### VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JnanaSangama", Belgaum -590014, Karnataka.



# LAB REPORT on

## **COMPUTER NETWORKS**

Submitted by

**RIA JAIN (1BM21CS163)** 

in partial fulfillment for the award of the degree of BACHELOR OF ENGINEERING
in
COMPUTER SCIENCE AND ENGINEERING



B.M.S. COLLEGE OF ENGINEERING
(Autonomous Institution under VTU)
BENGALURU-560019
JUN-2023 to SEP-2023
B. M. S. College of Engineering,

### **Bull Temple Road, Bangalore 560019**

(Affiliated To Visvesvaraya Technological University, Belgaum) **Department of Computer Science and Engineering** 



#### **CERTIFICATE**

This is to certify that the Lab work entitled "COMPUTER NETWORKS" carried out by RIA JAIN(1BM21CS163), who is a bonafide student of B. M. S. College of Engineering. It is in partial fulfillment for the award of Bachelor of Engineering in Computer Science and Engineering of the Visvesvaraya Technological University, Belgaum during the year 2023. The Lab report has been approved as it satisfies the academic requirements in respect of a Computer Networks - (22CS4PCCON) work prescribed for the said degree.

**Dr. Nandini Vineeth** Assistant Professor Department of CSE BMSCE, Bengaluru **Dr. Jyothi Nayak**Professor and Head
Department of CSE
BMSCE, Bengaluru

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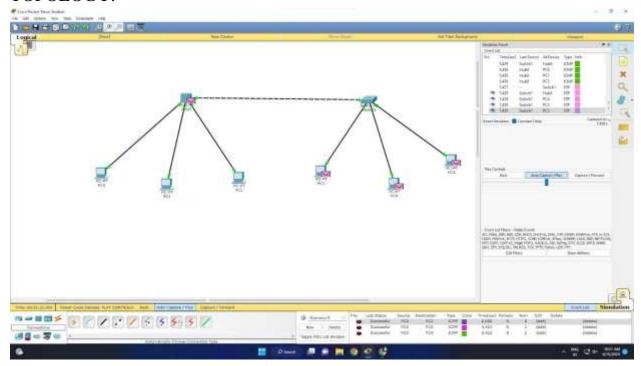
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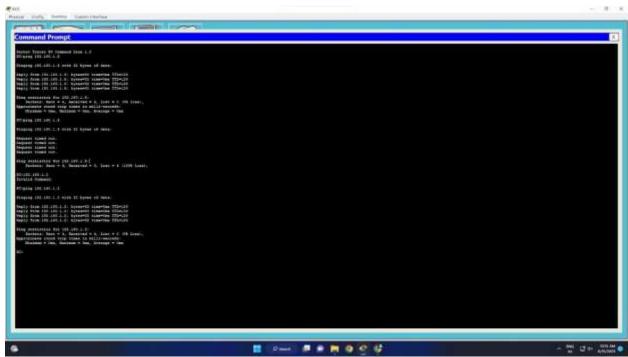
Sl.	Date	Experiment Title	Page No.
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		CYCLE 1	
1	16/6/23	Create a topology and simulate sending a simple PDU from source to destination using hub and switch as connecting devices and demonstrating ping messages.	
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4	17/7/23	Configure DHCP within a LAN and outside LAN.	
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9	1/8/23	To construct a VLAN and make a pc communicate among VLAN.	
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11	18/8/23	To construct a WLAN and make the nodes communicate wirelessly.	
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13	1/9/23	Write a program for error-detecting code using CRC CCITT (16-bits).	
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15	1/9/23	Using TCP/IP sockets, write a client-server program to make the client sending the file name and the server to send back the contents of the requested file if present.	
16	1/9/23	Using UDP sockets, write a client-server program to make client sending the file name and the server to send back the contents of the requested file if present.	

