LAN CONCEPT

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Motivation

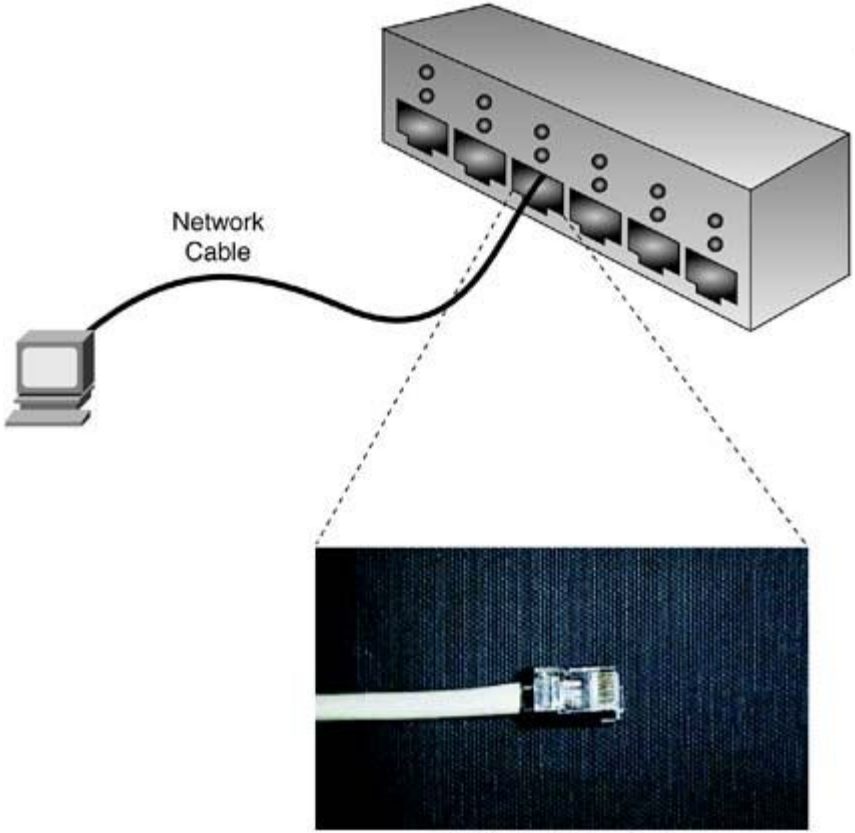
In today's business environment, **businesses need information to survive**. With technology, this has been made possible, the use of new methods of communicating such as the use of voice, video, **data which is transmitted over networks is crucial**.

As such, we **need to design LANs** with these needs in mind.

Physical Switch Platform

switched network is the physical switch itself.

A LAN switch is a device that is made up of many ports connecting LAN segments, such as 100-Mbps Ethernet, and a high-speed port, such as Gigabit Ethernet. The high-speed port, in turn, connects the LAN switch to other devices in the network.



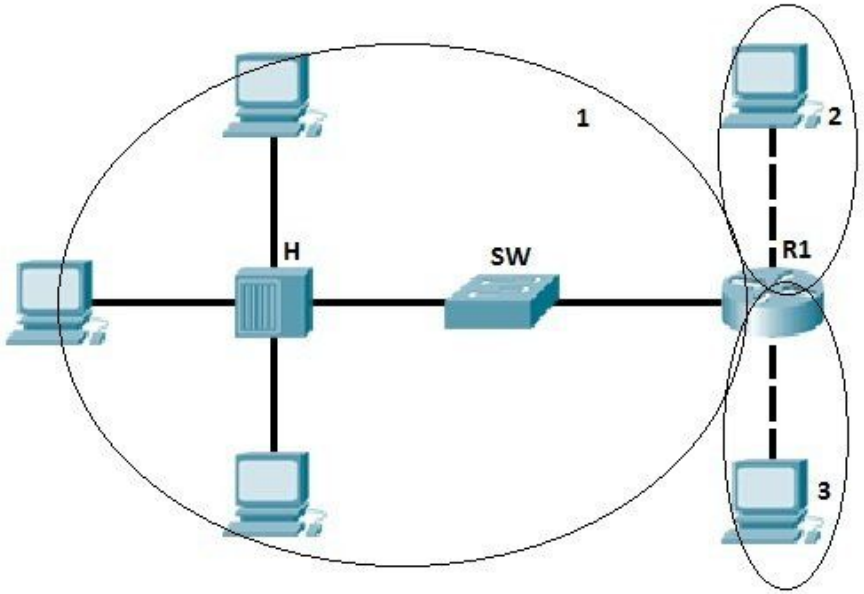
Cable Jack Termination
(Plugs into the NIC and
Switch Ports)

