

A decorative graphic consisting of multiple parallel, wavy lines in various colors including purple, blue, orange, and green, flowing from the left side of the page towards the right, creating a sense of movement and connectivity.

Data Protection in Transition to the Cloud

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About the SNIA DPCO Committee

- This tutorial has been developed, reviewed and approved by members of the Data Protection and Capacity Optimization (DPCO) Committee which any SNIA member can join for free
- The mission of the DPCO is to foster the growth and success of the market for data protection and capacity optimization technologies
 - ◆ Online DPCO Knowledge Base: www.snia.org/dpco/knowledge
 - ◆ Online Product Selection Guide: <http://sniadataprotectionguide.org>
- 2015 goals include educating the vendor and user communities, market outreach, and advocacy and support of any technical work associated with data protection and capacity optimization



Check out these **SNIA-DPCO Tutorials** at www.snia.org/education/tutorials

- **Intro to Data Protection: Backup to Tape, Disk and Beyond**
- **Trends in Data Protection**
- **Advanced Data Reduction Concepts**

Organizations of all types and sizes are moving many, but usually not all, applications and data to public and private clouds, and the hybrid environments thus created are an increasing challenge for those responsible for data protection. There are many new services available in the cloud for backup and disaster recovery that can help, but IT managers want to avoid setting up separate data protection procedures for each of the parts of their hybrid environments.

Topics will include:

- Trends in cloud usage and the impact on data protection
- New services available for backup and disaster recovery
- Benefits of managing data protection in today's cloud environment

- Cloud: Defined
- Research & Trends
- Deployment Models & Challenges
- Summary
- Questions to Ask you CSP for Data Protection

➤ SNIA Dictionary

- ◆ [Cloud] A set of data processing components that can be automatically provisioned by consumers, over a network and that provide secure multi-tenancy

➤ Wikipedia

- ◆ Cloud computing, or something being in the cloud, is an expression used to describe a variety of different types of computing concepts that involve a large number of computers connected through a real-time communication network such as the Internet