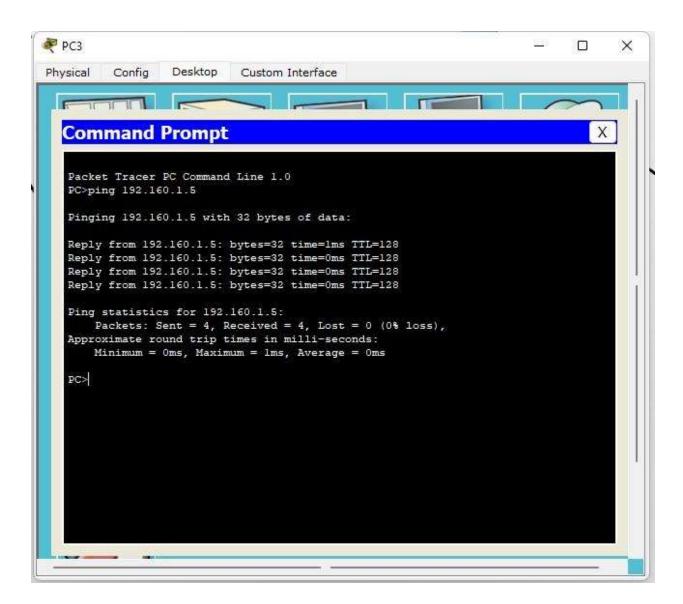
Create a topology and simulate sending a simple PDU from source to destination using hub and switch as connecting devices and demonstrate ping messages.

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	Step 1 - select and doctors and add generic
	suffich and hub to workspace. Add 6 p 12-PT
	Step 2: make connections using copper straight cable
	Sep 3: Open each PC configuration window and
	charge the Paddies to 10.0.0.1, 100.02,
	10003, 10004, 10005, 10006 xespectively
	Step 4 5 Save
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reg	y have 10.0.0.3 bytes= 32 time= 0ms TTL= 120

Ping statistics for 10.0.0.3: Puck ets: Sout = 4, Received = 4, Lost -0 (0.1. Loss), Approximate round top times in willi-joronds: Minimum = Oms, Maximum = Oms, Average = oms Scenaro: Sending packet package from PCO to PCI in hub. The package 93 lent from PCO to the HUB, The HUB sends the package to PCI and PCD. Since PCI is the receiver it receives the package and reads the acknowledgement back to RE HUB which revols it back to PCO that is the puder and other PC's Scenario: 2 1000 sending package from PC3 to PC4 an swatch. The package is sent from PC3 to switch PC4 which receives the packet and since it is the receiver, it rends the acknowledgment back to & switch that sends to Scenaño: 3 lending blu PC's connected to lwitch and HUB, lacket is sail from PCO to PC4. The HUB words the packet to PCI, PC 2 and the switch. The switch sends the packet to PC3 and then PC4 which is the readings lends the acknowledgment back to switch which souls it back to the HUB which forwards it all the PC's connected to the MUB ie Pro, Pri and Pra.



