Cloud Computing In the Secure Realm

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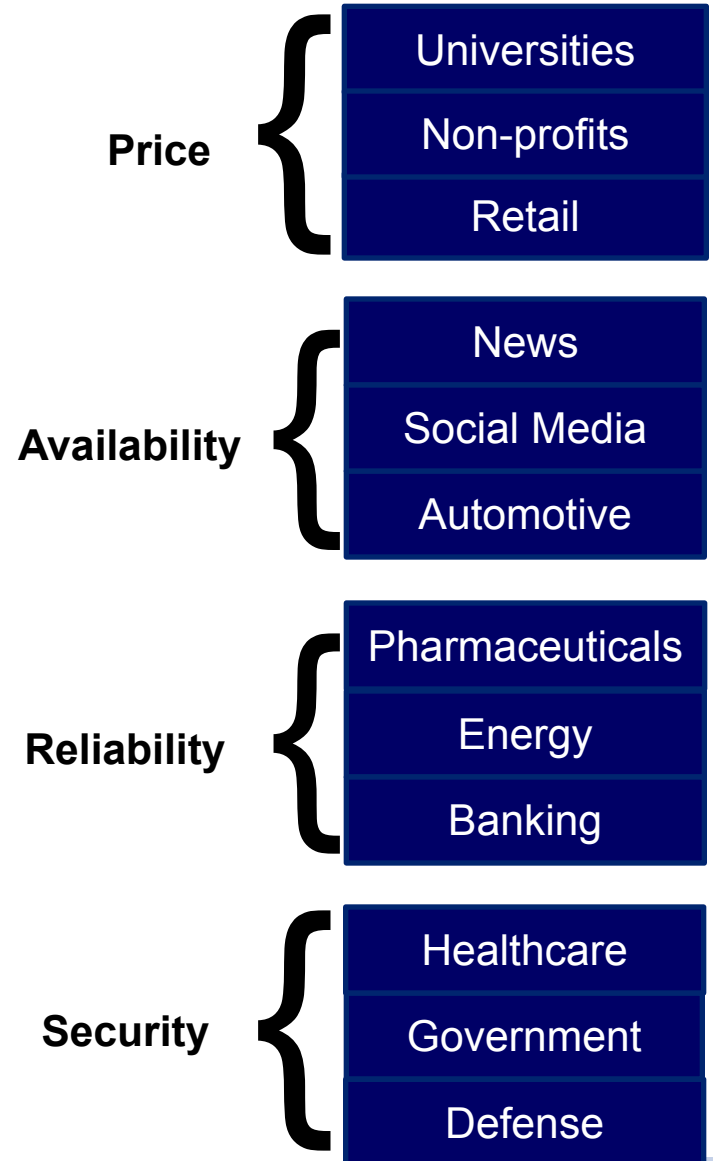**May 4, 2011**

Markets Based on Need

Instead of grouping markets by industry, we are grouping them by needs. This enables us to position ourselves more effectively in the markets.

Markets By Industry

News	Banking
Pharmaceuticals	Non-profits
Energy	Universities
Healthcare	Retail
Social Media	Automotive
Defense	Government

Markets By Needs

Price
- Universities
- Non-profits
- Retail

Availability
- News
- Social Media
- Automotive

Reliability
- Pharmaceuticals
- Energy
- Banking

Security
- Healthcare
- Government
- Defense

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The Untapped "Security is a Top Priority" Market

The Situation

Necessary Shift

Current Priorities

Target Priorities

The cloud has been built with:

- A reduction in **Price** as the primary goal

- **Availability** as a necessary requirement

- **Reliability** as a selling point

- **Security** as an *afterthought*

Availability and Price have come at the **expense** of security.

This has left an untapped market of industries/companies that are reluctant to adopt because security is their #1 priority and that is not the case with providers:

- *Healthcare and Pharmaceuticals*

- *Defense and Military*

- *HIPPA regulated organizations*

- *PCI DSS regulated organizations*

- *Sarbanes-Oxley regulated orgs*

Current Priorities	Target Priorities
Price	Security
Availability	Reliability
Reliability	Availability
Security	Price

