DAYANANDA SAGAR COLLEGE OF ENGINEERING
COMPUTER SCIENCE & ENGINEERING

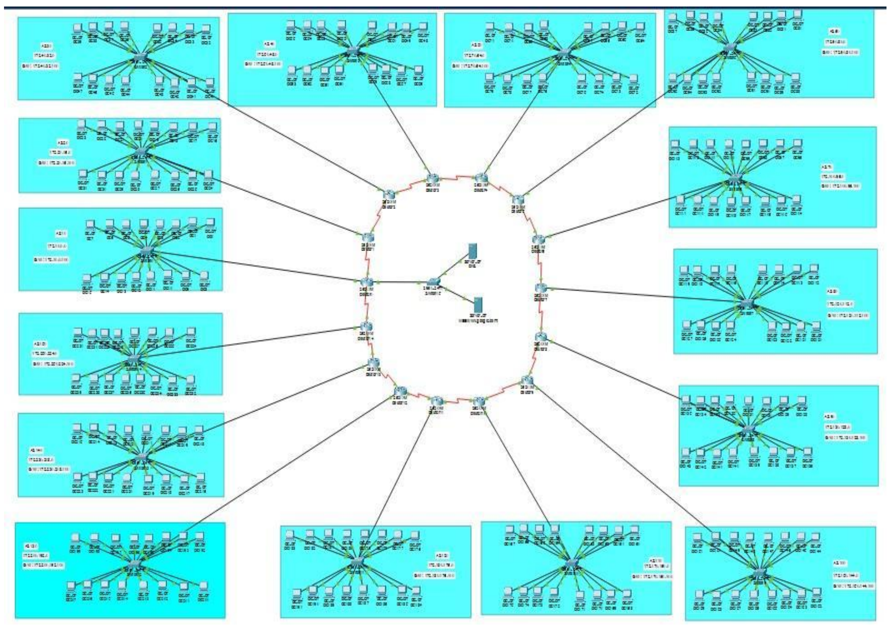
Minor Project- Report
Aug-2021-2022

Course Faculty: Prof. Ramya K.M — Course Name & Code: 19CS5DLCNL
Semester: 5 — Date:16/12/2021

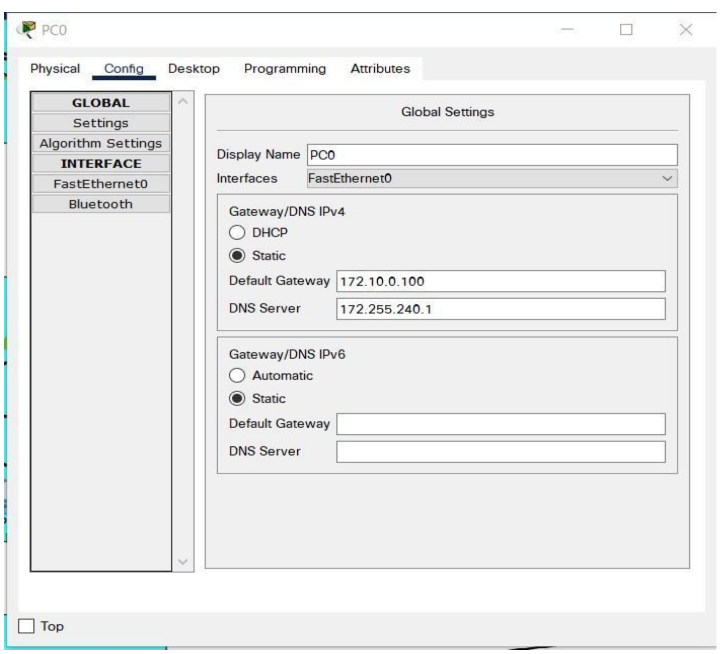
TITLE OF THE PROJECT	Design & Implementation of 15 Subnets with BGP			
STUDENT NAME	Adithya N	Aditi A H	Aditya Raj	Aditya Singh
USN	1DS19CS009	1DS19CS010	1DS19CS011	1DS19CS012
INDIVIDUAL CONTRIBUTION	Topology and IP configuration, Subnetting	Local DNS and Web DNS, Router configuration	Router configuration, Subnetting	Router configuration, PC configuration
GUIDE	Dr. Deepak.G & Prof.Sunanda			
PROJECT ABSTRACT:	We are going to design and implement 15 subnets with BGP. To achieve this we are going to use Class B IP with 16 systems/subnet, where the first two octets represent the network while the last two octets represent the host. In our project, we are making use of the address 172.0.0.0. We will be using 15 routers, 15 switches and 240 pcs to get the desired result. The router we will be using 2620XM Router and switch 2960-24TT. We also make use of DNS & HTTP servers to integrate our project with an application. Block size is 4,096. The number of bits borrowed by the host is 4 bits. So using all these conditions we are going to design and implement our project.			
INTRODUCTION	A routing protocol specifies how routers communicate with each other in the best possible path. So, the routing protocol we will be using in our project is Dynamic Routing Protocol. Dynamic Routing automatically adjusts the routes according to the current state of the route in the routing table. We use BGP which is an example of a dynamic routing protocol. Border Gateway Protocol (BGP) advertises, learns, and chooses the best paths inside the Internet. When two ISPs are connected, they typically use BGP to exchange routing information. BGP defines two classes for neighbours: Internal BGP (iBGP) operates within the same autonomous system. External BGP (eBGP) operates in between the multiple autonomous systems. We have used these concepts while designing our project.			