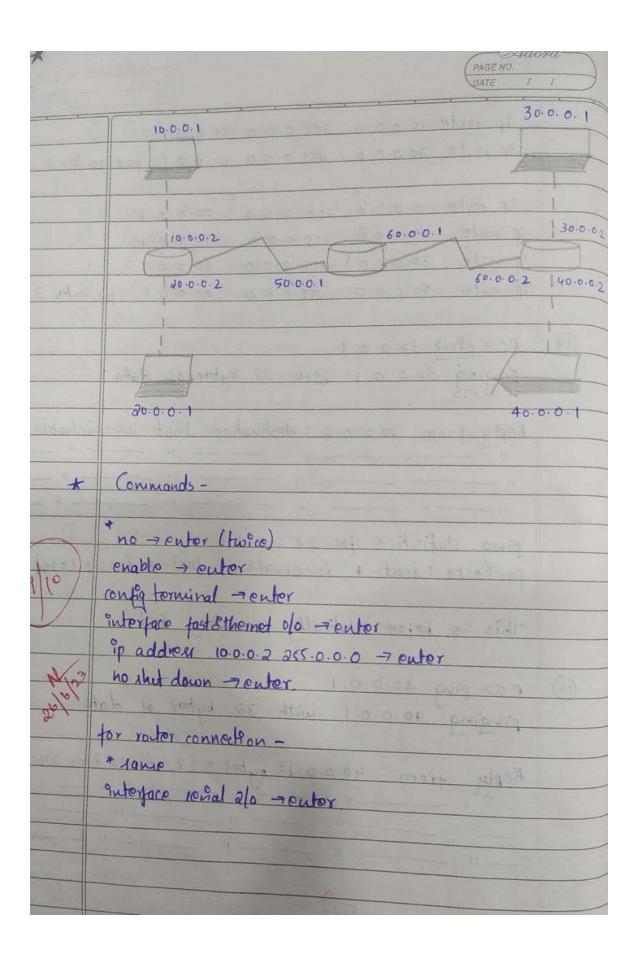


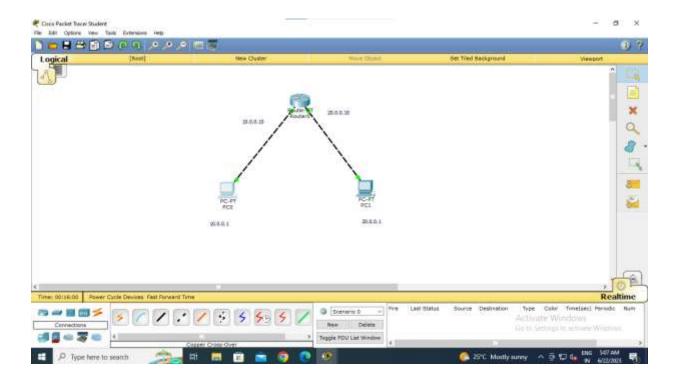


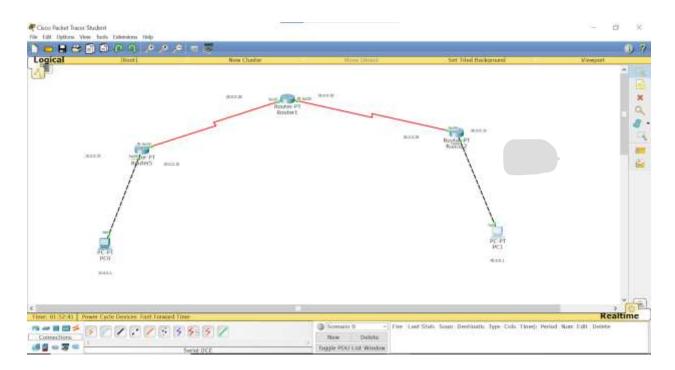
Configure IP address to routers (one and three) in packet tracer. Explore the following messages: ping responses, destination unreachable, request timed out, reply.

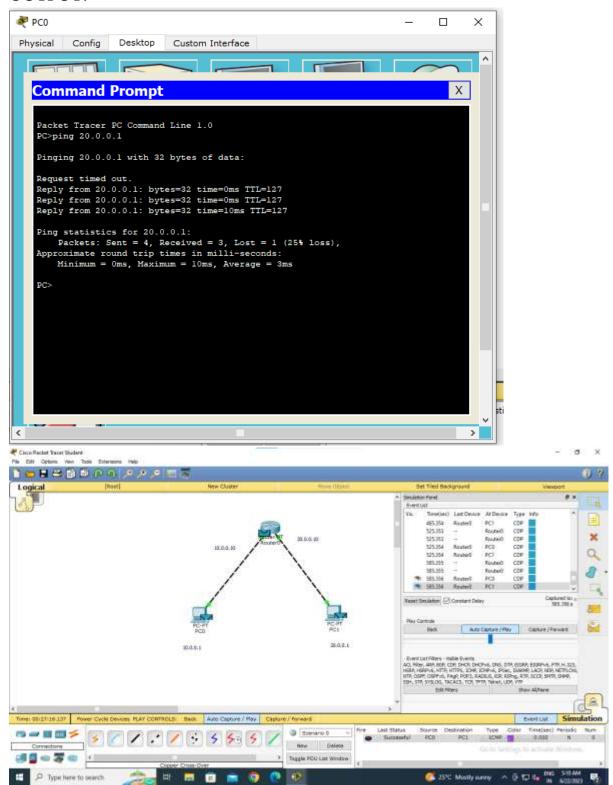
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© Repeat some for PC 2000.1.  ① Repeat some for PC 2 and PC4 ② Council rater I and reverse to volter 3. ③ Postors to be connected through 102al PTE and PC to restor 1 hosted be connected through copper (ross over Postor) I CII type————————————————————————————————————	
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The connection plw rector 183 is now active  (a) Repeat stop to to rector 2 and 3  (b) Go to router 1 (11 1 type thou ip note.	-
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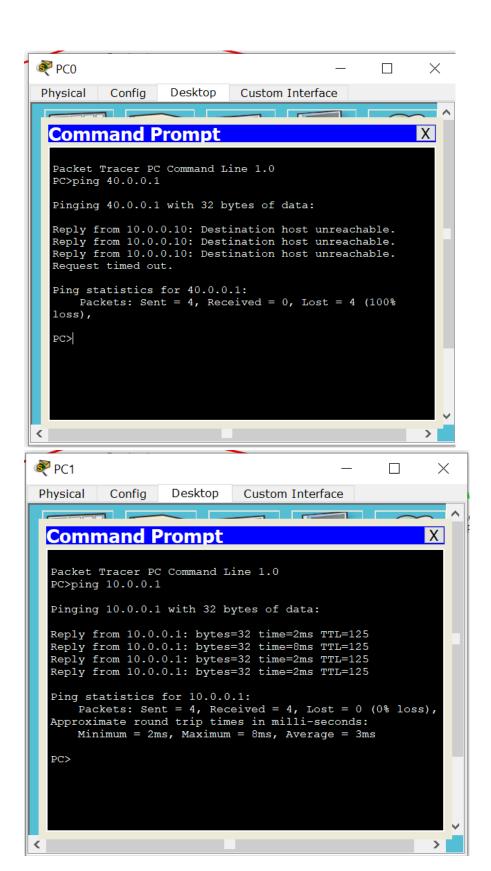
(Fg 3)	PAGE NO.  PATE / /
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	sprote 20.0.0.0 255.0.0.0 60.0.0.1 for voctor2
	8p rate 10.0.0.0 per-0.0.0 50.0.0.1
33016	ip note 20.0.0.0 ass.0.0.0 50.0.0.1
	90 voite 30.0.0.0 255.0.0.0 60.0.0.1
G. D. Helbar	ap note 40.0.0.0 205.0.0.0 80.0.0.1 for rates 3
<u> </u>	PC> ping 30.0.0.1
	pinging 30.0.0.1 with 32 bytes of dato:
100	Reply from 20.0.0.2: destination host unreachable
	" " " " " " " "
	n-n-n-n-n-n-
	ping statistics for 30.0.0.1: packects: sout-4, foreivad = 0, lost=4 (100/1 loss)
	Thus is before statically connecting Pci.
(3)	
	pinging 40.0.0.1 with 30 bytro1 of dato:
	Reply from 40.0.0.1: bytos = 32 times=2 ms TTL=125
47	
	monte ?
	show ip asme? Topology

