Cisco security Engineer track

I Learn Academy

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Project Documentation: Building and securing a small Network

Overview:

We designed a small, secure network that consists of a core switch which is connected with three distributed switches, every one of the distributed switch is connected with 3 access switches, every switch has 3 VLANS and a printer, the 3 printer are in a one VLAN and every VLAN has 5 pcs or laptops, with 5 servers and google server.

Cisco Devices Used: Pcs, laptops , switches, multilayer switches and router.

Features & Protocols:

- **Portfast:**

Is a Cisco technique that puts a switch interface into forwarding mode immediately, skipping the listening and learning states. This is useful for interfaces that connect to computers or servers so that these devices don't have to wait until the interface is up and running.

- **Port security:**

Is a feature used in networking, particularly in Ethernet networks, to enhance the security of switch ports. It controls access to the network by restricting which devices can connect to a port.

- **Rapid-PVST:**

Provides a separate instance of RSTP for each VLAN. It helps to prevent loops and ensures rapid convergence of the network by managing VLAN-specific topologies, improving recovery times in case of link failures.

- **BPDU Guard:**

(Bridge Protocol Data Unit Guard) is a security feature used in network switches to protect against misconfigurations and potential network loops

BPDU Guard enhances network stability and security by safeguarding against unexpected BPDUs that could disrupt the network topology.

- **The Spanning Tree Protocol:**

(STP) is a network protocol used to prevent loops in Ethernet networks.

In the context of the Spanning Tree Protocol (STP), "select root and secondary" generally refers to the process of determining the root bridge and the paths to secondary switches

VTP:

Or VLAN Trunking Protocol, is a Cisco proprietary protocol used to manage and propagate VLAN (Virtual Local Area Network) configuration information across a network

DTP:

Or Dynamic Trunking Protocol, is a Cisco proprietary protocol used to manage the dynamic creation of trunk links between Cisco switches

VLAN:

A VLAN, or Virtual Local Area Network, is a logical grouping of devices within a network that allows them to communicate as if they were on the same physical network, even if they are located on different switches or in different geographical locations

Channel group:

A channel group, often referred to in networking as a "port channel" or "EtherChannel," is a method used to combine multiple physical Ethernet links into a single logical link. This technique enhances bandwidth and provides redundancy.

DHCP:

Or Dynamic Host Configuration Protocol, is a network management protocol used to automatically assign IP addresses and other network configuration parameters to devices on a network. This helps devices communicate on IP networks without the need for manual configuration.

NAT:

Or Network Address Translation, is a technique used in networking to modify the IP address information in the headers of packets while they are in transit across a router or firewall. It is commonly used for several purposes, primarily to conserve IP addresses and enhance security.

Access Control List (ACL):

Is a set of rules used to control network traffic and determine whether to allow or deny packets based on specific criteria. ACLs are commonly used in routers and firewalls to enhance network security by filtering traffic

EIGRP:

Or Enhanced Interior Gateway Routing Protocol, is a dynamic routing protocol developed by Cisco. It is designed to facilitate efficient routing within an autonomous system (AS) and offers several advantages for managing IP networks.