LAB 02 Switching/VLAN

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CMPS1192 Networking Fundamentals
September 17, 2024

Dell PowerConnect 2824 (24 Gigabit Ethernet Ports)

Asset

System Name (0-160 Characters)	CMPS1192 2024-1
System Contact (0-160 Characters)	Andres Hung & Jennessa Sierra
System Location (0-160 Characters)	JAG PC LAB
MAC Address	a4:ba:db:85:ea:a9
Sys Object ID	1.3.6.1.4.1.674.10895.3028
Service Tag	
Asset Tag (0-16 Characters)	
Serial No.	
Date	
Time	
System Up Time	

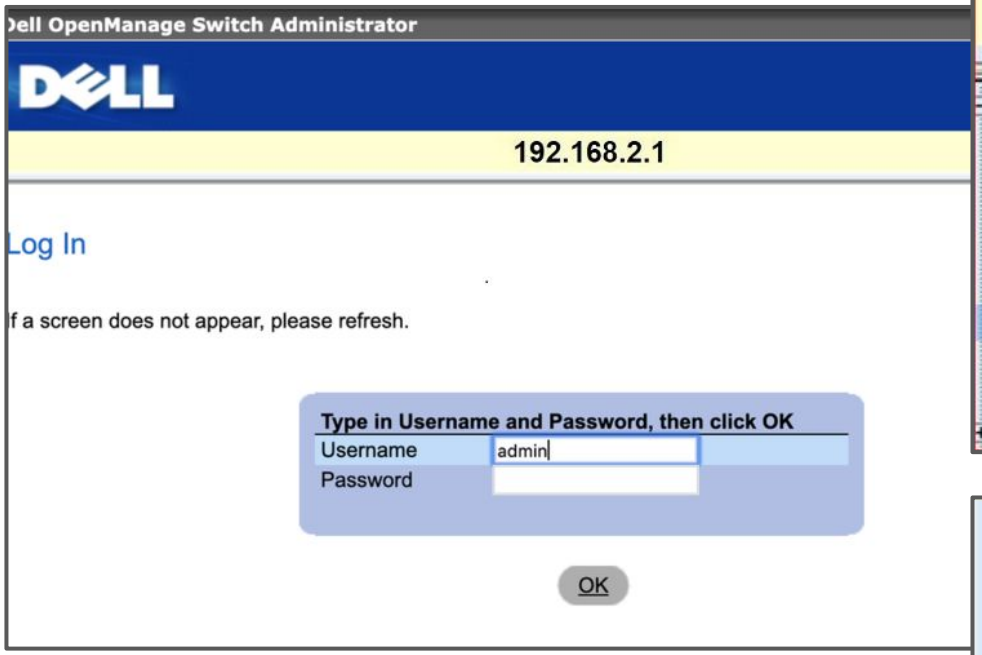
AX88179A
Connected
Details...

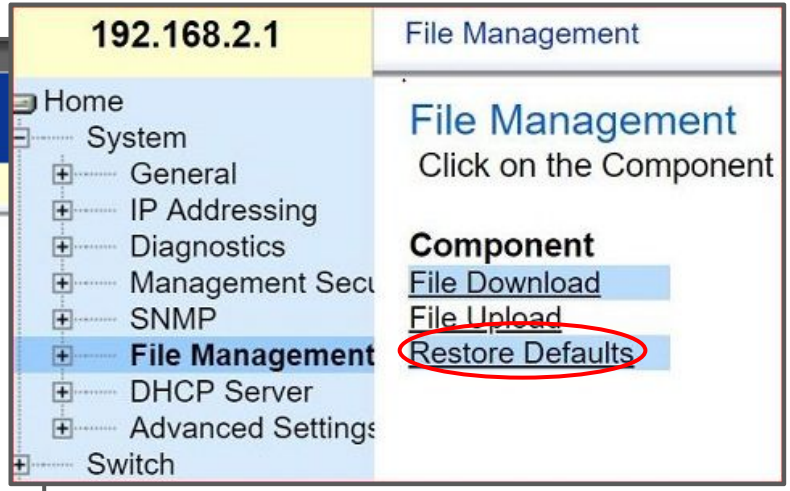
IPv4 Configured	Manually
IP address	192.168.2.10
Subnet mask	255.255.255.0
Router	192.168.2.1

