CompTIA Network+ Exam N10-008

Lesson 20

Summarizing Cloud and Datacenter Architecture

Objectives

- Summarize cloud concepts
- Explain virtualization and storage area network technologies
- Explain datacenter network architecture

Lesson 20

Topic 20A

Summarize Cloud Concepts

Cloud Scalability and Elasticity

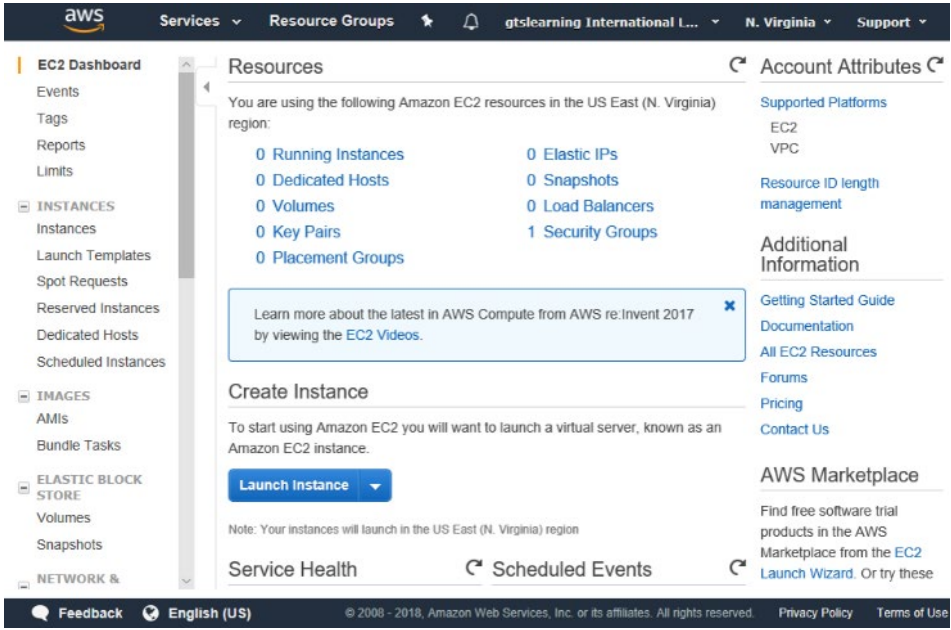
- What is a cloud?
  - For the consumer?
  - For the service provider?
- Scalability
  - Control cost of resource provision
  - Scale out versus scale up
- Elasticity
  - Ability to map resource provision to demand
- Cloud and virtualization

Cloud Deployment Models

- Public (multi-tenant)
  - Cloud service provider (CSP)
  - Multi-cloud
- Hosted private
- Private
  - On-premise or offsite
- Community
- Hybrid

Cloud Service Models

- Infrastructure as a Service
  - Appliance/server provisioning
- Software as a Service
  - Software provisioning
- Platform as a Service
  - Database and application server provisioning
- Desktop as a Service
  - Client desktop/app provisioning



Cloud Connectivity Options

- Internet/virtual private network (VPN)
  - Interface with cloud application over the web
  - Use VPN for better security and congestion control
  - Still limited by public Internet latency and bottlenecks
- Direct/private connection/co-location
  - Direct link between enterprise servers and cloud servers within datacenter

Infrastructure as Code

- Provisioning through standard scripts
  - Eliminate lack of consistency/snowflakes
- Automation
  - Script a single task or build
- Orchestration
  - Sequence of automation scripts
  - Co-ordinate provisioning across multiple systems

Cloud Security Implications

- Transfer of risk/service level agreement (SLA)
  - Cloud responsibility matrix
  - Security of the cloud versus security in the cloud (Amazon)
- Legal/regulatory responsibility
- Insider threat (from service provider)

Review Activity: Cloud Concepts

- Cloud Scalability and Elasticity
- Cloud Deployment Models
- Cloud Service Models
- Cloud Connectivity Options
- Infrastructure as Code
- Cloud Security Implications