Lan design concept

- Network segmentation and broadcast traffic management – this is mainly through the **use of VLANs**
- Security
- Easy configuration and management of the switches
- Redundancy

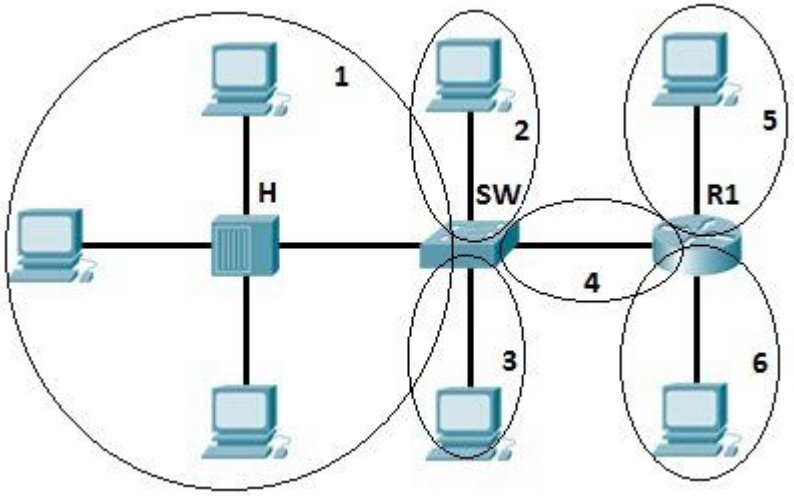
Broadcast domain

A broadcast domain is the **domain in which a broadcast is forwarded**. A broadcast domain contains all devices that can reach each other at the data link layer (OSI layer 2) by using broadcast. All ports on a hub or a switch are by default in the same broadcast domain. All ports on a router are in the different broadcast domains and routers don’t forward broadcasts from one broadcast domain to another.



Collision domain :

