

# CLOUD SECURITY

Your Data, Other People's Computers: What Could Go Wrong?

2017

# ABOUT THE PRESENTERS



## David Stanton, Moderator and Security & Privacy Director at Protiviti

David Stanton has 18 years of IT and IT Security consulting experience and received a BBA in Managerial Information Systems from Baylor University. He joined the Protiviti Dallas office in the IT Consulting practice focusing on Security and Privacy in 2013. Prior to Protiviti, David held the position of Data Protection and Privacy lead for a Fortune global 500 consulting firm and was previously Information Security Officer (ISO) for a top 5 US credit union. David is also the past VP of the North Texas ISSA group and speaks to large audiences on a regular basis (around Cloud Security, Third Party Risk Management, Forensics / Incident Handling, and Cyber Threats).



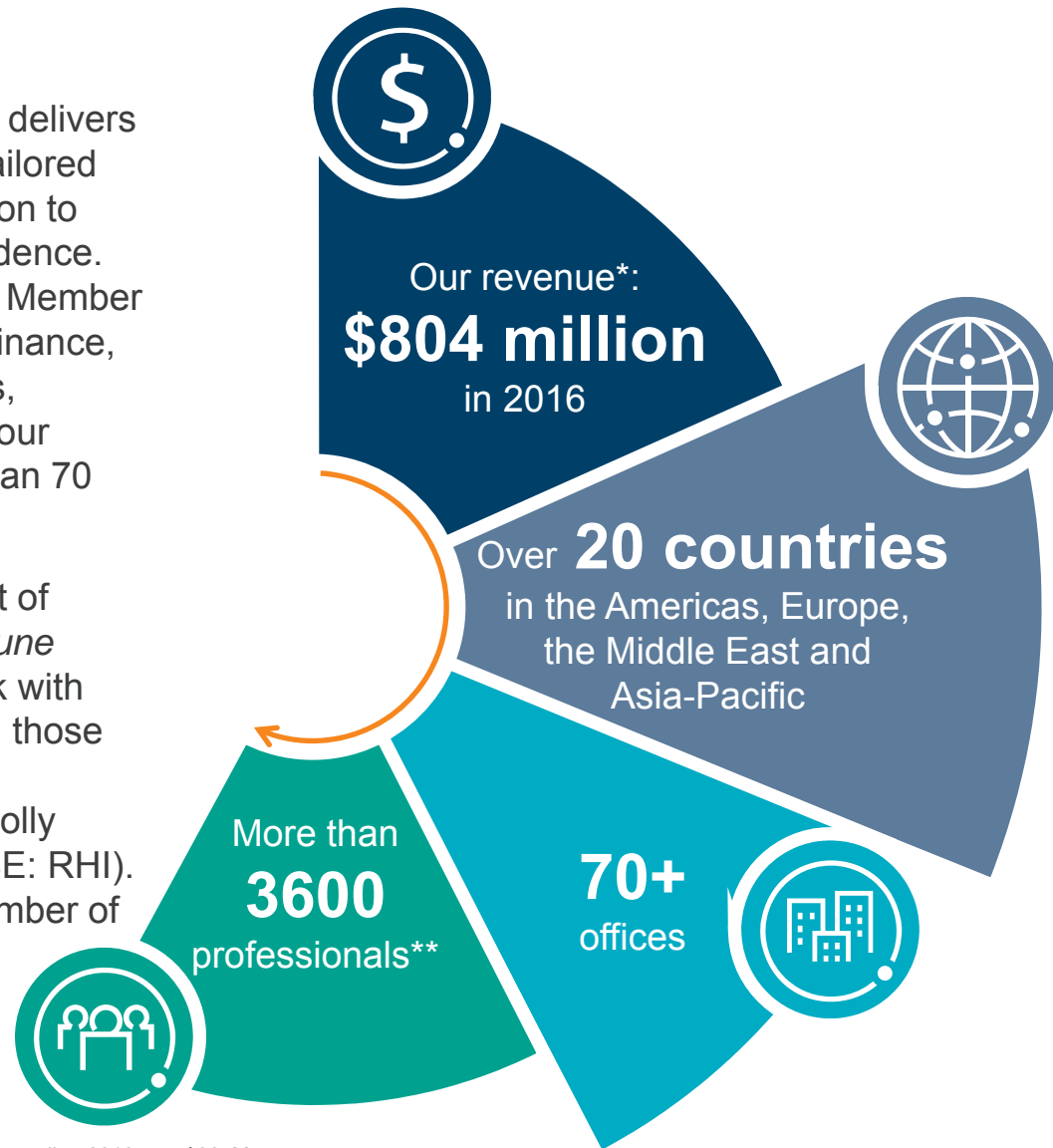
## Dr. D Kall Loper, National Lead for Incident Response at Protiviti

Dr. Loper has been a practicing professional and researcher in Digital Forensics and Incident Response (DFIR) since 1997. He completed a dissertation on hacker communication methods and content in 2000. Dr. Loper was lead instructor, author, and peer review board member for the Electronic Crime and Technology Center of Excellence in the United States Department of Justice. Dr. Loper worked in the forensics and incident response practices at a Big 4 consulting firm before joining Protiviti as the National Lead for Incident Response. Dr. Loper has published books and articles and given numerous presentations in DFIR and is the past, multi-term President of the High Tech Crime Investigation Association's Southwest Chapter.

