SRM INSTITUTE OF SCIENCE & TECHNOLOGY
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DELHI-NCR CAMPUS, GHAZIABAD (U.P.)

COMPUTER COMMUNICATIONS LAB

(Subject Code: 18CSS202J)

B.TECH. (CoMpUTEr sCiENCE ANd ENGiNEEriNG) - i

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Experiment-7 Create a network for data transfer

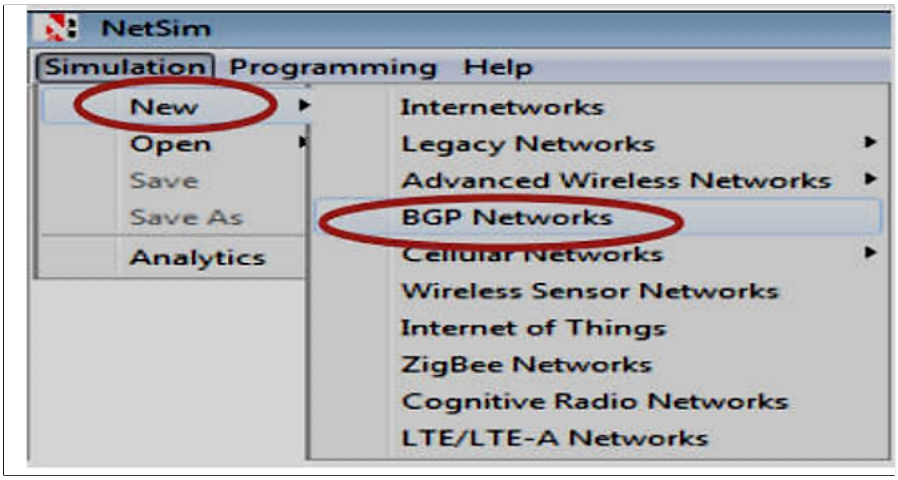
through Border Gateway Protocol (BGP).

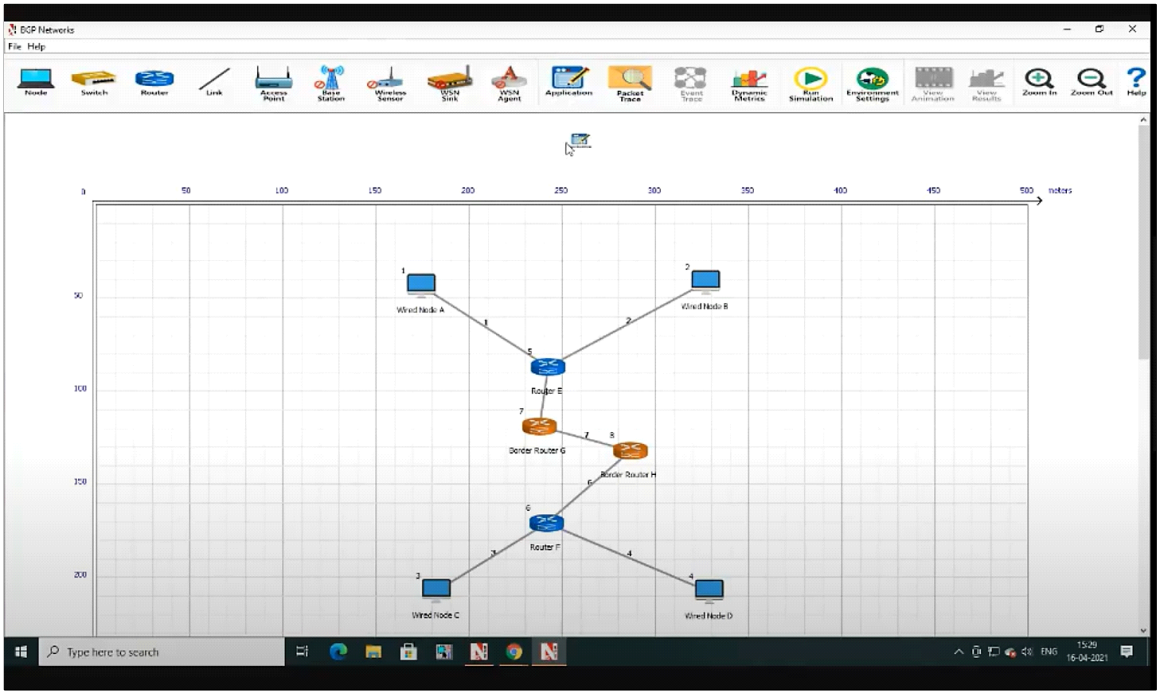
Theory: In BGP, the Packets are transmitted between the Autonomous system using Path vector Routing.