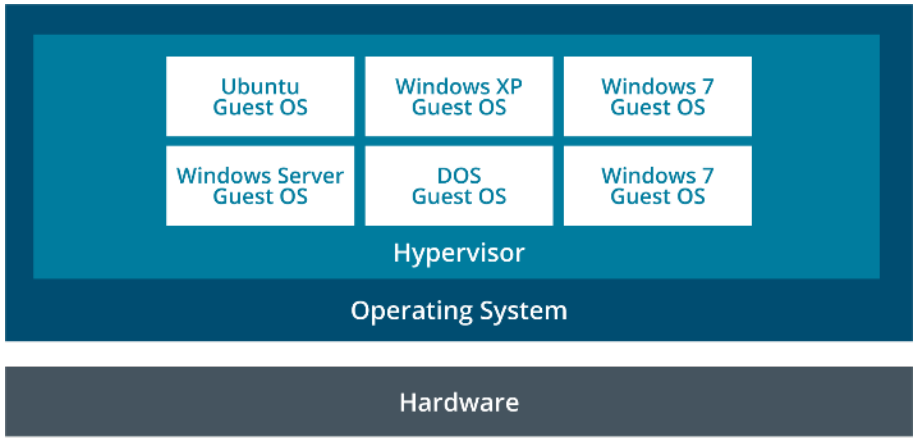
Lesson 20

Topic 20B

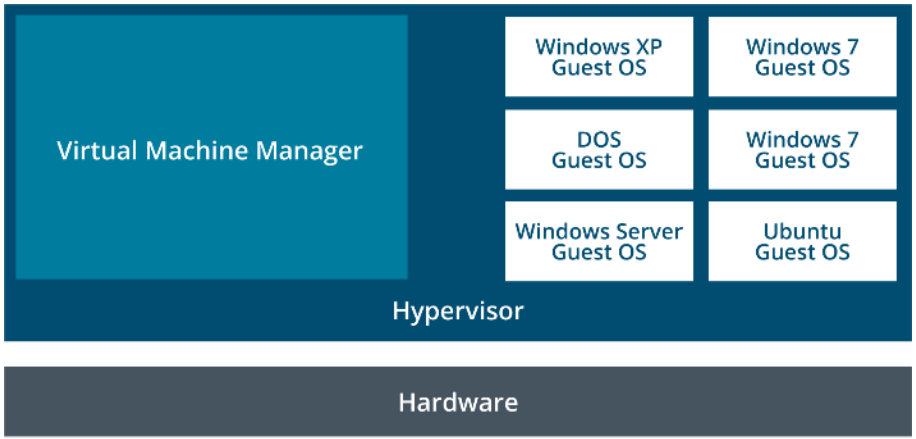
Explain Virtualization and Storage Area Network Technologies