DESIGN

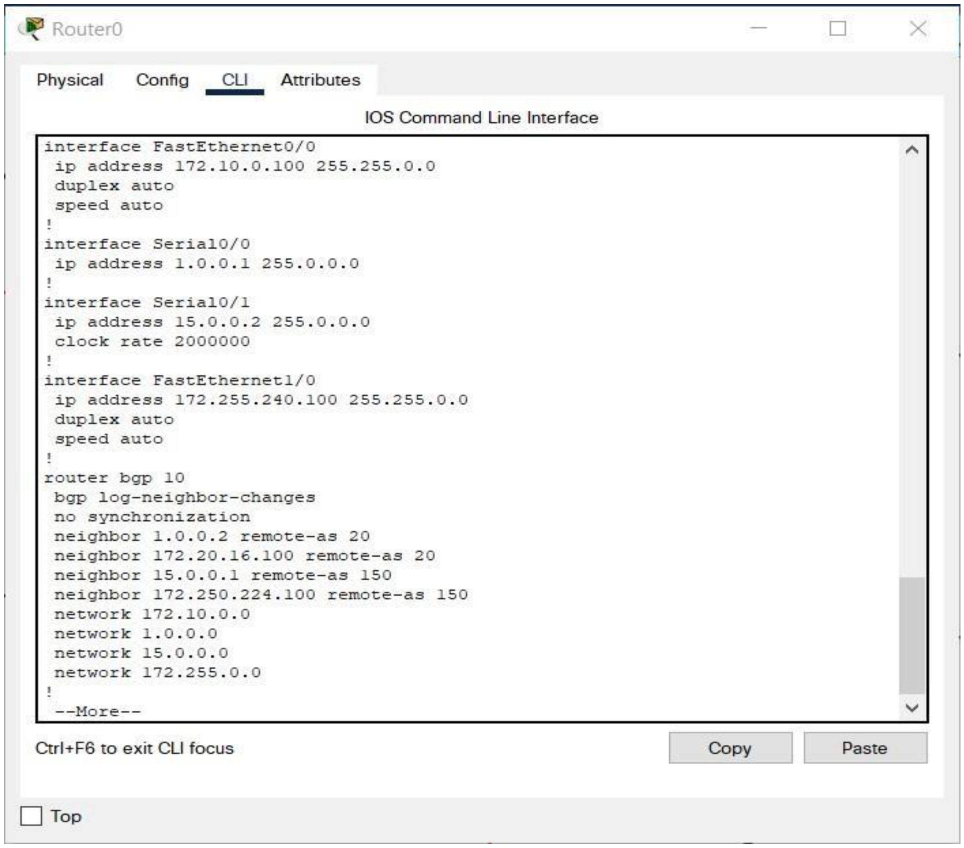
BGP TOPOLOGY



