VLAN:

- VLAN stands for Virtual Local Area Network.
- VLAN is a logical grouping of networking devices.
- Break large broadcast domain in smaller broadcast domains.
- VLANs divide the switch into different LAN segments.
- Consider Virtual Local Area Network (VLAN) as a subnet.
- Two different subnets cannot communicate each other without router.
- Two different VLANs also requires router to communicate.
- VLAN used in Switches and it operates at Layer 2.
- By default, in every switch there is five VLANs.
- VLAN 1 is the default VLAN for every switch port.
- The standard VAN range is from VLAN 1 to 1005.
- The Extended VLAN range is from VLAN 1006 – 4094.
- Extended-range are store in running configuration.
- VTP version 3 and transparent mode support extended-range.
- The reserved VLAN range is from VLAN 1002-1005.
- VLANs 1, 1002 to 1005 are created automatically & cannot be removed.
- Voice VLAN enables the access port to carry IP voice traffic.
- By default, in every cisco Switch the voice VLAN is disabled.
- VLANs are stored in Cisco Switch vlan.dat file in Flash Memory.

VLAN Analogy:

- Partition hard disks on a computer into several logical partitions.
- The main purpose of hard disks partition is to organize the disk space.
- It ensure that corruption of partition does not affect another partition.
- Like a big room separated by partitions to make them two houses for use.
- VLAN is like as big office separated by partitions makes in many offices.
- It is like a big classroom, divide into many section such as Class A, B, C etc.

Advantage of VLAN:

- Solve broadcast problem.
- Reduce the size of broadcast domains.
- Allow us to add additional layer of security.
- Make device management easier.
- Implement logical grouping of devices by function.

Type of VLAN	Descriptions
Data	Use for normal data
Voice	Use for IP phone/Voice over IP
Private	Use for security, it divided primary and secondary VLAN
Management	A VLAN which is used for Telnet and SSH configuration
Extended	Usable if VTP mode is transparent on switches
Native VLAN	Untagged frame is send over trunk link (by default VLAN1)

Access Port:

- Access port transports traffic to and from only the specified VLAN allotted to it.
- Access port will only have a single VLAN set up on the interface.
- Access port carries traffic for just a single Virtual Local Area Network (VLAN).
- If VLAN is not configured, the interface can carry traffic for default VLAN that is VLAN1.

Commands	Description
SW1(config)# interface ethernet0/3	Enter interface mode
SW1(config-if)# switchport access vlan 10	Places the interface e0/3 in vlan 10
SW1(config-if)# switchport mode access	Defines the port as an access port

VLAN Database:

- The VLAN database is used to store vlan data, such as the VLAN ID, name and MTU.
- The default location of the VLAN database is in the local **vlan.dat** file.
- VLAN database is stored in non-volatile memory, which is flash.

Commands	Description
SW1#dir | SW1#show flash	Verify VLAN database
SW1#more unix:/vlan.dat-00004	To read VLAN database
SW1#delete unix:/vlan.dat-00004	Delete VLAN database

```
SW1#dir
Directory of unix:/

5111993  -rw-        1136   Feb 2 2019 10:03:09 +00:00  NETMAP
5111994  -rw-       16384   Feb 2 2019 10:03:09 +00:00  nvram_00004
5111900  -rw-        1373   Feb 2 2019 09:04:34 +00:00  startup-config.cfg
5112796  -rw-         616   Feb 2 2019 11:00:25 +00:00  vlan.dat-00004
5112791  -rw-         787   Feb 2 2019 10:03:09 +00:00  ubridge.log
```

Normal VLAN:

- Normal VLANs range are from VLANs **1** to VLAN **1005**.
- Normal VLANs can be configured both database configuration mode & global.
- Normal VLANs are stored in **vlan.dat** file in Flash memory.
- VTP versions 1 and 2 can advertise normal range VLANs only.

