Semester	T.E. Semester VI – EXTC Engineering
Subject	Computer Communication Network (CCN)
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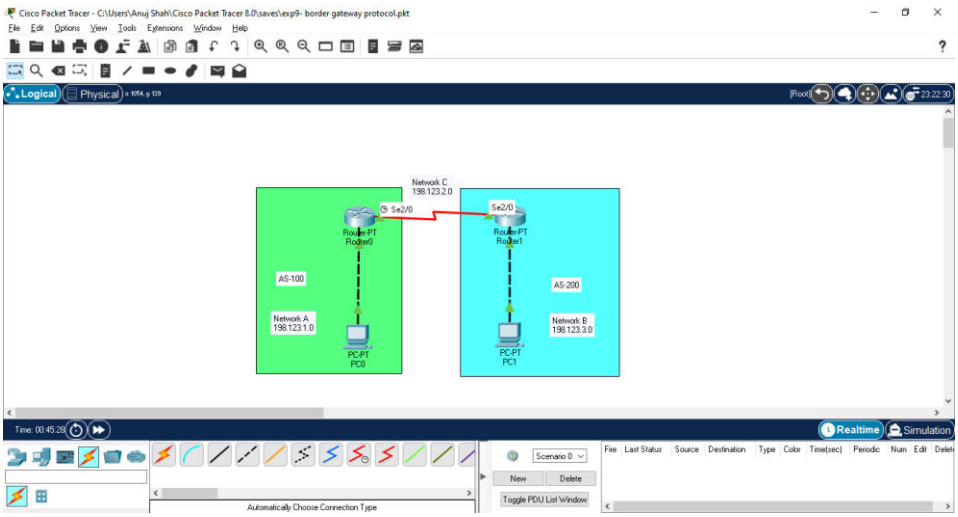
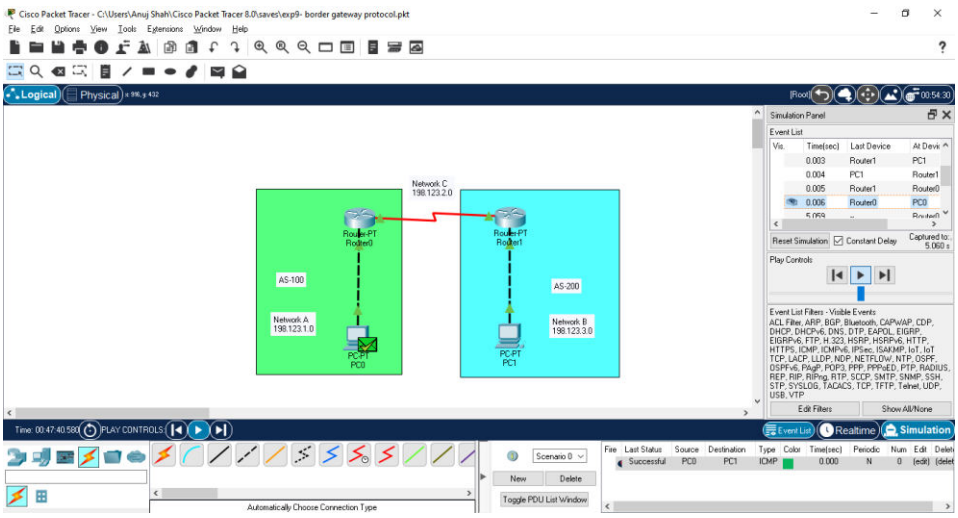
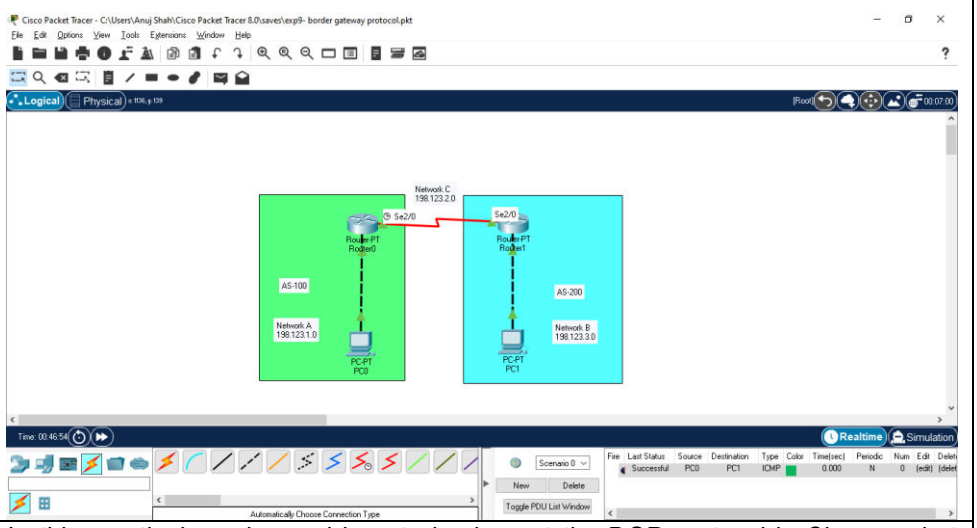
Experiment Number	09	
Experiment Title	Implementation of Border Gateway Protocol(BGP) in Cisco packet Tracer	
Aim	To set up and configure a network using Border Gateway Protocol(BGP) in Cisco packet Tracer .Establish transmission of packets from one AS to the other AS and verify its successful transmission	
Resources / Apparatus Required	Hardware: Internet Connected PC	Software: Cisco Packet Tracer
Theory:	A Routing Protocol is a combination of rules and procedures that let routers in an internet inform each other of changes. It allows routers to share whatever they know about the internet or their neighborhood Routing inside an AS is referred to as interior routing whereas routing between AS's is referred to as exterior routing. Border Gateway Protocol (BGP) is an inter-domain or inter-autonomous system routing protocol: routing between different ASs. BGP uses path vector routing to update the routing table in an area. PVR defines the exact paths as an ordered list of ASs that a packet should travel thru to reach the destination (besides having the destination network and next router info.) in its routing table. Security and Political issues involved: more desired to avoid 'unsaved' paths/routes/ASs than to take a shorter route. The AS boundary router that participate in PVR advertise the routes of the networks in their own AS to neighbor AS boundary routers. Instead of periodically advertise to its neighbours the cost to each destination, each BGP router tells its neighbor the exact path it is using.	

