Cloud Computing

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Do you Use the Cloud?

Outline

- What is Cloud Computing
- Concept of Cloud Computing
- Use of Cloud Computing in corporate
- Cloud Characteristics
- Cloud Terminologies
- Cloud Service Models
- Cloud Deployment Models
- Conclusion

Cloud computing

- coined for what happens when applications and services are moved into the internet
- Not sudden
  - computer systems remote share
- companies delivering services from the cloud
  - • Google — email access, document applications, text translations, maps, web analytics, and much more.
  - • Microsoft —Office 365 online service that allows for content and business intelligence tools to be moved into the cloud, and Microsoft currently makes its office applications available in a cloud.

High-Availability

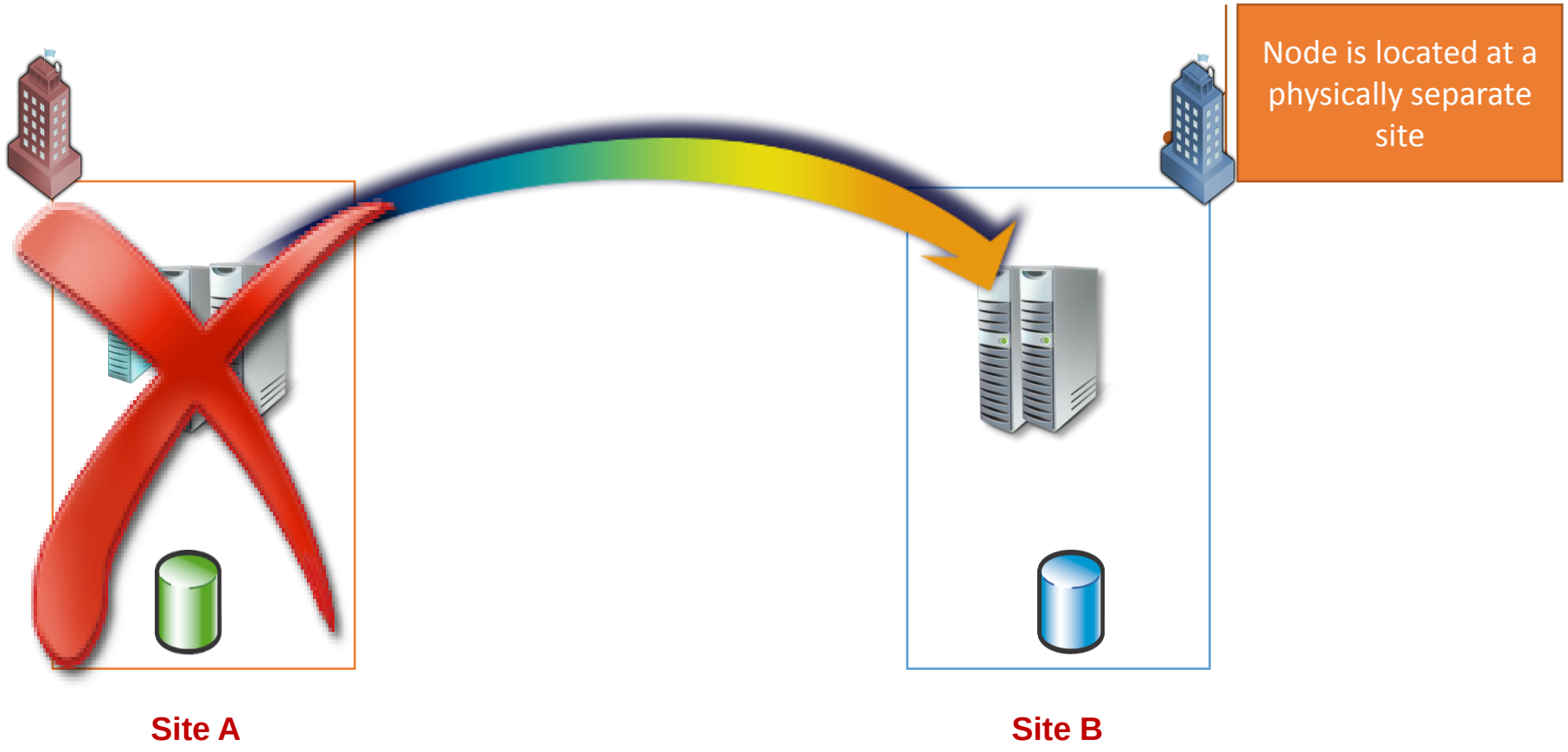
High-Availability allows applications to maintain service availability by moving them between nodes in a cluster

Site A

But what if there is a catastrophic event and you lose the entire datacenter?