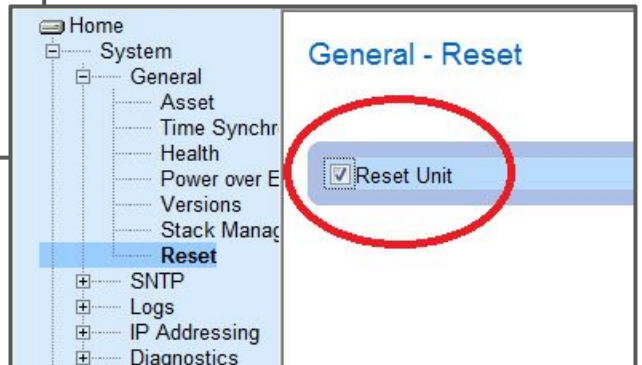
IP Interface Parameters

DHCP	Disable	
IP Address	192.168.2.1	(X.X.X.X)
Subnet Mask	255.255.255.0	(X.X.X.X)
Default Gateway	0.0.0.0	(X.X.X.X)

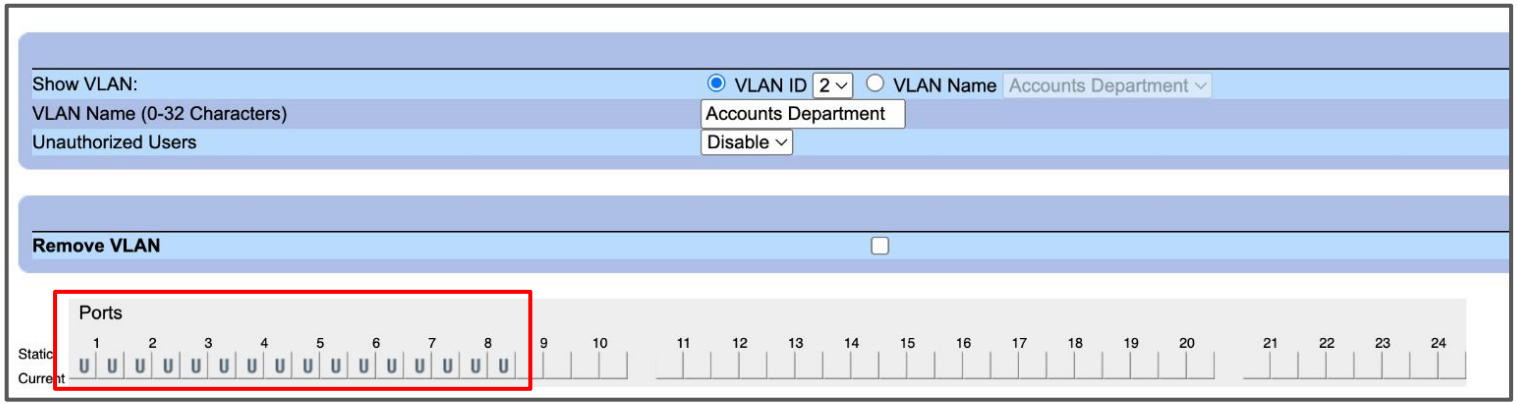
WebGUI Interface Login & Reset

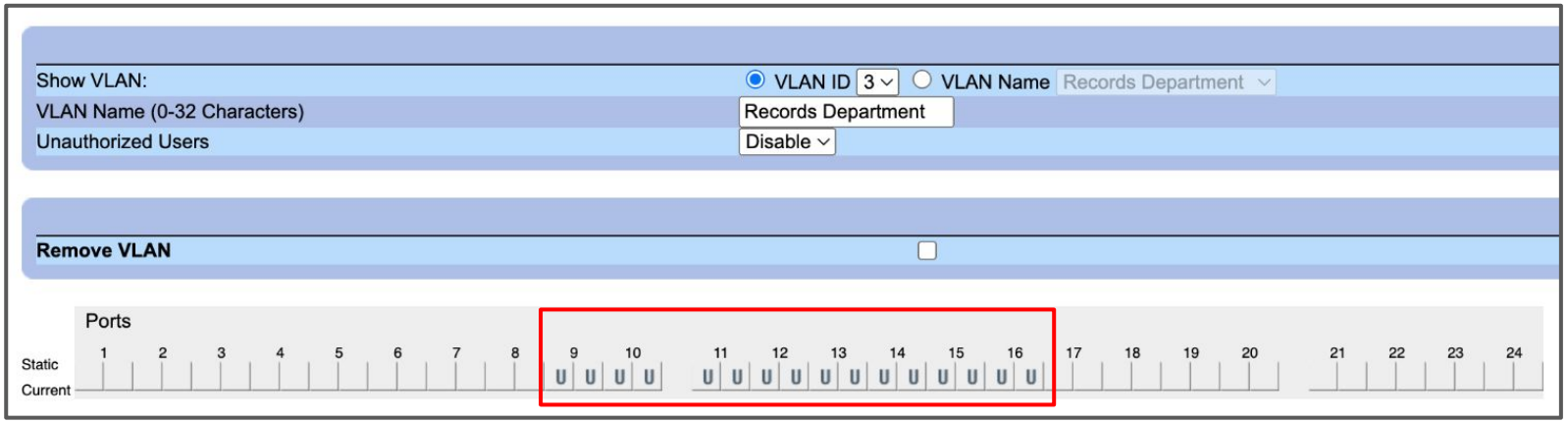