Hypervisor Types

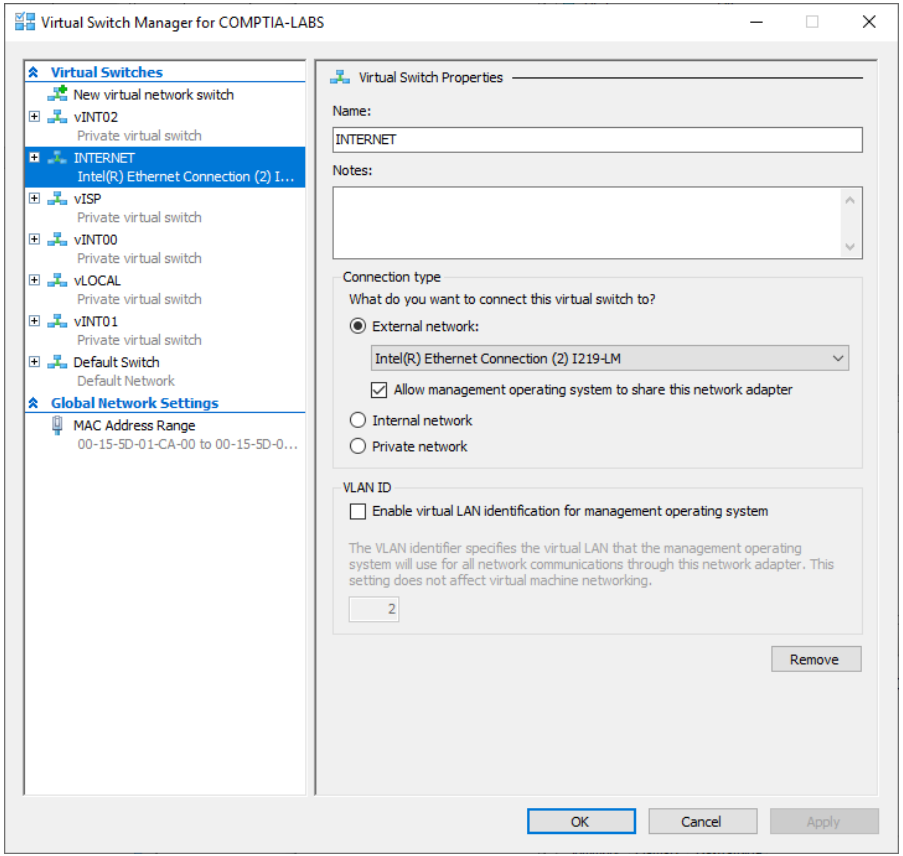
- Type II
- Host-based
- Installed to host OS



- Type I
- Bare-metal
- Installed to host hardware



Virtual NICs and Switches



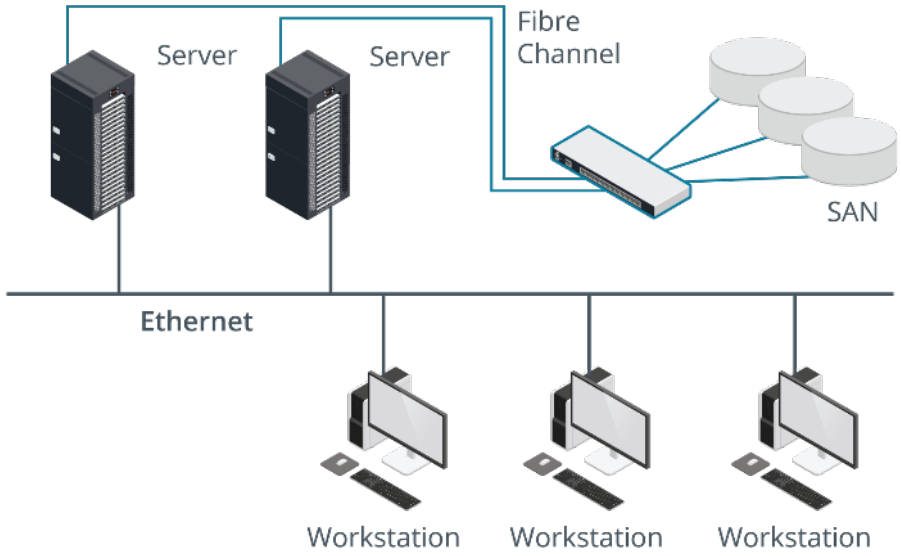
- Guest OS can have one or more virtual network adapters
- Guests can be connected to VM-only networks or join the host network
- Virtual switch is implemented by hypervisor to connect VMs in different types of network

Network Function Virtualization

- VMs on virtual networks need the same services as physical networks
  - Provisioning DHCP services to VMs
  - Configuring default gateway for VMs
  - Configuring network firewall for VM segment
- Provision virtual appliances
  - Router, firewall, load balancer, or malware/intrusion detection
- Network Function Virtualization (NFV)
  - Virtual Network Function (VNF)
  - NFV infrastructure
  - Management and orchestration (MANO)

Storage Area Networks

- Block-level access to storage resource
- Only accessed by application servers
- Integrate multiple types of storage technology
  - Tiered performance