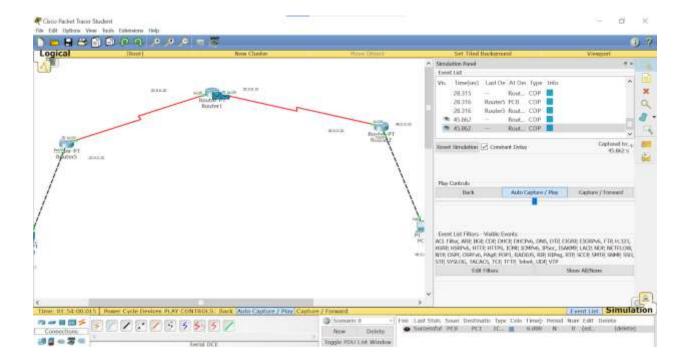








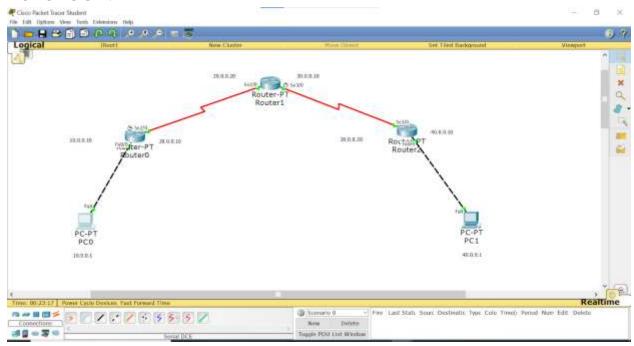


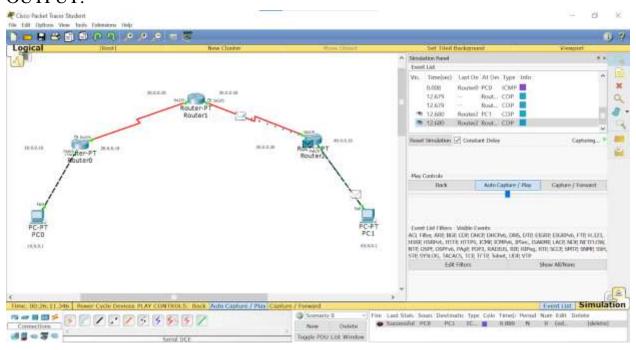


Configure default route, static route to the Router.