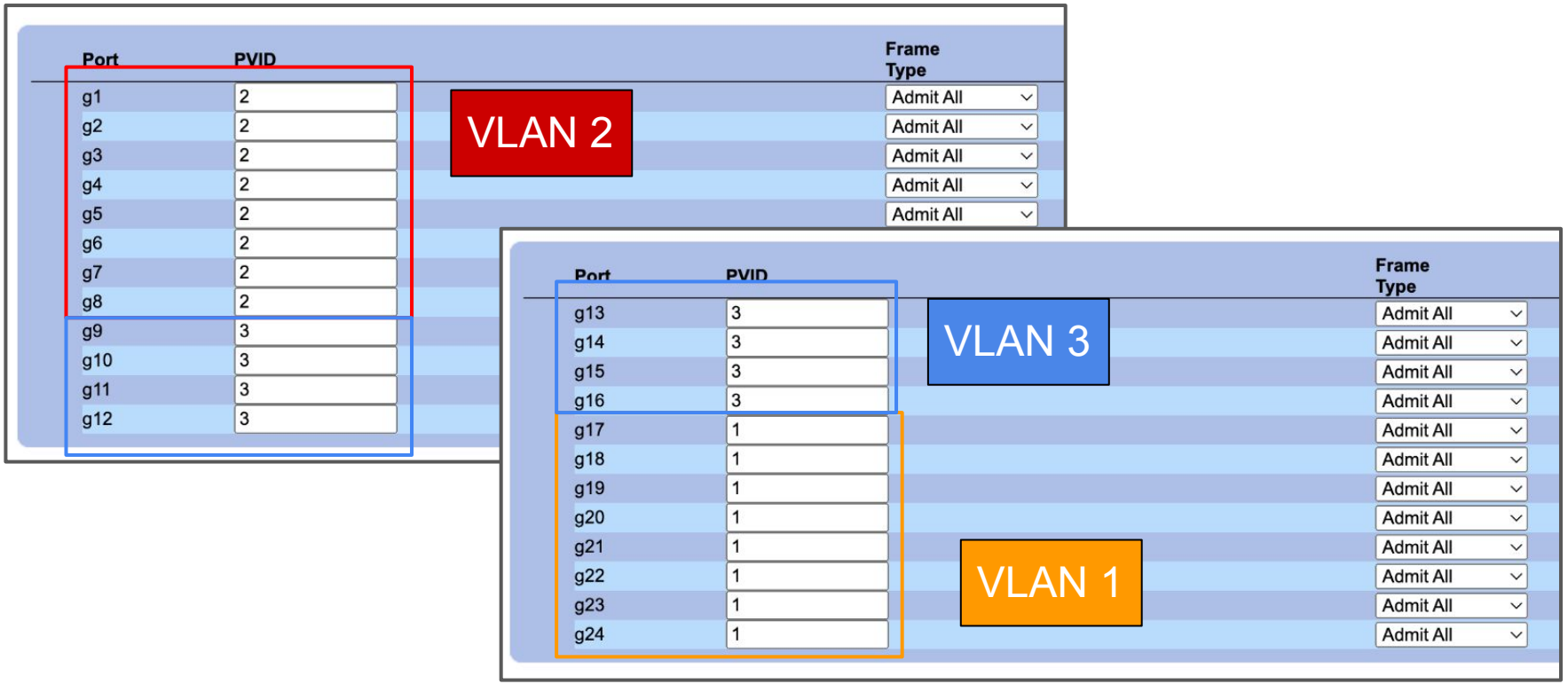


VLAN Setup


Show VLAN:
VLAN ID 2
VLAN Name Accounts Department
VLAN Name (0-32 Characters)
Accounts Department
Unauthorized Users
Disable
Remove VLAN
Ports
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Static
Current
U U U U U U U U U U U U U U U U


