Course Code: **CAP 276** Course Instructor: **Dr. Manmohan Sharma**
Course Title: **Data Communication and Networking Laboratory**
Roll Number: **RD2110B79** Registration Number: **12102801**
Name: **Atul Kumar** Set Assigned: **B**
Page Number: **01** Total Pages: **08**

Question: Design a network topology with star backbone connected to bus, ring and mesh topologies.

Objective:-

- The main objective of data communication and networking is to provide seamless exchange of data between any two points in the world. This exchange of data takes place over a computer network.
- It also allows "Resource Sharing", and it is to make all programs, data and equipment available to anyone on the network without the regard to the physical location of the resource and the user.
- Computer networks provide a powerful communication medium. A file that was updated or modified on a network can be seen by the other users on the network immediately.
- Networking will help you to develop and improve your skill set and stay on top of the latest trends.

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Page Number: **02** Total Pages: **08**

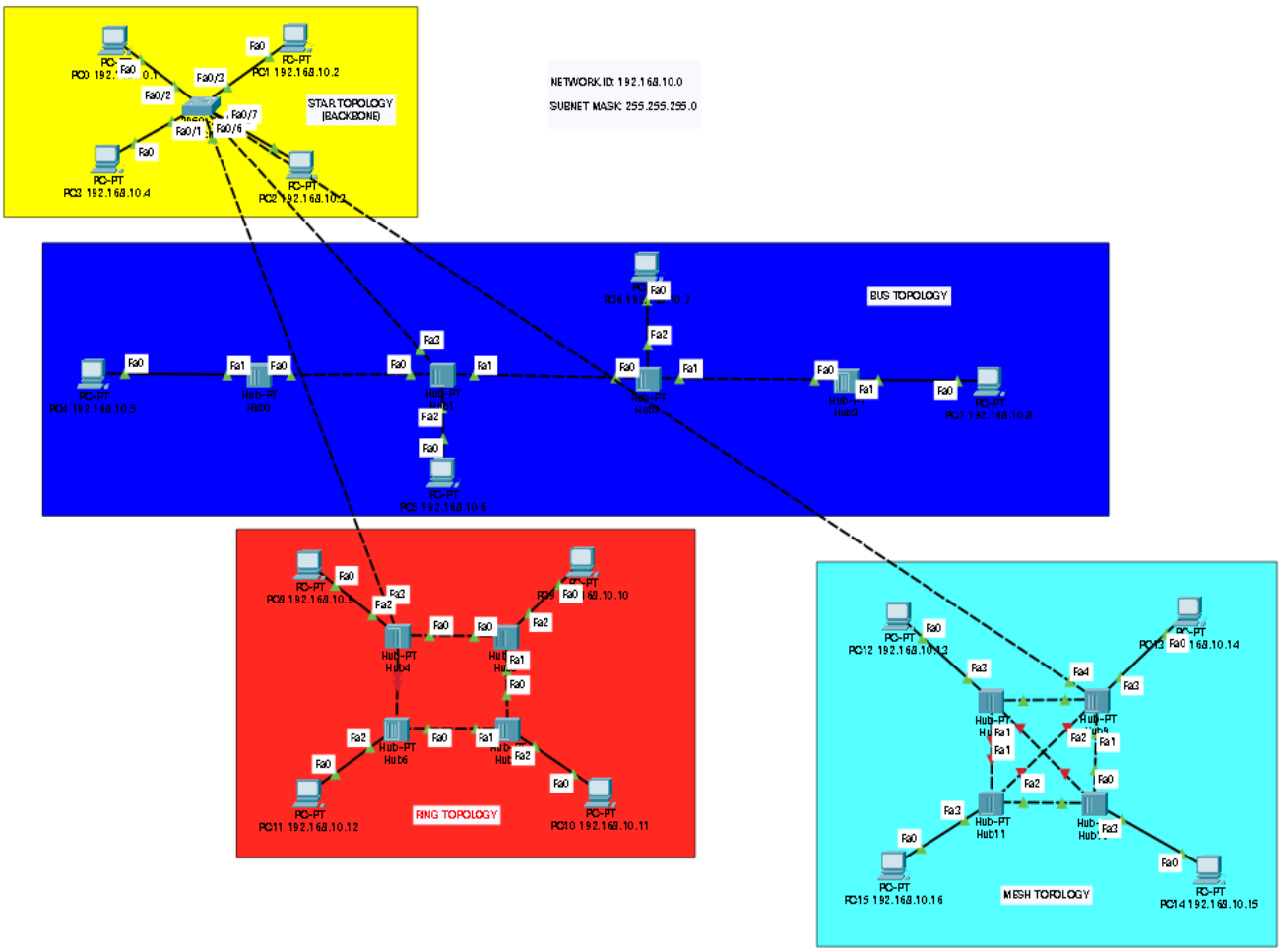

Figure: Star Backbone Connected with Bus, Ring & Mesh Topologies

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Page Number: **03** Total Pages: **08**