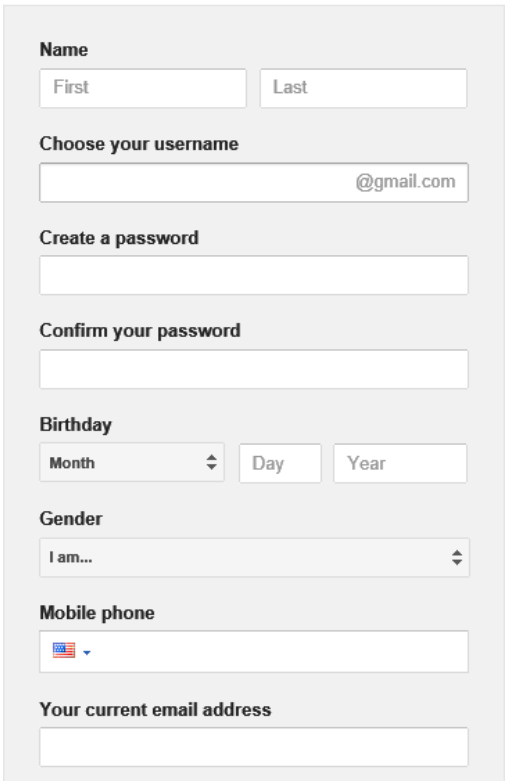
Disaster Recovery

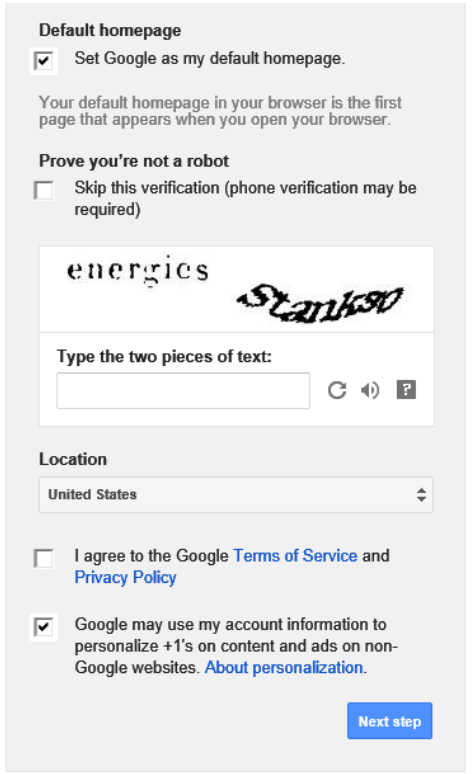
Disaster Recovery (DR) allows applications to maintain service availability by moving them to a cluster node in a different physical location



The Cloud Requires

- An Internet connection
- An account - Created with a user name and a password
- Agree to Terms





So what is the cloud?

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Computing and software resources that are delivered on demand, as service.

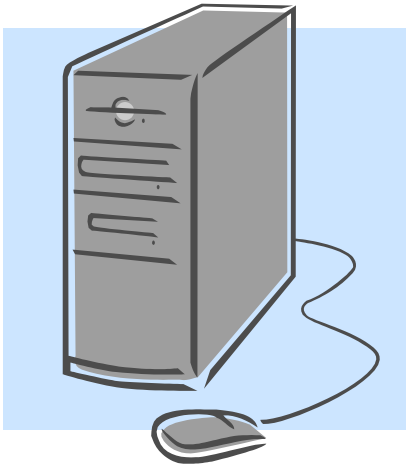
(2013, January) A Walk in the Clouds. *Cloud Computing, CDW-G Reference Guide.,* 3-5.