Show VLAN:
VLAN ID 3
VLAN Name Records Department
VLAN Name (0-32 Characters)
Records Department
Unauthorized Users
Disable
Remove VLAN
Ports
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Static
Current
U U U U U U U U U U U U U U U U

Port Tables


Port
PVID
Frame Type
g1 2 Admit All
g2 2 Admit All
g3 2 Admit All
g4 2 Admit All
g5 2 Admit All
g6 2
g7 2
g8 2
g9 3
g10 3
g11 3
g12 3
VLAN 2
Port
PVID
Frame Type
g13 3 Admit All
g14 3 Admit All
g15 3 Admit All
g16 3 Admit All
g17 1 Admit All
g18 1 Admit All
g19 1 Admit All
g20 1 Admit All
g21 1 Admit All
g22 1 Admit All
g23 1 Admit All
g24 1 Admit All
VLAN 3
VLAN 1

Ping Test (on same VLAN)

```
 andreshung  ~  ping 192.168.2.11
PING 192.168.2.11 (192.168.2.11): 56 data bytes
64 bytes from 192.168.2.11: icmp_seq=0 ttl=128 time=4.993 ms
64 bytes from 192.168.2.11: icmp_seq=1 ttl=128 time=3.083 ms
64 bytes from 192.168.2.11: icmp_seq=2 ttl=128 time=2.853 ms
64 bytes from 192.168.2.11: icmp_seq=3 ttl=128 time=2.944 ms
64 bytes from 192.168.2.11: icmp_seq=4 ttl=128 time=2.769 ms
^C
--- 192.168.2.11 ping statistics ---
5 packets transmitted, 5 packets received, 0.0% packet loss
round-trip min/avg/max/stddev = 2.769/3.328/4.993/0.839 ms
```

```
jennx@JS-PC in ~ via  v20.11.1
❯  ping 192.168.2.10

Pinging 192.168.2.10 with 32 bytes of data:
Reply from 192.168.2.10: bytes=32 time=2ms TTL=64
Reply from 192.168.2.10: bytes=32 time=2ms TTL=64
Reply from 192.168.2.10: bytes=32 time=2ms TTL=64
Reply from 192.168.2.10: bytes=32 time=2ms TTL=64

Ping statistics for 192.168.2.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 2ms, Average = 2ms

jennx@JS-PC in ~ via  v20.11.1 took 3s
❯
```

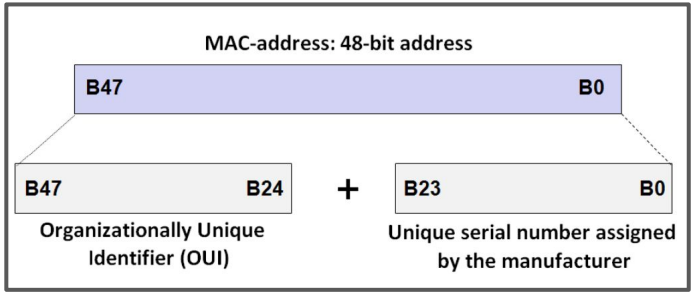
Ping Test (on different VLAN)

```
 andreshung  ~  ping 192.168.2.11
PING 192.168.2.11 (192.168.2.11): 56 data bytes
Request timeout for icmp_seq 0
Request timeout for icmp_seq 1
Request timeout for icmp_seq 2
Request timeout for icmp_seq 3
ping: sendto: No route to host
Request timeout for icmp_seq 4
ping: sendto: Host is down
Request timeout for icmp_seq 5
ping: sendto: Host is down
Request timeout for icmp_seq 6
ping: sendto: Host is down
Request timeout for icmp_seq 7
ping: sendto: Host is down
Request timeout for icmp_seq 8
ping: sendto: Host is down
Request timeout for icmp_seq 9
^C
--- 192.168.2.11 ping statistics ---
11 packets transmitted, 0 packets received, 100.0% packet loss
```

```
jennx@JS-PC in ~ via  v20.11.1
❯  ping 192.168.2.10

Pinging 192.168.2.10 with 32 bytes of data:
Request timed out.
Request timed out.
Reply from 192.168.2.11: Destination host unreachable.
Reply from 192.168.2.11: Destination host unreachable.

Ping statistics for 192.168.2.10:
    Packets: Sent = 4, Received = 2, Lost = 2 (50% loss),

jennx@JS-PC in ~ via  v20.11.1 took 15s
❯
```

