

VLAN Implementation

With 802.1q tag-based VLAN, we can deploy VLAN members across multiple switches.

DESCRIPTION

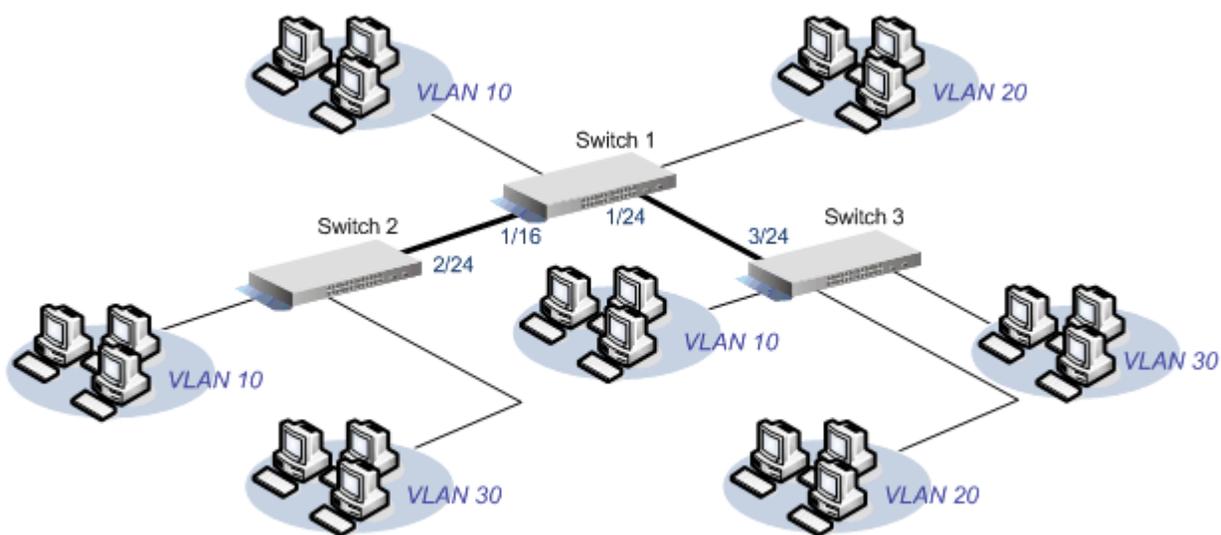
When the VLAN members are in different rooms, it is a must that VLAN traffic can cross different switches and still flow within the VLAN. Instead of port-based VLAN, switch makes it possible by tag-based VLAN.

Tag-based VLAN (IEEE 802.1q) uses a technique to insert a "tag" into the Ethernet header as a switch receives untagged packets. Tag contains a VLAN Identifier (VID) that indicates the VLAN numbers and is well-known to each switch that supports 802.1q. VLAN can span many switches as long as tag isn't removed. Of switches that support 802.1q, we take three SP1658A for example.

CONFIGURATION

Step 1. Create VLAN

Create VLANs that have traffic passing by. As the figure demonstrated, VLAN 30 traffic are transmitted between Sw#2 and Sw#3 and are both existing in Sw#1, Sw#2 and Sw#3.



Switch 1:

VLAN group 10 (VID=10): #1~#4, #16, #24

VLAN group 20 (VID=20): #5~#8, #16, #24

VLAN group 30 (VID=30): #16, #24

Switch 2:

VLAN group 10 (VID=10): #1~#4, #24

VLAN group 30 (VID=30): #9~#12, #24

Switch 3:

VLAN group 10 (VID=10): #1~#4, #24

VLAN group 20 (VID=20): #5~#8, #24

VLAN group 30 (VID=30): #9~#12, #24

Add the switch ports that connect hosts to certain VLAN.

Note: The switch ports that inter-connect switches should participate in all VLANs that exist in the local switch.

Step 2. Setup Tagged Ports

The switch ports that connect hosts are usually set to untagged ports. The switch ports that inter-connect switches should be set to tagged. Or tag will be removed as packets leave switch for another switch.

Switch 1:

Tagged Ports: #16, #24

Untagged Ports: Others

Switch 2:

Tagged Ports: #24

Untagged Ports: Others

Switch 3:

Tagged Ports: #24

Untagged Ports: Others

Step 3. Setup PVID (Port VLAN ID)

Incoming port assigns configured PVID to packets for their VLAN ID as it receives them. Then, packets are forwarded to all members of VLAN group that has the same VID value as PVID. PVID of ports that inter-connect switch just remain default setting, PVID=1.

Switch 1:

Port/PVID: 1/10 ~ 4/10, 5/20 ~ 8/20, and others are "1"

Switch 2:

Port/PVID: 1/10 ~ 4/10, 9/30 ~ 12/30, and others are "1"

Switch 3:

Port/PVID: 1/10 ~ 4/10, 5/20 ~ 8/20, 9/30 ~ 12/30, and others are "1"

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