**Name : Omkar Deshpande**

**Roll No. : 33213**

**Batch : K10**

**Assignment No.5**

**Title :** Using a network simulator configure VLAN , Dynamic trunk

protocol and spanning tree protocol ,OSPF-explore neighboyr-ship

conitio and requirement,neighbour-ship state,OSPF metric cost

calculation.

**Theory**

**VLAN**

It is a logical grouping of networking devices.When we create Vlan,we actually break broadcast domain in smalller broadcast domains.Consider VLAN as a subset,same as two different sunets cannot communicate with each other without router,different VLAn also require router to communicate.

**Advantages of VLAN :**

* Solve broadcast problem.
* Reduce size of broadcast domain.
* Aloow us to add aditional layer of security.
* Make device management easier.
* Allow us to implment logical grouping of devices by function instead of location.

**VLAN Membership :**

VLAN membership can be assigned to a device by one of two methods,

1) Static

2) Dynamic

These methods decide how a switch will associate its ports with VLANs.

**1) Static :**

Assigning VLAN statically is the most common and secure method.It is a pretty easy to set up and supervise.In this method we manually assign VLAN to switch port.VLAN configured in this way are usually known as port based VLAN.

**2)Dynamic :**

In this,VLAN are assigned to port automatically depending on the connected device.In this method , we have configure one switch from network as server.Server contains device speific information like MAC address,IP address ,etc.This information is mapped with VLAN .Switch acting s server known as VMPS(VLAN Membership Policy Server).

**VLAN Connectons :**

During configuration of VLAN on port,we need to know what type of connection it has.Switch ports two types of VLAN connection.

1)Access link

2)Trunk link

1)Access Link :

It is the connection where switch port is connected with a device that has a standardized ethernet NIC.Standard NIC only understand IEEE 802.3 or Ethernet II frames.Aceess link connetion can only be assigned with single VLAN.

2)Trunk Linl

It is a connection where switch port is connected with a device that is capable to understand multiple VLAN.

**Dynamic Trunking Protocol**

DTP is a cisco proprietory protocol.It automatically configures trunking on necessary ports.It operate in 5 modes.

1. DTP mode ON
2. DTP mode Desirable
3. DTP mode Auto
4. DTP mode No-Negotiate
5. DTP mmode off

**Spanning Tree Protocol**

It is a layer 2 protocol,used for removing loops.For backup purpose we typically create bakuplink for important resource.In oyr scenario,all offices have backup links that create loops in topology.STP automatically removes layer 2 loop.STP multicasts frame that contain information about switch interfaces.These frames are called BDDU.

**OSPF**

OSPF stands for open shortest path first.It is a link state open standard based routing protocol.

**Features of OSPF :**

* It supports both IPV4 and IPV6 routed protocols.
* It support load balancing with equal cost routes for same destination
* Since it is based on open standard ,it will run on most routers
* It is a classless protocol.

**Disadvantages of OSPF :**

* Require extra CPU process to run SPF algorithm.
* Require more RAM to store adjacency topology.
* It is more complex to setu and hard to troubleshoot.

**NAT**

There are several situations where we need address translation such as a network which do not have sufficient public IP adress want to connect with internet,two network which have same IP address want to merge or due to security reason a network want to hide its internal IP structure from the external world.NAT it is a process which traslates or map private IP address to public IP address.

**Types of NAT :**

1. Static NAT
2. Dynamic NAT
3. PAT.(Port Address Tranlation)

**Conclusion:**

In this way,I have configured VLAN,DTP,STP,OSPF using network simulator.