Procedure :	1. Open cisco packet tracer. 2. Select the required end devices such as PC, routers from the end devices and Network devices 3. Connect Network using automatic connections 4. Configure the end devices(PC's) using the suitable IP addresses 5.Configure the routers in their fast Ethernet port and turn them on 6. Configure the link between three networks which are present between the 2 routers on serial port. Select the clock speed as 64000 if clock is present and if absent select not set option from clock rate. 7. Observe that the entire network has turned from red to green 8. Using CLI of each router use commands for BGP being executed 9. Choose the packet from tools and select its source and destination. 10.Confirm successful delivery in the real time mode 11. Click Start simulation. Observe the successful delivery of packet through tick mark(Acknowledgement)
Screenshots of the Output(Response)	**Network with two Routers and connections active**  **Successful transmission of packet from source to destination with acknowledgment received in simulation mode(Tick mark)**  **In real time mode message of successful tranmission of packet between two**

	networks 
Conclusion:	In this practical, we learned how to implement the BGP protocol in Cisco packet tracer, and we verified that it works by sending a packet over the network.
Post Lab Questions:	1. What is inter domain routing? 2.List the features of BGP Routing protocol **Inter-domain routing** Intra-domain is any protocol in which the routing algorithm works only within domains. On the other hand, Inter-domain is any protocol in which the routing algorithm works within and between domains. Protocols used in Inter-domain routing are known as EGPs (exterior gateway protocols). An exterior gateway protocol is a routing protocol used to exchange routing information between autonomous systems. This exchange is crucial for communications across the Internet. Notable exterior gateway protocols include Exterior Gateway Protocol (EGP), now obsolete, and Border Gateway Protocol (BGP). Interdomain routing protocol assumes that the internet contains the collection of interconnected AS (autonomous systems). In this Routing, routing takes place between the autonomous networks. Sources: • https://www.geeksforgeeks.org/differences-between-intradomain-and-interdomain-routing/ • https://en.wikipedia.org/wiki/Exterior_gateway_protocol **BGP routing protocol** The characteristics of BGP follow: • BGP is an exterior gateway protocol (EGP) used in routing in the Internet. It is an interdomain routing protocol. • BGP is a path vector routing protocol suited for strategic routing policies. • It uses TCP port 179 to establish connections with neighbors.

	• BGPv4 implements CIDR (classless inter-domain routing) • eBGP is used for external neighbors. It is used between different autonomous systems. • iBGP is used for internal neighbors. It is used within an AS. • BGP uses several attributes in the routing-decision algorithm. • It uses confederations and route reflectors to reduce BGP peering overhead. • The MED (metric) attribute is used between autonomous systems to influence inbound traffic. • Weight is used to influence the path of outbound traffic from a single router, configured locally. Source: Cisco Press, Border Gateway Protocol, Route Manipulation, and IP Multicast https://www.ciscopress.com/articles/article.asp?p=762938&seqNum=3