From ground
to cloud

The Back Story

Computer Storage

- Computers have internal or hard drive storage(C: Drive)
- CPU has a drive for storing programs, documents, pictures, videos, presentations, etc…



Standard Computer Tower or Central Processing Unit (CPU)

Inside the Computer

Internal Storage

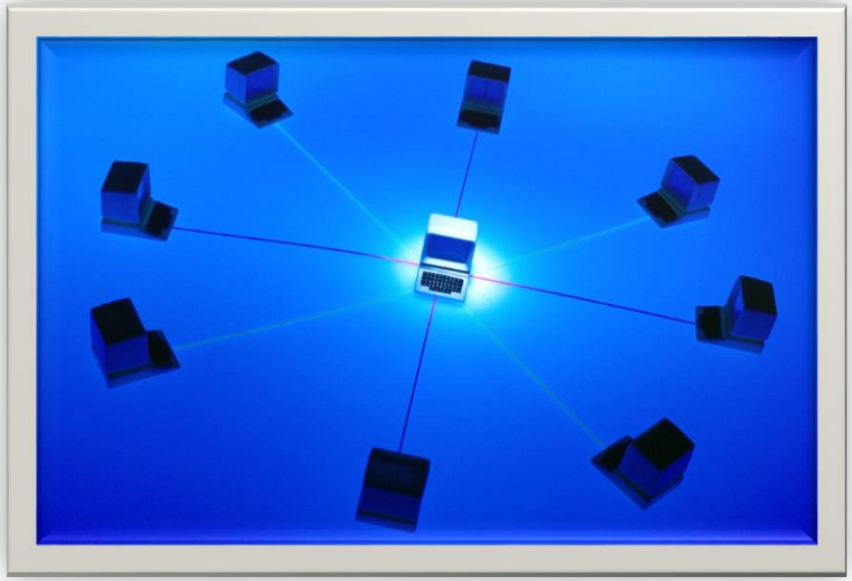
- Content is stored on THAT computer
- To use content must return to THAT computer
- Cannot access this content from another device or computer

Programs

- Purchase programs
- Load to the computer
- Each computer would need the program loaded and stored on the internal drive