Path Vector Routing:
Path vector routing is used for inter-domain routing. It is similar to distance vector routing. In path vector routing we assume that there is one Router (there can be many) in each autonomous system which acts on behalf of the entire autonomous system. This Router is called the Border Router. The Border Router in one Autonomous System creates a routing table and advertises it to neighboring Border Router which belongs to neighboring autonomous systems. The idea is same as distance vector routing except that only Border Routers in each autonomous system can communicate with each other. The Border Routers advertises the path, not the metric, in its autonomous system or other autonomous systems.

Procedure: Step 1:

Go to Simulation à New à BGP Networks





Sample Inputs:

Follow the steps given in the different samples to arrive at the objective.

- Total no of nodes used: 4
- Total number of Internal Routers used: 2
- Total number of Border Routers used: 2

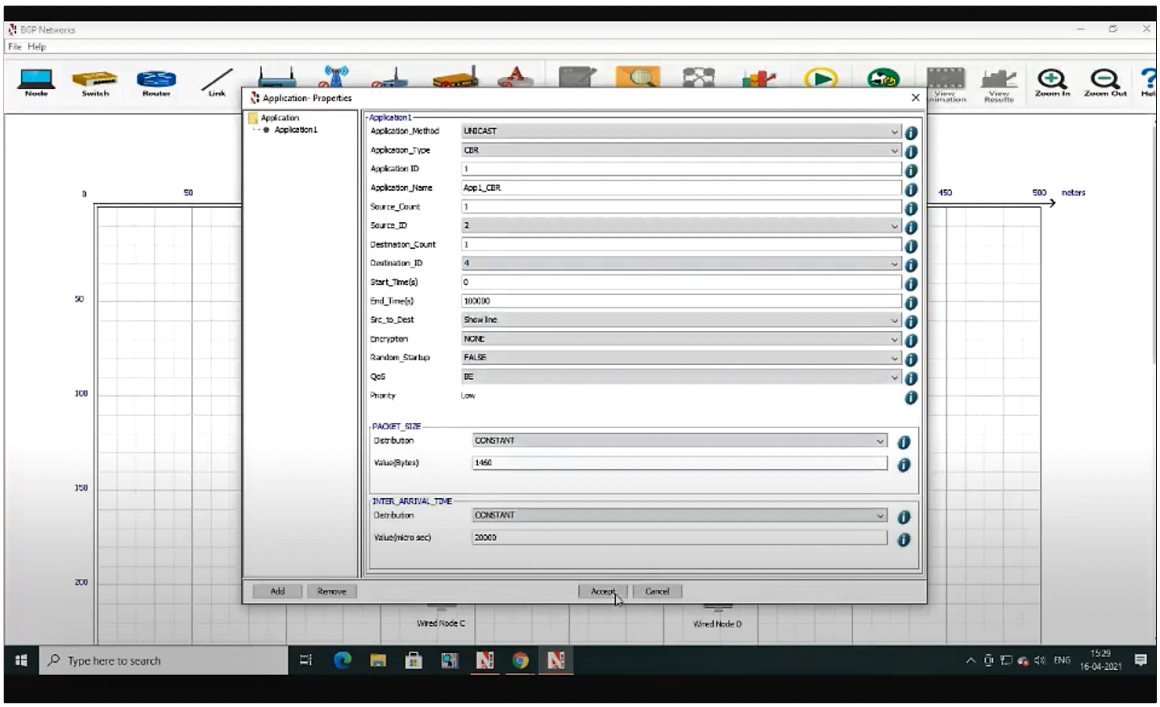
The devices are interconnected as given below,

- Wired Node E and Wired Node F are connected by Link 1 and Link 2 to Router C.
- Internal Router C and Border Router A are connected by Link 3.
- Border Router A and Border Router B are connected by Link4.
- Border Router B and Router D are connected by Link 5.
- Router D is connected by Link 6 and Link 7to Wired Node G and Wired Node H respectively.