Address Resolution Protocol (ARP)

```
andreshung ~ ping 192.168.2.11
```



Media Access Control

```
Ethernet II, Src: 00:53:ff:ff:aa:aa, Dst: ff:ff:ff:ff:ff:ff
  > Destination: ff:ff:ff:ff:ff:ff
  > Source: 00:53:ff:ff:aa:aa
    Type: ARP (0x0806)
    Padding: 000000000000000000000000000000000000
```

ARP Request

Data Link Layer

Comms within Network

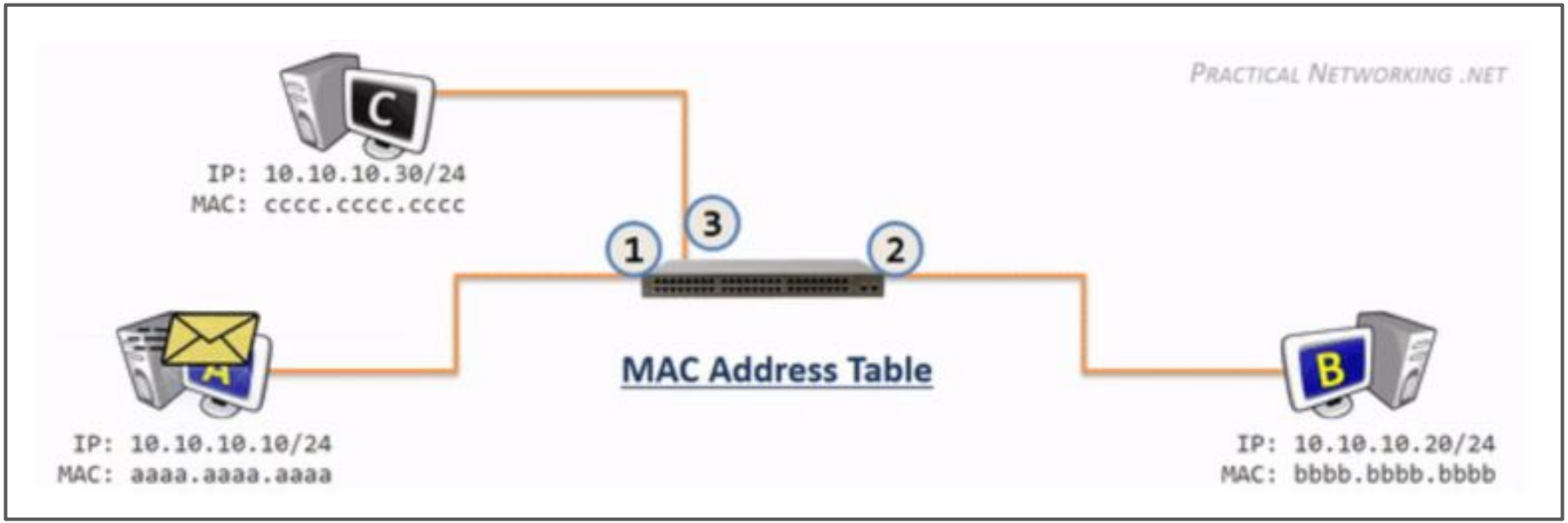
```
Ethernet II, Src: 00:53:ff:ff:bb:bb, Dst: 00:53:ff:ff:aa:aa
  > Destination: 00:53:ff:ff:aa:aa
  > Source: 00:53:ff:ff:bb:bb
    Type: ARP (0x0806)
    Padding: 000000000000000000000000000000000000
```

ARP Reply

ARP TABLE

192.168.2.11 = 00:53:ff:ff:bb:bb

The Switch (Layer 2 Device)