Networked Storage

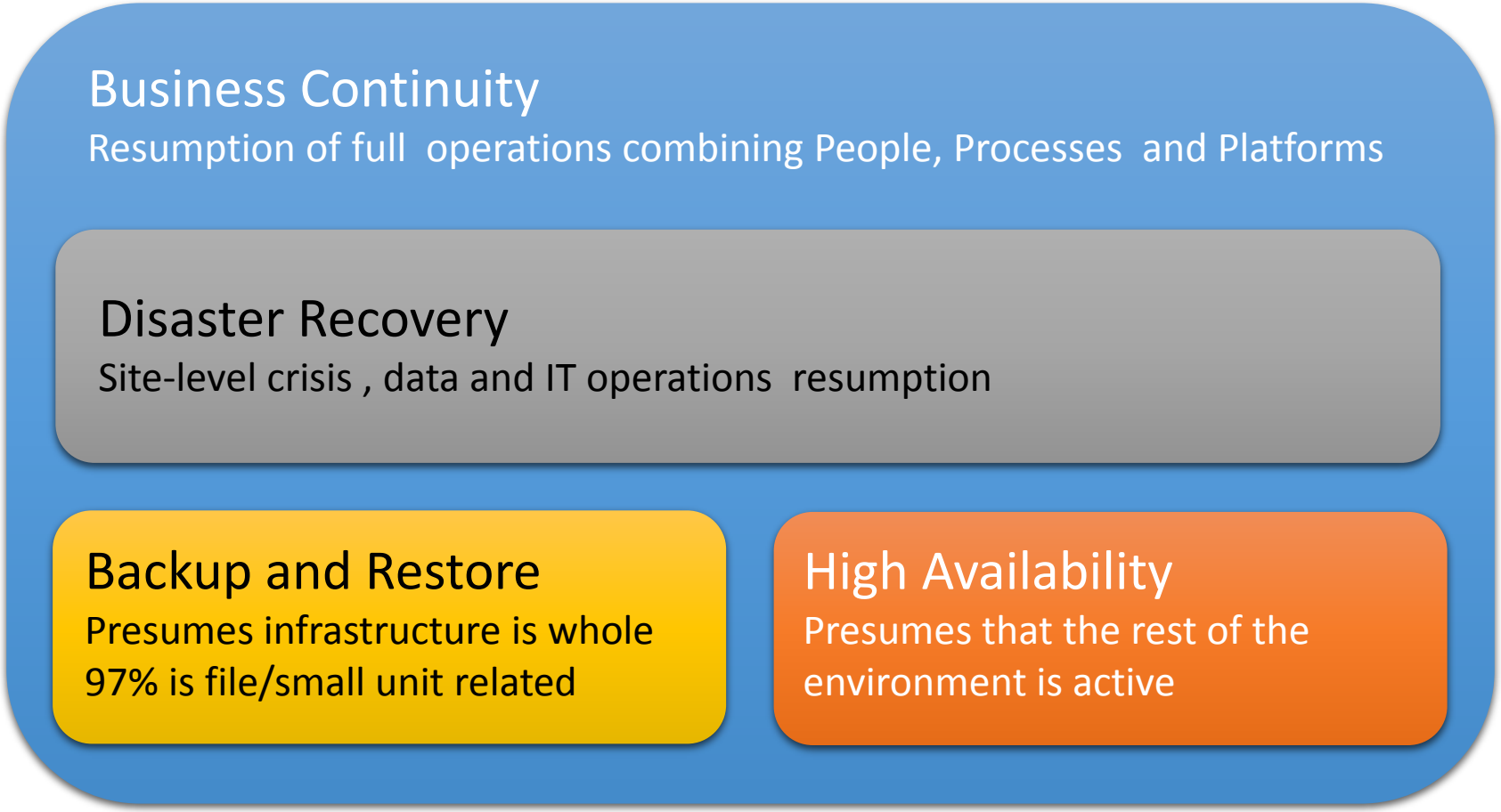
- Multiple work stations talk to one unit that stores information and data.
- Data is not saved to the C: drive, but to a network drive
- Can retrieve the data stored to the network from any of the connected workstations.



Cloud Storage

- Create an Account – User name and password
- Content lives with the account in the cloud
- Log onto any computer with Wi-Fi to find your content

Why Cloud ???


Business Continuity
Resumption of full operations combining People, Processes and Platforms
Disaster Recovery
Site-level crisis , data and IT operations resumption
Backup and Restore
Presumes infrastructure is whole
97% is file/small unit related
High Availability
Presumes that the rest of the environment is active