# WHO WE ARE

Protiviti is a global consulting firm that delivers deep expertise, objective insights, a tailored approach and unparalleled collaboration to help leaders face the future with confidence. Protiviti and our independently owned Member Firms provide consulting solutions in finance, technology, operations, data, analytics, governance, risk and internal audit to our clients through our network of more than 70 offices in over 20 countries.

We have served more than 60 percent of *Fortune* 1000® and 35 percent of *Fortune* Global 500® companies. We also work with smaller, growing companies, including those looking to go public, as well as with government agencies. Protiviti is a wholly owned subsidiary of Robert Half (NYSE: RHI). Founded in 1948, Robert Half is a member of the S&P 500 index



\*Inclusive of Protiviti's Member Firm network, revenue for the year ending 2016 was \$865M

\*\*Inclusive of Protiviti's Member Firm network, the number of professionals is more than 4600

# AGENDA

Cloud Intro

Market Forecast

Cloud Risks

Managing Cloud Risks

# CLOUD INTRO: TERMS, USES, AND STRUCTURES

Overview

Models

Uses

# OVERVIEW – CLOUD COMPUTING

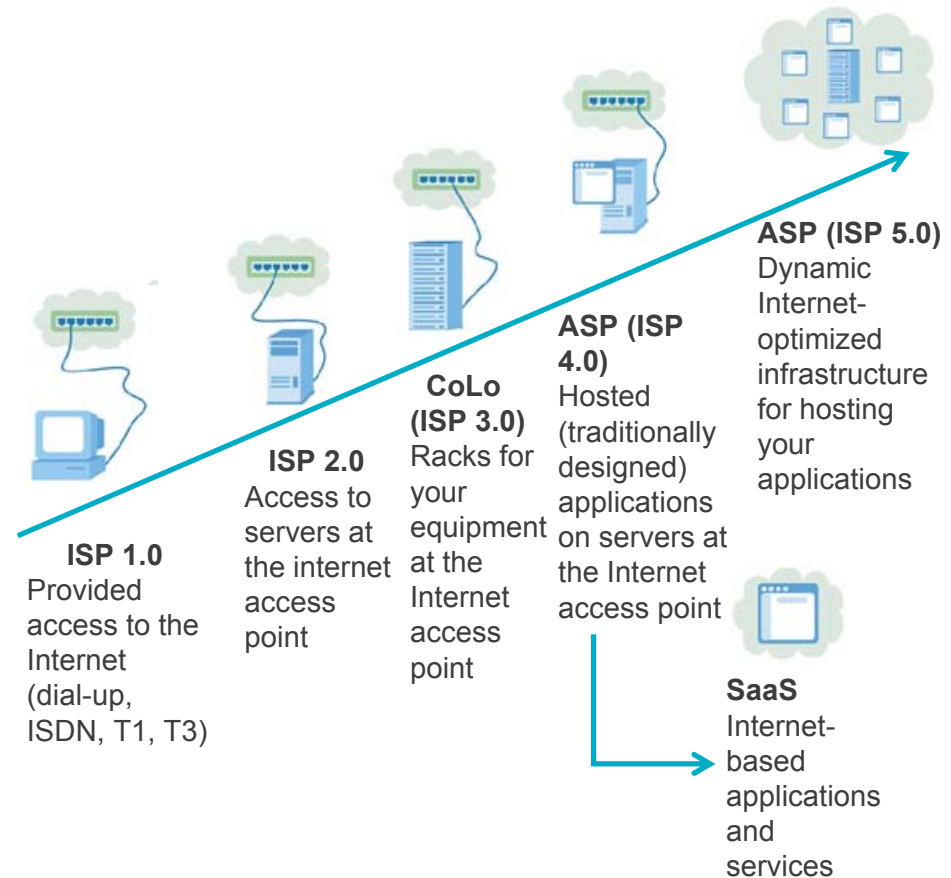
Cloud computing is Internet-based computing, whereby shared resources, software and information are provided to computers and other devices on-demand, like a public utility.

It is a paradigm shift following the mainframe to client-server architecture that preceded it in the early 1980s. Details are abstracted from the users who no longer have need of, expertise in, or control over the technology infrastructure “in the cloud” that supports them.

