19. DTP / VTP (Not in Syllabus)

Dynamic Trunking Protocol (DTP)

- **Purpose**: Allows switches to negotiate the status of their switchports dynamically:
    - **Access Ports**
    - **Trunk Ports**
- **Default Setting**: DTP is enabled by default on all Cisco switch interfaces.
- **Manual Configuration**: Recommended for security purposes. Use the following commands:
    - `switchport mode access`
    - `switchport mode trunk`

💡 Use the command:

show interfaces <interface-id> switchport

to check a switchport's settings.

Key Recommendation: Disable DTP on all switchports and configure them manually for security.

DTP Modes

Dynamic Desirable

- Actively attempts to form a trunk with another Cisco switch.
- Forms a trunk with:
    - `switchport mode trunk`
    - `switchport mode dynamic desirable`
    - `switchport mode dynamic auto`
- **Note**: If the other interface is set to `static access`, a trunk will not form, and it will remain an access port.

Dynamic Auto

- Does not actively try to form a trunk.
- Forms a trunk if the connected switch actively attempts it.
- Forms a trunk with:

    - `switchport mode trunk`
    - `switchport mode dynamic desirable`

Trunk to Access Connection

- Results in a **Mismatched Mode**.
- This configuration is invalid and will generate an error. Traffic will not work.

Mode Compatibility Table

Administrative Mode	Trunk	Dynamic Desirable	Access	Dynamic Auto
Trunk	Trunk	Trunk	X	Trunk
Dynamic Desirable	Trunk	Trunk	Access	Trunk
Access	X	Access	Access	Access
Dynamic Auto	Trunk	Trunk	Access	Access

Additional DTP Details

- **DTP does NOT form a trunk** with:
    - Routers
    - PCs
    - Non-switch devices
- **Default Administrative Modes**:
    - Old switches: `switchport mode dynamic desirable`
    - Newer switches: `switchport mode dynamic auto`

How to Disable DTP Negotiation on an Interface

1. `switchport nonegotiate`
2. `switchport mode access`

Security Tip: Always disable DTP and manually configure switchports as access or trunk.

Encapsulation

- Supported encapsulation types:
    - 802.1Q
    - ISL

DTP Negotiation (enabled by default):

switchport trunk encapsulation negotiate

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- **Priority**: ISL is preferred over 802.1Q.
    - DTP frames are sent:
        - In VLAN1 when using ISL
        - In the Native VLAN when using 802.1Q (default Native VLAN is VLAN1).

VLAN Trunking Protocol (VTP)

💡 Use the command:

show vtp status

to check VTP status in Privileged EXEC mode.

Overview

- **Purpose**: Configures VLANs on a central switch (server) that other switches (clients) synchronize with.
- **Use Case**: Large networks with many VLANs to reduce manual configuration.
- **Recommendation**: Rarely used and not recommended.

VTP Versions

1. **v1**
    - Does not support extended VLAN range (1006–4094).
2. **v2**

    - Does not support extended VLAN range (1006–4094).
    - Supports Token Ring VLANs.
3. **v3**
    - Supports extended VLAN range (1006–4094).
    - Stores VLAN database in NVRAM (for clients).

VTP Modes

1. **Server Mode**
    - Can add, modify, or delete VLANs.
    - Stores VLAN database in NVRAM.
    - Increments revision number with every change.
    - Advertises the latest VLAN database to clients.
    - Can act as a client to another server with a higher revision number.
2. ⚠️ **Caution**: Connecting an old switch with a higher revision number to the network can overwrite VLAN databases across the domain.
3. **Client Mode**
    - Cannot add, modify, or delete VLANs.
    - Does not store the VLAN database in NVRAM (except in v3).
    - Synchronizes VLAN database from the server.
    - Forwards VTP advertisements to other switches.
4. **Transparent Mode**
    - Does not participate in VTP domain synchronization.
    - Maintains its own VLAN database in NVRAM.
    - Can add, modify, or delete VLANs locally.
    - Forwards VTP advertisements within the same domain.

VTP Domains

- A switch with no VTP domain (domain NULL) will automatically join the VTP domain of any received advertisement.
- If a switch receives an advertisement from the same domain with a higher revision number, it will update its VLAN database.

Revision Numbers

- Resetting a revision number to 0:
    1. Change the VTP domain to an unused one.

2. Switch to transparent mode.

VTP Version Configuration

💡 Use the command:

(config)# vtp version <version-number>

to set the VTP version. Changing the version will force an update across all connected switches.