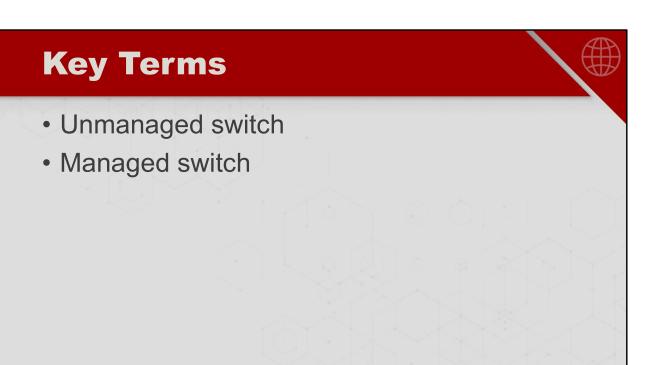# Chapter 11

Switch Features

Episode 11.01

Episode title: **Switch Management**

Objective: **2.1 Compare and contrast various devices, their features, and their appropriate placement on the network**

Key Terms

- Unmanaged switch
- Managed switch

Quick Review

- Managed switches require configuration
- In order to manage a switch based on IP address, the computer must be on the same subnet as the switch
- Be sure to change the default password on a switch

Episode 11.02

Episode title: **Introduction to VLANs**

Objective: **2.1 Compare and contrast various devices, their features, and their appropriate placement on the network**

2.3 Given a scenario, configure and deploy common Ethernet switching features

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Key Terms

- Virtual LAN (VLAN)
- Data VLAN
- Voice VLAN

Quick Review

- A VLAN splits one broadcast domain into two or more broadcast domains

- A managed switch that supports VLANs requires configuration

- Ubiquiti and Netgear are two among many different brands of switches

Episode 11.03

Episode title: **InterVLAN Routing**

Objective: **2.1 Compare and contrast various devices, their features, and their appropriate placement on the network**

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Key Terms

- You can use a router to connect two VLANs
- Higher-end switches offer interVLAN routing
- InterVLAN routing acts like one or more virtual routers

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Quick Review

- VLANs create separate broadcast domains
- Connect the broadcast domains with physical routers
- Broadcast domains can be connected with virtual routers using interVLAN routing

Episode 11.04

Episode title: **Trunking**

Objective: **2.3 Given a scenario, configure and deploy common Ethernet switching features**

Key Terms

- Trunking
- Port tagging
- 802.1Q
- VLAN Trunking Protocol (VTP)

Quick Review

- Trunking enables VLANs to span more than one switch

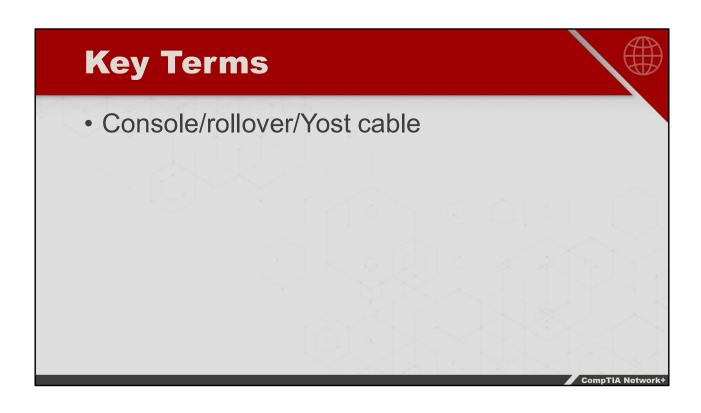- VLAN Trunking Protocol (VTP) is Cisco's proprietary protocol to update multiple VLAN switches

Episode 11.05

Episode title: **Cisco Commands**

Objective: **3.1 Given a scenario, use the appropriate statistics and sensors to ensure network availability**

5.3 Given a scenario, use the appropriate network software tools and commands

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Key Terms

- Console/rollover/Yost cable

Cisco show route Command

- Need to insert a screen shot from Michael of running show route on a managed switch. Messaged him 11/9.

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Quick Review

- The show config command displays the running configuration
- The show interface command displays the interfaces for all the ports
- Runts are packets that are smaller than the required Ethernet standard
- Giants are packets that are larger than the required Ethernet standard
- The show route command displays the routing table

Episode 11.06

Episode
title: **Switch Port Protection**

Objective: **2.3 Given a scenario, configure and deploy common Ethernet switching features**
4.3 Given a scenario, apply network hardening techniques

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Key Terms

- Switch port
- Spanning Tree Protocol (STP)
- Root guard
- Bridge protocol data units (BPDU) guard
- DHCP snooping

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Quick Review

- Switch ports do not use IP addresses or work with Layer 3

- Switch interconnections use STP to detect looping by deactivating the port, if necessary

- BPDU guard is a Cisco method allowing only non-switch devices to connect to the switch
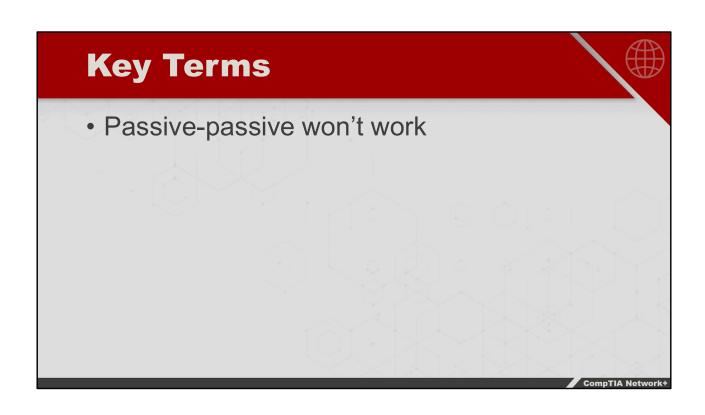
Episode 11.07