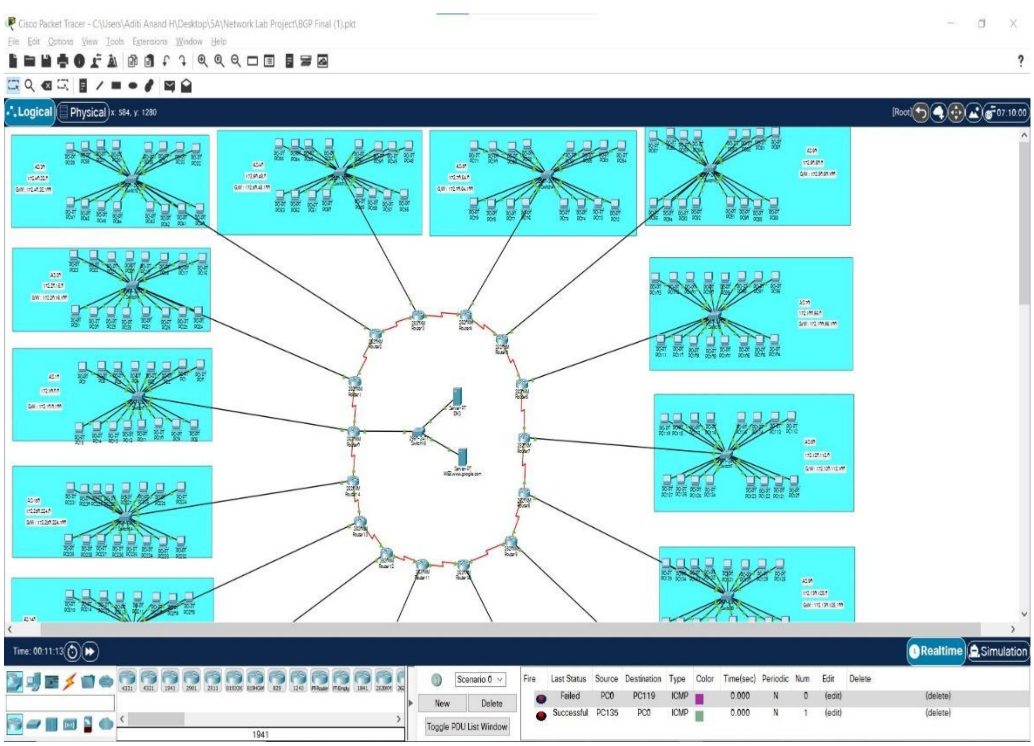
PC CONFIGURATIONS



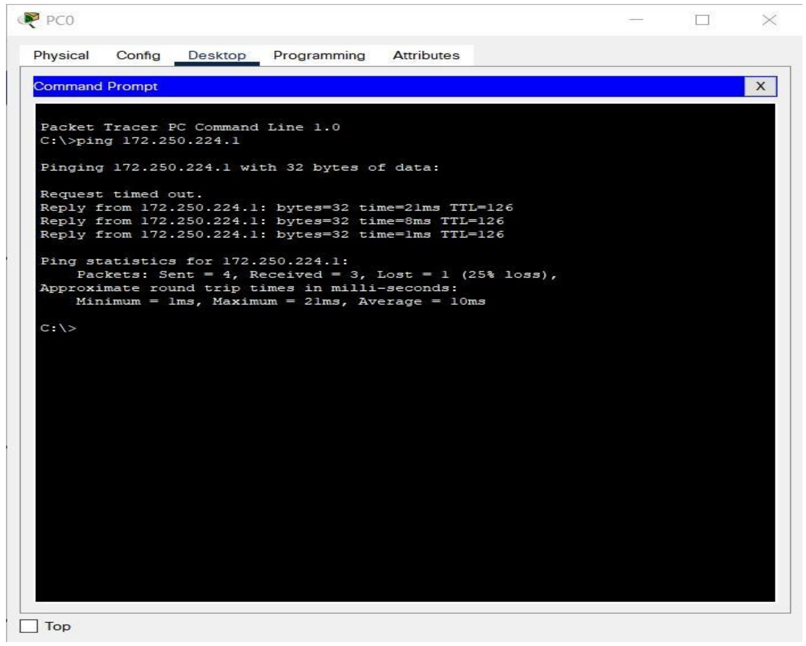
