

CompTIA Network+ Exam N10-008

Lesson 18



Explaining Disaster Recovery and High Availability Concepts

Objectives

- Explain disaster recovery concepts
- Explain high availability concepts

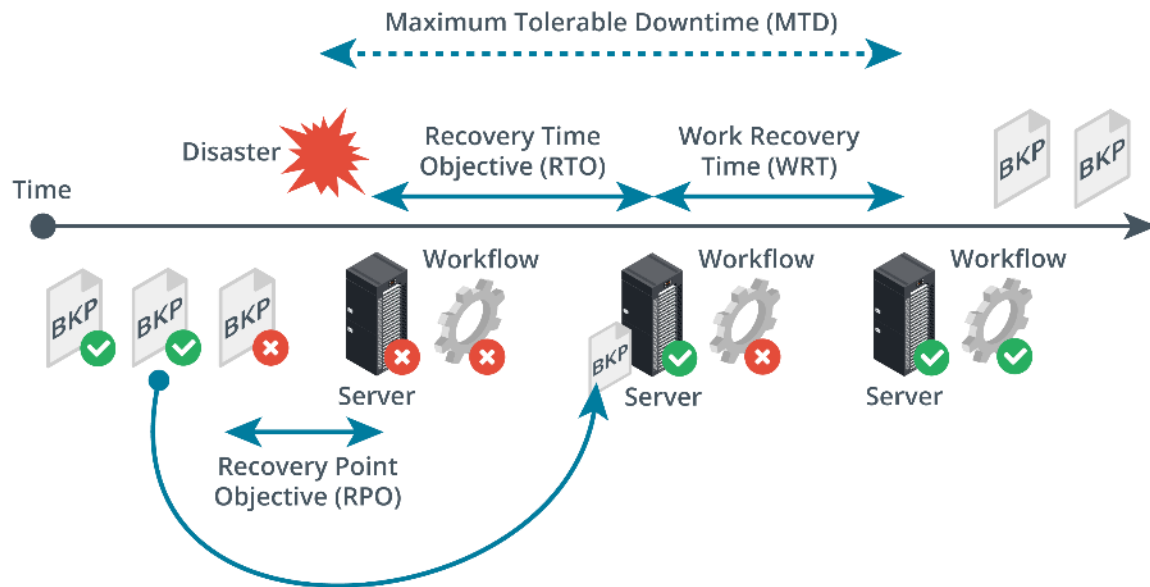
Lesson 18

Topic 18A

Explain Disaster Recovery Concepts

High Availability

- Availability and high availability
 - Percentage uptime
 - Maximum Tolerable Downtime (MTD)
- Recovery metrics
 - Recovery time objective (RTO)
 - Work recovery time (WRT)
 - Recovery point objective (RPO)



Fault Tolerance and Redundancy

- Reliability metrics
 - Mean Time Between Failures (MTBF)
 - Operational time / # failures
 - Mean Time to Failure (MTTF)
 - Used for non-repairable components
 - Operational time / # devices
 - Mean Time to Repair (MTTR)
 - Unplanned maintenance time / # incidents
- Redundant system types
 - Hardware spares, network links, power systems, system and data backups, cluster services, ...

Recovery Sites

- Alternate processing sites that will not be affected by same disaster event
- Hot site
 - Failover in seconds or minutes
- Warm site
 - Failover in hours
- Cold site
 - Failover in days
- Cloud site
 - Transfer responsibilities to cloud provider
 - Cannot transfer all the risk

Facilities and Infrastructure Support

- Heating, ventilation, air conditioning (HVAC)
 - Temperature sensors and moisture detection sensors
 - Office areas versus datacenter/equipment rooms
- Fire suppression
 - Emergency procedures and alarms
 - Portable extinguisher usage
 - Sprinkler systems

Power Management

- Spikes, surges, brownouts, and blackouts
- Power Distribution Unit (PDU)
 - Filter and stabilize grid power and facilitate remote monitoring
- Battery backups and Uninterruptible Power Supplies (UPSs)
 - Battery-backed cache
 - UPS runtime
- Generators
 - Replacement for grid power
 - Must be used with UPS
 - Renewable power sources

Network Device Backup Management


- Network appliance configuration backup
 - Startup versus running configuration
 - Version history and rollback
- Backup modes
 - State/bare metal
 - Configuration file
- Backing up/logging other state information

Review Activity: Disaster Recovery Concepts

- High Availability
- Fault Tolerance and Redundancy
- Recovery Sites
- Facilities and Infrastructure Support
- Power Management
- Network Device Backup Management

Lab Activity

Assisted Lab: Backup and Restore Network Device Configuration

- 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”