SAN Connection Types

- Fibre Channel
  - Initiator
  - Target
  - FC switch
- Fibre Channel over Ethernet (FCoE)
  - Converged network adapter (CNA)

iSCSI

```
/> ls
o- / ..... [...]
  o- backstores ..... [...]
  | o- block ..... [Storage Objects: 1]
  | | o- md0 ..... [/dev/md/md0 (10.0GiB) write-thru activated]
  | |   o- alua ..... [ALUA Groups: 1]
  | |     o- default_tg_pt_gp ..... [ALUA state: Active/optimized]
  | o- fileio ..... [Storage Objects: 0]
  | o- pscsi ..... [Storage Objects: 0]
  | o- ramdisk ..... [Storage Objects: 0]
  o- iscsi ..... [Targets: 1]
  | o- iqn.2021-03.com.515support.smb10-iscsi:server ..... [TPGs: 1]
  |   o- tpg1 ..... [no-gen-acls, auth per-acl]
  |     o- acls ..... [ACLs: 1]
  |     | o- iqn.2021-03.com.515support.ms10-iscsi:client ..... [1-way auth, Mapped LUNs: 1]
  |     |   o- mapped_lun0 ..... [lun0 block/md0 (rw)]
  |     o- luns ..... [LUNs: 1]
  |     | o- lun0 ..... [block/md0 (/dev/md/md0) (default_tg_pt_gp)]
  |     o- portals ..... [Portals: 1]
  |       o- 0.0.0.0:3260 ..... [OK]
  o- loopback ..... [Targets: 0]
  o- vhost ..... [Targets: 0]
/>
```

- Tunneling protocol that enables the transfer of SCSI data over an IP-based network
- Can be used to link SANs or create low-cost SANs

Review Activity: Virtualization and SAN Technologies

- Hypervisor Types
- Virtual NICs and Switches
- Network Function Virtualization
- Storage Area Networks
- SAN Connection Types
- iSCSI

