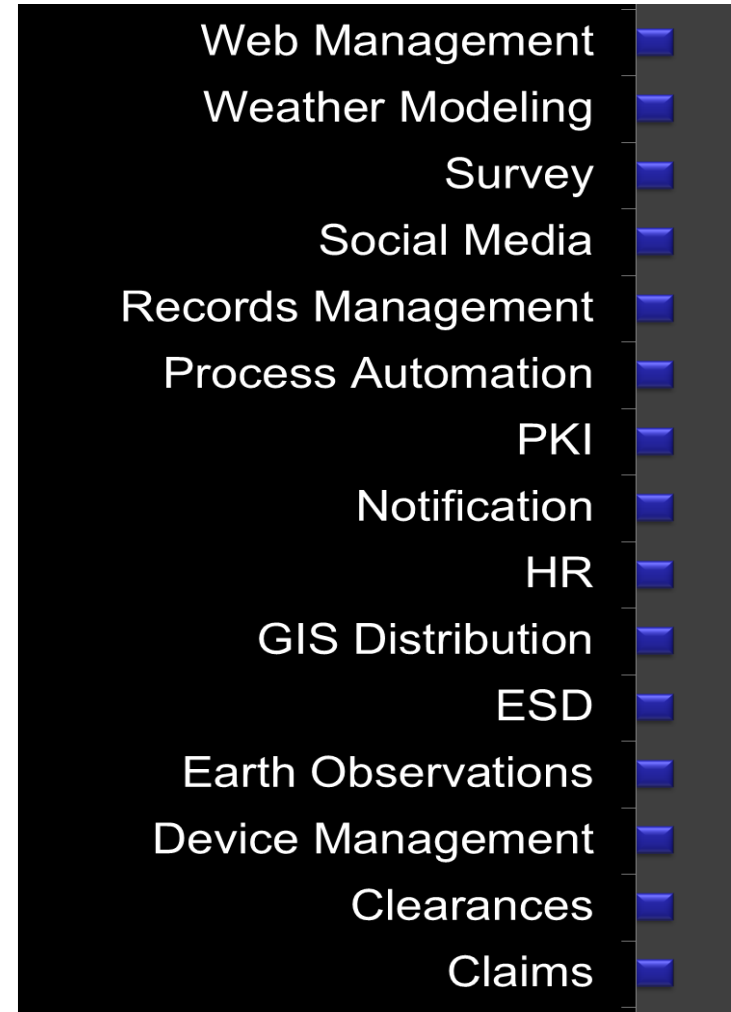
