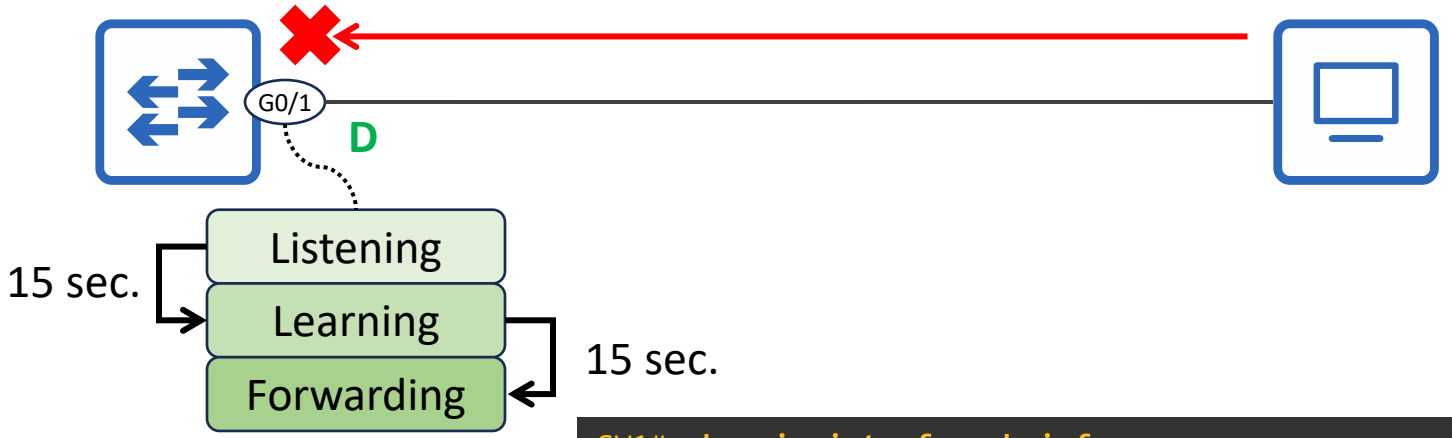
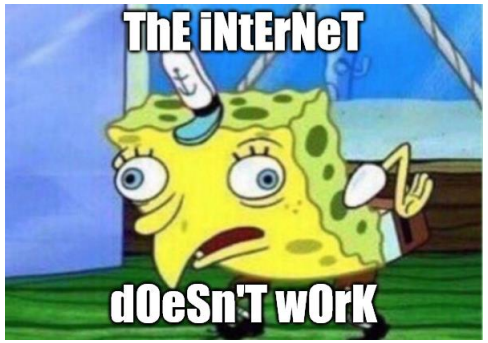
Things we'll cover

- STP Toolkit
  - **PortFast – this video**
    - Allows switch ports connected to end hosts to immediately enter the STP Forwarding state, bypassing Listening and Learning.
  - BPDU Guard
    - Automatically disables a port if it receives a BPDU, protecting the STP topology by preventing unauthorized devices from becoming part of the network.
  - BPDU Filter
    - Stops a port from sending BPDUs or processing received BPDUs.
  - Root Guard
    - Prevents a port from becoming a Root Port by disabling it if superior BPDUs are received, thereby enforcing the current Root Bridge.
  - Loop Guard
    - Protects the network from loops by disabling a port if it unexpectedly stops receiving BPDUs, ensuring it does not mistakenly enter the Forwarding state.

PortFast – the problem






```
SW1# show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/1     unassigned      YES unset  up                    up
```

- When an end host connects to a switch port, the port becomes **up/up** but can't send/receive data yet.
  - It is a **Designated port** but will take 30 seconds before it enters the **Forwarding** state:
    - 15 seconds in **Listening**
    - 15 seconds in **Learning**

- This leads to a poor user experience.
  - The user probably doesn't even know STP exists.
  - They just know "the internet doesn't work" for 30 seconds when they connect their computer.
  - This wait is unnecessary, because there is no risk of a Layer 2 loop occurring between a switch/PC.

PortFast – the solution

- When **PortFast** is configured on a port, the port immediately enters the **Forwarding** state when connected to another device.
  - It bypasses **Listening**/**Learning** and can send/receive data right away.

PortFast configuration

- When **PortFast** is configured on a port, the port immediately enters the **Forwarding** state when connected to another device.
  - It bypasses **Listening**/**Learning** and can send/receive data right away.