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Potential Spending on Cloud Computing by Federal Agency
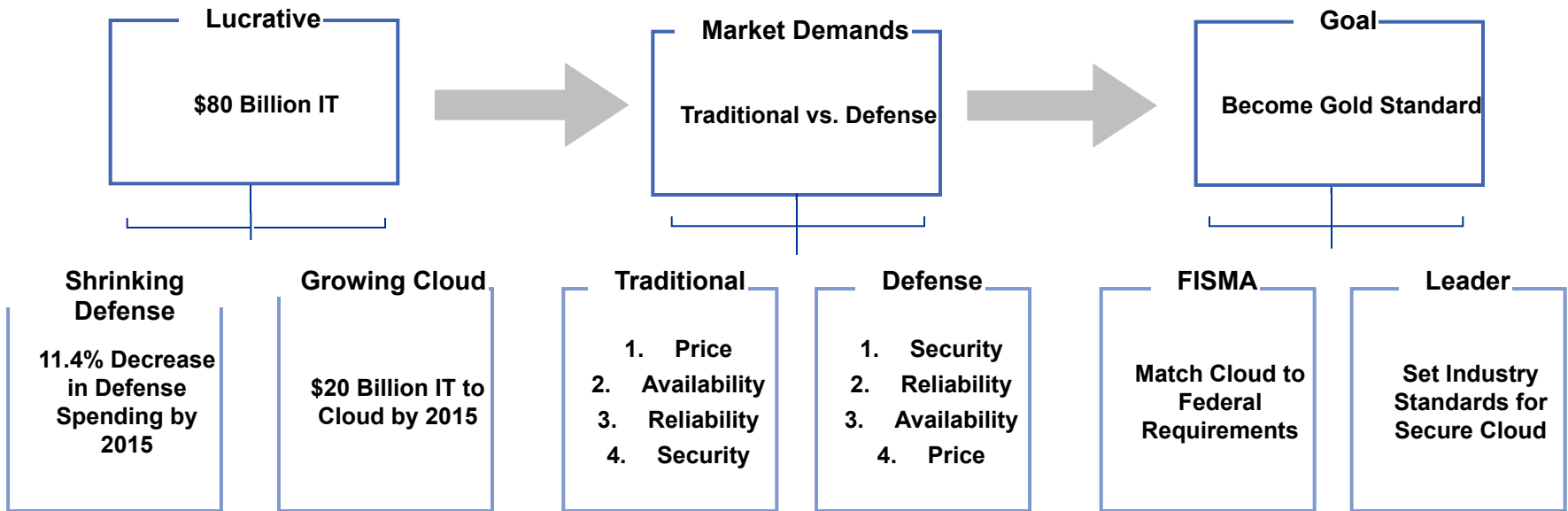

Estimates of Cloud Computing Spent by Federal Agency
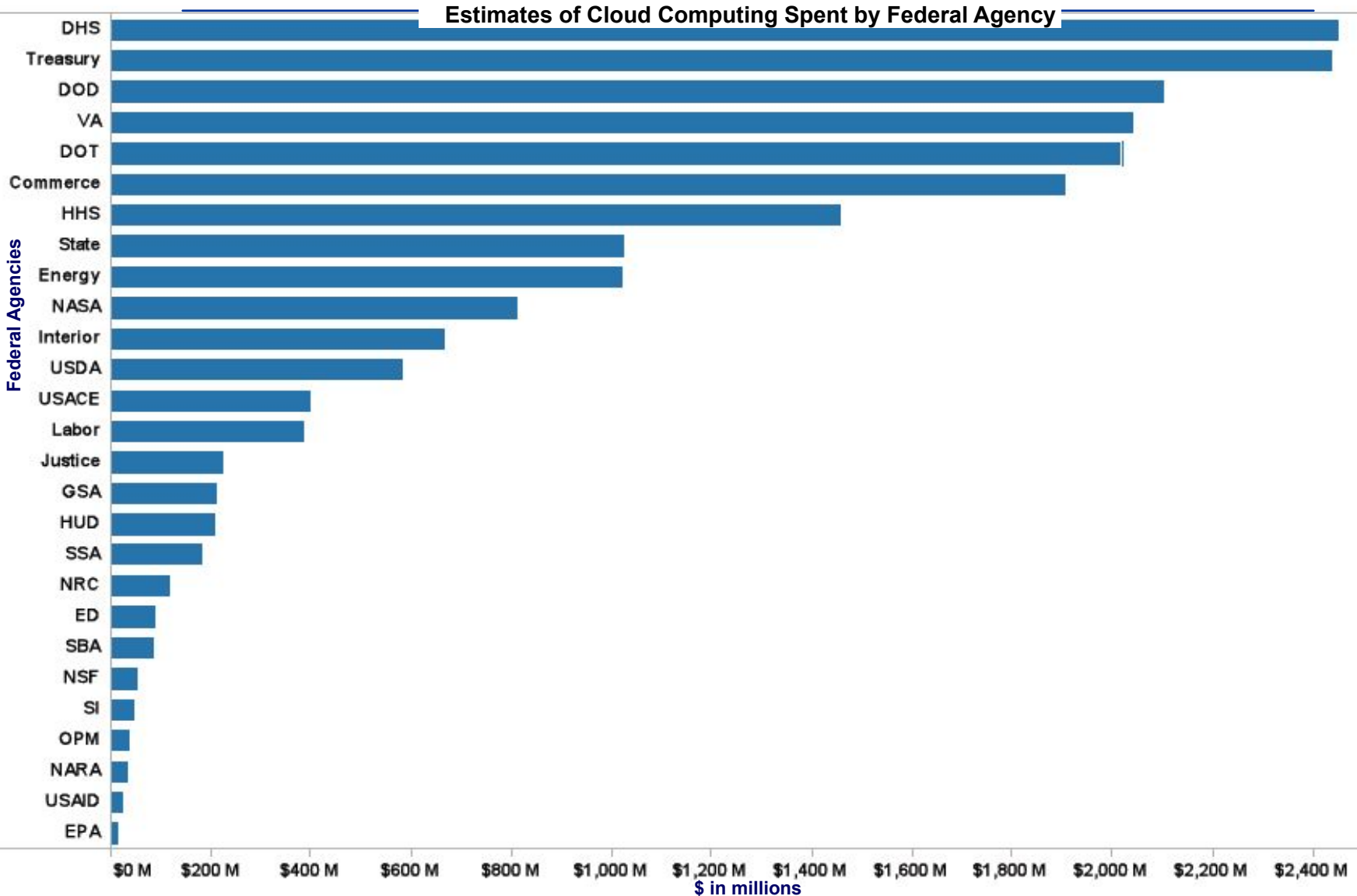
Source: Agency estimates reported to the Office of Management and Budget (OMB)