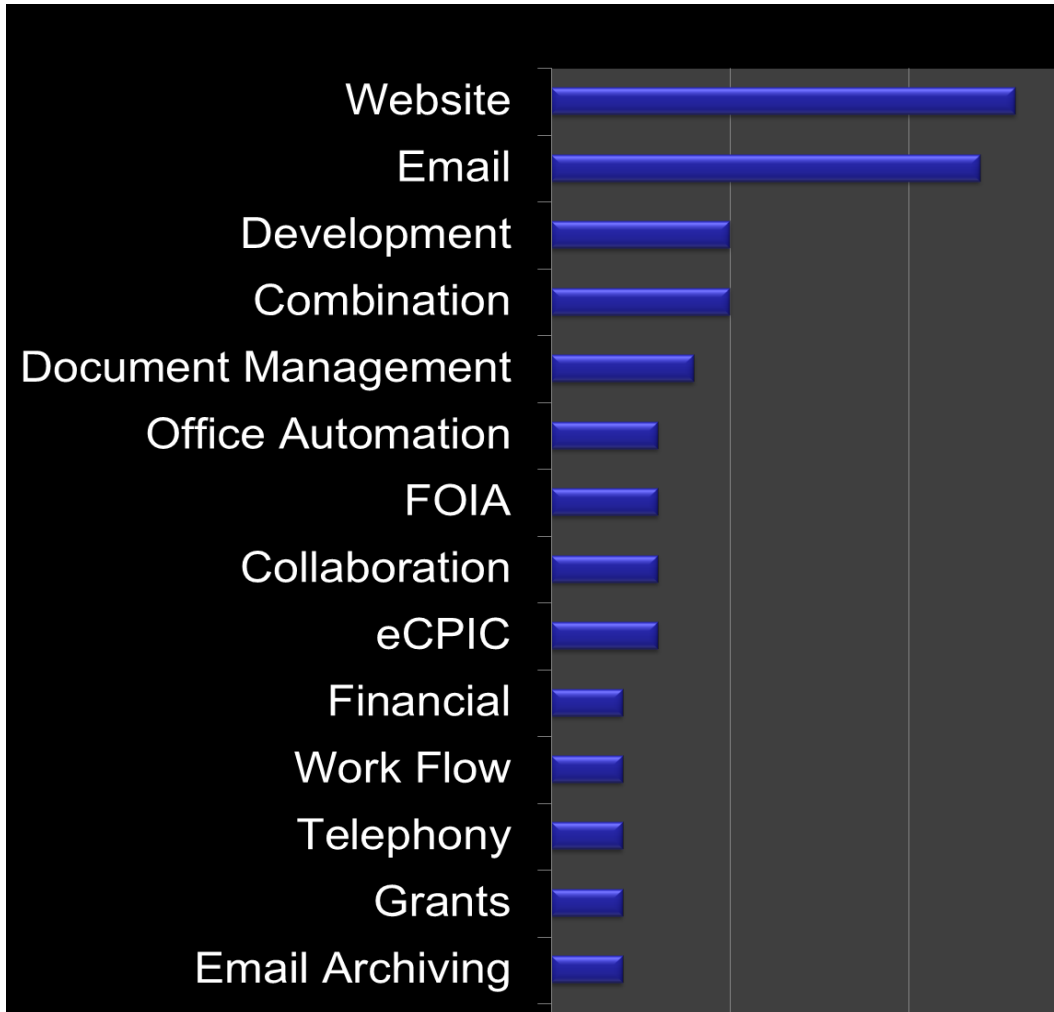