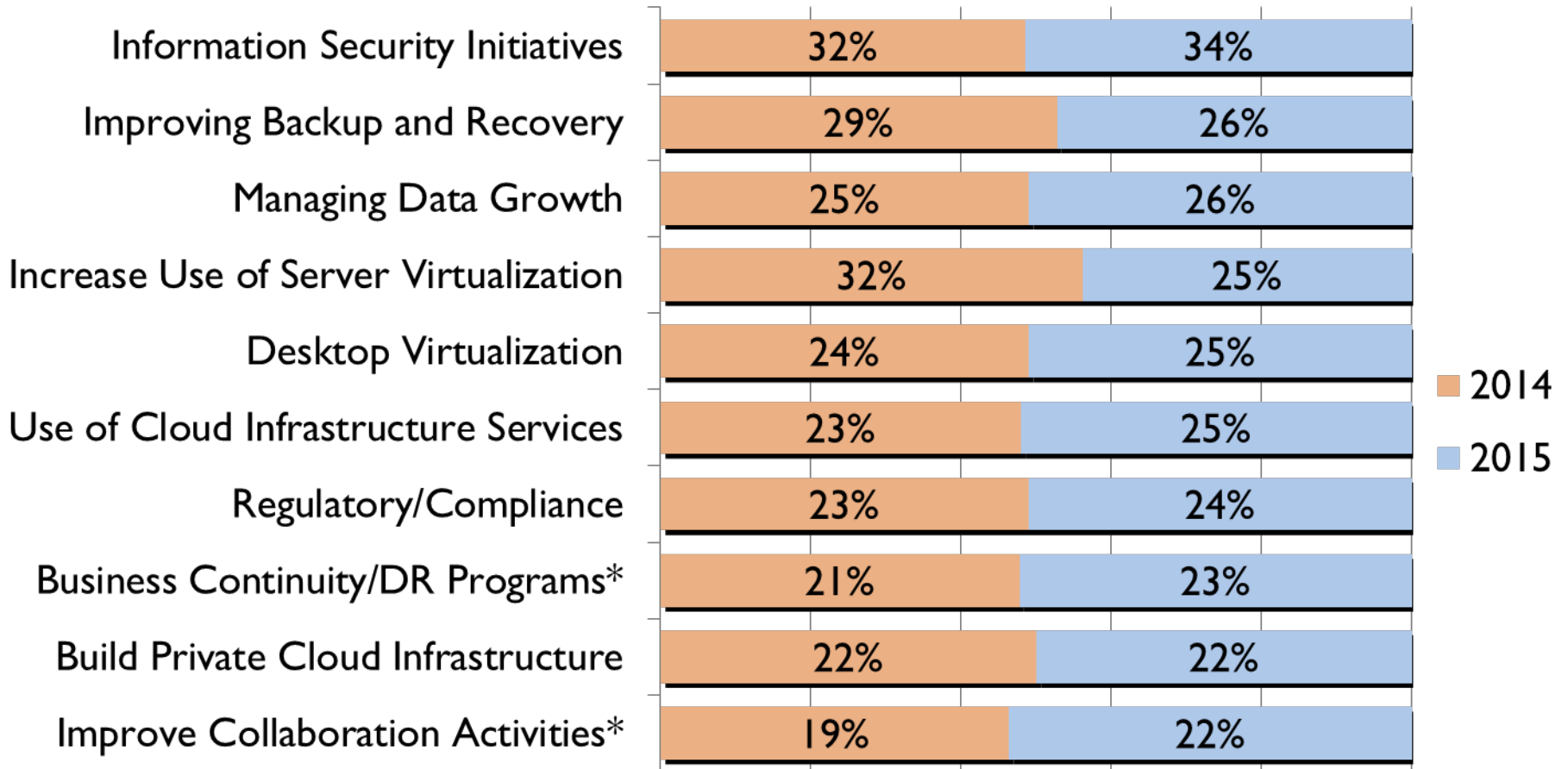
➤ Cloud Computing for Dummies

- ◆ The “cloud” in cloud computing can be defined as the set of hardware, networks, storage, services, and interfaces that combine to deliver aspects of computing as a service



Research & Trends

Top of Mind: Key IT Priorities



Source: Enterprise Strategy Group, 2014, 2015 IT Spending Intentions Survey

* Not in 2014 Top 10

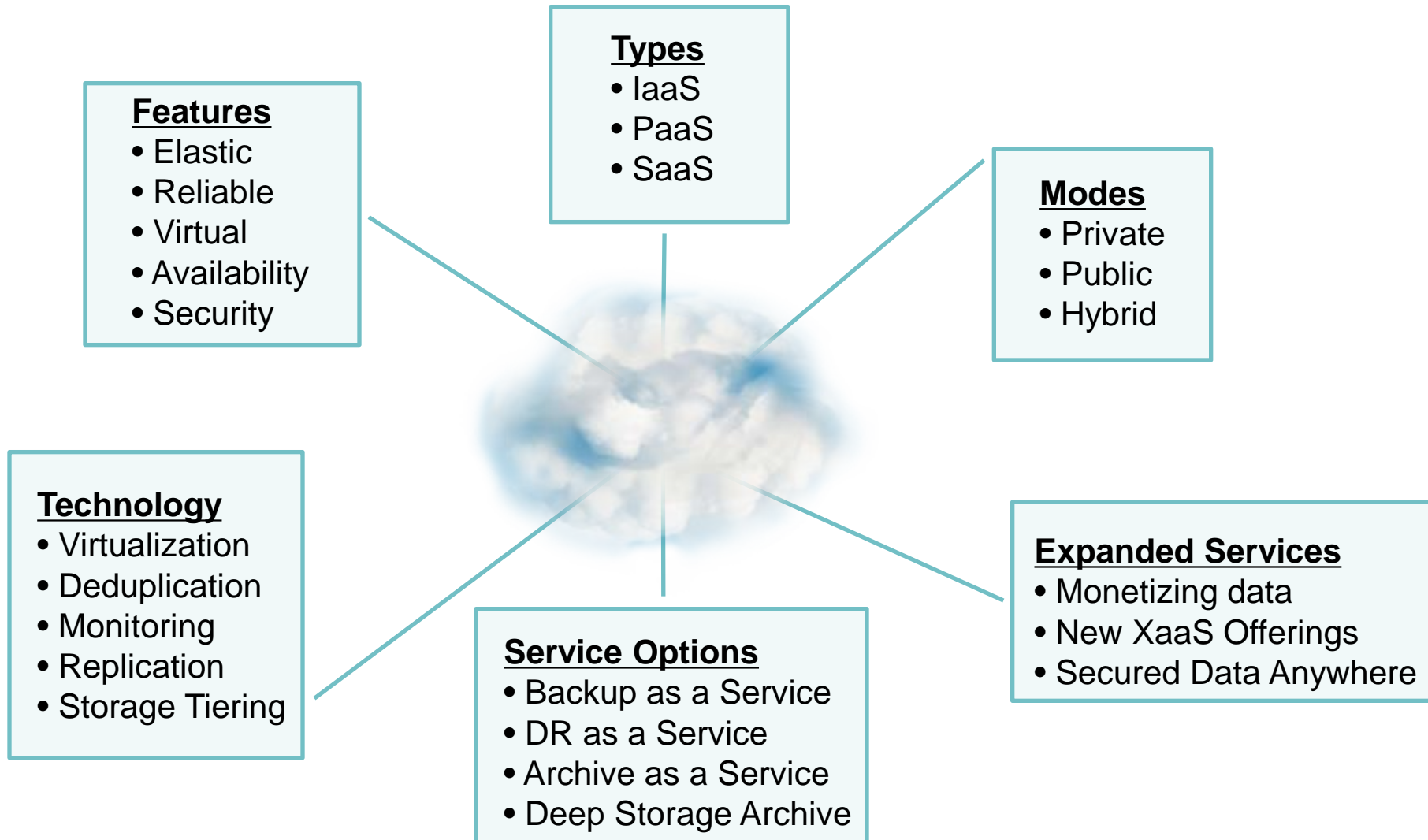
- ◆ 2008 - 2011: Top three barriers to entry
 - ◆ Security, Access and Control
- ◆ Cloud solutions have matured
- ◆ Many concerns relieved
- ◆ Driving nearly 90%* who plan, or are using cloud today