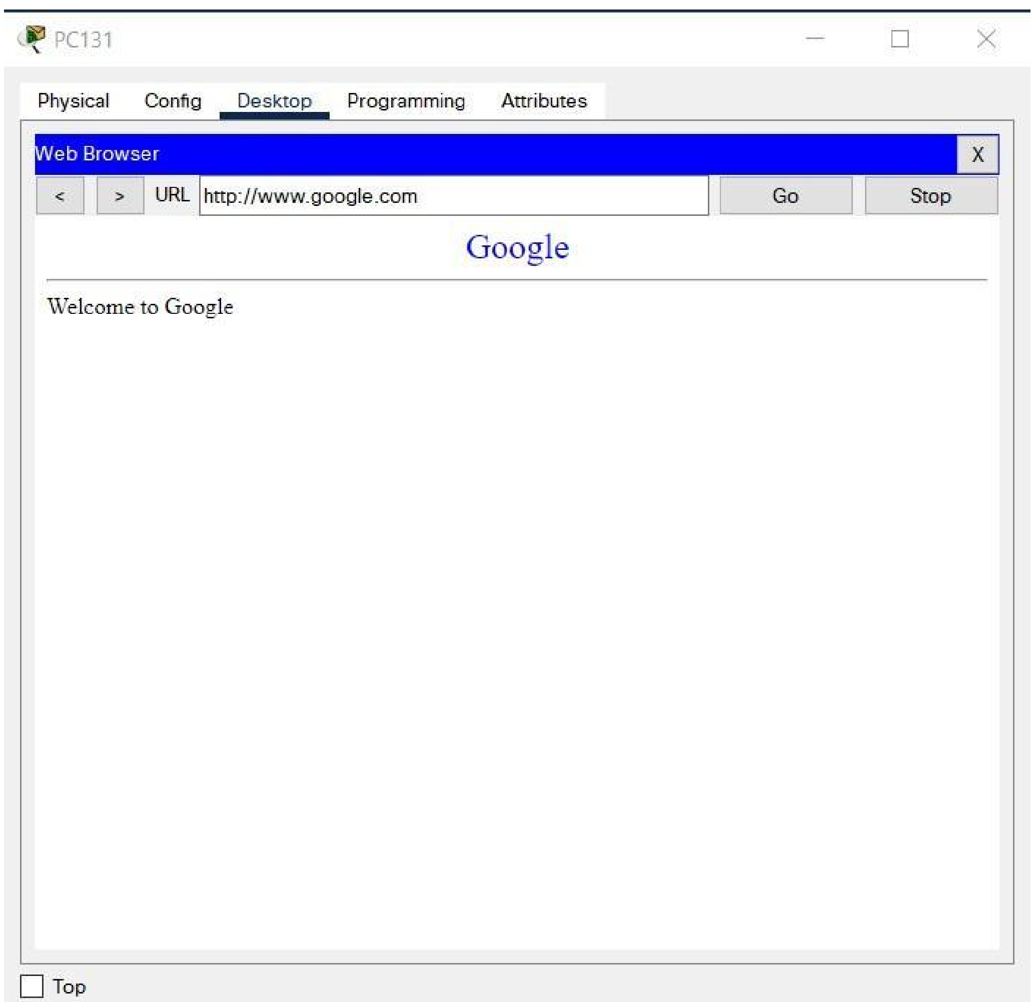
ROUTER- BGP CONFIGURATIONS