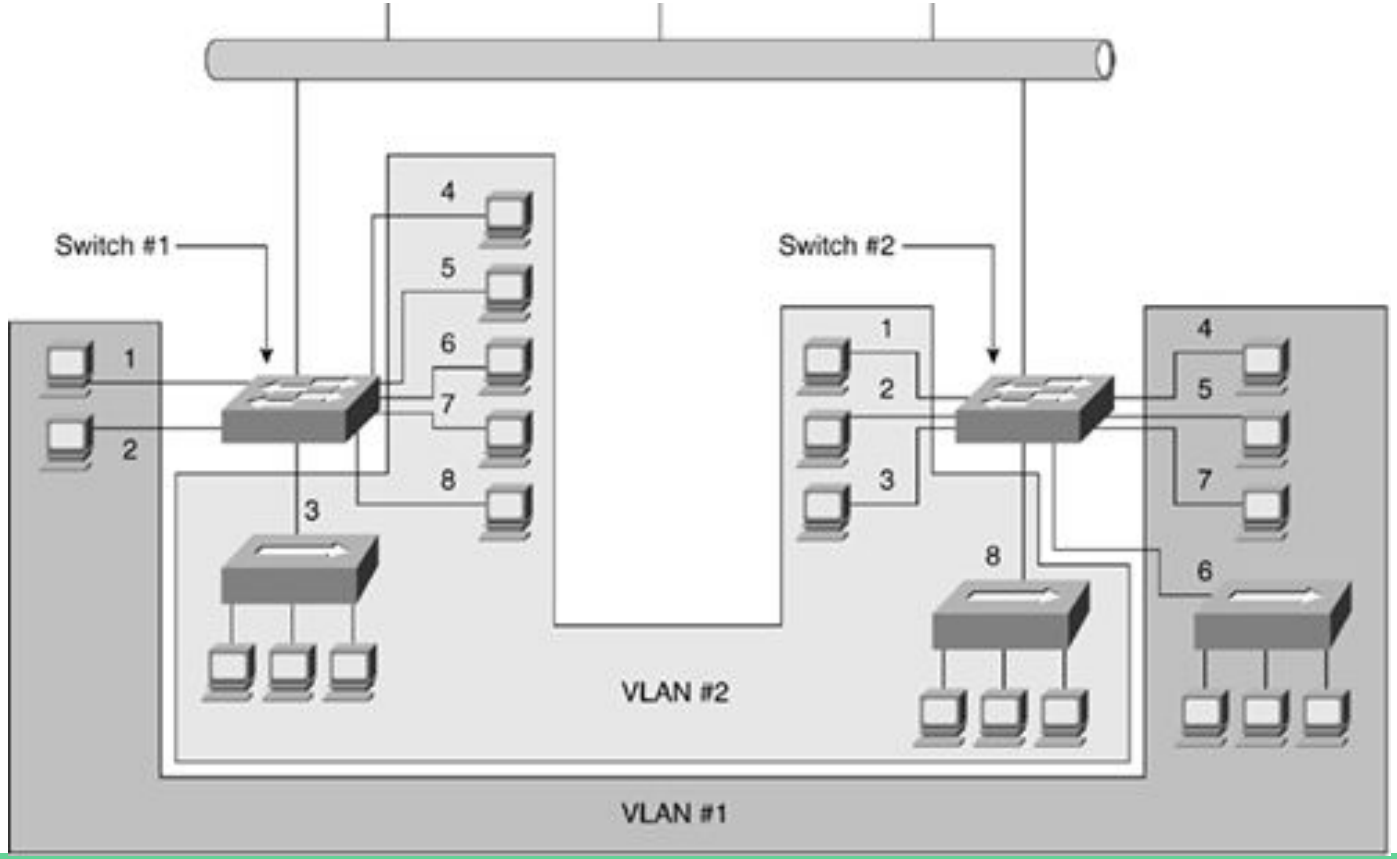
A collision domain is, as the name implies, **the part of a network where packet collisions can occur.** A collision occurs when two devices send a packet at the same time on the shared network segment. The packets collide and both devices must send the packets again, which reduces network efficiency. Collisions are often in a hub environment, because each port on a hub is in the same collision domain. By contrast, each port on a bridge, a switch or a router is in a separate collision domain.

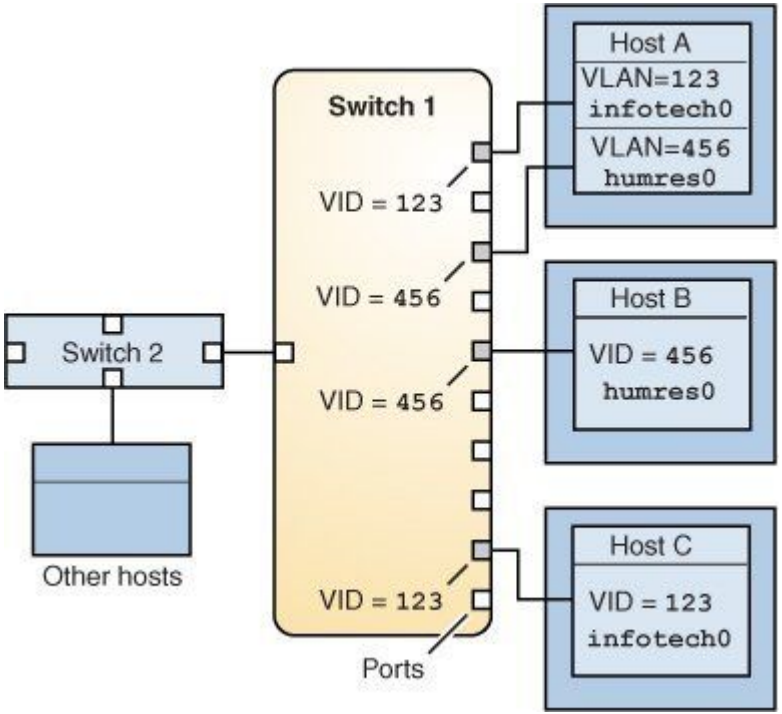


Few additional examples of LAN designs ...