Source: Enterprise Strategy Group, 2014 IT Spending Intentions Survey

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Deployment Models & Challenges

Main Aspects of Cloud



Source: EU CORDIS

*aaS Types: Defined

- ◆ Software as a Service (SaaS)
 - ◆ Delivery over a network, on demand, of the use of an application

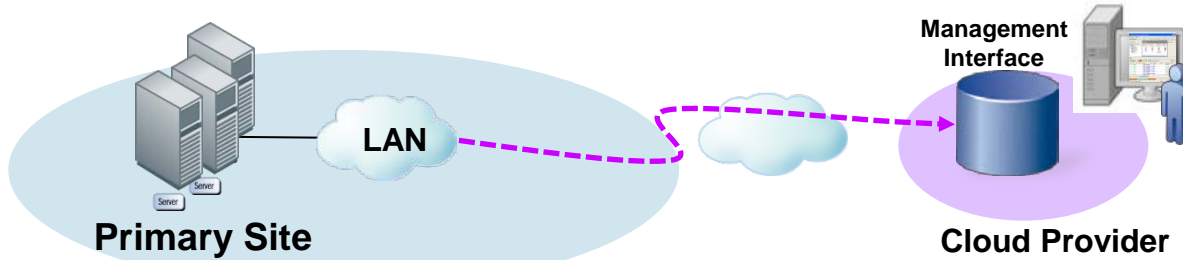
- ◆ Infrastructure as a Service (IaaS)
 - ◆ Delivery over a network of an appropriately configured virtual computing environment, based on a request for a given service level

- ◆ Platform as a Service (PaaS)
 - ◆ Delivery over a network of a virtualized programming environment, consisting of an application deployment stack based on virtual computing environment; typically PaaS is based on IaaS, and is either self-provisioned or provisionless, and is billed based on consumption