- You can configure PortFast in two ways:
  1. Interface config mode:
     `SW1(config-if)# spanning-tree portfast`
     This enables PortFast only on the individual interface.

  2. Global config mode:
     `SW1(config)# spanning-tree portfast default`
     This enables PortFast on all access ports.

- Connections between switches are almost always **trunk** links.
- Connections to end hosts are almost always **access** links.

PortFast configuration: per-port


```
SW1(config)# interface g0/1
SW1(config-if)# spanning-tree portfast
%Warning: portfast should only be enabled on ports connected to a single
 host. Connecting hubs, concentrators, switches, bridges, etc... to this
 interface  when portfast is enabled, can cause temporary bridging loops.
 Use with CAUTION

%Portfast has been configured on GigabitEthernet0/1 but will only
 have effect when the interface is in a non-trunking mode.

SW1# show spanning-tree interface g0/1 detail
 Port 2 (GigabitEthernet0/1) of VLAN0001 is designated forwarding
   Port path cost 4, Port priority 128, Port Identifier 128.2.
   Designated root has priority 32769, address 5254.0016.c410
   Designated bridge has priority 32769, address 5254.0016.c410
   Designated port id is 128.3, designated path cost 0
   Timers: message age 0, forward delay 0, hold 0
   Number of transitions to forwarding state: 1
   The port is in the portfast edge mode
   Link type is point-to-point by default
   BPDU: sent 1272, received 0
```

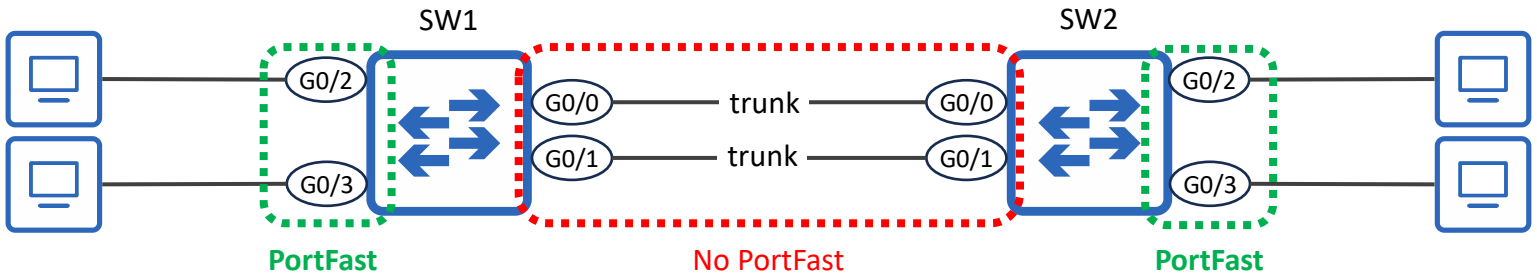
PortFast should NOT be configured on ports connected to switches or temporary Layer 2 loops can occur.

Even if you configure **`spanning-tree portfast`** on a trunk port, it won't be active.

`show spanning-tree interface` *`interface-name`* **`detail`**

- There are two kinds of PortFast:
  - **edge**
  - **network**
- **edge** is the kind we are covering in this video.
- **network** is used for a feature called Bridge Assurance (not a CCNA topic).

PortFast configuration: default



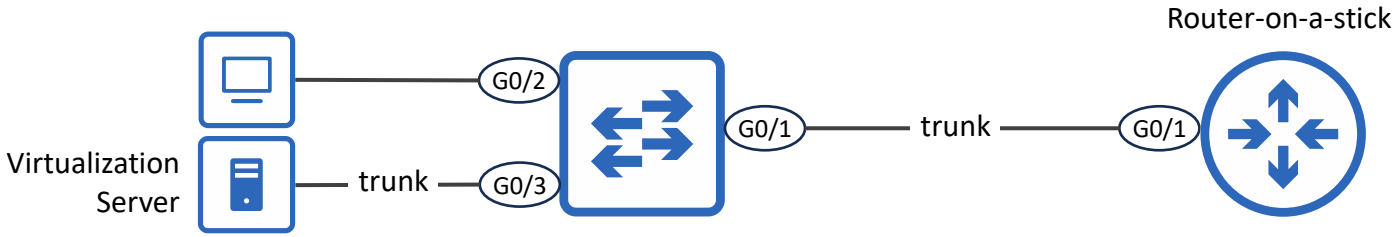

```
SW1(config)# spanning-tree portfast default
%Warning: this command enables portfast by default on all interfaces. You
 should now disable portfast explicitly on switched ports leading to hubs,
 switches and bridges as they may create temporary bridging loops.
```

