BRYANT CCNA 2018
SECTION 5 - Config Modes, IOS Help, Intro to VLANS

GOAL: Reset configs on all second-hand hardware

Config 1: Config Modes and IOS Help Intro

Privileged Exec Mode: "enable mode"

```
Switch> enable
Switch# configure terminal     (or 'conf t')
Switch(config)#
```

Set hostname:
```
(config)# hostname SW1
SW1(config)#
```

IOS Help: help with commands

```
SW1(config)# h?          <-- on end of input for list
help hostname hw-module

SW1(config)# hostname ?  <-- after command for argument list
  WORD This system's network name
```

Config 2: Exec Timeout, Logging Sync, the Console Port

```
SW1(config)# line con 0
SW1(config-line)# exec-timeout 0 0
                # logging synchronous
```
} disable timeout and enable synchronous logging for lab environ.

exec-timeout <minutes> <seconds>
- set timeout, use 0 0 to disable
- it is NOT recommended in production to disable timeout, for security reasons

logging synchronous
- enable synchronous logging
- log output is emitted after a command is entered, will not interrupt.

no logging synchronous
- disable synchronous logging

Config 3: VLAN Lab Begins

Review: VLANs break up broadcast domains.
- group hosts by department, security clearance, etc.
- can be used to increase security, if desired.
* - prevent Network performance degredation.

A broadcast storm can gradually slow overall network performance slowly over time. At a certain point, the switch is too busy handling broadcasts that it can't carry out basic functions (like forwarding frames!) efficiently.

It is better to avoid this before it happens than to have to try to recover!

```
# show vlan
# show vlan brief
```
} view vlan info

Setting VLAN on Interface

```
# conf t
(config)# int fast 0/2
(config-if)# switchport access vlan 24
% Access VLAN does not exist. Creating VLAN 24
```

Create VLAN from Global Config

```
(config)# vlan 42
```

Remove VLAN

```
(config)# no vlan 42
```

Config 5: More VLANs / Erasing the Switch / VLAN.DAT

Reset Configuration

```
# write erase
# reload
```
} - erase NVRAM
- restart switch

This will erase the NVRAM, which contains the startup-config. The running-config will stay running.

NOTE: vlans are stored elsewhere and will not be reset.

Delete VLAN Configuration

```
# del vlan.dat
Delete filename [vlan.dat]?
```
← do NOT type 'Y'

```
Delete flash:vlan.dat [confirm]
```

Config 6: Intro to Trunking

Trunking is the process of creating a logical connection between two physically connected switches, allowing frames to be sent between them.

A tag indicating the destination VLAN is placed into the frame by the transmitting switch. The recieving switch uses this frame tagging to see which VLAN should recieve the frame.

ISL: Inter-Switch Protocol

- cisco-proprietary: non-cisco switches can't use it.
- many cisco switches also do not support ISL
- encapsulates the entire frame, resulting in greater overhead than IEEE 802.1q
- does not recognize native VLAN concept

IEEE 802.1q ("dot1q")

- Industry standard trunking protocol; can be used by non-cisco and cisco switches alike.
- does not encapsulate the frame
- inserts a 4-byte value indicating the VLAN ID into the ethernet header
- recognizes native VLAN concept

The native VLAN is simply the default VLAN, or VLAN 1 on cisco switches.

Dot1q recognizes the native VLAN, and will not even tag the ethernet header if the frame is destined for the native VLAN.

ISL just encapsolates every frame, whether it is on the native VLAN or not.

Config 7: The Trunking Port Modes

Access Ports belong to exactly one VLAN and cannot trunk. Check access ports with "show vlan"

Trunk Ports belong to all VLANs. View Trunk ports with 'show interface trunk' and will not show up under 'show vlan'.

(config-if)# switchport mode ?
access dynamic trunk

access - specifically turn trunking off
trunk - specifically turn trunking on
} unconditionally

dynamic - negociates trunking dynamically.
- dynamic desirable - actively attempting to trunk. will form a trunk if remote port is on, desirable, or auto mode.
- dynamic auto - passive mode. the port will trunk, but the remote port must initiate. will trunk with desirable or on mode on remote, but not with a passive remote (auto)

nonegociate - puts a port into permanent trunking mode but Dynamic Trunking Protocol (DTP) frames are not sent.

DTP is a negotiation protocol used to decide which trunking protocol to use (if both switches support both protocols) and if to trunk at all.

Config 8: Filtering Traffic on a Per-VLAN basis

Trunks are members of Every VLAN, but sometimes this can create unnecessary traffic forwarding.

We can deny traffic the ability to cross the trunk on a per VLAN basis with

switch port trunk allowed vlan ?

with the options:

add all except none remove

which are all self-explanitory.