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COMPUTER SCIENCE & ENGINEERING
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Worksheet 2.4

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Subject Name: Computer Networks **Subject Code: 21CSH-256**

Aim: Configure a network using Link State Routing Protocol using Packet Tracer or NS2.

Objective: To stimulate Link State routing Protocol

Procedure:

1. Place the devices such as routers, switches and end devices
2. Establish connections between these devices using different cables
3. Enter the IP addresses and the accordingly
4. Enter the CLI commands for each router
5. Send message and watch the data being sent using real time stimulation

Theory & Output:

Link State Routing protocol: Link state routing is a technique in which each router shares the knowledge of its neighborhood with every other router in the internetwork.

The three keys to understand the Link State Routing algorithm:

- **Knowledge about the neighborhood:** Instead of sending its routing table, a router sends the information about its neighborhood only. A router broadcast its identities and cost of the directly attached links to other routers.

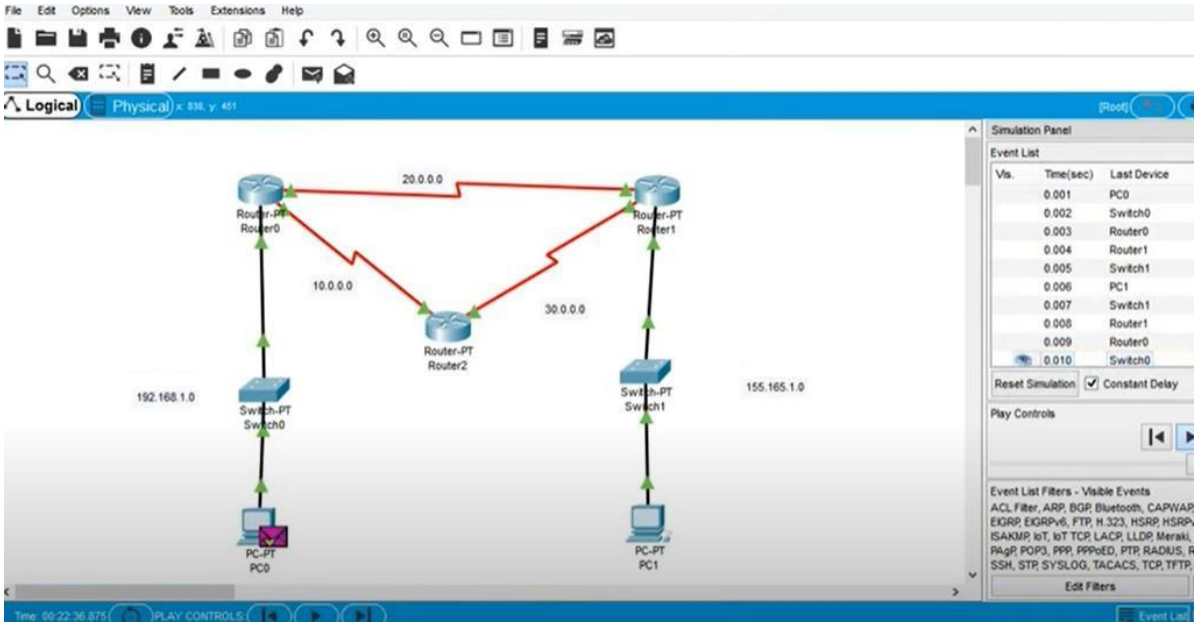
- **Flooding:** Each router sends the information to every other router on the internetwork except its neighbors. This process is known as Flooding. Every router that receives the packet sends the copies to all its neighbors. Finally, each and every router receives a copy of the same information.
- **Information sharing:** A router sends the information to every other router only when the change occurs in the information.

Protocols of Link State Routing

- **Open Shortest Path First (OSPF):** Open Shortest Path First (OSPF) is a unicast routing protocol developed by a working group of the Internet Engineering Task Force (IETF). It is an intra-domain routing protocol. It is an open-source protocol. It is similar to Routing Information Protocol (RIP). OSPF is a classless routing protocol, which means that in its updates, it includes the subnet of each route it knows about, thus, enabling variable-length subnet masks. With variable-length subnet masks, an IP network can be broken into many subnets of various sizes. This provides network administrators with extra network configuration flexibility. These updates are multicasts at specific addresses (224.0.0.5 and 224.0.0.6). OSPF is implemented as a program in the network layer using the services provided by the Internet Protocol. IP datagram that carries the messages from OSPF sets the value of the protocol field to 89. OSPF is based on the SPF algorithm, which sometimes is referred to as the Dijkstra algorithm.

CLI Commands used

1. **Exit:** is used to configure parameters that apply to the entire switch.
2. **Router OSPF 1:** is used to to configure Open Shortest Path First (OSPF). OSPF also allows packetauthentication and uses IP multicast when sending and receiving packets.
3. **Network IP mask area 0:** it is used to tell router about various networks connected toit.



Result

We were able to successfully stimulate Link State routing Protocol