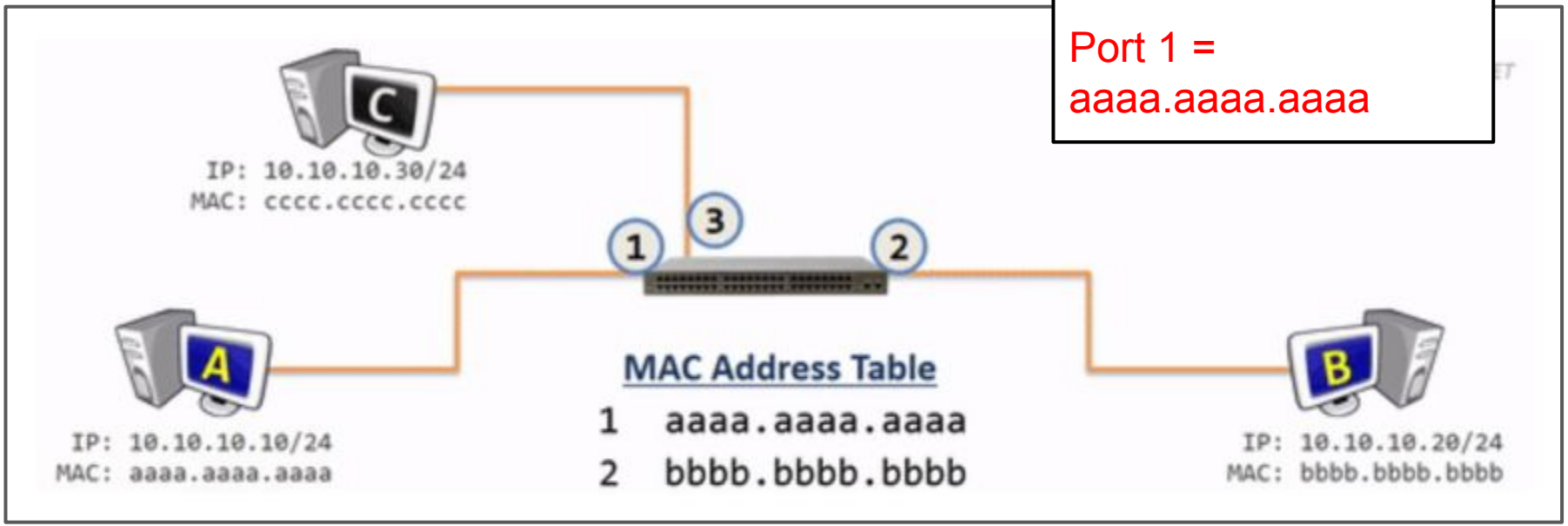


Learning, Flooding, Forwarding, Filtering

The Switch (Layer 2 Device)