Simplified National Institute of Standards and Technology (NIST) version of Cloud Computing: The five characteristics of cloud computing:

- On-demand self-service
- Ubiquitous network access
- Location independent resource pooling
- Rapid elasticity
- Pay per use

## Cloud Computing: The Latest Evolution of Hosting

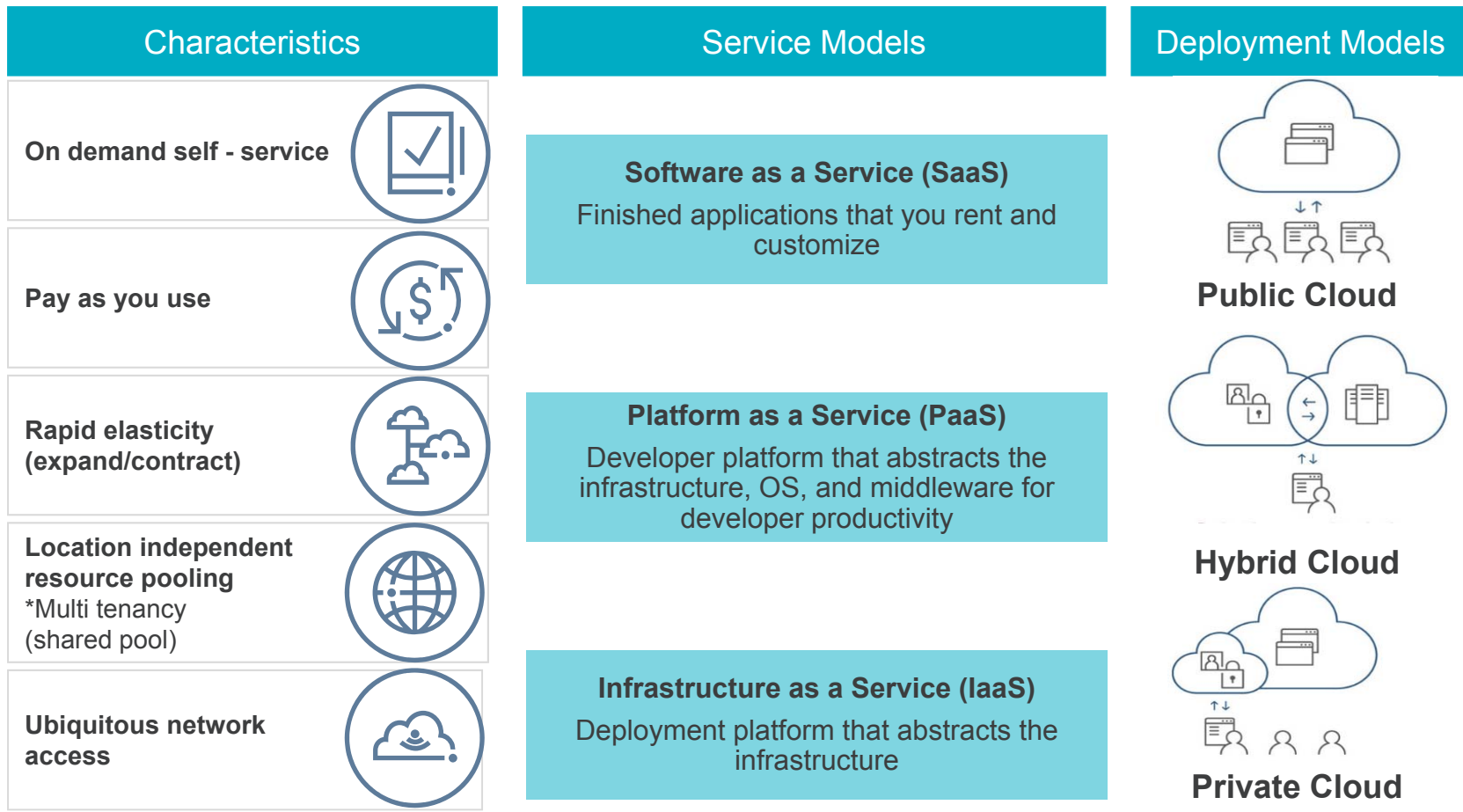


Source: [www.wikipedia.com](http://www.wikipedia.com)

Source: Forrester Research, Inc.

# MULTIPLE MODELS OF CLOUD COMPUTING

Cloud computing is a model for enabling on - demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction OR simply, “IT runs over the internet instead of installing hardware and software yourself.”



# CLOUD USAGE – HOW CAN IT HELP BUSINESSES?

## (1/2)



Allowing High Variable Demand - Elastic nature of the infrastructure to rapidly allocate and de-allocate massively scalable resources to business services on demand



Decoupling of the business service from the infrastructure needed to run it (virtualization)



Flexibility to choose multiple vendors that provide reliable and scalable business services, development environments, and infrastructure that can be leveraged out of the box and billed on a metered basis—with no long term contracts



Reaching Geographically Dispersed Users



Consolidating Company IT



# CLOUD USAGE – HOW CAN IT HELP BUSINESSES? (2/2)



Planning for Disaster Recovery



Reduced costs due to operational efficiencies, and more rapid deployment of new business services



Operational Expertise – Patch Management, Version Updates, Data Security Management