**Common Sense in Play?**

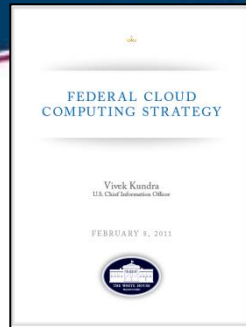
# Cool Insights

## *Feds Placing Bets on Cloud*

0 5 10 15 1

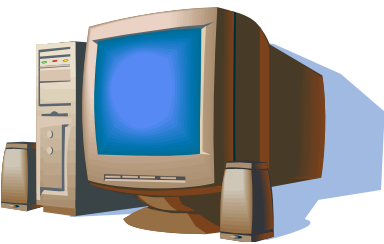


# How Do You Decide?



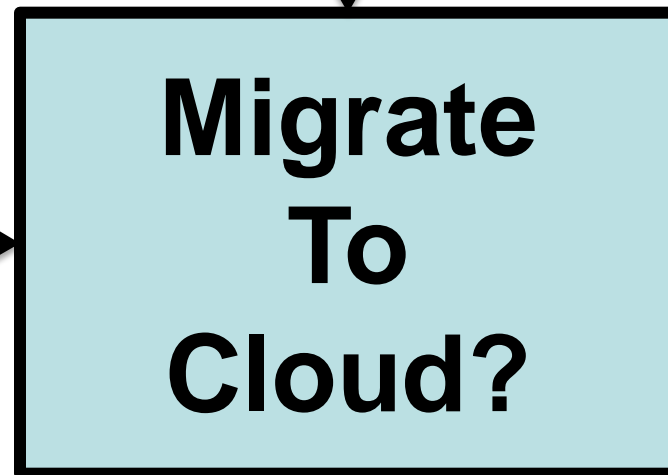
## Controls

- Decision Factors
- Guidance



## Inputs

- Candidate System List
- Provider Capabilities



## Outputs

- Services in Cloud



## Mechanisms

- FAA IT Governance Processes



# How Do You Decide?

## Decision Factors You Can Trust

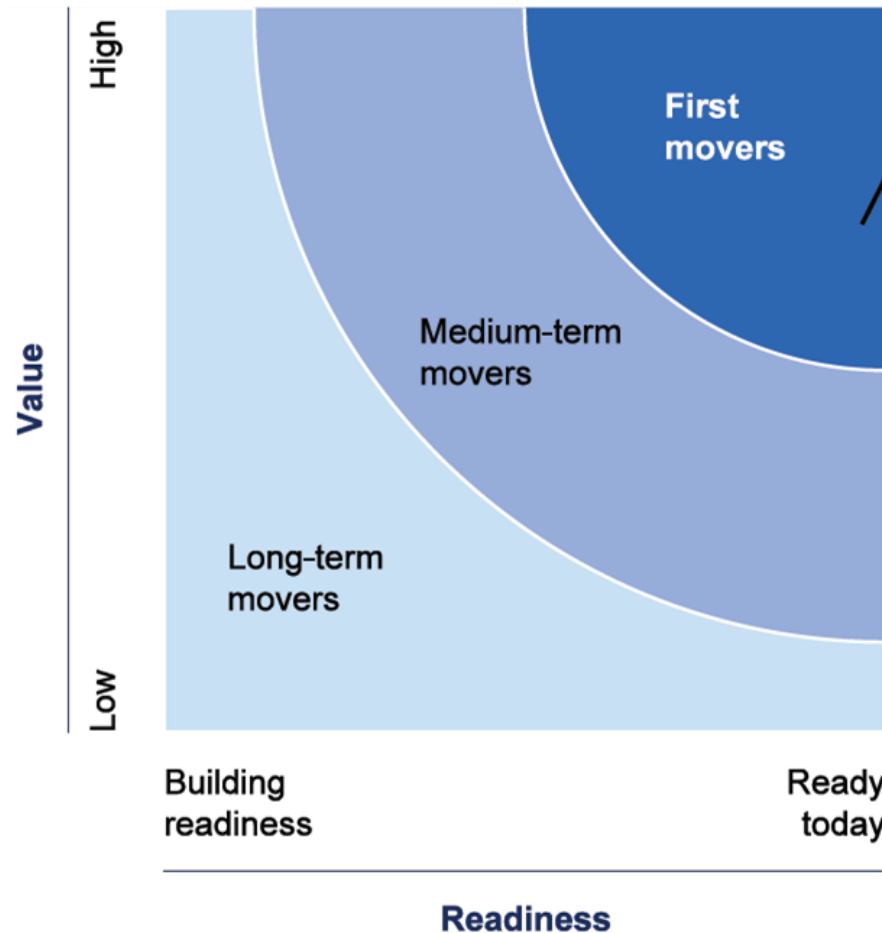
### Value Criteria

*What benefit does Cloud Migration provide?*

- Efficiency
- Agility
- Innovation

### Other Criteria

- Color of Money



### Readiness Criteria

*Is it Feasible to migrate to Cloud now?*

- Security
- Service Characteristics
- Market Characteristics
- Network Readiness
- App & Data Readiness
- Government Readiness
- Technology Lifecycle