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Targeted Market - Defense

Lucrative	Market Demands	Goal
$80 Billion IT	Traditional vs. Defense	Become Gold Standard

Shrinking Defense

11.4% Decrease in Defense Spending by 2015

Growing Cloud

$20 Billion IT to Cloud by 2015

Traditional

1. Price
2. Availability
3. Reliability
4. Security

Defense

1. Security
2. Reliability
3. Availability
4. Price

FISMA

Match Cloud to Federal Requirements

Leader

Set Industry Standards for Secure Cloud

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Making Security the Top Priority

Establish Practices & Create Standards	Roll out Changes & Implement Standards	Coin the "Armored Cloud"	Iterative Improvements

First

- Coordinate with Department of Defense guidelines
- Align with the Trusted Cloud Initiative
- Get the pulse of the security community

See the appendix for more

Second

- Create micro datacenters
- Give options for hosting based on jurisdiction
- Physical separation
- Encryption at every level possible
- IDS and IPS implementation
- Control the human element

See the appendix for more

Third

- Become the golden standard
- Publicize advantages
- Capitalize on public breeches
- Transparency in practices
- Salesforce.com approach to branding

Fourth

- Constantly make improvements
- Agile development
- Google Chrome approach to security

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Risk

	Risks		Mitigation

Changing Regulations — **Establish clear communication with the federal government**

Competition for Control — **Establish standard operation procedures that designate control**

Market Uncertainty — **Plan to adapt to market demands**

Opportunity Cost — **Specializing in security will lead to new markets**

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Financial Analysis

10 Year Incremental Income

($ in millions)	2012	2014	2016	2018	2020
Incremental Revenue	408	572	789	1085	1493
Incremental Cost	100	140	200	270	370
Operating Income	306	429	503	814	1120
Income Tax	107	150	207	285	392
Net Income	199	279	384	523	728

Total Cost Margin	25%	Op. Income Margin	75%
Tax Cost	35%	Incremental Revenues	Appendix

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Financial Analysis

NPV
$4.74 Billion

$ in millions

Discount Rate 8.9%

Years

Key Takeaways

No New Technology Being Invented

- All the techniques already exist in some fashion

- No R&D necessary

- Quick implementation timeline

- Same infrastructure, different configuration

Lucrative Vertical Market

- Immediate needs

- Stable market

- Supportive environment

- High utilization

Not Mutually Exclusive with Currently Provided Services

- Current offerings remain the same

- IaaS and PaaS can grow as usual

- "Armored Cloud" is a parallel offering

- Simply a different ordering of priorities

Positive Spillover Opportunities to Other Industries

- Defense technology innovation is a springboard for commercial products

- Cross industry applications

- Universal value in security

- Market leading service differentiator

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Questions & Answers

Markets By Need	**Timeline**	**Benefits**	**Beta Rate**
Shift To Security	**Risks**	**SWOT**	**Guidelines**
Fed's Interest In Cloud	**Net Income**	**Financial Projections**	**Roll-out Specifics**
DOD	**NPV**	**Financial Assumptions**	**References**