Cost allocation flexibility for customers wanting to move CapEx into OpEx

# MARKET FORECAST

Consolidation in IaaS and PaaS

Differentiation in SaaS

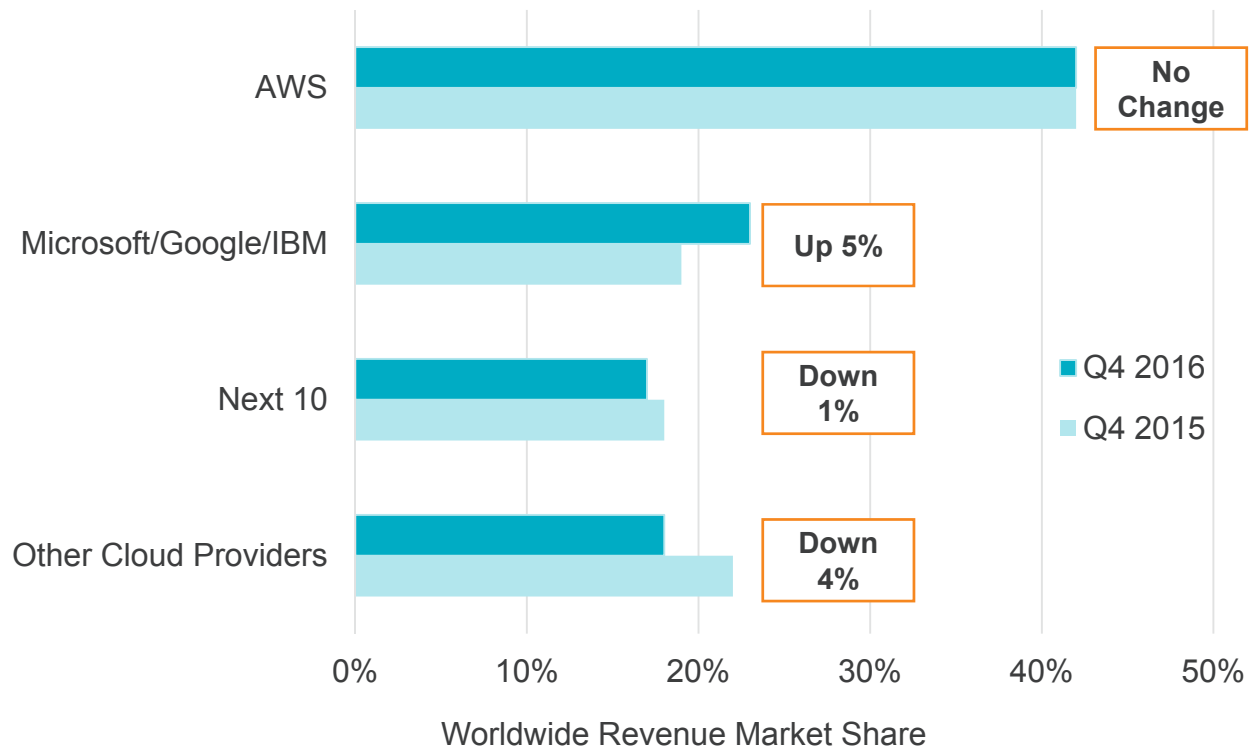
Cloud Computing Trends

# CLOUD SERVICES MARKET OUTLOOK

Cloud Service Provider market is dominated by small group in IaaS & PaaS

## The Race for Public Cloud Leadership

Change in Public IaaS & PaaS Market Shares



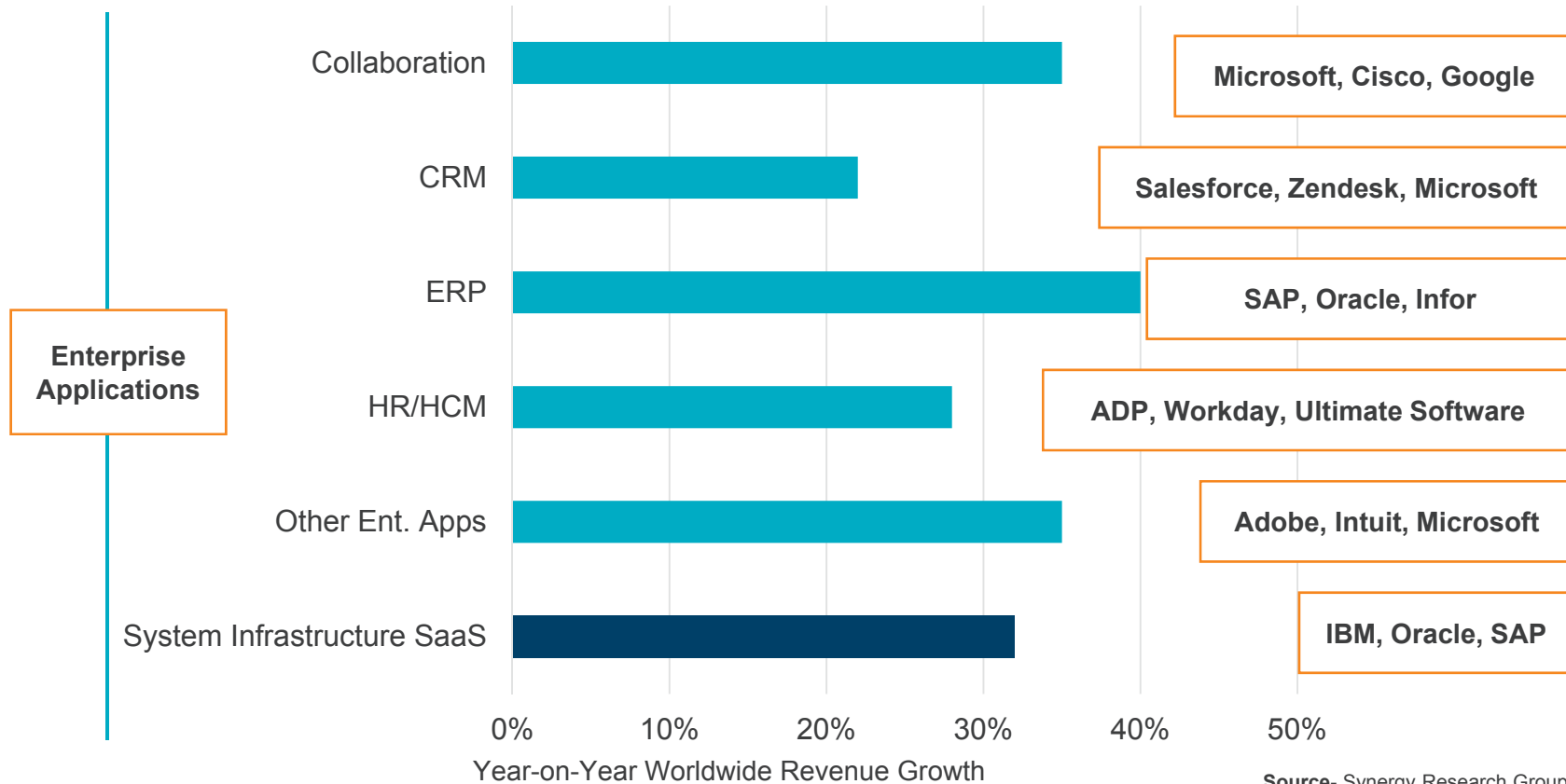
Source- Synergy Research Group

**Synergy Research Group's 2016 Review shows \$148 billion Cloud Market Growing at 25% Annually**

# CLOUD SERVICES MARKET OUTLOOK

The SaaS market grew by 32% (y-o-y) with approximately \$48 billion in revenue.

Enterprise SaaS Growth & Market Leaders – Q4 2016



Synergy Research predicts that the SaaS market will double in the next three years.

# CLOUD COMPUTING: TRENDS

2017

CIO Magazine predicts \$146 billion cloud market in 2017 with 22% growth. Similar, but more optimistic predictions come from Synergy Research.

Security, automation, and legacy applications will continue to be concerns as cloud implementation spreads. However, major barriers to operational implementation are greatly diminished.