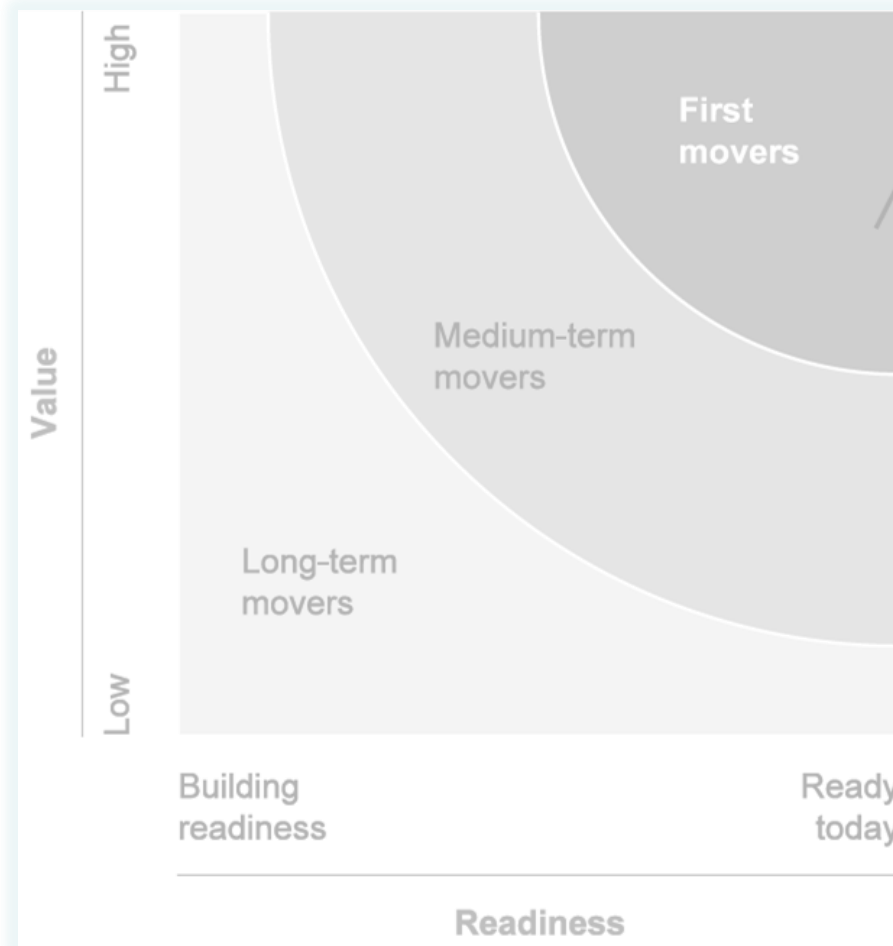
# How Do You Decide? *What is Most Important?*

## Value Criteria

- **Efficiency**
- Agility
- Innovation

## Other Criteria

- Color of Money

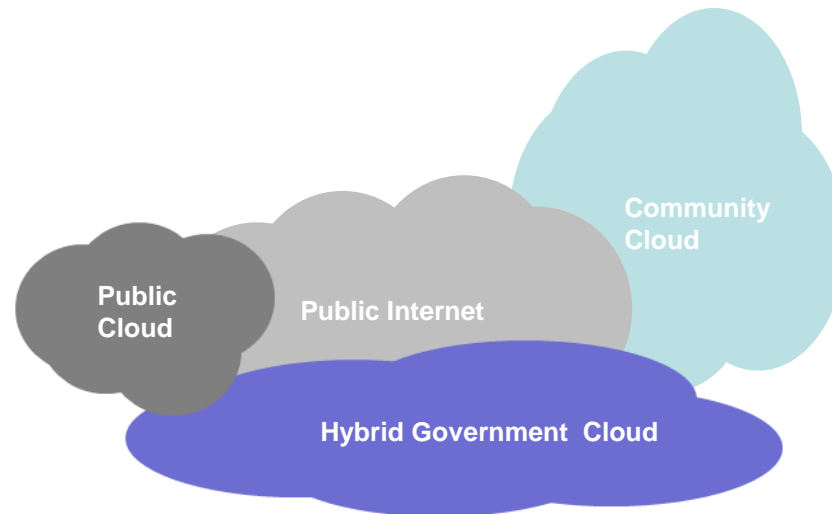


## Readiness Criteria

- **Security**
- Service Characteristics
- Market Characteristics
- **Network Readiness**
- **App & Data Readiness**
- **Government Readiness**
- Technology Lifecycle