- Access ports only (not trunk ports).
- To disable PortFast on a specific access port:
  - `SW1(config-if)# spanning-tree portfast disable`

```
SW1# show spanning-tree interface g0/2 detail
 Port 3 (GigabitEthernet0/2) of VLAN0001 is designated forwarding
   Port path cost 4, Port priority 128, Port Identifier 128.3.
   Designated root has priority 32769, address 5254.0016.c410
   Designated bridge has priority 32769, address 5254.0016.c410
   Designated port id is 128.3, designated path cost 0
   Timers: message age 0, forward delay 0, hold 0
   Number of transitions to forwarding state: 4
   The port is in the portfast edge mode by default
   Link type is point-to-point by default
   BPDU: sent 22, received 0
```

```
SW1# show spanning-tree interface g0/1 detail
 Port 2 (GigabitEthernet0/1) of VLAN0001 is designated blocking
   Port path cost 4, Port priority 128, Port Identifier 128.2.
   Designated root has priority 32769, address 5254.0016.c410
   Designated bridge has priority 32769, address 5254.0016.c410
   Designated port id is 128.2, designated path cost 0
   Timers: message age 0, forward delay 10, hold 0
   Number of transitions to forwarding state: 0
   Link type is point-to-point by default
   BPDU: sent 17, received 0
```

PortFast on trunk ports



- The standard PortFast configuration commands only enable PortFast on access ports.
  - Per-port: `SW1(config-if)# spanning-tree portfast`
  - Default: `SW1(config)# spanning-tree portfast default`

- In some cases, you might want to enable PortFast on a trunk port:
  - A port connected to a virtualization server with virtual machines (VMs) in different VLANs.
  - A port connected to a router via router-on-a-stick (ROAS).

- This can only be configured per-port in interface config mode:
  - `SW1(config-if)# spanning-tree portfast trunk`

```
SW1(config-if)# spanning-tree portfast trunk
%Warning: portfast should only be enabled on ports connected to a single
 host. Connecting hubs, concentrators, switches, bridges, etc... to this
 interface  when portfast is enabled, can cause temporary bridging loops.
 Use with CAUTION

SW1# show spanning-tree interface g0/1 detail
!output omitted
   The port is in the portfast edge trunk mode
!output omitted
```

PortFast edge

- In modern Cisco switches, if you use the commands covered in this lecture, the device will automatically add the **edge** keyword to the configuration.
  - `SW1(config-if)# spanning-tree portfast`
  - In the running-config: **`spanning-tree portfast edge`**

  - `SW1(config-if)# spanning-tree portfast trunk`
  - In the running-config: **`spanning-tree portfast edge trunk`**

  - `SW1(config)# spanning-tree portfast default`
  - In the running-config: **`spanning-tree portfast edge default`**

- You can use either version of the commands when configuring PortFast.
- The end result is the same: **edge** will always be added in the configuration.
- **`spanning-tree portfast disable`** doesn't use the **edge** keyword.

```
SW1(config)# interface g0/1
SW1(config-if)# spanning-tree portfast

SW1# show running-config interface g0/1
Building configuration...

Current configuration : 113 bytes
!
interface GigabitEthernet0/1
 switchport access vlan 10
 switchport mode access
 spanning-tree portfast edge
end
```

- Use **`show running-config interface`** *`interface-name`* to view the running-config for the specified interface.
- Doesn't work in Packet Tracer.

Automatically added **edge** to the end of the command.

Summary

- When a host connects to a switch port, by default it takes 30 seconds before the port can send/receive data.

- **PortFast** allows a switch port to immediately enter the STP **Forwarding** state, bypassing the **Listening** and **Learning** states.

- It can be configured in two ways:
  1. Interface config mode:
     `SW1(config-if)# spanning-tree portfast [edge]`
     This enables PortFast only on the individual interface. Only active when in access mode.

  2. Global config mode:
     `SW1(config)# spanning-tree portfast [edge] default`
     This enables PortFast on all access ports.
     You can then use **`spanning-tree portfast disable`** to disable PortFast on specific ports.

- PortFast should not be configured on ports connected to a switch, as it can cause temporary Layer 2 loops.

- You can enable PortFast on a trunk port with **spanning-tree portfast** [**edge**] **trunk**.

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*As of August 28th, 2024