Five metro areas account for 27% of worldwide retail and wholesale colocation revenues. (New York, London, Washington, Tokyo and Silicon Valley). The next ten largest metro markets account for another 25% of the worldwide market. Top 15 metros include six in the US, four in the EMEA region and five in the APAC region. PaaS & IaaS will continue to consolidate.

SaaS Product differentiators include security, Industry aware data lift-and-shift tools, industry aware real-time analytics, and cost containment based on specific use patterns. SaaS cloud providers will see growth in regional and specialized industry offerings.

PaaS and IaaS consolidation for efficiency of scale and SaaS diversification for service delivery will reinforce the client organization trend toward multi-sourcing.

**Cloud providers will see greater scrutiny in Privacy and Security as consumer sophistication increases.**

# CLOUD RISKS: WHAT COULD POSSIBLY GO WRONG?

Business Solutions and Technical Risks

CSA Risk Survey

Cloud Computing Visibility

# COMPLEX PROBLEMS WITH COMPLEX SOLUTIONS

## Breed complex risks

1 Unrelenting regulatory regiment--GLBA, CCAR, SEC, etc.

2 Ever-changing competitive landscape--both emerging (Apple Pay) and traditional (Mobile Branch)

3 Security and privacy concerns--DDoS, data breach, cyber security, threats and vulnerability

4 Core refresh and modernization of aging and complex IT infrastructure--buy vs. build; application rationalization; integration with legacy infrastructure