Episode title: **Port Bonding**

Objective:
2.3 Given a scenario, configure and deploy common Ethernet switching features

3.3 Explain high availability and disaster recovery concepts and summarize which is the best solution

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Key Terms

- NIC teaming
- Port bonding (a.k.a. port aggregation)
- Make group first, then assign switch ports to group
- Group = Port-channel
- Link Aggregation Control Protocol (LACP)
- Active-active and active-passive work

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Key Terms

- Passive-passive won't work

Quick Review

- Port bonding links switch ports to increase bandwidth
- Use LACP for the trunking protocol
- Set ports to active

Episode 11.08

Episode
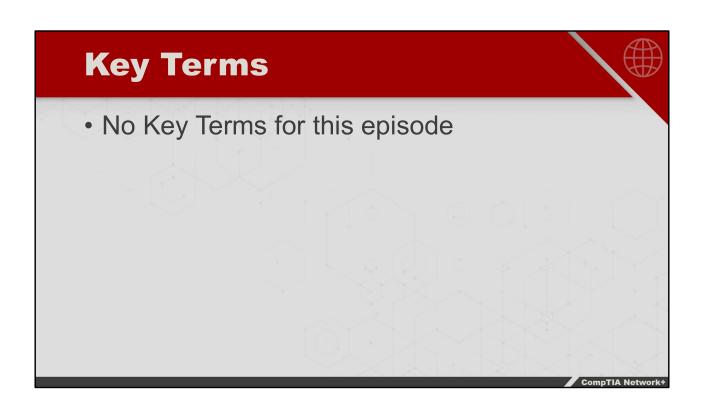title: **Port Mirroring**

Objective: **2.3 Given a scenario, configure and deploy
            common Ethernet switching features**

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Key Terms

- No Key Terms for this episode

Quick Review

- Port mirroring enables the traffic flowing through one port to be monitored on another port
- This feature enables administrators to inspect traffic remotely from a suspect machine
- Port mirroring is configured on a switch by providing a source port and a destination port

Episode 11.09

Episode
title: **Quality of Service**

Objective: **2.2 Compare and contrast routing technologies and bandwidth management concepts**

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Key Terms

- Traffic shaping
- Quality of service (QoS)

Quick Review

- Quality of service controls help you better manage available bandwidth
- One type of QoS control is traffic shaping
- Simple QoS on SOHO routers allows you to set priorities for different protocols

Episode 11.10

Episode
title: **IDS vs. IPS**

Objective: **2.1 Compare and contrast various devices, their
features, and their appropriate placement on the
network**

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Key Terms

- Intrusion detection system (IDS)
- IDS out-of-band does monitoring and alerts
- Intrusion prevention system (IPS)
- IPS in-band actively stops or rejects

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Quick Review

- An intrusion detection system (IDS) detects and reports possible attacks to the administrators

- An intrusion prevention system (IPS) runs inline with the network and acts to stop detected attacks

- A firewall filters, an IDS notifies, an IPS acts to stop

Episode 11.11

Episode title: **Proxy Servers**

Objective: **2.1 Compare and contrast various devices, their features, and their appropriate placement on the network**

Key Terms

- Forward proxy sever
- Transparent proxy
- Transparent proxy must be inline
- Reverse proxy server

Forward Proxy Server

- Dedicated box or software
- In an organization (e.g. schools)
- Caching
- Content filtering
- Acts like a firewall

Proxy Servers

- Application – specific
  - Web proxy
  - FTP proxy
  - VoIP proxy

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Reverse Proxy Servers

- High security
- Handle DoS attacks
- Load balancing
- Caching
- Encryption acceleration

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Quick Review

- Forward proxy servers hide the clients from the server by forwarding the message to the server
- Forward proxy servers can be configured for caching, content filtering, and firewall capability
- Reverse proxy servers hide the server, and can provide load balancing and caching for high activity pages

Episode 11.12

Episode title: **Load Balancing**

Objective: **2.1 Compare and contrast various devices, their features, and their appropriate placement on the network**

Key Terms

- Round robin via DNS
- Delegation – reverse lookup zones
- Sever – side load balancing
- Clustering

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Quick Review

- Load balancing can be configured as client-side or server-side and provides high availability
- Load balancing can route the the most available server, either by a configured list (round robin) or by least response time
- Server-side load balancing uses a sophisticated hardware device that is located within the server

Episode 11.13

Episode title: **Device Placement Scenarios**

Objective: **2.1 Compare and contrast various devices, their features, and their appropriate placement on the network**

5.5 Given a scenario, troubleshoot general networking issues

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Key Terms

- Edge firewall
- Interior firewall
- Inline IPS (in-band)
- Internal firewall
- Reverse proxy

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Quick Review

- DMZs are used to protect public-facing servers by creating an isolated area for those devices
- Two firewalls are used in a DMZ: one allowing unsolicited traffic to public service, and second maintaining isolation of the private network
- Internal firewalls can used to block specific access for areas that may need additional restrictions but, still function within the main domain