Lesson 18

Topic 18B

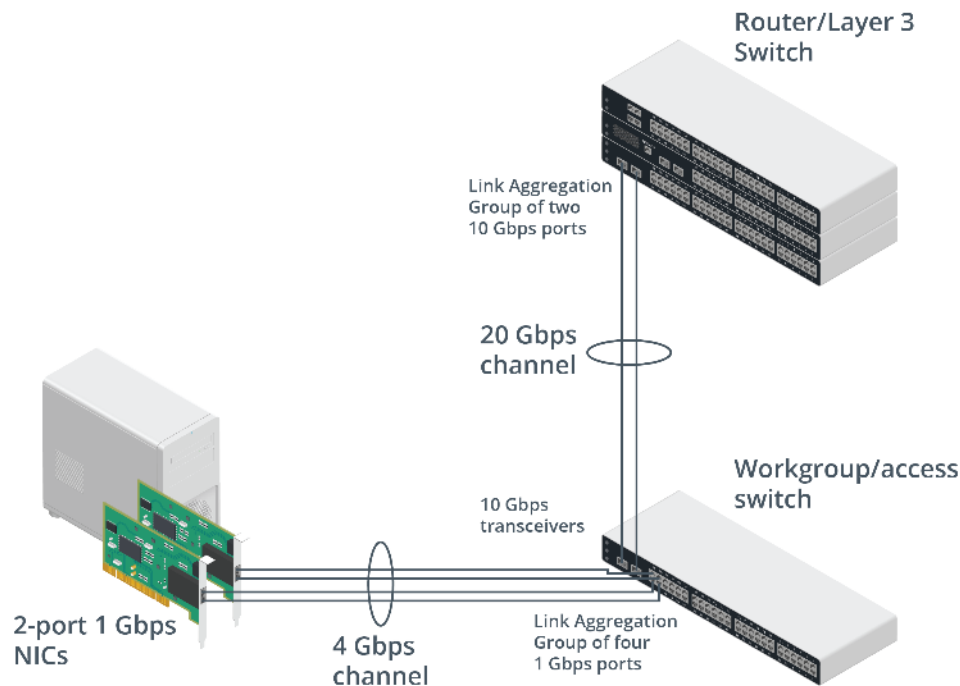
Explain High Availability Concepts

Multipathing

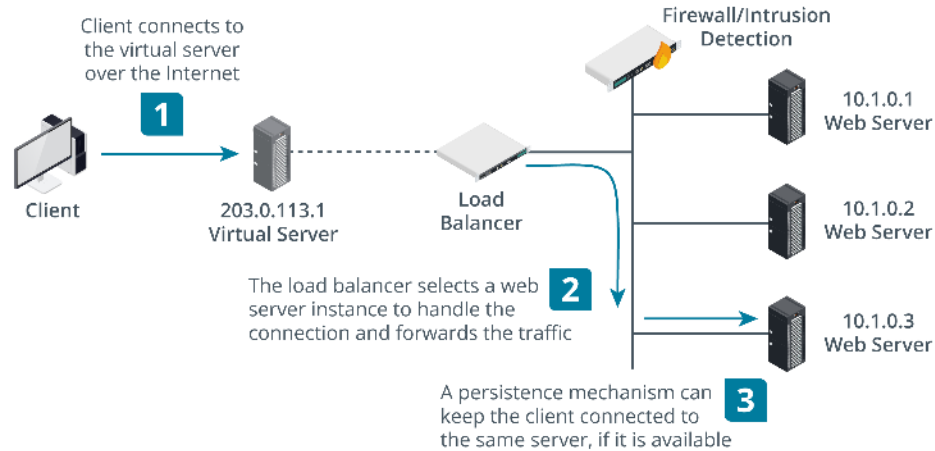
- Multiple physical links between nodes
 - Routed internetwork
 - SAN multipathing
 - Multiple ISPs
- Diverse paths
 - Ensure physical separation of first mile links to ISPs
 - Ensure independence of ISP's networks

Link Aggregation/NIC Teaming

- Bundle multiple physical links into a single channel
- Channel can use combined bandwidth of links
- Channel redundancy against link failure
- IEEE 802.3ad/802.1ax
 - Link Aggregation Group (LAG)
 - Link Aggregation Control Protocol (LACP)