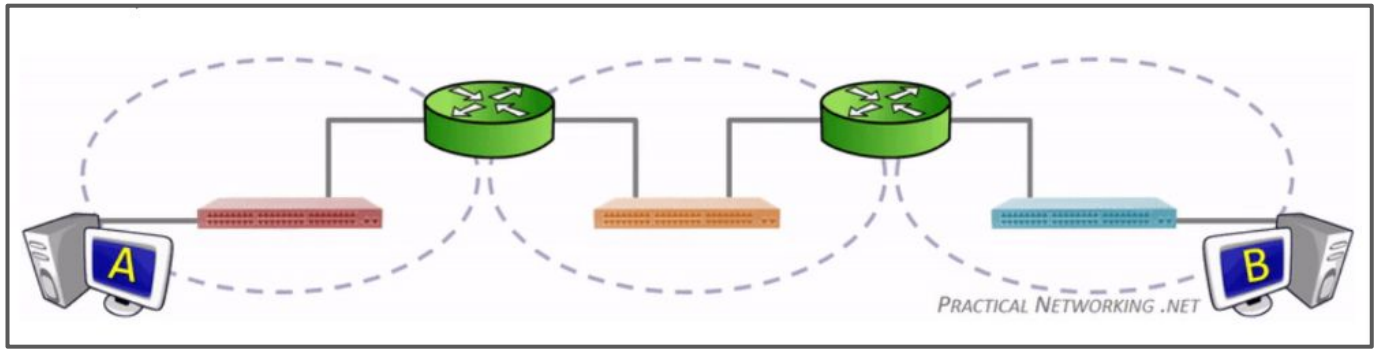
MAC Address Table

Port 1 =
aaaa.aaaa.aaaa

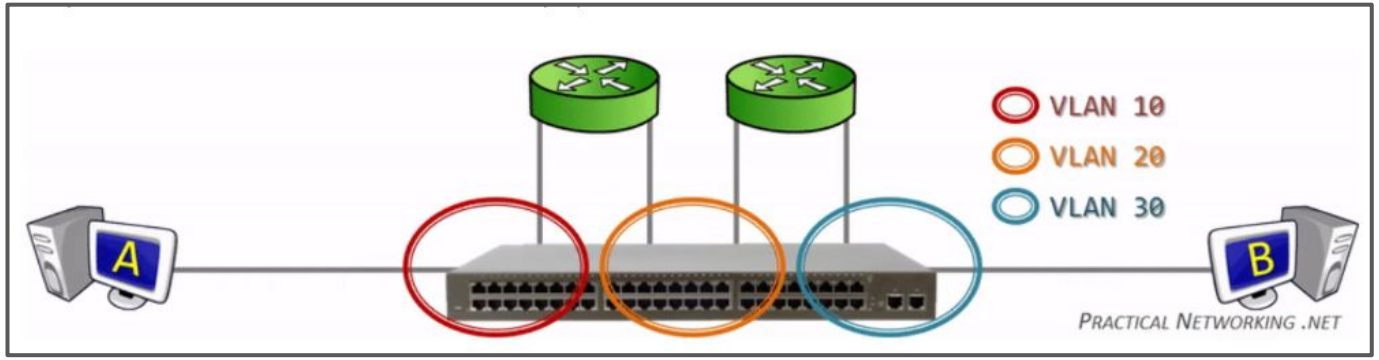


Learning, Flooding, Forwarding, Filtering

Virtual Local Area Networks (VLANs)