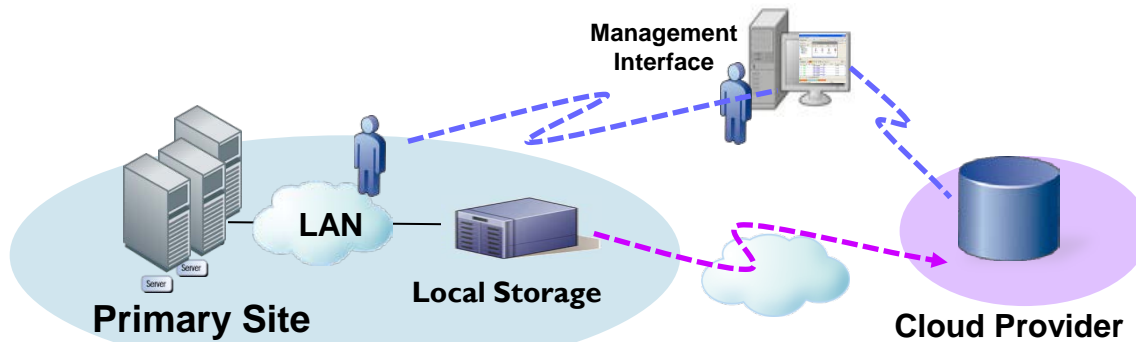
*aaS Types: Simple Overview

- ❖ **Software as a Service (SaaS)**
 - ◆ HR Solutions
 - ◆ CRM
 - ◆ Cloud backup solutions
- ❖ **Infrastructure as a Service (IaaS)**
 - ◆ Foundation to run your system or solution
 - ◆ Hardware, network, firewalls, etc.
 - ◆ Disaster Recovery as a Service
- ❖ **Platform as a Service (PaaS)**
 - ◆ An architecture on which to build your applications/services

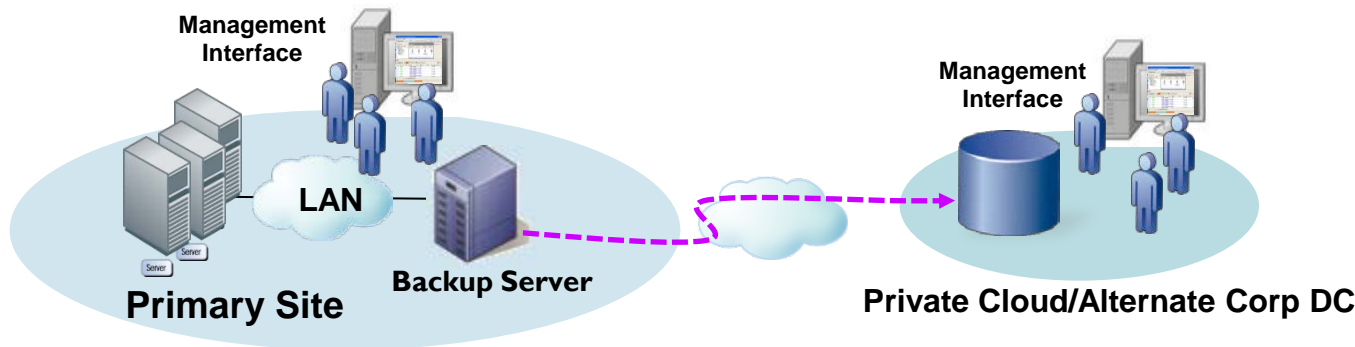
Deployment Models for Backup



Public Cloud SaaS:
Secure &
Multi-tenant



Hybrid Cloud:
Secure &
Multi-tenant



Private Cloud:
Secure &
Single Tenant

➤ Public Cloud

- ◆ 100% connected cloud solution, e.g., SaaS
- ◆ Typically equipment is not on premise
- ◆ Secure and Multi-tenant

➤ Hybrid Cloud

- ◆ On and off premise assets
- ◆ In-house servers and storage + cloud resources
- ◆ Both public cloud and private cloud

➤ Private Cloud

- ◆ Either owned or rented
- ◆ Only 1 tenant

Considerations

- ◆ Key considerations for choosing a deployment model
- ◆ What are the benefits?
- ◆ Questions to ask a CSP for data protection

Choosing a Deployment Model

◆ Key considerations

- ◆ Total amount of data to protect
- ◆ RTO / RPO
- ◆ Is your data already in the cloud?
- ◆ Frequency of restores/recoveries
- ◆ Limited or no IT staff/budget

Cloud Based Data Protection: Benefits

- Replication based data protection
 - ◆ Efficiently use resources
 - ◆ Transfer data incrementally

- Eliminate costs and complexities
 - ◆ Reduce or eliminate tape

- Security
 - ◆ Data encryption at rest and in flight
 - ◆ Securely store data offsite
 - ◆ Ubiquitous data access

Cloud Based Data Protection: Benefits (Cont.)