Set the properties for each device by following the tables

Application Properties	Application 1	Application 2
Application_Type	CUSTOM	CUSTOM
Source_Id	5	6
Destination_Id	7	8
Application Data size		
Distribution	Constant	Constant
Application Data size (bytes)	1472	1472
Inter Arrival Time		
Distribution	Constant	Constant
Mean Inter Arrival Time (µs)	20000	20000

Link Properties	Link 1	Link 2	Link 3	Link 4	Link 5	Link 6	Link 7
Bit Error Rate (BER)	0	0	0	0	0	0	0
Downlink Speed (Mbps)	8.448	8.448	10	1000	10	8.448	8.448
Uplink Speed (Mbps)	8.448	8.448	10	1000	10	8.448	8.448



Sample 1:

If selected internal gateway protocol is RIP then Router properties are as follows:

Router Properties	Border_ Router A		Border_ Router B	
	Interior Routing table	Exterior Routing table	Interior Routing table	Exterior Routing table
Protocol Type	RIP	BGP	RIP	BGP
Update Timer	30	-	30	-
Timeout Timer	180	-	180	-
Garbage Collection Timer	120	-	120	-

Router Properties	Router C	Router D
Routing Protocol	RIP	RIP
Update Timer	30	30
Timeout Timer	180	180
Garbage Collection Timer	120	120

Simulation Time - 10 Sec

(***Note:*** *The Simulation Time can be selected only after doing the following two tasks,)*

- *Set the properties of Routers*
- *Then click on Run Simulation button).*

After simulation save the experiment.

Sample 2:

If you want to select your internal gateway protocol as OSPF then here is the information you need to fill in for Router properties:

Router Properties	Border_ Router A		Border_ Router B	
	Interior Routing table	Exterior Routing table	Interior Routing table	Exterior Routing table
Protocol Type	OSPF	BGP	OSPF	BGP
LSRefreshTime	1800	-	1800	-
MaxAge	3600	-	3600	-

Router Properties	Router C	Router D
Routing Protocol	OSPF	OSPF
LSRefreshTime	1800	1800
MaxAge	3600	3600

Simulation Time - 10 Sec

(***Note:*** *The Simulation Time can be selected only after doing the following two tasks,)*

- *Set the properties of Routers*
- *Then click on Run Simulation button).*

Output:

After running this scenario, in Performance Metrics screen, routing tables are obtained in BGP table and RIP metrics.

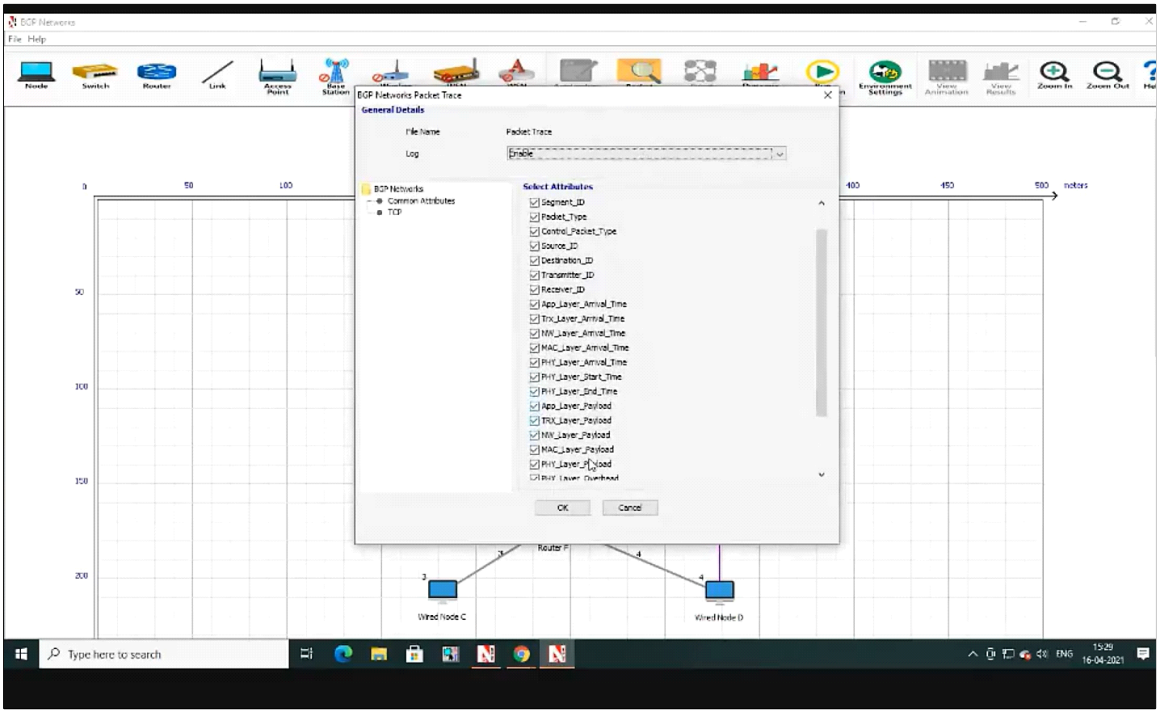
If you click over the RIP metrics, you will get the RIP routing table for internal routers. If you click over the BGP table, you will get the routing table for Border routers. We have shown the routing tables for Border Router 1 and 2.