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30 0 8	Configure default route, stable route to the routes
	Topology - 10-10 5 50 1/0 50 2
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	1 to ale
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184	and the later of the district to the later of the later o
	To Specify
	El allan al la
*	Procedure -
0	Connect the I router for each of the PC's and connect the other two router as shown in the topology.
9	PCL 45 200.1, set the gatemay 05 100 0.2 and
(3)	
	and router "I using pollowing commands:

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- no shot	
- exit	
-7 ? whorface 10	sal alo
- ip oddress	30.0.0.1 251.0.0.0
-7 no shut	
→ exit.	
- As voutor o a	nd I are connected to only one side we
perform defor	H rocking using pollowing commands:
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->config t	
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for roter 1 :	
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got TOUTROY 2 .	
-7ip ro	te 10.0.0.0 255.0.0.0 50.0.0.2
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	SURE SUL
Ping commands:	The second of th
Pc>ping	20.0.0.1
Pinging 20. 1	and with any
n 23 Real II	on a substant of data
7 700	10.0.0.1 01.1001
	1 10 0 1 100 20 1 1 1 1 1 1
	5, maximum = 20 ms, Aug = 16 ms





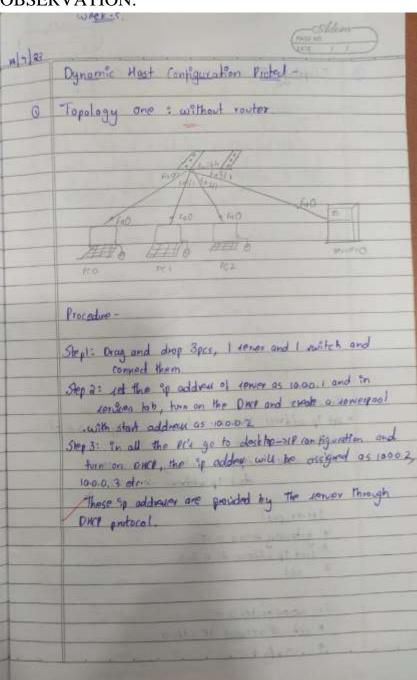
Desktop

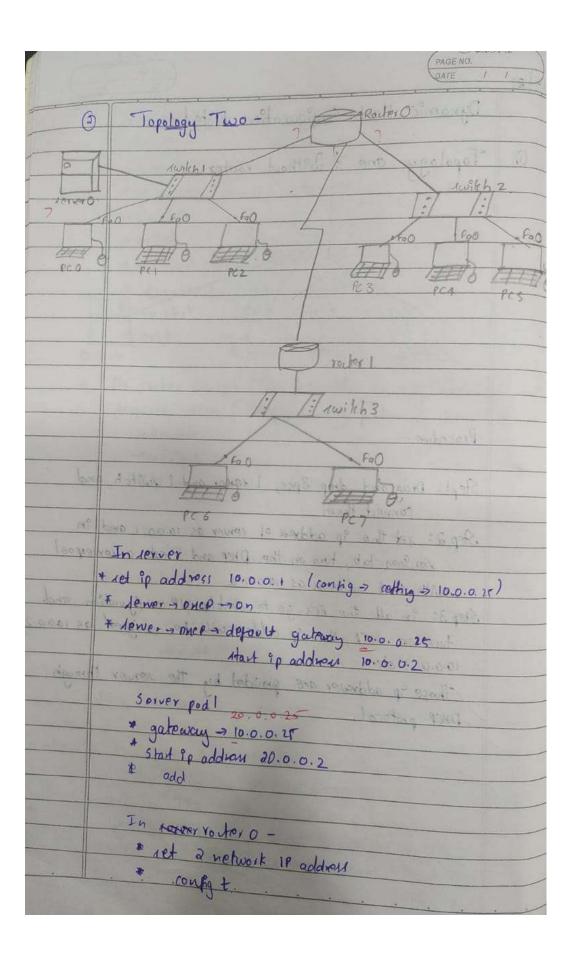
Custom Interface

### Command Prompt

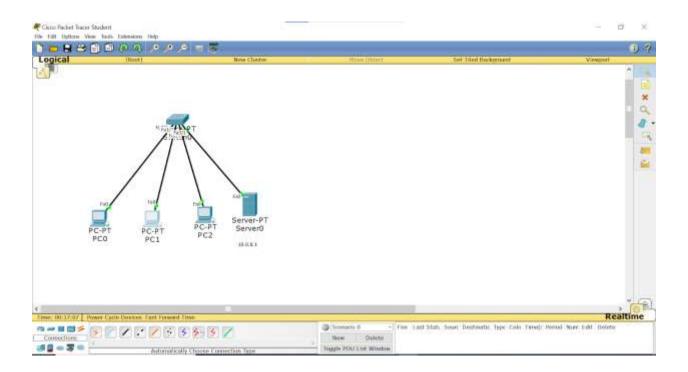
```
Packet Tracer PC Command Line 1.0 PC>ping 40.0.0.1
Pinging 40.0.0.1 with 32 bytes of data:
Request timed out.
Reply from 40.0.0.1: bytes=32 time=2ms TTL=125
Reply from 40.0.0.1: bytes=32 time=16ms TTL=125
Reply from 40.0.0.1: bytes=32 time=2ms TTL=125
Ping statistics for 40.0.0.1:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 16ms, Average = 6ms
PC>ping 40.0.0.1
Pinging 40.0.0.1 with 32 bytes of data:
Reply from 40.0.0.1: bytes=32 time=21ms TTL=125
Reply from 40.0.0.1: bytes=32 time=9ms TTL=125
Reply from 40.0.0.1: bytes=32 time=2ms TTL=125
Reply from 40.0.0.1: bytes=32 time=4ms TTL=125
Ping statistics for 40.0.0.1:
     Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
     Minimum = 2ms, Maximum = 21ms, Average = 9ms
PC>
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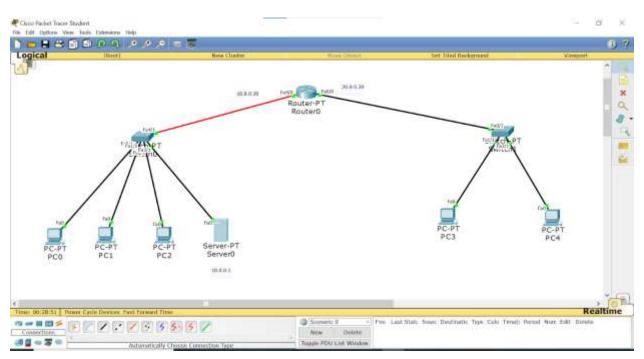
Configure DHCP within a LAN and outside LAN.

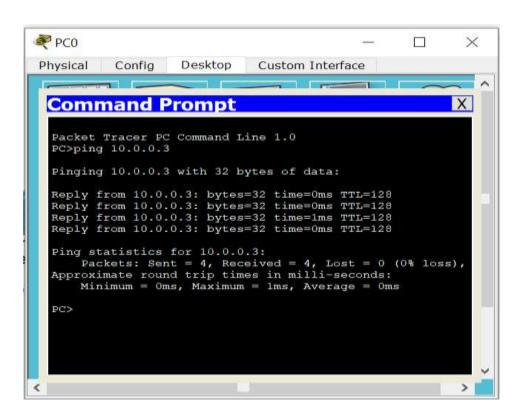


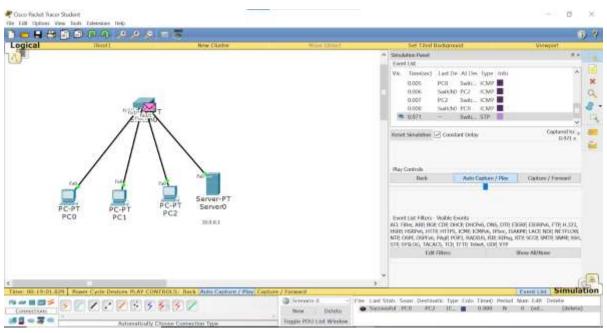


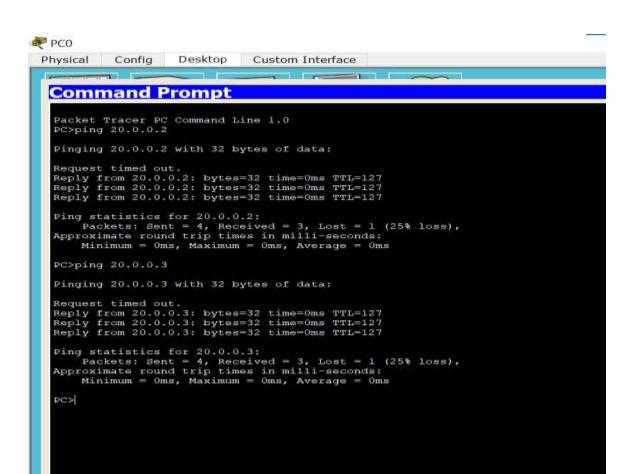