## Questions & Closing Comments





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# Recommendations

- How to go about Slide 14
- Understanding business processes around each of candidate?
- Cloud or business process change
- Consolidation of systems.
- Migration opportunity to clean up the house
  - When you move, you consolidate and clean up.
- Just moving is a waste of resources,time,and money
- Consolidate and optimize
- Clean up portfolio.
- Take cost out,



## Migrating to Cloud – Other Considerations

- Quantifying decision factors
- Resolving the “DISA Dilemma”
  - 👍 DISA as provider of choice
  - 👎 DISA considered too expensive and too slow.
  - ✓ FAA IaaS may beat the DISA Dilemma
- Incorporating Cloud Decisions into an organization’s IT governance process
- Getting the money “up front” to Migrate

# Importance & Benefits

## *Drivers & Impediments*

### Drivers for migration to services/cloud

- Acquisition reform – mandating performance based contracts (President Obama)
- “Gates Memo” – SECDEF driving efficiencies in DoD spending (Aug 2010)
- Color of Money – The appropriations for fulfilling a needed capability differ depending on the approach (system vs service) adopted. Cuts in IT spending may drive organizations to leverage O&M funds to obtain needed capabilities.
- Federal “Cloud First” Policy – OMB requires federal agencies to default to cloud-based solutions whenever a secure, reliable, cost-effective cloud option exists (Nov 2010, US Chief Performance Officer Jeffrey Zients)
- Technology
  - Recently able to create commodity/utility computing and applications (e.g. virtualization)
  - Scaling to large enterprises

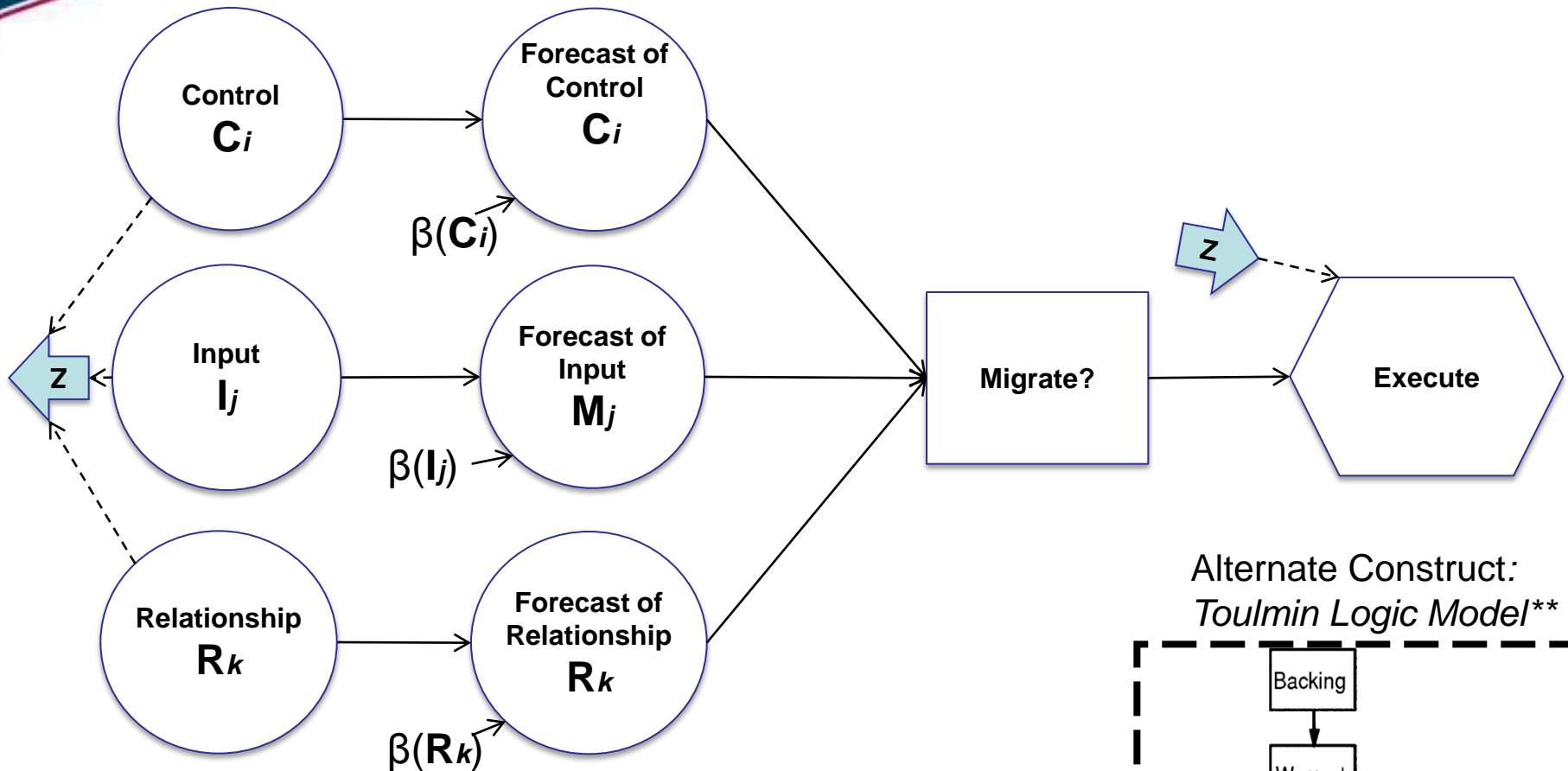
### Impediments towards adopting cloud/services