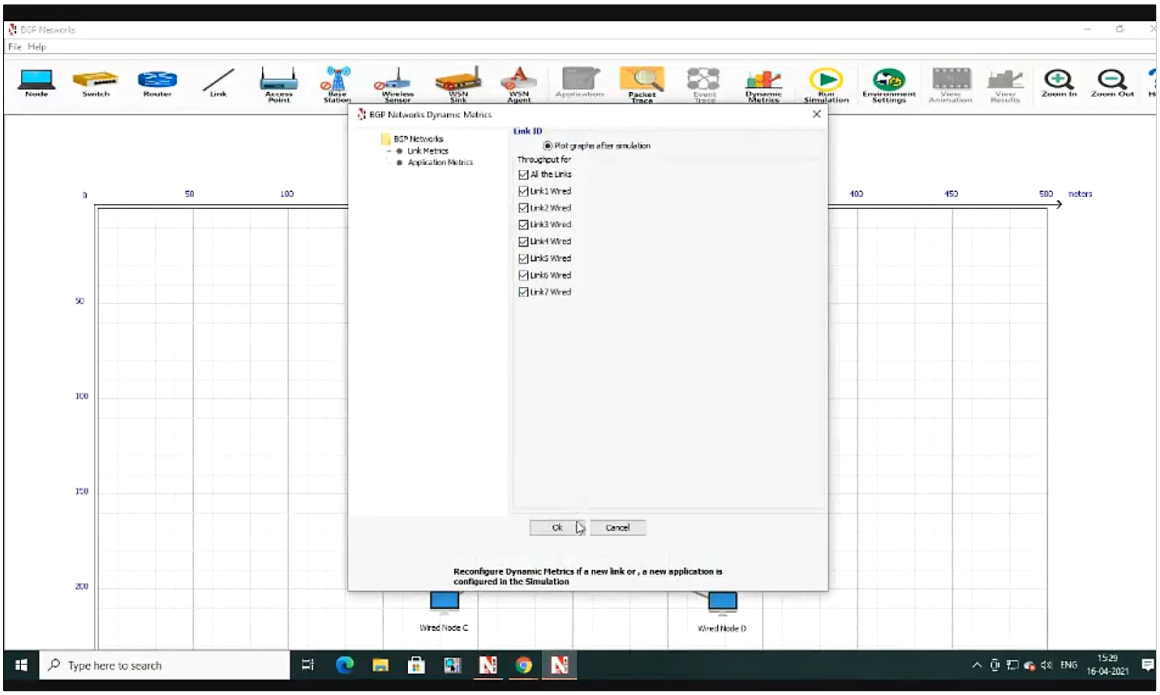
The Border Routers stores the node's remote address in its Routing Table as shown in the above Tables under —Peer Remote Address column.

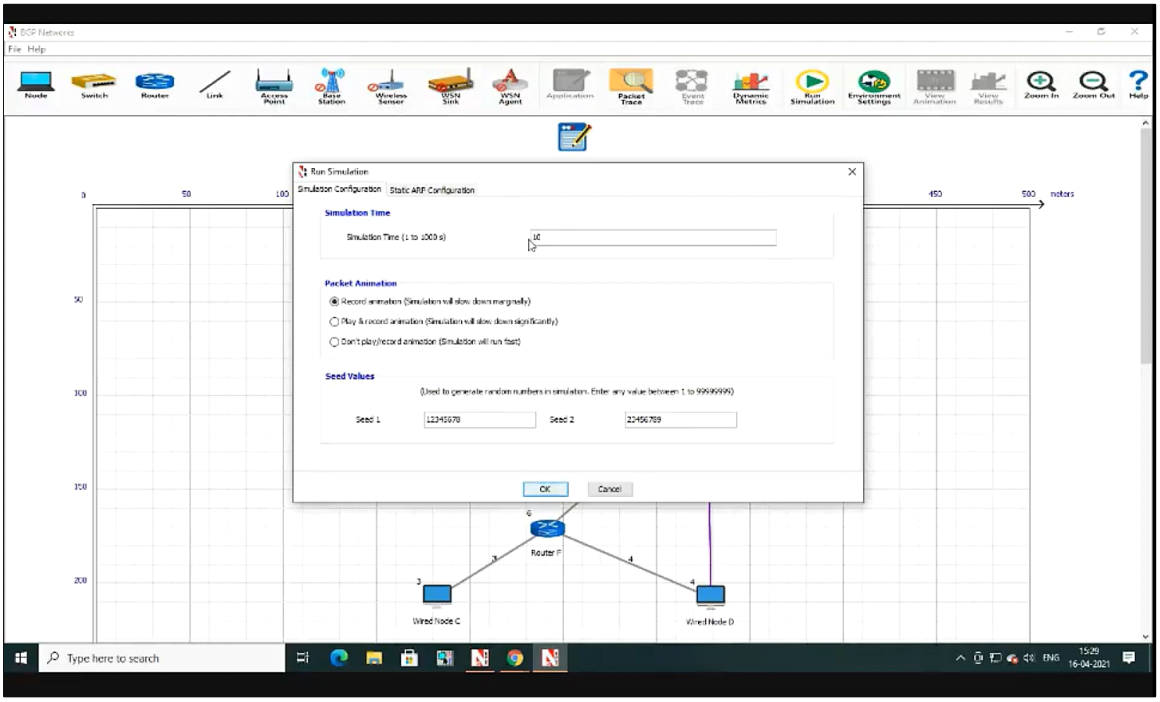
Output: (Sample 2)