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Appendix

SWOT Analysis

Strengths	Weaknesses	Opportunities	Threats
Product Differentiation	Vulnerable reputation	Increase in profitability	Increase risk to hackers
Low R&D timeframe	Opportunity cost	Set industry standards	Out-innovated

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Financial Projections

$ in Billions	2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	Comments
FY 2012 PB	685.7	553	571	586	598	611	623.22	635.6844	648.3981	661.366	Assume 2% growth rate
Cloud Spending		2.2	2.040382	2.422815	2.859431	3.355684	3.942929	4.625056	5.42519	6.363748	7.464677	BEST CASE REVENUE
Cloud %	0.321%	0.369%	0.424%	0.488%	0.561%	0.645%	0.742%	0.853%	0.981%	1.129%	Assume 1.5% growth rate
Market Share	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Assume 20%
Firm Revenue		0.44	0.408076	0.484563	0.571886	0.671137	0.788586	0.925011	1.085038	1.27275	1.492935	
Revenue NPV	$4.74										
Costs	0.11	0.10	0.12	0.14	0.17	0.20	0.23	0.27	0.32	0.37	
Operating Income		0.33	0.306057	0.363422	0.428915	0.503353	0.591439	0.693758	0.813779	0.954562	1.119701	
OI NPV	$3.56										
Tax	0.1155	0.10712	0.127198	0.15012	0.176173	0.207004	0.242815	0.284822	0.334097	0.391896	
NI	0.2145	0.198937	0.236224	0.278795	0.327179	0.384436	0.450943	0.528956	0.620465	0.727806	
NI NPV	$2.31										

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Financial Assumptions

Margin Assumption

Sales Force

Revenue	1,551,145
Var. Costs	208,243
CM	1,342,902
CM %	86.57%
R&D	187,887
GM	1,155,015
GM %	**74.46%**

Amazon Cloud

Revenue	500,000,000
Servers	40,000
Cost per serve	3,000
Server Cost	120,000,000
NO OH CM	380,000,000
CM	**76.00%**

Assume:	
10 yr US Treasury Bond (Yahoo Finance)	3.35%
Beta (Google Finance)	1.11
Market Risk Premium	5%
Required Return on Equity (Re):	0.089

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Beta Rate

Electric Utility (West)	14	0.75	83.18%	31.47%	0.48	2.60%	0.49
Electrical Equipment	79	1.32	10.91%	15.54%	1.21	6.61%	1.29
Electronics	158	1.13	18.40%	12.85%	0.97	14.08%	1.13
Engineering & Const	17	1.65	7.93%	28.52%	1.56	15.56%	1.85
Entertainment	75	1.72	37.99%	14.68%	1.30	5.92%	1.38
Entertainment Tech	31	1.39	7.80%	7.49%	1.29	16.71%	1.55
Environmental	69	0.85	41.13%	11.02%	0.62	2.50%	0.64
Financial Svcs. (Div.)	230	1.37	135.83%	18.63%	0.65	13.43%	0.75
Food Processing	109	0.87	28.98%	21.80%	0.71	3.91%	0.74
Foreign Electronics	9	1.14	29.55%	30.06%	0.94	23.30%	1.23
Funeral Services	5	1.22	50.78%	29.02%	0.90	4.27%	0.94
Furn/Home Furnishings	30	1.67	26.18%	16.87%	1.37	8.32%	1.49
Healthcare Information	26	0.94	4.86%	22.42%	0.91	5.67%	0.96
Heavy Truck/Equip Makers	8	1.94	46.41%	19.97%	1.42	8.90%	1.55
Homebuilding	24	1.39	89.05%	6.07%	0.76	27.68%	1.05
Hotel/Gaming	52	1.76	49.08%	15.93%	1.25	6.15%	1.33
Household Products	22	1.17	18.38%	27.46%	1.03	2.14%	1.05
Human Resources	24	1.44	9.14%	23.73%	1.35	14.23%	1.57
Industrial Services	137	0.96	26.26%	20.50%	0.79	7.97%	0.86
Information Services	26	1.10	20.21%	22.44%	0.95	3.28%	0.98
Insurance (Life)	31	1.39	18.28%	20.29%	1.21	15.97%	1.44
Insurance (Prop/Cas.)	67	0.92	11.12%	19.50%	0.85	10.27%	0.94
Internet	180	1.11	1.57%	7.89%	1.09	9.48%	1.21
Machinery	114	1.22	28.52%	19.61%	0.99	5.82%	1.05
Maritime	53	1.37	138.71%	6.54%	0.60	6.88%	0.64
Medical Services	139	0.88	38.70%	20.56%	0.67	15.24%	0.80
Medical Supplies	231	1.02	11.48%	13.12%	0.93	7.65%	1.01
Metal Fabricating	30	1.44	18.24%	22.51%	1.26	12.60%	1.44
Metals & Mining (Div.)	69	1.33	11.01%	7.07%	1.21	3.32%	1.25
Natural Gas (Div.)	32	1.25	34.98%	15.07%	0.97	2.08%	0.99
Natural Gas Utility	27	0.65	62.04%	23.93%	0.44	2.08%	0.45
Newspaper	13	1.71	46.80%	29.44%	1.29	4.07%	1.34
Office Equip/Supplies	24	1.45	45.11%	14.81%	1.05	12.11%	1.19
Oil/Gas Distribution	12	0.97	75.32%	15.06%	0.59	2.68%	0.61
Oilfield Svcs/Equip.	95	1.48	18.94%	16.42%	1.28	4.76%	1.34
Packaging & Container	27	1.06	44.52%	20.44%	0.78	7.43%	0.85
Paper/Forest Products	37	1.52	71.26%	15.23%	0.95	6.62%	1.01
Petroleum (Integrated)	23	1.21	18.37%	27.13%	1.07	4.84%	1.12