- Risks (real or perceived)
- Lack of experience (federal suppliers and acquirers)

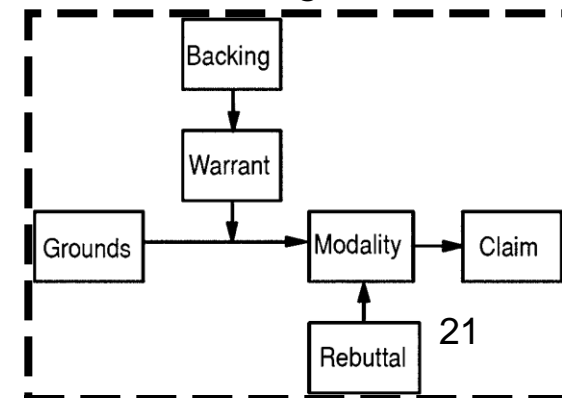
#### **The lack of a decision model:**

- 1) slows the adoption of services/cloud,**
- 2) Increases the risk of adopting the wrong decisions for services/cloud**

## Inference (Relevance) Diagram



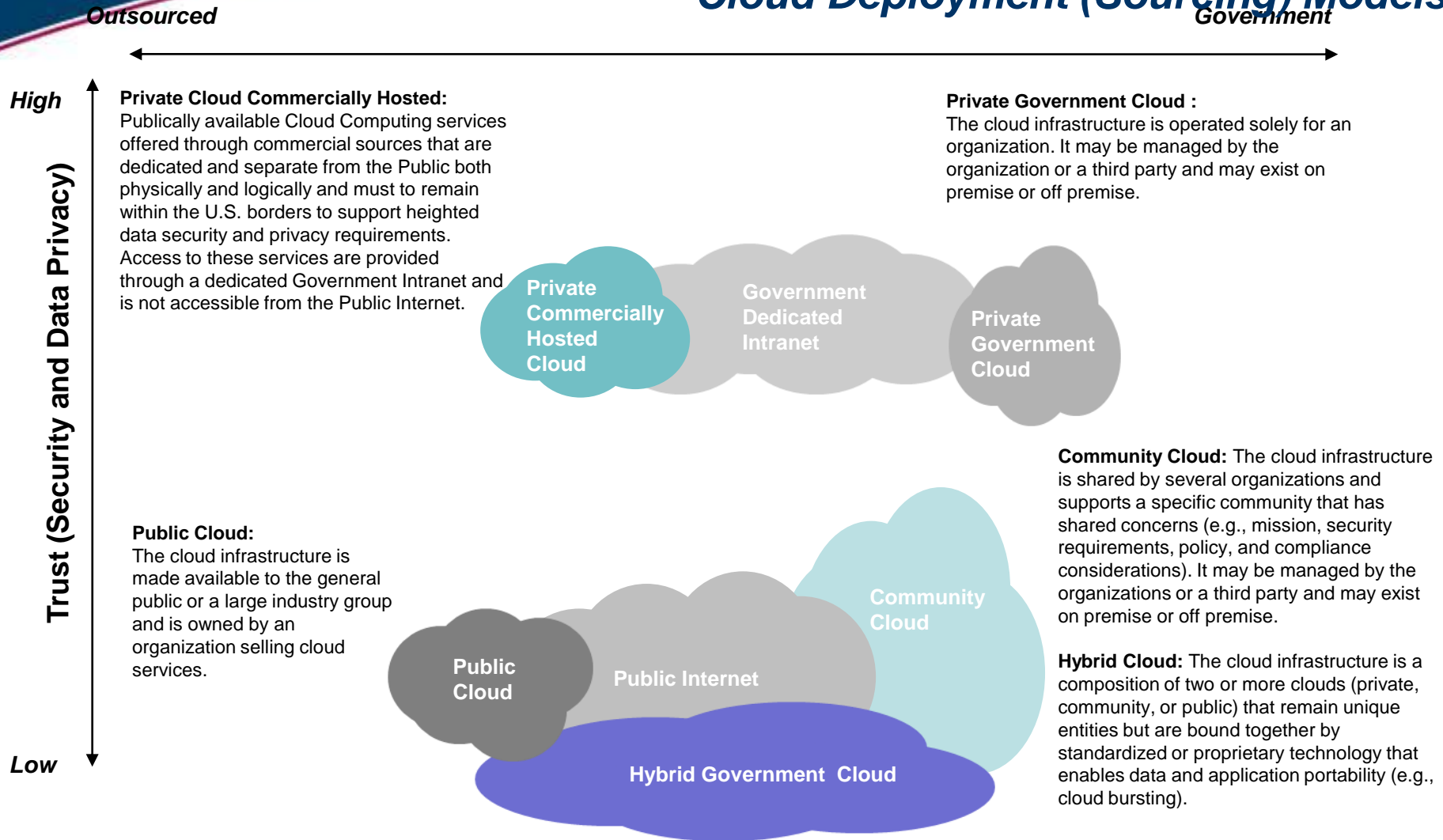
Alternate Construct:  
*Toulmin Logic Model\*\**



\*\* Toulmin, Rieke, and Janik, 1984

# Cloud – A Quick Refresher

## Cloud Deployment (Sourcing) Models



# Opening My Advisory Committee

## Dr. Andrew Sage (Co-Director)

- Pre-eminent Systems Engineer
- Systems Integration and Architecting, Complex Adaptive Systems and Knowledge Management, Economic Systems Analysis, Systems Mgmt
- Elected to the National Academy of Engineering for contributions to the theory and practice of systems engineering and systems mgmt



## Prof Paul Strassman (Co-Director)

- Former DoD CIO (ASD C3I)
- Distinguished Professor of Information Sciences



## Dr. David Schum

- Leading authority on decision theory
- Study of the properties, uses, and marshaling of evidence in probabilistic reasoning.
- 2006 Faculty Research Award (GMU, Volgenau)