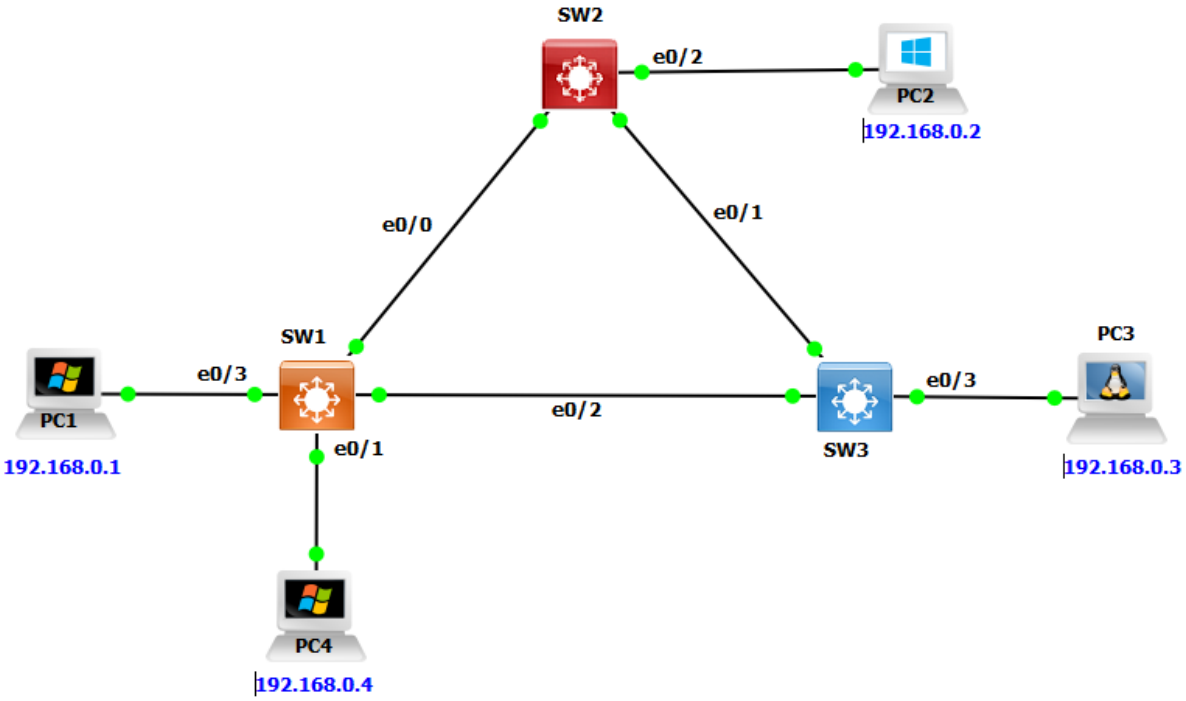
Extended VLANs:

- Extended VLANs are VLANs that fall in the range **1006 to 4094**.
- Extended VLAN are mainly used in service provider networks.
- Extended VLAN allow for the provisioning of large numbers of customers.
- Extended VLANs differ from normal VLANs because they have higher numbers.
- Extended VLANs must be configured in VTP transparent mode or VTP V3.
- Extended VLANs are saved and store in switch running-configuration.

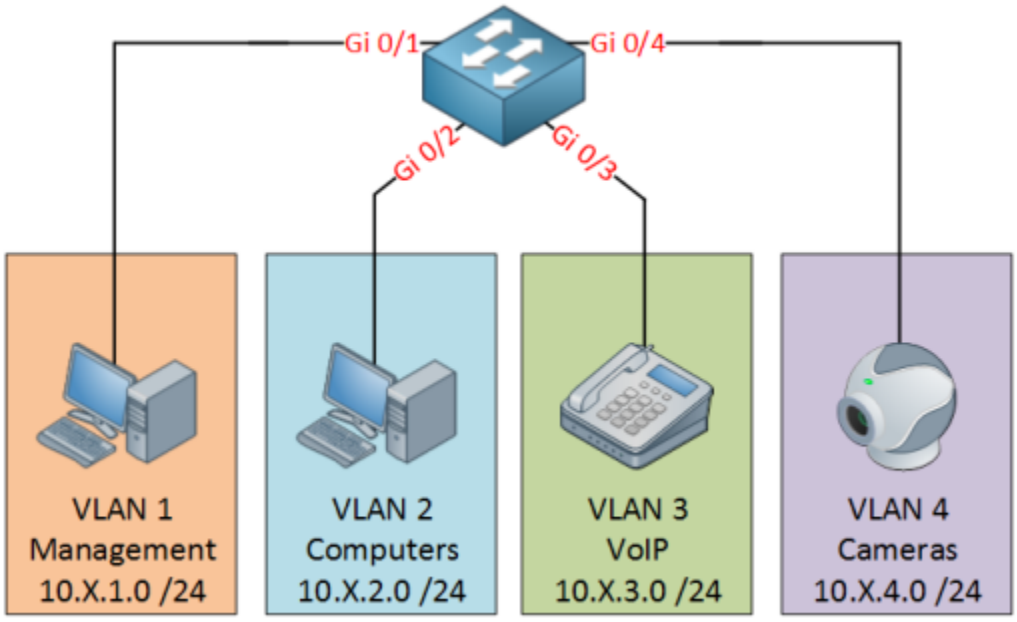
```
SW1(config)#vlan 1008
SW1(config-vlan)#exit
SW1(config)#exit
SW1#show running-config | sec vlan
vlan internal allocation policy ascending
vlan 1008
```