5 Cost pressures and 24x7x365--Do more with less

6 Demand for speed to market and innovation--Shift to agile methodologies

7 IT strategy "Re-Launch" and application rationalization



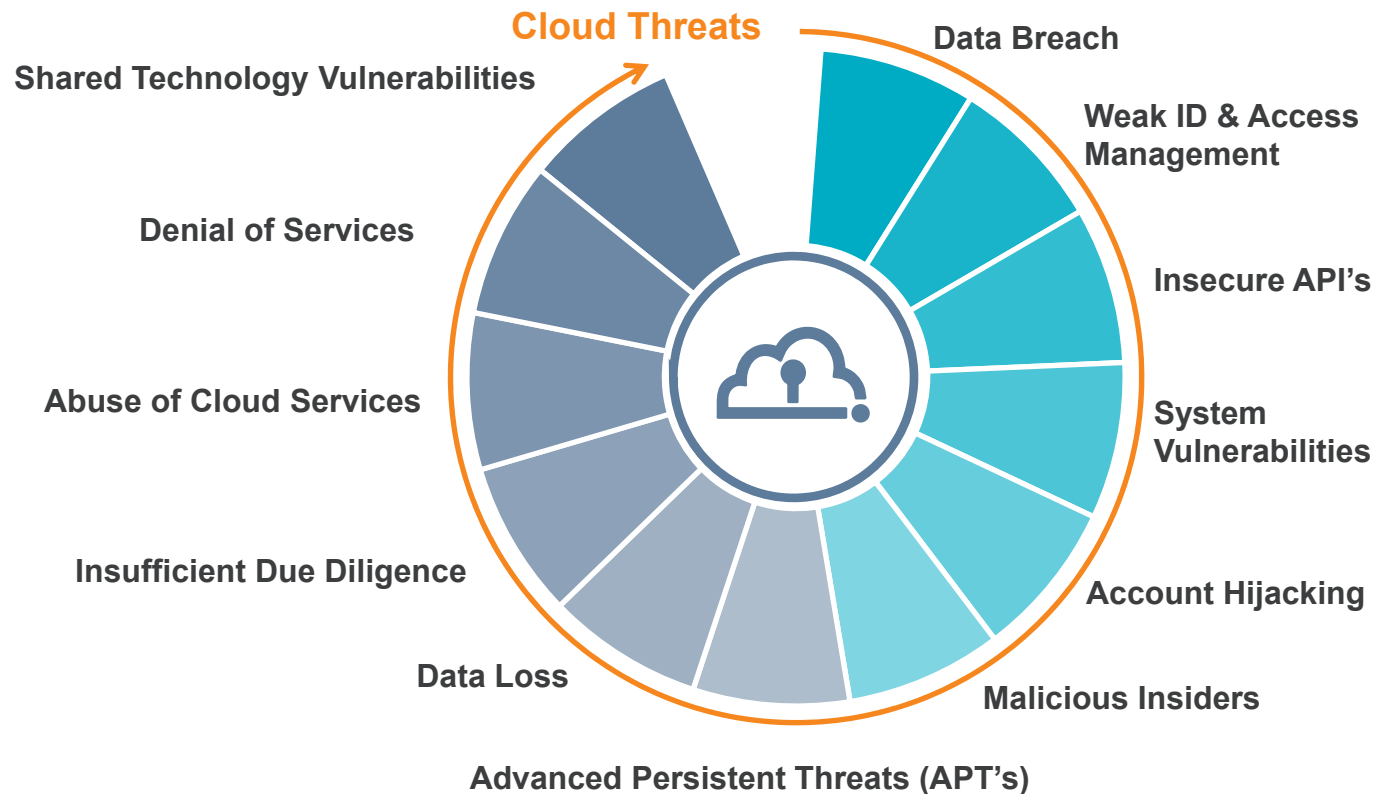
**Cloud Computing has the promise to address many of these challenges but...**

- Recognize efforts required often go beyond cloud migration / implementation
- Need to be cognizant of new complex risks and challenges down the road