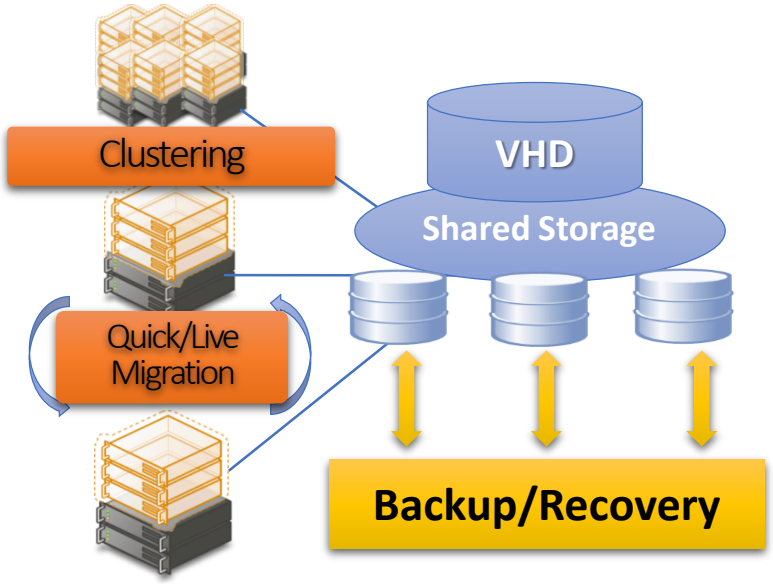
Business Continuity

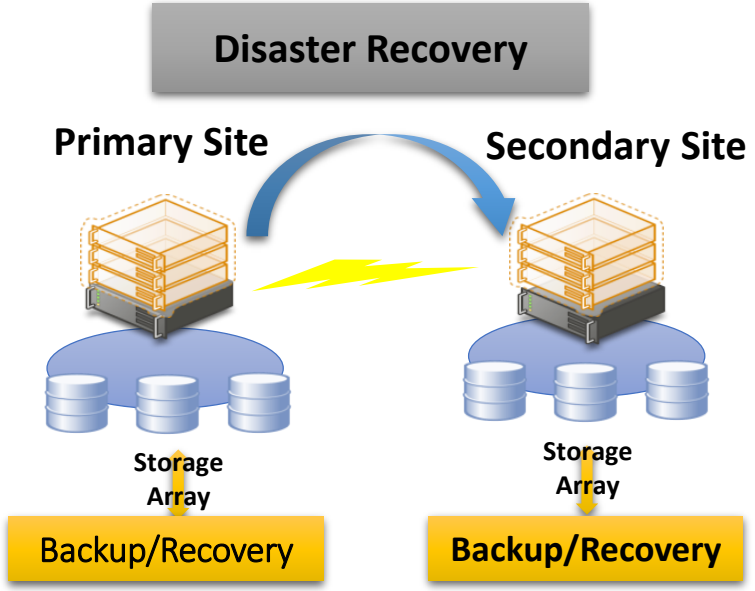
Business Continuity

- High Availability
- Disaster Recovery
- Backup and Recovery

Virtualization reduces BC costs and minimizes business downtime by:

- increasing the availability of infrastructure
- extending protection to more applications
- simplifying backups, recovery and DR testing





Some Terminology

- RTO – Recovery Time Objective
  - How much data you can afford to lose…
- RPO – Recovery Point Objective
  - How long you can afford to be down…
- Hot site
  - Servers up and operational at remote site at all times.
- Warm site
  - Servers pre-provisioned at remote site. Tasks to complete for failover to occur.
- Cold site
  - Empty site and servers on retainer awaiting DR event.

Cloud characteristics

- Shared Infrastructure
  - virtualized software model,
  - sharing of physical services, storage
  - Good networking capabilities
  - It should be most of the available infrastructure
- Dynamic Provisioning
  - automatically using software automation
  - High levels of reliability and security

Cont…

- Network Access
  - Needs to be accessed across the internet
  - broad range of devices such as PCs, laptops, and mobile devices