Lesson 20

Topic 20C

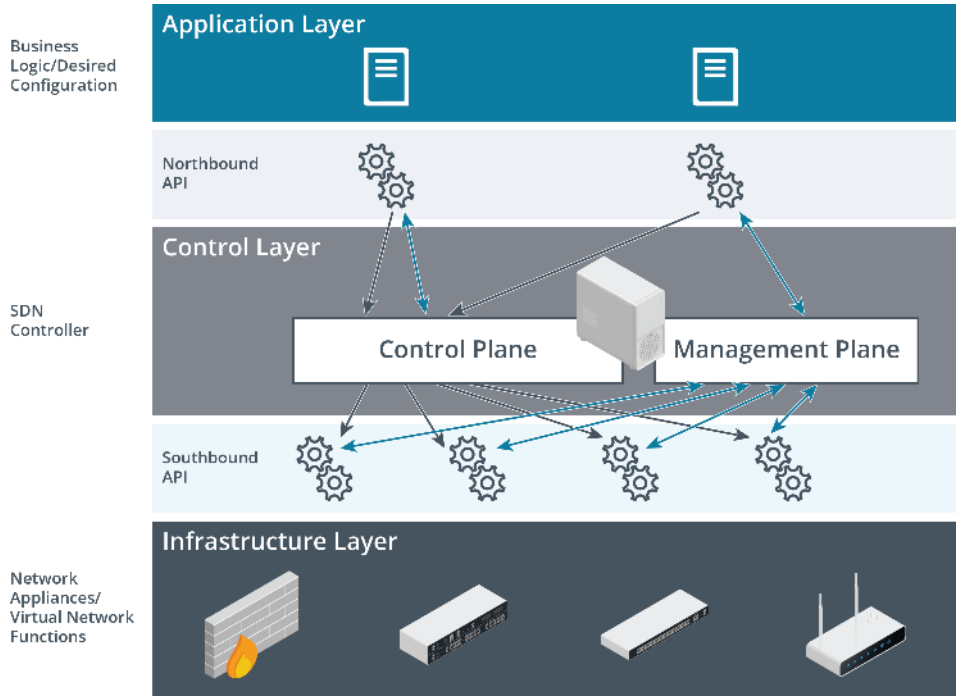
Explain Datacenter Network Architecture

Datacenter Network Design

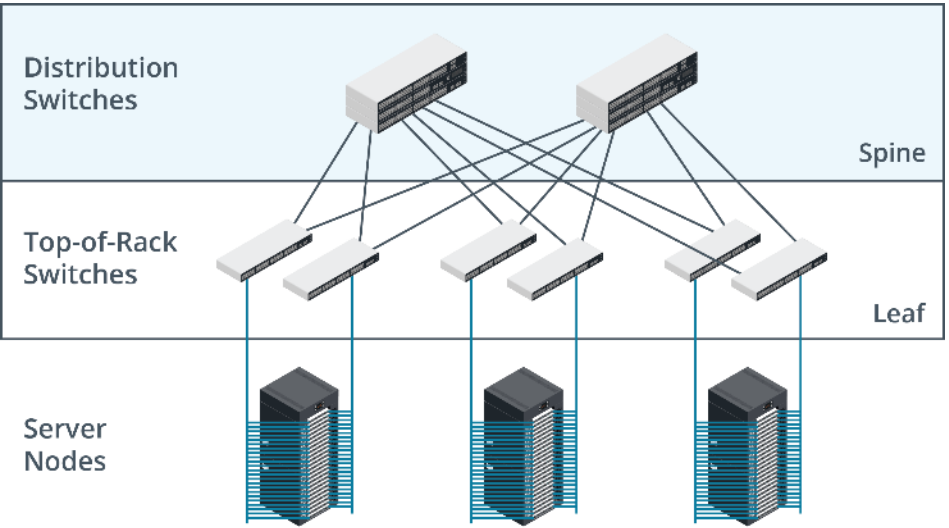
- Datacenters
  - Dedicated location for hosting server infrastructure
  - Networking, power, climate control, and physical access control features
- Traffic flows
  - North-south versus east-west
- Overlay networks
  - Abstracts physical topology
  - Encapsulates point-to-point traffic

Software Defined Networking

- Make components of datacenter fully accessible to automation and orchestration
- SDN architecture
  - Application and infrastructure layers at top and bottom
  - SDN inserts a control layer
  - Northbound and southbound APIs
- Management plane



Spine and Leaf Topology



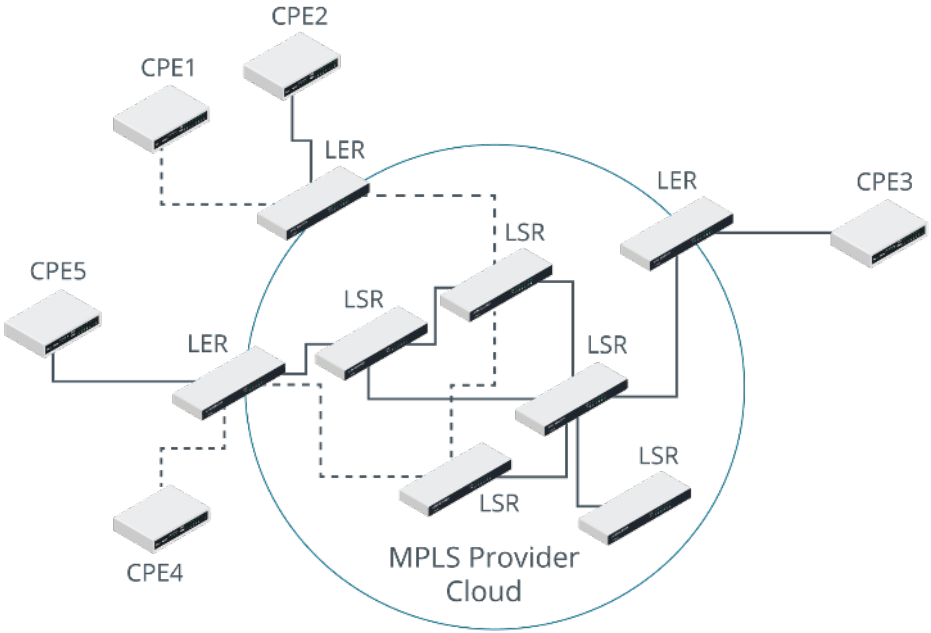
- Leaf layer forms a full mesh with spine
- Advantages
  - Single hop predictability
  - Loop free multipathing
- Top-of-rack switch models