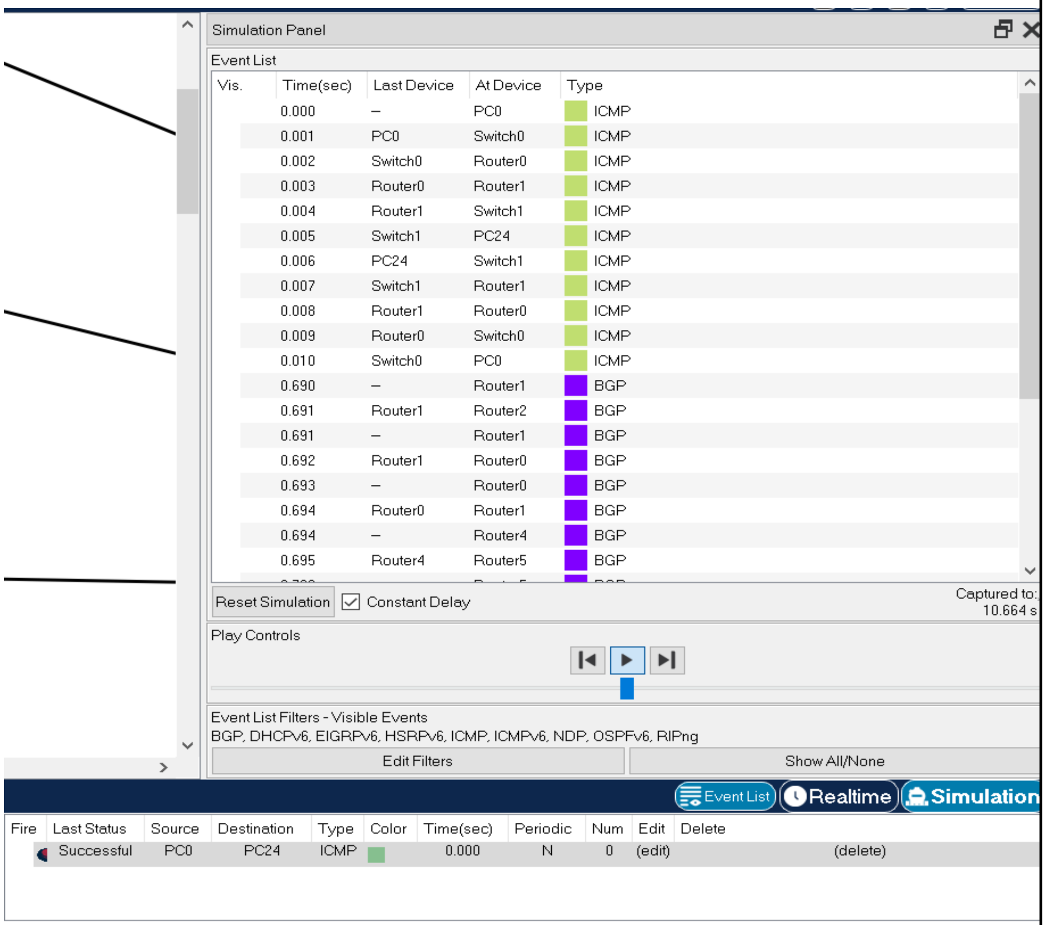
MESSAGE TRANSMISSION

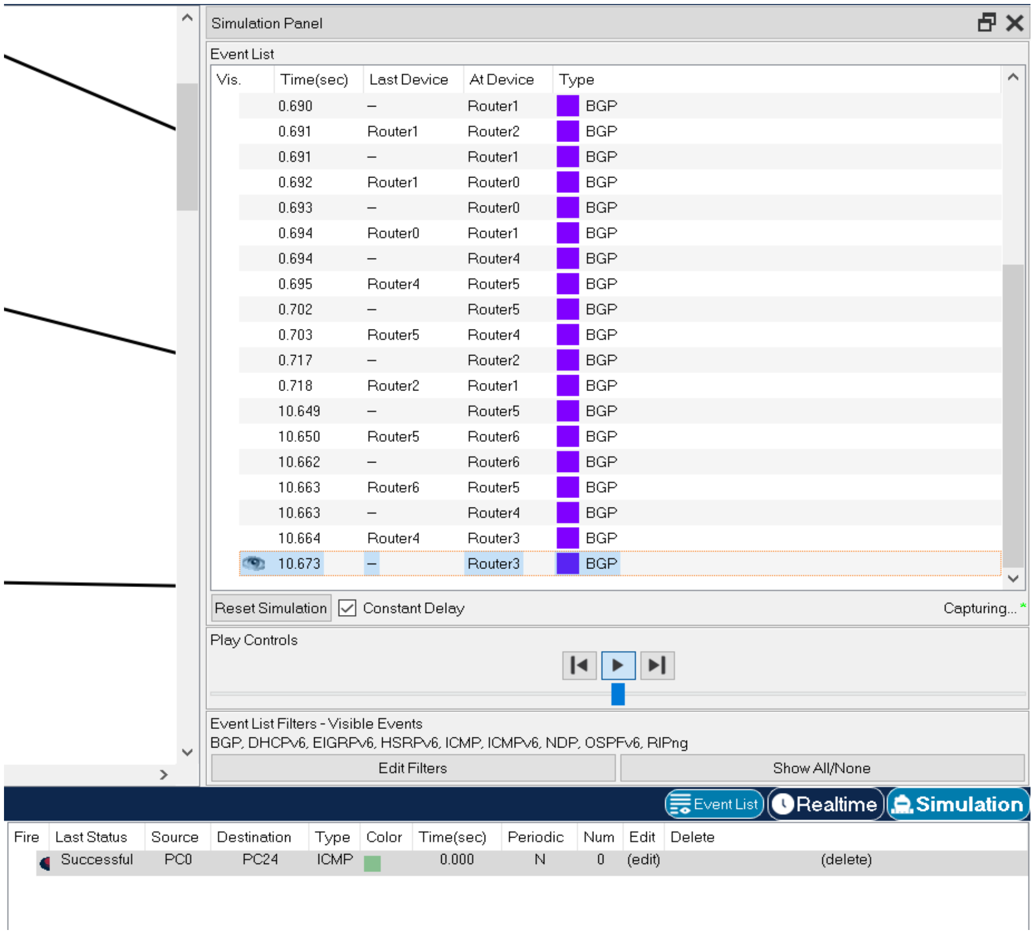


PLATFORM USED (H/W & S/W TOOLS TO BE USED	Cisco Packet Tracer
PROJECT SOURCE CODE LINK (GITHUB/ GOOGLE DRIVE)	https://github.com/adithya-n11/Design-Implementation-of-15-Subnets-with-BGP
CONCLUSION /FUTURE ENHANCEMENT	● BGP is the protocol underlying the global routing system of the internet. ● It manages how packets get routed from network to network through the exchange of routing and reachability information among routers. ● BGP directs packets between autonomous systems, which are networks managed by a single enterprise or internet service provider (ISP's). ● BGP creates network stability by guaranteeing routers that can adapt to route failures: when one path goes down, a new path is quickly found. BGP makes routing decisions based on paths, defined by rules or network policies set by network administrators.