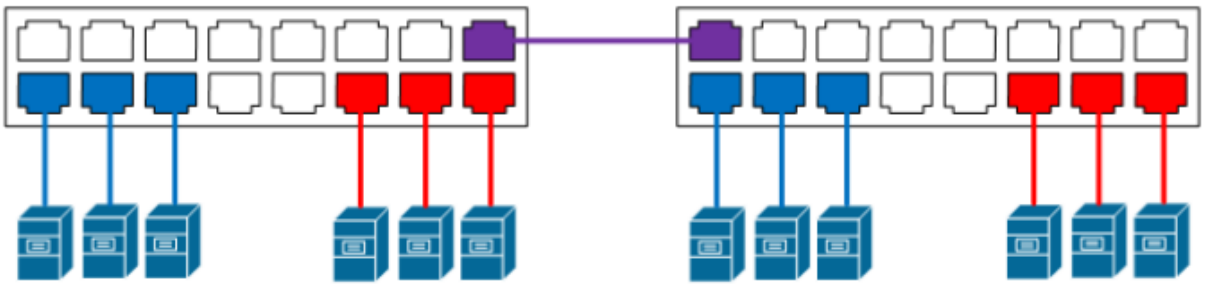
Voice VLAN:

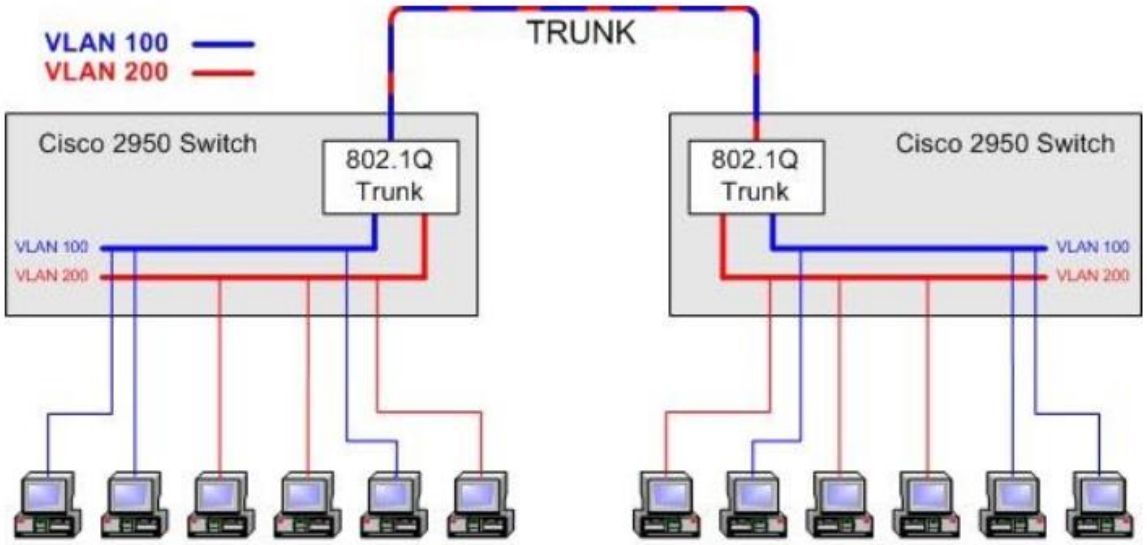
- Voice VLAN enables access port to carry IP voice traffic from an IP phone.
- Voice VLAN feature enables access ports to carry IP voice traffic.
- The voice VLAN feature is supported only on access ports.
- The Voice VLAN is also known as the Auxiliary VLAN (AUX VLAN).
- By default, in Cisco Switch the voice VLAN is disabled.



Commands	Description
SW1(config)#vlan 10 SW1(config-vlan)#name HR	Create a VLAN Name VLAN
SW1(config)# no vlan 10	Delete VLAN
SW1# show vlan brief	Verify VLAN creation
SW1# show flash OR dir	Verify VLAN database
SW1(config)#vlan 5 SW1(config-vlan) # name Voice SW1(config)#interface e0/1 SW1(config-if)#switchport voice vlan 5	Configure a Voice VLAN Name voice VLAN Interface mode Put the interface in voice VLAN 5
SW1# show interface e0/1 switchport	Verify switchport configuration
SW1# show interface e 0/1 status	Determine the physical status






VLAN 100
VLAN 200
TRUNK
Cisco 2950 Switch
802.1Q
Trunk
VLAN 100
VLAN 200
802.1Q
Trunk
Cisco 2950 Switch
VLAN 100
VLAN 200