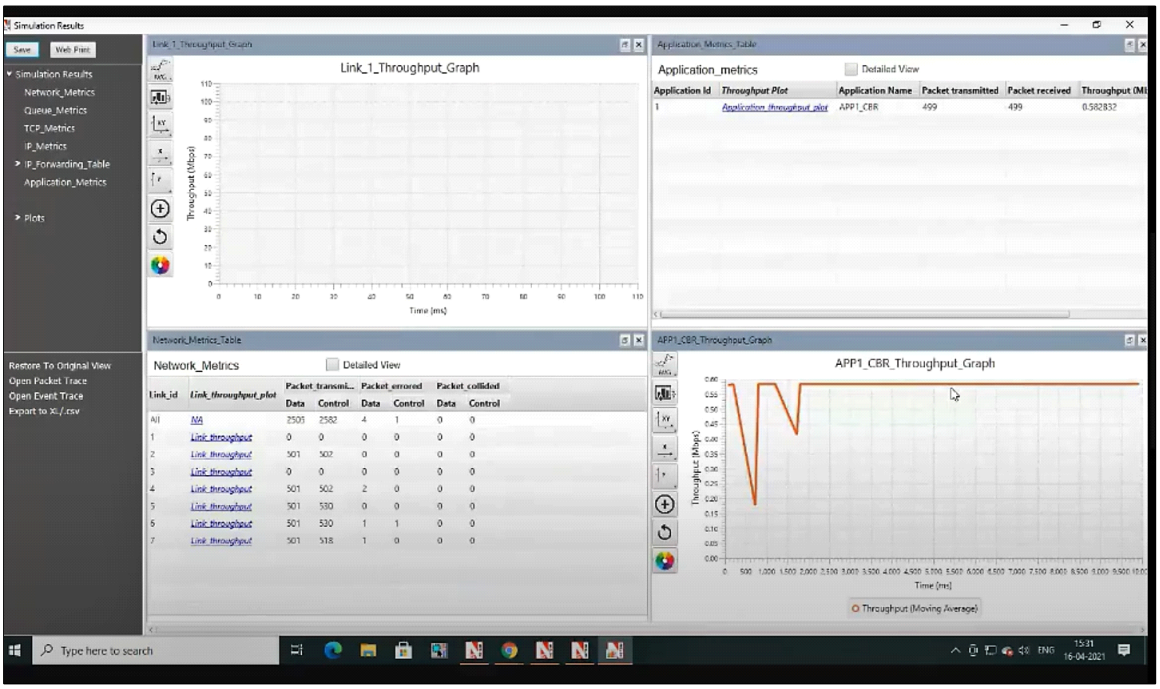
After running this scenario, in Performance Metrics screen, routing tables are obtained in BGP table and OSPF metrics.

If you click over the OSPF metrics, you will get the OSPF routing table for internal routers. If you click over the BGP table, you will get the routing table for Border routers. We have shown the routing tables for Border Router 1 and 2.









Inference:

First the internal Routing tables (RIP/OSPF table) are formed among all the Routers. The Border Routers contains the network address of the next hop and the destination nodes as represented in the routing table. Border Routers communicate with each other

by passing their Routing tables resulting in the formation of external Routing tables (BGP table). Then actual packet transmission takes place from Source to Destination.

Result: Network created and the data transferred through Border Gateway Protocol (BGP).