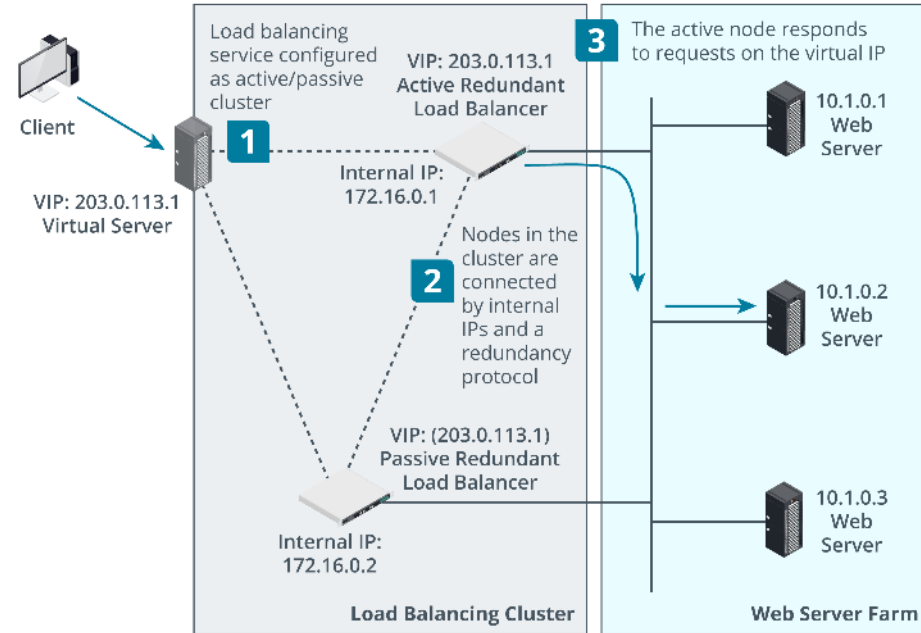
Load Balancers



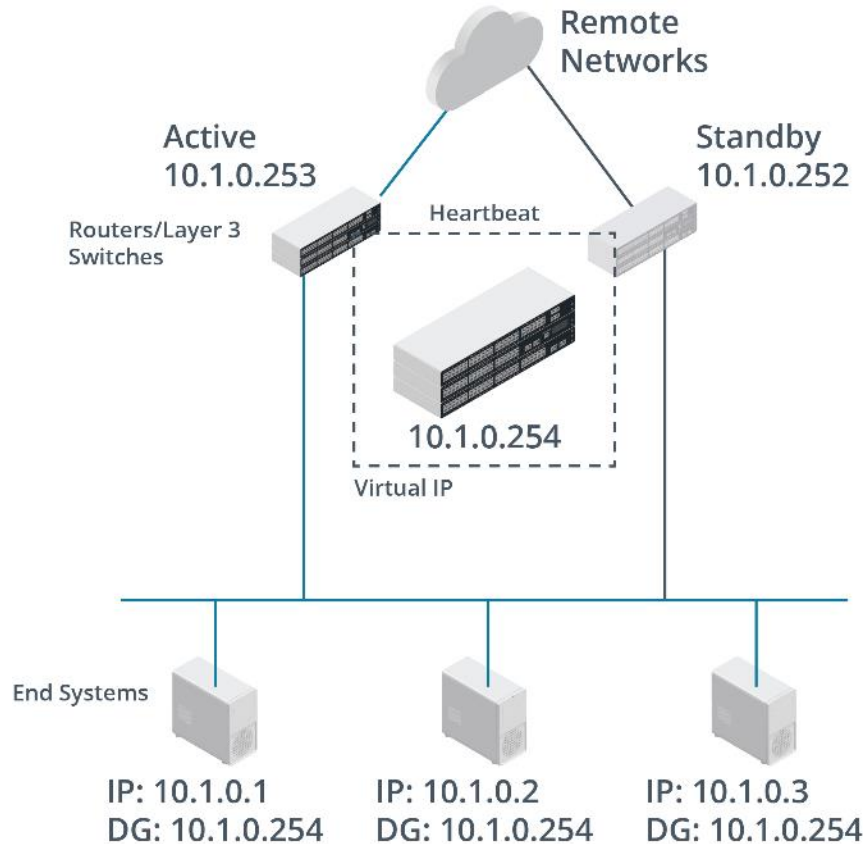
- Distribute client requests
- Placed in front of server farm or resource pool
- Layer 4 switch versus layer 7 switch

Redundant Hardware/Clusters

- Nodes that must share common data
- Virtual IP
 - External address for service shared by processing nodes
 - Common Address Redundancy Protocol (CARP)
- Active-passive and active-active clustering



First Hop Redundancy



- Provision multiple default gateways without complex routing on hosts
- Hot Standby Router Protocol (HSRP)
 - Routers share common virtual IP and MAC
 - Standby group with priority standby router
- Virtual Router Redundancy Protocol (VRRP)
 - Universal

Review Activity: High Availability Concepts

- Multipathing
- Link Aggregation/NIC Teaming
- Load Balancers
- Redundant Hardware/Clusters
- First Hop Redundancy

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Summary