VLAN Infrastructure

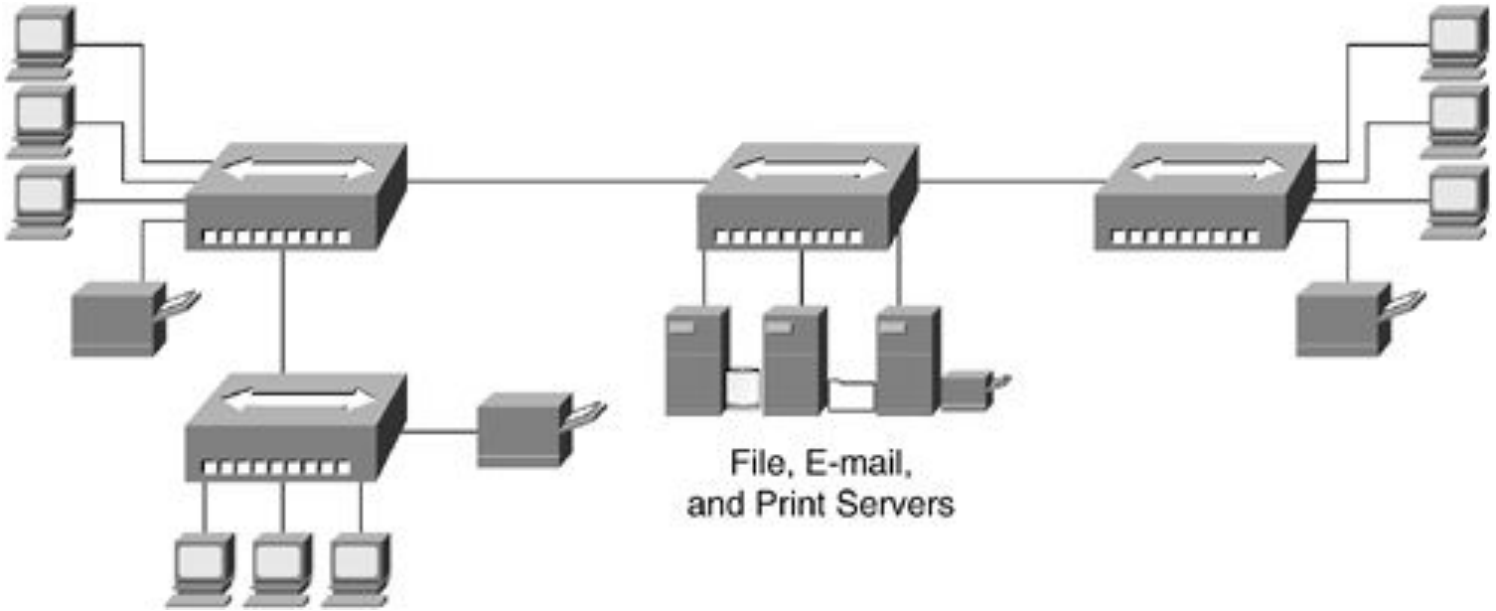
Without a router, hosts in one VLAN cannot communicate with hosts in another VLAN.




Switch 1
VID = 123
VID = 456
VID = 456
VID = 123
Ports
Switch 2
Other hosts
Host A
VLAN=123
infotech0
VLAN=456
humres0
Host B
VID = 456
humres0
Host C
VID = 123
infotech0

Flat Network Topology

The typical architecture for a small LAN is workstations, printers, and servers attached to one or more hubs or to a small switch in a flat topology



List the key benefits of concept of VLAN .. [Home work]