Initial IP Configuration:-

Device	Interface	IP Configuration	Connected with
PC0	**Fa0**	**192.168.10.1**	**Switch0**
PC1	**Fa0**	**192.168.10.2**	**Switch0**
PC2	**Fa0**	**192.168.10.3**	**Switch0**
PC3	**Fa0**	**192.168.10.4**	**Switch0**
PC4	**Fa0**	**192.168.10.5**	**Hub0**
PC5	**Fa0**	**192.168.10.6**	**Hub1**
PC6	**Fa0**	**192.168.10.7**	**Hub2**
PC7	**Fa0**	**192.168.10.8**	**Hub3**
PC8	**Fa0**	**192.168.10.9**	**Hub4**
PC9	**Fa0**	**192.168.10.10**	**Hub5**
PC10	**Fa0**	**192.168.10.11**	**Hub7**
PC11	**Fa0**	**192.168.10.12**	**Hub6**
PC12	**Fa0**	**192.168.10.13**	**Hub8**
PC13	**Fa0**	**192.168.10.14**	**Hub9**
PC14	**Fa0**	**192.168.10.15**	**Hub10**
PC15	**Fa0**	**192.168.10.16**	**Hub11**
Switch0	**Fa0/1**	**----------**	**PC3**

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Name: **Atul Kumar** Set Assigned: **B**
Page Number: **04** Total Pages: **08**

Device	Interface	IP Configuration	Connected with
Switch0	**Fa0/2**	**----------**	**PC0**
Switch0	**Fa0/3**	**----------**	**PC1**
Switch0	**Fa0/4**	**----------**	**PC2**
Switch0	**Fa0/5**	**----------**	**Hub1**
Switch0	**Fa0/6**	**----------**	**Hub4**
Switch0	**Fa0/7**	**----------**	**Hub9**
Hub0	**Fa1**	**----------**	**PC4**
Hub0	**Fa0**	**----------**	**Hub1**
Hub1	**Fa0**	**----------**	**Hub0**
Hub1	**Fa1**	**----------**	**Hub2**
Hub1	**Fa2**	**----------**	**PC5**
Hub1	**Fa3**	**----------**	**Switch**
Hub2	**Fa0**	**----------**	**Hub1**
Hub2	**Fa1**	**----------**	**Hub3**
Hub2	**Fa2**	**----------**	**PC6**
Hub3	**Fa0**	**----------**	**Hub2**
Hub3	**Fa1**	**----------**	**PC7**
Hub4	**Fa0**	**----------**	**Hub5**
Hub4	**Fa1**	**----------**	**Hub6**

Course Code: **CAP 276** Course Instructor: **Dr. Manmohan Sharma**
Course Title: **Data Communication and Networking Laboratory**
Roll Number: **RD2110B79** Registration Number: **12102801**
Name: **Atul Kumar** Set Assigned: **B**
Page Number: **05** Total Pages: **08**

Device	Interface	IP Configuration	Connected with
Hub4	**Fa2**	**----------**	**PC8**
Hub4	**Fa3**	**----------**	**Switch**
Hub5	**Fa0**	**----------**	**Hub4**
Hub5	**Fa1**	**----------**	**Hub7**
Hub5	**Fa2**	**----------**	**PC9**
Hub6	**Fa0**	**----------**	**Hub7**
Hub6	**Fa1**	**----------**	**Hub4**
Hub6	**Fa2**	**----------**	**PC11**
Hub7	**Fa0**	**----------**	**Hub5**
Hub7	**Fa1**	**----------**	**Hub6**
Hub7	**Fa2**	**----------**	**PC10**
Hub8	**Fa0**	**----------**	**Hub9**
Hub8	**Fa1**	**----------**	**Hub11**
Hub8	**Fa2**	**----------**	**Hub10**
Hub8	**Fa3**	**----------**	**PC12**
Hub9	**Fa0**	**----------**	**Hub8**
Hub9	**Fa1**	**----------**	**Hub10**
Hub9	**Fa2**	**----------**	**Hub11**

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Page Number: **06** Total Pages: **08**

Device	Interface	IP Configuration	Connected with
Hub9	**Fa3**	**----------**	**PC12**
Hub9	**Fa4**	**----------**	**Switch**
Hub10	**Fa0**	**----------**	**Hub9**
Hub10	**Fa1**	**----------**	**Hub11**
Hub10	**Fa2**	**----------**	**Hub8**
Hub10	**Fa3**	**----------**	**PC14**
Hub11	**Fa0**	**----------**	**Hub10**
Hub11	**Fa1**	**----------**	**Hub8**
Hub11	**Fa2**	**----------**	**Hub9**
Hub11	**Fa3**	**----------**	**PC15**

Process Description:-

All topologies consist of four hosts.

Step 1: First you have to create Star topology which is the backbone for this network. For creating star, you can use Switch/Hub. Here I used switch, now take 4 PCs and connect with switch through Straight-through cable (For connecting different devices) and then assign unique IP

Configuration to all the 4 PCs. Now, your star topology is ready.

Step 2: Now you have to create Bus, Ring and Mesh topologies here you have to take 4 Hubs and 4 PCs for all the three topologies. In bus, all the hubs are arranged in a linear manner whereas in ring all the hubs are arranged in a ring shape. In mesh, you can arrange by your choice. Now you have to connect all the hubs of the bus and the ring each other through Cross-over cable (For connecting same devices) but in mesh you have to connect each hub with the all-remaining hubs. Now connect PC to the hubs in all the above topologies and also assign unique IP Configuration to all the PCs.

Step 3: All the three topologies are created. Now connect all the three topologies to the backbone (Star Topology) one by one through Cross-over cable means you have to connect bus, ring and mesh to the connecting device of the backbone (Switch). You can select any one of the four hubs of the bus, ring and mesh and connect it

to the Switch in the star topology.

Step 4: Now the all three topologies are connected to the star, you can also see there are some green arrows sign in the cable of the entire network that's means your connection is correctly established.

Step 5: Your network is ready to communicate now you can send packets(data) from one host (Source) to another host (Destination) in the entire network.

Thank You