Datacenter Access Types

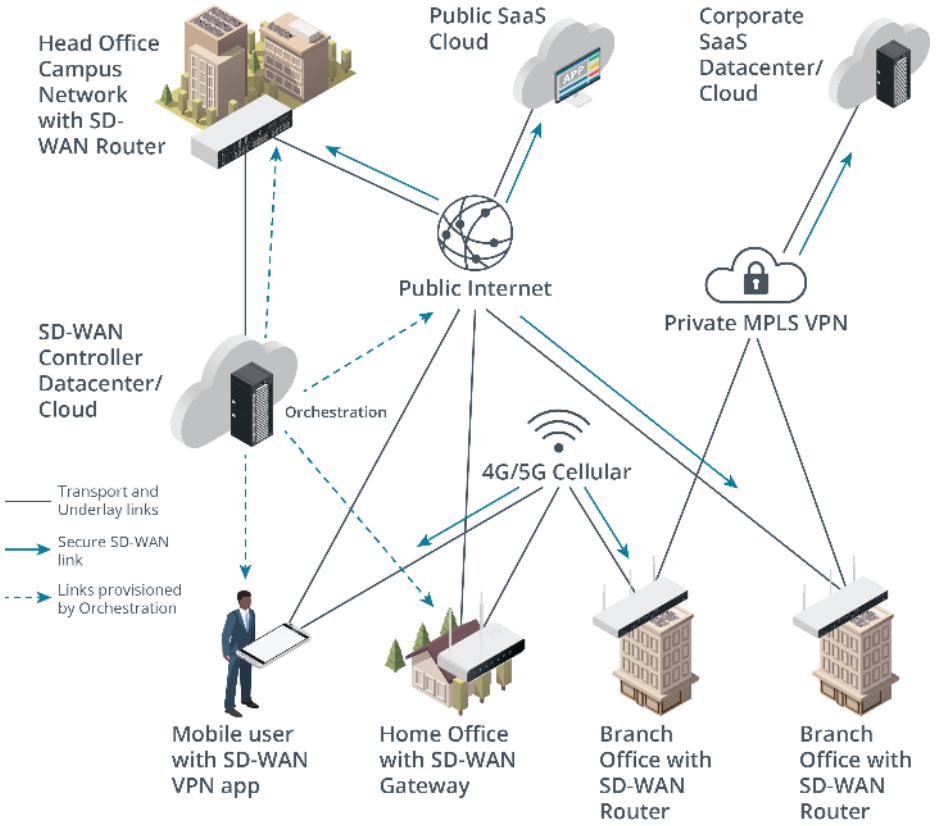
- Branch office versus on-premises
  - Servers in hub location and data replicated to branches
  - Multipoint GRE used to connect branches with head office in VPNs
- Colocation
  - Installing servers to a hosted environment

Multiprotocol Label Switching

- Service provider VPN solution
- Overlay network facilitating point-to-point and point-to-multipoint links over public networks
- Traffic shaping



Software-defined WAN



- Secure access to datacenters from multiple remote locations
- Overlay network managed by SD-WAN controller
- All links authenticated and secured
- Can use multiple underlay network technologies

Review Activity: Datacenter Network Architecture

- Datacenter Network Design
- Software Defined Networking
- Spine and Leaf Topology
- Datacenter Access Types
- Multiprotocol Label Switching
- Software-defined WAN

Lab Activity

Applied Lab: Troubleshoot Service and Security Issues

- Lab types
  - Assisted labs guide you step-by-step through tasks
  - Applied labs set goals with limited guidance
- Complete lab
  - Submit all items for grading and check each progress box
  - Select “Grade Lab” from final page
- Save lab
  - Select the hamburger menu and select “Save”
  - Save up to two labs in progress for up to 7 days
- Cancel lab without grading
  - Select the hamburger menu and select “End”

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Summary