- Managed Metering
  - provide reporting and billing information

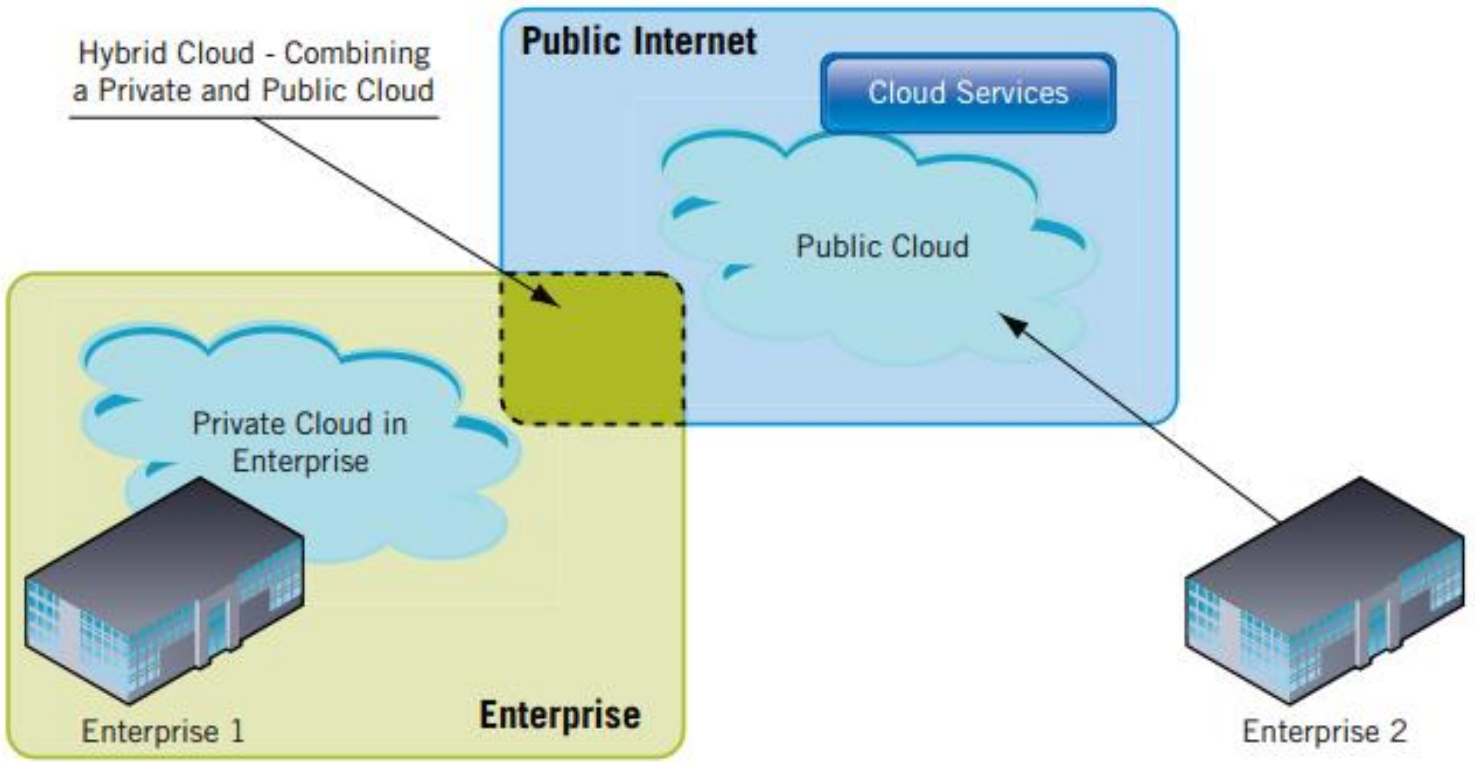
Service Models

- Software as a Service (SaaS)
  - Consumers purchase the ability to access and use an application or service that is hosted in the cloud.
- Platform as a Service (PaaS)
  - Consumers purchase access to the platforms, enabling them to deploy their own software and applications in the cloud.
- Infrastructure as a Service (IaaS)
  - Consumers control and manage the systems in terms of the operating systems, applications, storage, and network connectivity, but do not themselves control the cloud infrastructure