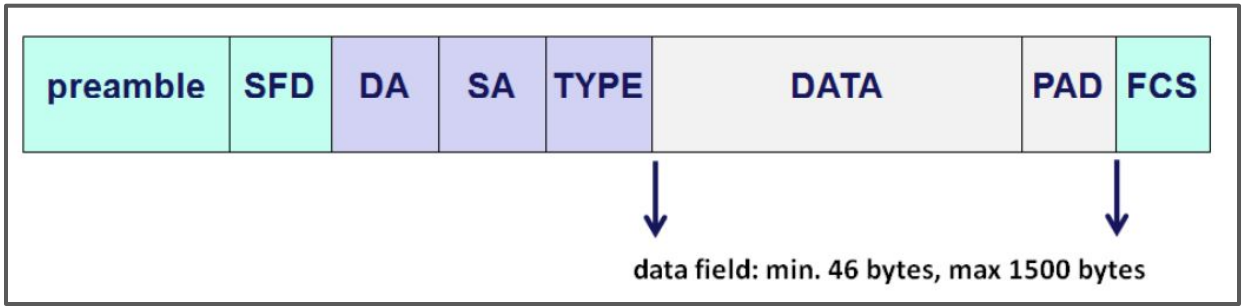


Multiple Switches

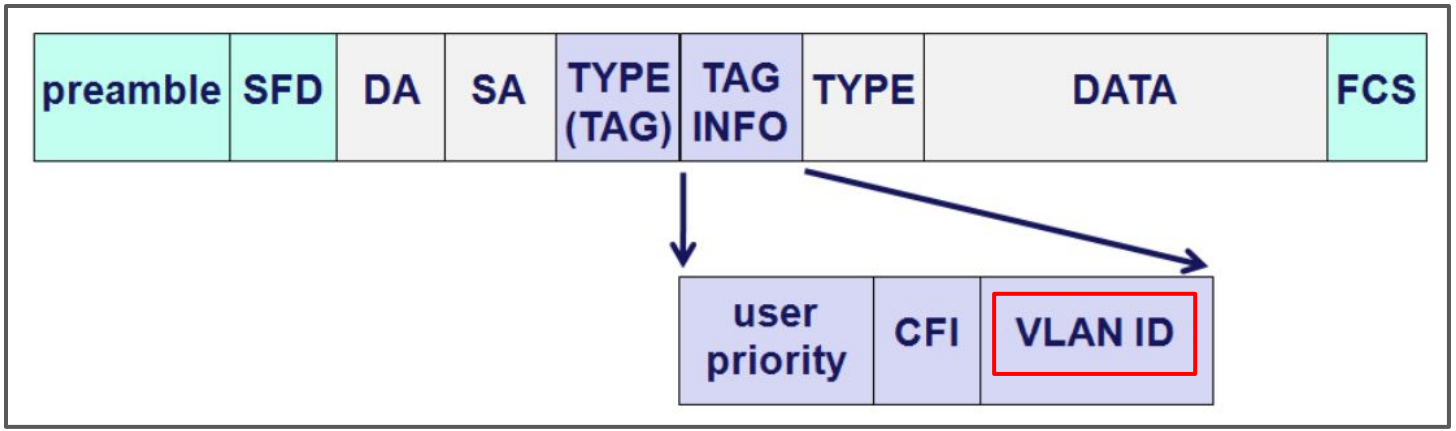


1 Switch w/ VLANs

Layer 2 Ethernet Frames



Ethernet Dataframe

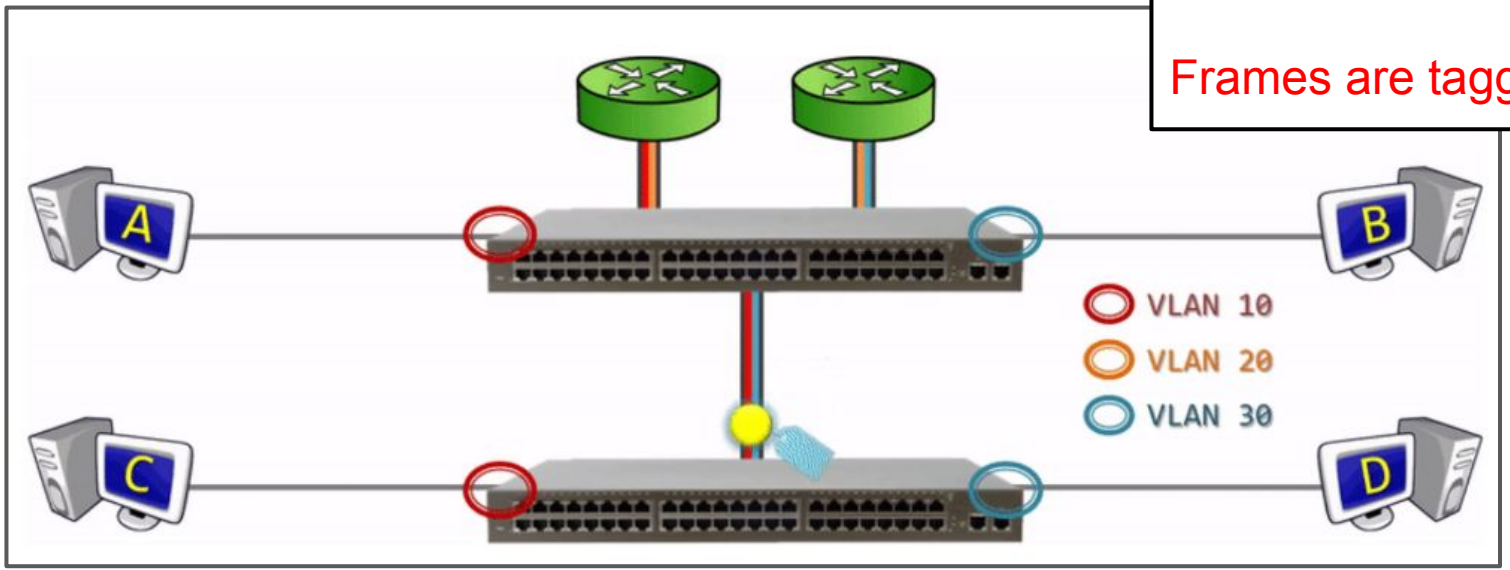


IEEE802.1Q

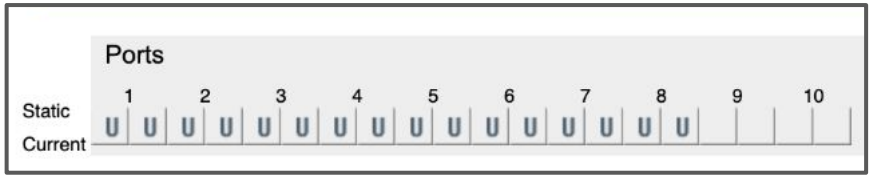
Tagged/Untagged Ports

Trunk Port: Carries Traffic for Multiple VLANs

Frames are tagged



Access Port: To end devices.
Frames are untagged



Network Created in Lab 02