Guidelines

Trusted Cloud Initiative:

Mission Statement: To Promote Education, Research and Certification of Secure and Interoperable Identity in the Cloud

"The Trusted Cloud Initiative will help cloud providers develop industry-recommended, secure and interoperable identity, access and compliance management configurations, and practices. We will develop reference models, education, certification criteria and a cloud provider self-certification toolset in 2010. This will be developed in a vendor-neutral manner, inclusive of all CSA members and affiliates who wish to participate."

Department of Defense:

"As the Federal Government moves to the cloud, it must be vigilant to ensure the security and proper management of government information to protect the privacy of citizens and national security.

The transition to outsourced, cloud computing environment is in many ways an exercise in risk management. Risk management entails identifying and assessing risk, and taking the steps to reduce it to an acceptable level. Throughout the system lifecycle, risks that are identified must be carefully balanced against the security and privacy controls available and the expected benefits. Too many controls can be inefficient and ineffective. Federal agencies and organizations should work to ensure an appropriate balance between the number and strength of controls and the risks associated with cloud computing solutions.

The Federal Government will create a transparent security environment between cloud providers and cloud consumers. The environment will move us to a level where the Federal Government's understanding and ability to assess its security posture will be superior to what is provided within agencies today. The first step in this process was the 2010 Federal Risk and Authorization Management Program (FedRAMP). FedRAMP defined requirements for cloud computing security controls, including vulnerability scanning, and incident monitoring, logging and reporting. 14 Implementing these controls will improve confidence and encourage trust in the cloud computing environment.

To strengthen security from an operational perspective, DHS will prioritize a list of top security threats every 6 months or as needed, and work with a government-wide team of security experts to ensure that proper security controls and measures are implemented to mitigate these threats."

Implementation Specifics

Micro datacenters and jurisdiction

The construction of micro datacenters allows them to be spread out, to mitigate the risk of natural disasters, and more importantly, to provide the option to host data based on jurisdictional preference.

- "Data location. When you use the cloud, you probably won't know exactly where your data is hosted. In fact, you might not even know what country it will be stored in. Ask providers if they will commit to storing and processing data in specific jurisdictions, and whether they will make a contractual commitment to obey local privacy requirements on behalf of their customers, Gartner advises."

Physical separation

Though not the most cost effective, the option for leased infrastructure or platform nodes to be hosted on physically isolated machines (from other customers) should be provided. This allows the customer to be certain that their information is sandboxed from other customers at both the software and hardware levels, adding another layer of security and assurance.

Encryption at every level

Encryption provides security, but comes at the cost of increased computing power and infrastructure so it is not usually implemented across the board. If security is the highest priority, which it is in Armored Cloud's case, then all of the machines must have full drive encryption, all communications too and from the data centers must be encrypted, and a proper public key infrastructure must be in place to authenticate and validate all access.

IDS and IPS

Intrusion Detection Systems and Intrusion Prevention Systems must be employed in greater numbers and varieties to stop not only the most common threats, but all known vectors of attack.

Human element

The personnel managing the systems and accounts must be trained so defense is instilled at every level. No phishing scams!

Google Chrome approach

Have an open channel so bugs and securities holes can be reported. Make sure the report to patch time is as small as possible.

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