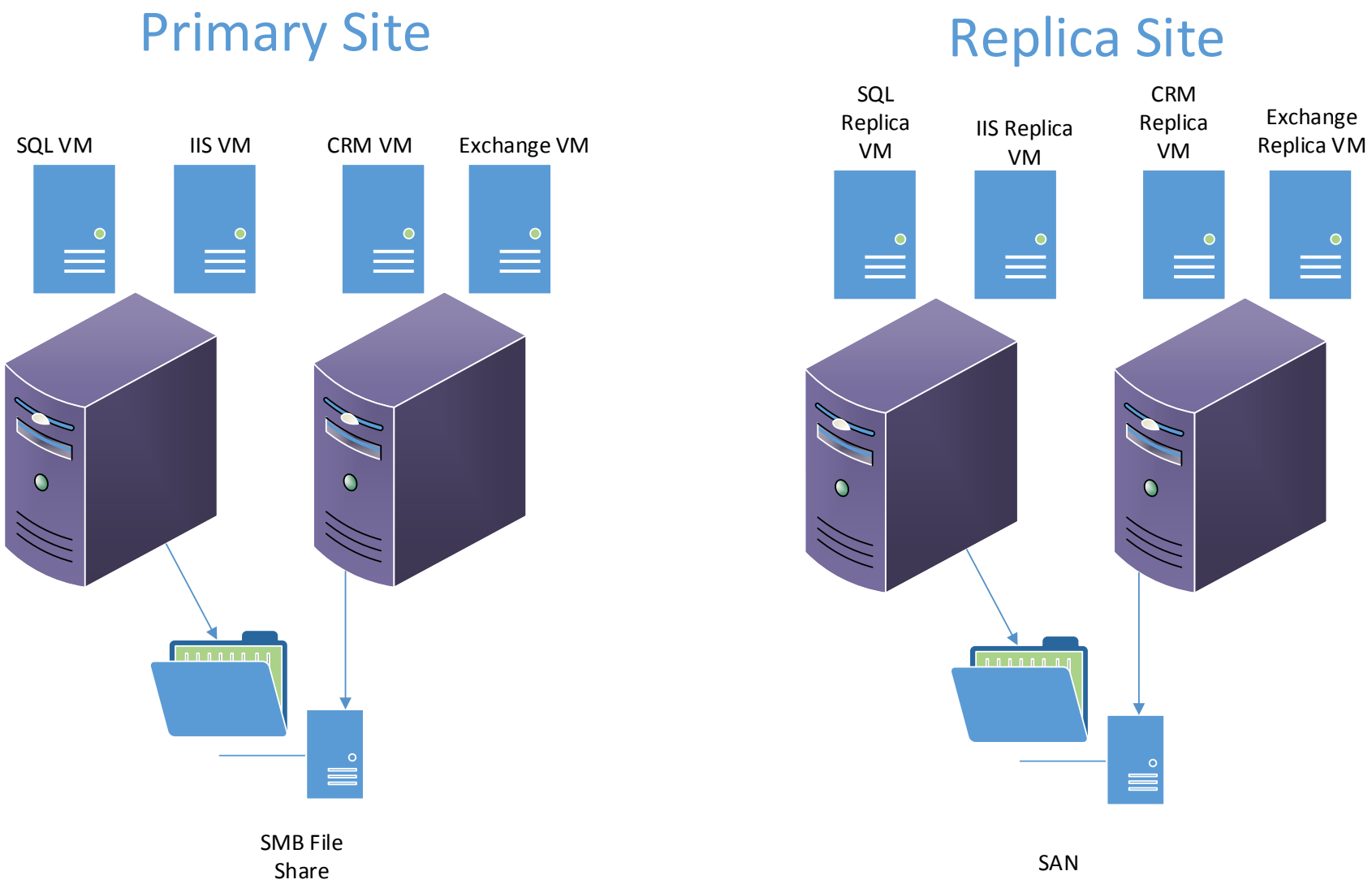
Deployment Models

- **Private Cloud** — The cloud infrastructure has been deployed, and is maintained and operated for a specific organization
- **Community Cloud** — The cloud infrastructure is shared among a number of organizations with similar interests and requirements
- **Public Cloud** — The cloud infrastructure is available to the public on a commercial basis by a cloud service provider.
- **Hybrid Cloud** — The cloud infrastructure consists of a number of clouds of any type, but the clouds have the ability through their interfaces to allow data and/or applications to be moved from one cloud to another

Cont..


Hybrid Cloud - Combining
a Private and Public Cloud
Public Internet
Cloud Services
Public Cloud
Private Cloud in
Enterprise
Enterprise 1
Enterprise
Enterprise 2

Enterprise Scenario Overview



Benefits

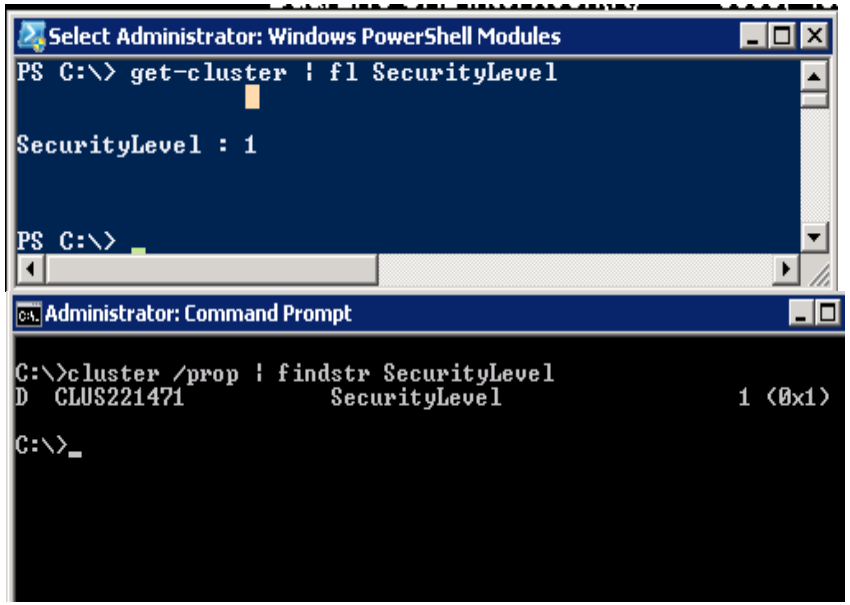
- Cost Savings
- Scalability/Flexibility
- Reliability
- Maintenance
- Mobile Accessible