UI SCREENSHOTS	**PING STATISTICS**  **WEB SERVER** 

SIMULATION

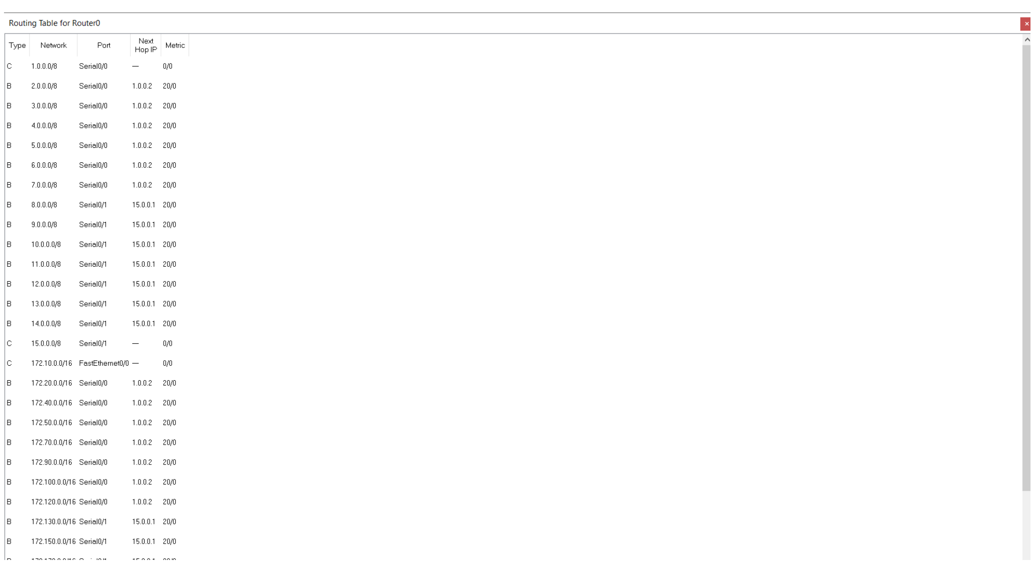

Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.000 -- PC0 ICMP
0.001 PC0 Switch0 ICMP
0.002 Switch0 Router0 ICMP
0.003 Router0 Router1 ICMP
0.004 Router1 Switch1 ICMP
0.005 Switch1 PC24 ICMP
0.006 PC24 Switch1 ICMP
0.007 Switch1 Router1 ICMP
0.008 Router1 Router0 ICMP
0.009 Router0 Switch0 ICMP
0.010 Switch0 PC0 ICMP
0.690 -- Router1 BGP
0.691 Router1 Router2 BGP
0.691 -- Router1 BGP
0.692 Router1 Router0 BGP
0.693 -- Router0 BGP
0.694 Router0 Router1 BGP
0.694 -- Router4 BGP
0.695 Router4 Router5 BGP
Reset Simulation
Constant Delay
Captured to:
10.664 s
Play Controls
Event List Filters - Visible Events
BGP, DHCPv6, EIGRPv6, HSRPv6, ICMP, ICMPv6, NDP, OSPFv6, RIPng
Edit Filters
Show All/None
Event List
Realtime
Simulation
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
Successful PC0 PC24 ICMP 0.000 N 0 (edit) (delete)



Vis.	Time(sec)	Last Device	At Device	Type
	0.690	--	Router1	BGP
	0.691	Router1	Router2	BGP
	0.691	--	Router1	BGP
	0.692	Router1	Router0	BGP
	0.693	--	Router0	BGP
	0.694	Router0	Router1	BGP
	0.694	--	Router4	BGP
	0.695	Router4	Router5	BGP
	0.702	--	Router5	BGP
	0.703	Router5	Router4	BGP
	0.717	--	Router2	BGP
	0.718	Router2	Router1	BGP
	10.649	--	Router5	BGP
	10.650	Router5	Router6	BGP
	10.662	--	Router6	BGP
	10.663	Router6	Router5	BGP
	10.663	--	Router4	BGP
	10.664	Router4	Router3	BGP
	10.673	--	Router3	BGP

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC0	PC24	ICMP		0.000	N	0	(edit)	(delete)

ROUTING TABLE



Routing Table for Router0

Type	Network	Port	Next Hop IP	Metric
C	1.0.0.0/8	Serial0/0	---	0/0
B	2.0.0.0/8	Serial0/0	1.0.0.2	20/0
B	3.0.0.0/8	Serial0/0	1.0.0.2	20/0
B	4.0.0.0/8	Serial0/0	1.0.0.2	20/0
B	5.0.0.0/8	Serial0/0	1.0.0.2	20/0
B	6.0.0.0/8	Serial0/0	1.0.0.2	20/0
B	7.0.0.0/8	Serial0/0	1.0.0.2	20/0
B	8.0.0.0/8	Serial0/1	15.0.0.1	20/0
B	9.0.0.0/8	Serial0/1	15.0.0.1	20/0
B	10.0.0.0/8	Serial0/1	15.0.0.1	20/0
B	11.0.0.0/8	Serial0/1	15.0.0.1	20/0
B	12.0.0.0/8	Serial0/1	15.0.0.1	20/0
B	13.0.0.0/8	Serial0/1	15.0.0.1	20/0
B	14.0.0.0/8	Serial0/1	15.0.0.1	20/0
C	15.0.0.0/8	Serial0/1	---	0/0
C	172.10.0.0/16	FastEthernet0/0	---	0/0
B	172.20.0.0/16	Serial0/0	1.0.0.2	20/0
B	172.40.0.0/16	Serial0/0	1.0.0.2	20/0
B	172.50.0.0/16	Serial0/0	1.0.0.2	20/0
B	172.70.0.0/16	Serial0/0	1.0.0.2	20/0
B	172.90.0.0/16	Serial0/0	1.0.0.2	20/0
B	172.100.0.0/16	Serial0/0	1.0.0.2	20/0
B	172.120.0.0/16	Serial0/0	1.0.0.2	20/0
B	172.130.0.0/16	Serial0/1	15.0.0.1	20/0
B	172.150.0.0/16	Serial0/1	15.0.0.1	20/0