# CLOUD SECURITY ALLIANCE 2016

## From the CSA Report: The Treacherous 12 – Cloud Computing Top Threats in 2016

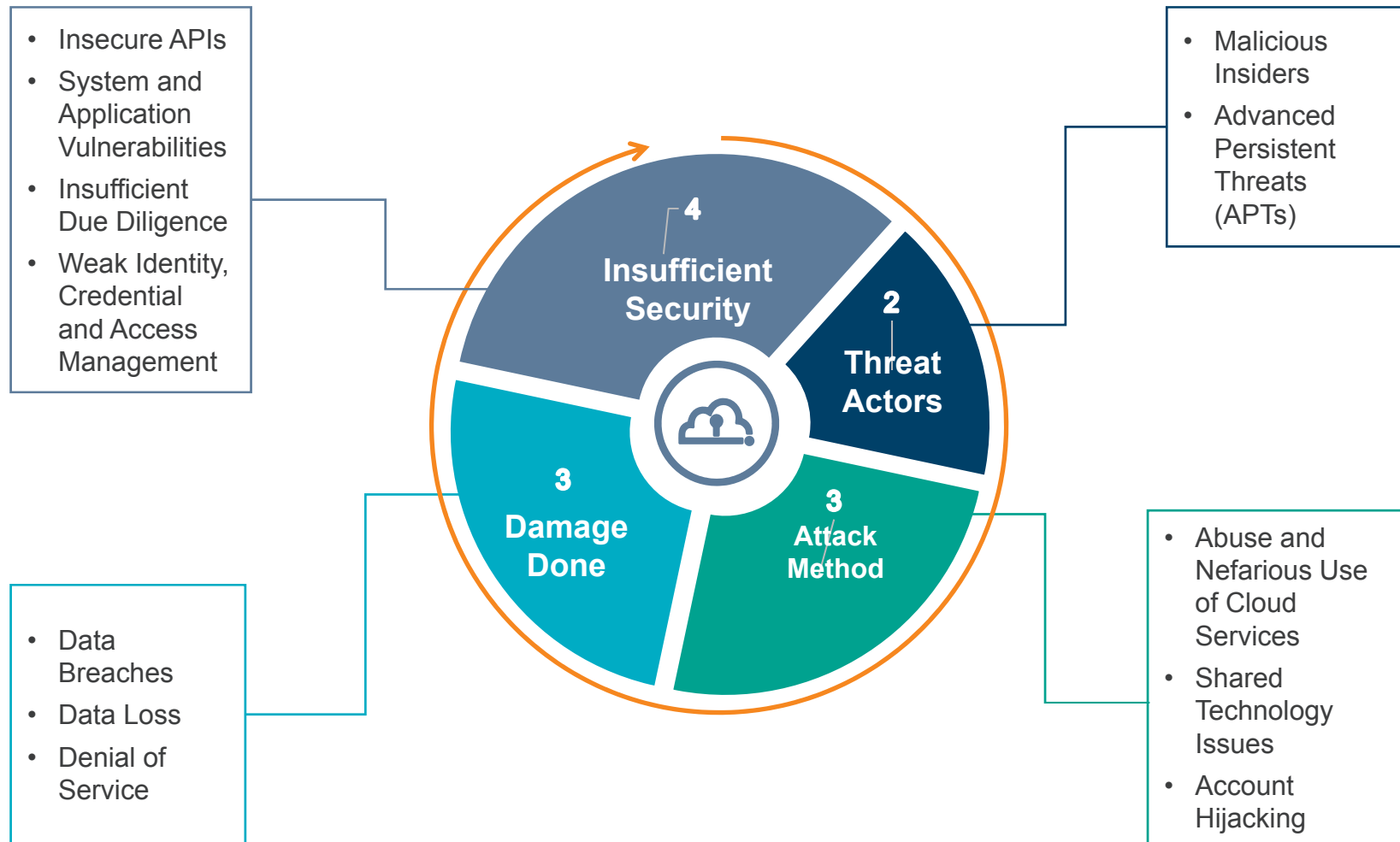
This is an unrefined listing of top responses from 271 people in an unreported number of requests.