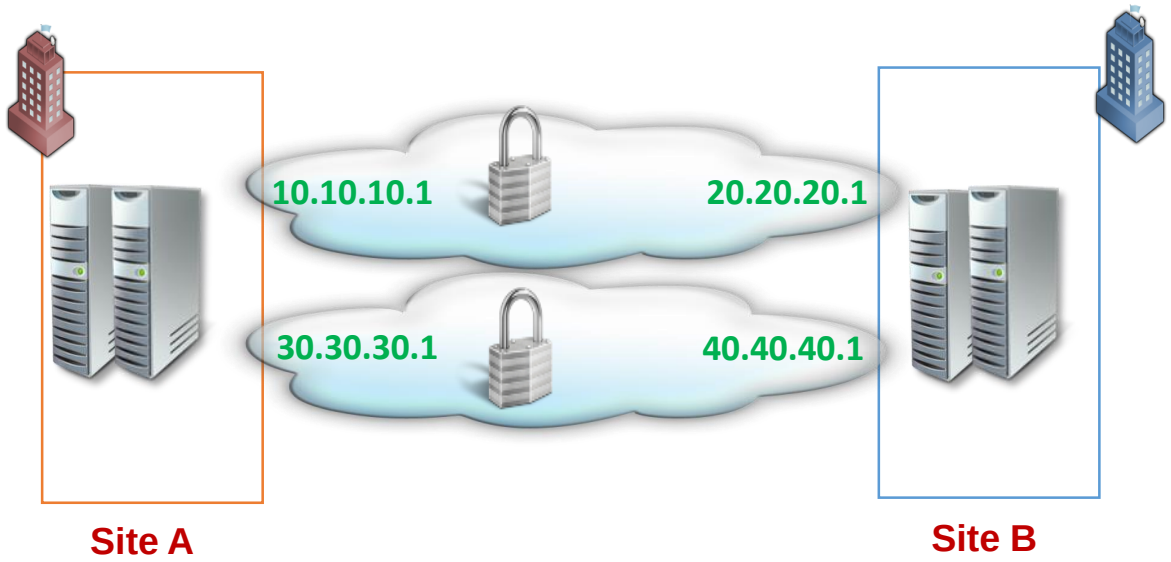
Challenges

- Security and Privacy
- Lack of Standards
- Continuously Evolving
- Compliance Concerns

Security over the WAN

- Encrypt inter-node communication
- Trade-off security versus performance
  - 0 = clear text
  - 1 = signed (default)
  - 2 = encrypted





Communications in the Cloud

- type of service and the device(s) being used to access it
- require web page, or could involve an application

  - **Automation** - How can we keep up with the rapid network changes?
  - **Scalability** - How can we deal with large scale data centers and networks?
  - **Management** - How can we manage these networks?

Networking Has to Change

- New **infrastructure**: For example, everything is becoming virtualized, infrastructure is becoming programmable, and servers and applications have mobility
- New **applications**: For example, data-intensive analytics, parallel and clustered processing, telemedicine, remote experts, and community cloud services
- New **access**: For example, mobile device-based access to everything and virtual desktops
- New **traffic**: For example, predominantly server-to-server traffic patterns and location-independent endpoints on both sides of a service or transaction