- ◆ Limit Exposure and Reduce Risk
 - ◆ Hybrid Cloud for faster recovery
 - ◆ Meet offsite compliance faster over legacy solutions

- ◆ CSP: Extends your IT environment
 - ◆ Interview CSP as though a badged employee
 - ◆ Documented Process and Procedures
 - > Access
 - > Upgrades
 - > Security breaches
 - > Communication...

Cloud Based Data Protection: Benefits (Cont.)

❖ Cost of ownership

- ◆ Compare existing solution vs. Proposed Cloud Solution
- ◆ Amortize acquisition costs over three years

❖ Recovery

- ◆ File recovery
 - › Caching device (local), provides benefit of fast recoveries
- ◆ System recovery
 - › Recovery at the volume or system level
- ◆ Operational recovery
 - › Recovery from a disaster: business continuity plan
- ◆ RTO defines best of breed options

Cost Comparison (Example)

Cloud Data Protection Solution (Data to Protect=10TB, 10% Annual Growth)				
	Year 1	Year 2	Year 3	Cost/Month/3 Years
Cloud Backup Service	48,000	48,000	48,000	\$4,000/mo
Hybrid Appliance w/SW	150,000	0	0	4,200/mo
HW Maintenance	15,000	15,000	15,000	\$1,250/mo
SW Maintenance	18,000	18,000	18,000	\$1,500/mo
			Total Monthly Cost	\$10,950/mo
			Total Solution Cost	\$394,200

Traditional HW/SW Backup Solutions (Data to Protect=10TB, 10% Annual Growth)				
	Year 1	Year 2	Year 3	Cost/Month/3 Years
SW Acquisition Costs	145,000	0	0	\$4,025/mo
Software Maintenance	30,450	30,450	30,450	\$2,540/mo
Tape/D2D HW costs	230,000	12,000	12,000	\$7,055/mo
Maintenance	23,000	23,000	23,000	\$1,900/mo
			Total Monthly Cost	\$15,520/mo
			Total Solution Cost	\$558,720

Summary: Cloud Data Protection

- **Cloud enables IT agility**
 - ◆ Do more with what you have today
 - ◆ Cloud + Data Protection = Perfect Storm
 - ◆ From data protection to disaster recovery
 - ◆ Ubiquitous cloud storage access
- **Optimize IT staff resources**
 - ◆ Set it and forget it protection
 - ◆ Increase IT bandwidth focus on more projects

Summary (Cont.)

➤ Offset CAPEX with OPEX

- ◆ Reduce onsite footprint (CAPEX)
- ◆ Move some operations to cloud (OPEX)
- ◆ Lower total cost of ownership

➤ Maintain better control

- ◆ Minimize local copies for fast recovery
- ◆ Actively Archive Data from primary to cloud
- ◆ Reduce physical onsite storage requirement

Questions to ask your CSP for Data Protection

- ◆ Cloud Provider 1 versus Cloud Provider 2
 - ◆ Security
 - › Do you support Encryption?
 - “In-flight” and “at-rest”
 - › How is Key Management (Encryption) handled?
 - › Is there a back-door to access the data?
 - ◆ Physical Access
 - ◆ Data Communication
 - › What are the options for data being transferred?
 - ◆ What are the options for data “seeding”
 - ◆ Data Privacy
 - › How do you ensure my data remains private?
 - ◆ Request a Proof of Concept (POC)
 - ◆ What is the liability that the CSP accepts?

➤ Cloud, Defined

- ◆ SNIA
 - > <http://snia.org/education/dictionary/c>
- ◆ Wikipedia
 - > http://en.wikipedia.org/wiki/Cloud_Technology
- ◆ Cloud Computing for Dummies
 - > <http://www.dummies.com/how-to/content/what-is-cloud-computing.html>

➤ Research and Trends

- ◆ Source: Enterprise Strategy Group
- ◆ 2015 Spending Intentions Report
- ◆ <http://www.esg-global.com/research-reports/2015-it-spending-intentions-survey/>

Source Citations (Cont.)

➤ Main Aspects to Cloud

- ◆ Source: EU Commissioned Research Report
- ◆ “The future of cloud computing”
- ◆ <http://cordis.europa.eu/fp7/ict/ssai/docs/cloud-report-final.pdf>

The SNIA Education Committee thanks the following individuals for their contributions to this Tutorial:

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