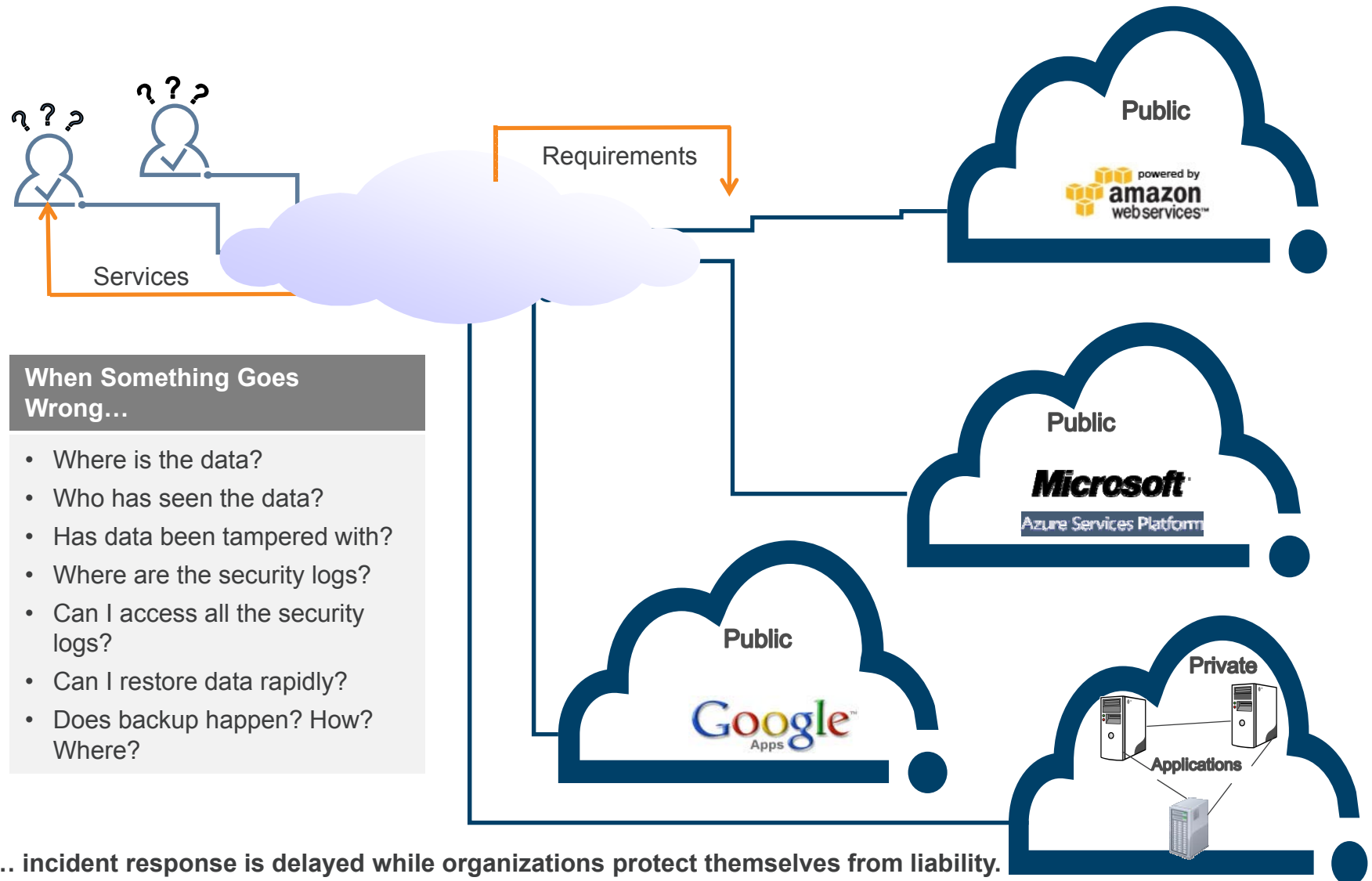


# PERCEIVED THREATS FACTORS

Four clusters tell a story of industry confusion, but real concerns



# CLOUDS ARE CLOUDY



# MANAGING CLOUD RISKS

Assessing the Cloud Strategy

Evaluating Cloud Providers

Supporting the Move to Cloud

Monitoring the Provider(s)



Dr. Gene Spafford

"When everything was done on paper, there were committees and audits and physical protections to make sure documents were protected and managed... We've got to do the same thing in an e-world... You can outsource some of the processing, but you can't outsource the responsibility."

# ASSESSING THE CLOUD STRATEGY



Validate Business Case



Risk Assessment

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## Aspects to Consider:

- Does the strategy align with the business needs?
  - Is there a clear understanding of the current state of applications and data that is being moved to the Cloud?
  - Who is going to manage the relationship with the Provider?
  - How is the data protected?
  - Are the responsibilities between your Company and the Provider clearly defined?
  - How will this move affect your DRP?
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# EVALUATING CLOUD PROVIDERS



Vendor Due Diligence



Data Protection



Third Party Management



Backup / DR Implications

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## Aspects to Consider:

- Where do you store my data?
- How closely aligned are your Company's risks and controls aligned with the Provider's?
- How do you ensure encryption and data integrity?
- What are the conditions under which third parties, including government agencies, might have access to my data?
- Do you have any DR and backup planning documents for review?
- What service-level guarantee can you offer under DR conditions

# EVALUATING CLOUD PROVIDERS



Service Level Agreements



Incident Response



Auditability



Application Functionality



Identity and Access Mgmt



Service Transition  
Planning

## Aspects to Consider:

- Provide availability historical data.
- Can you accommodate timely forensic investigation (e.g., eDiscovery)?
- Can you integrate directly with my directories and how?
- What is your procedure in handling a data breach?
- What will the cloud vendor will deliver at the end of the service period?

# ASSESSING THE CLOUD STRATEGY



Governance



Reporting/Monitoring  
Roles

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## Aspects to Consider:

- How will the relationship with the Provider be managed?
  - Who in your Company will confirm the accuracy of the invoices?
  - Who is responsible for monitoring SLAs?
  - How are control requirements being monitored?
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# CLOUD SECURITY OFFERINGS

# PROTIVITI, HELPING ENTERPRISES WITH SECURE CLOUD ADOPTION



## Strategy

- Cloud Model Determination
- Operations and Service Utilization Model
- Focus on Customer Experience



## Enterprise Architecture

- Planning and Alignment
- Scalability and Flexibility
- Future Enablement and Tech Refresh
- Infrastructure Requirements



## Service Management

- Model Selection
- Integration Management
- Legacy Service Considerations
- Disparate Platform Management



## Vendor Governance Measurement

- Vendor Selection
- Benchmarking
- Responsibility Definition
- SLA Monitoring & Reporting



## Program / Project Management

- Migration Strategy
- Implementation Planning and Execution



## Business Continuity Planning

- Backup / Replication
- Technology Requirements
- Recovery Objective Alignment



## Measurement & Monitoring

- Performance Mgmt
- Capacity Mgmt
- Notification and Escalation

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