## Dr. Edgar Sibley

- Information Technology (IT) Professor and Eminent Scholar
- Design and implementation of systems, several major economic issues such as reengineering, with extensions into large industrial enterprise and governmental efforts



A brilliant team of advisors ... with the right portfolio of expertise



# Cloud - and the Federal Government

## DOT "Cloud First" Candidates

### DOT Candidates

Organization	Cloud Service	Remarks
DOT	Geospatial Services	DOT's own "Google Maps"
DOT	Application: Development & Testing	Very popular among Feds
DOT	Website Hosting+	Shift to "content management"

Agencies Have Identified 78 Systems Migrating to the Cloud Within One Year

May 2011



# Migrating to Cloud – Decision Factors

## Value

### Efficiency: More affordable without sacrificing capabilities\*

- In terms of resources: People, money, physical assets
- **Scoring**: Services that have relatively high per-user costs, have low utilization rates, are expensive to maintain and upgrade, or are fragmented should score highly\*\*\*

### Agility: Responsiveness\*\*

- “Done correctly, the enterprise “easily scales; and the converse [is true as well]” \*\*
- Cloud computing approaches put IT agility in the hands of users, and this can be a qualitative benefit. \*\*\*
- **Scoring**:
  - Existing services that require long lead times to upgrade or change capacity should score highly \*\*\*
  - New or urgently needed services that would benefit from compressed delivery timelines.

### Innovation: Introducing something new

- This is about new capabilities achieved by leveraging cloud
- Could include new/improved soft quality attributes “ilities” such as better availability
- **Scoring**: Services that would most benefit from innovation should score highly

# Migrating to Cloud – Decision Factors

## *Readiness*

### **Security:** Compliance with guidance and protection of data

- Statutory compliance
- Data characteristics
- Privacy and confidentiality
- Integrity
- Data controls and access policies
- Governance

### **Service Providers' Characteristics:** Functionality & quality

- Interoperability, availability, performance, performance measurement approaches, reliability, scalability, portability, vendor reliability, and architectural compatibility
- Other regulatory compliance beyond security (e.g. records management)

### **Market Characteristics:** Competition and Interoperability

- Ability to switch service providers (avoid cloud vendor lock-in)
- Ability to interoperate with services outside of cloud vendor (e.g. authentication services)

### **Network Readiness:** Assured connectivity and bandwidth

# Migrating to Cloud – Decision Factors

## *Readiness con't*

### **Application and Data Readiness:** The core migration

- Clearly articulated and understood interfaces; limited coupling with external systems/services
- Clearly articulated and understood business rules
- Data is clean and able to extract

### **Government Readiness:** Cultural acceptance & cloud expertise

- Culture supportive of change
- Expertise in Service Level Agreements and Cloud services

### **Technology Lifecycle:** Timing of system/program milestones

- Avoid a planned or needed technology refresh
- Avoid a recompute of the legacy contract


## *Decision Variables – Other Factors*

- Color of Money: Restrictions related to Congressional appropriations
  - Cloud may recategorize costs from capital investment in hardware and infrastructure (CapEx) to a pay-as-you go (OpEx)



# Migrating to Cloud – Decision Factors

## *Security & FedRAMP*

A large, dark blue ribbon graphic with a 3D effect, spanning across the middle of the slide. It contains the text "Federal Risk and Authorization Management Program" in white, centered.

### Federal Risk and Authorization Management Program

- A government-wide initiative to provide joint authorizations and continuous security monitoring services
  - Unified government-wide risk management
  - Agencies would leverage FedRAMP authorizations (when applicable)
- This does not supplant existing agency authority to use systems that meet their security needs
- Initial focus on **cloud computing**

# Migrating to Cloud – Decision Factors

## *FedRAMP – Vendor Perspective*