6-35	PAGE NO.
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	* "p address 10.00.28 255.0.0.00
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	(111 9 20.0.0.25)
	* couple + interface posicinomed 0/0
	* 9p helper-addron 10.0.0.1
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	config t
	ip route 40.0.0.0 255.0.0.0 30.0.0.20
	- 199fd A
	In roctor 1 -
	O Create topology as strong on the pigers
	let up addies
	Config t
91	interface fastethornet 0/0
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biscost	and also that hattaches or as armed of
	to constant and the desired land
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	ip address 30.0.0.21 755 0.0.0
39	and with no shut of in some day of and (a)
2000	without the states of second to sever
	-> Static rowing for 10820 network
	config t
	ip rote 100.0.0 205.0.0.0 30.0.0.25
10/1	ip nule 20.0.0.0 200.0.0. 30.0.0.20
N.	no shut.
17/7/	and but itshut
	1ething helpor address
No. 18 Co.	coups t
. 404	A case scatelhound als
	ip-helper address (0.0.0.0) no shut
	THE PARTY NO SHOP

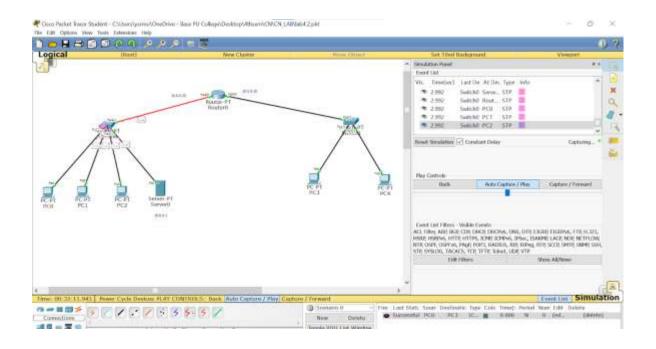






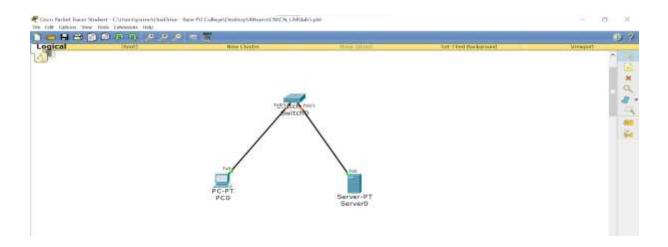


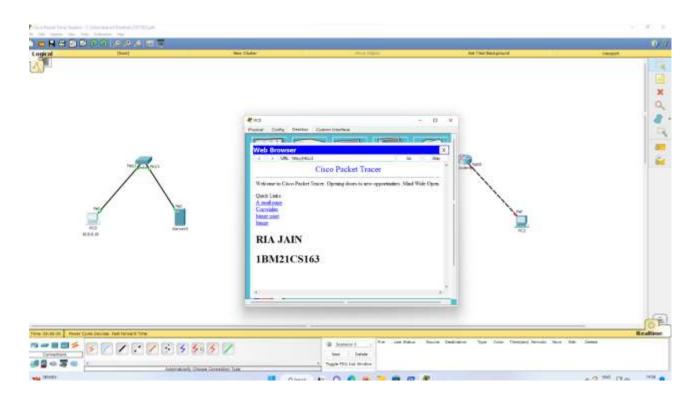




Configure Web Server, DNS within a LAN. OBSERVATION:

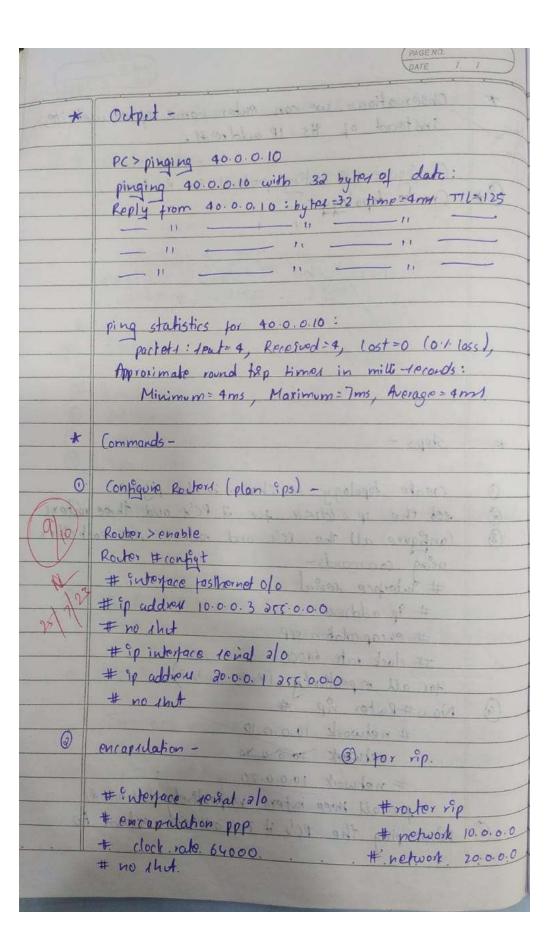
OBSE	CATE /
23 27 23	
	Output Configure web somer, DNI within a LAN
0 *	Create topology - Foods /: / -/: For 1/2
	with . Foo
	K WINDS
*	Steps -
0	Create topology as shown in the figure.
<u>@</u>	let the PC spaddrew as 10-0-0-10
9	Jet the server ap address as 10.0.0.20  Turn on the prus an sensees and add name
0	and address same as up address.  In MTP go to Endex. Internal and using the normal
1	html commands add name and UIN.
^	(HI) 18M7105163 (/HI)
6	Son to web however in PC and outer the URL same as name of website you sould in some
-	
*	Output -
	In web browser to PC we can now enter
	index. It m page.
	ria join web browser
	IBM21CS163   Utl http://example.com
	Rio Jain 18M2105 163

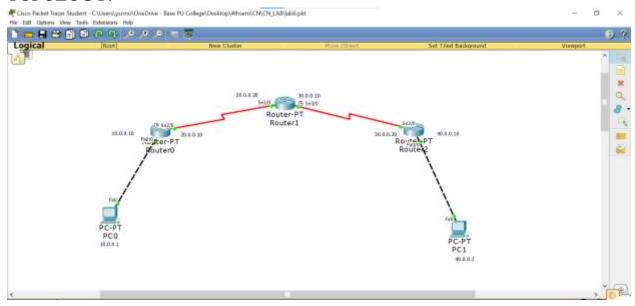


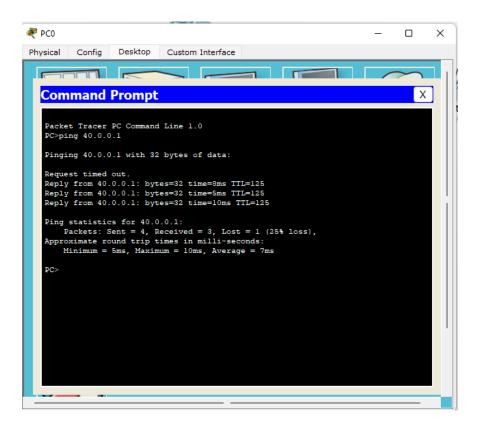


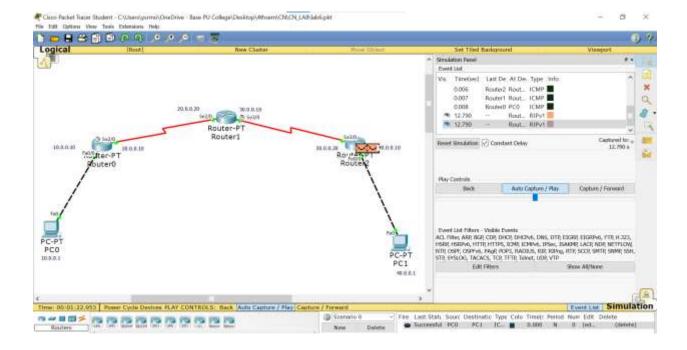
Configure RIP routing Protocol in Routers.

	(nu se
*	Observation - we can enter name of a website
1	instead of 4s if address.
who	O STATE SUPPLY STATE
	Configure RIP routing protocal in Routens.
@*	Create topology
	1 N 1974)
	5000 (+ 30 ) (+ ) (+ ) Fa 010
	1000 + 300 (+) Fable
	FERMIO GODINI KNOTI
	1-0/
	The state of the s
	Chill Commission of the Commis
	PEV P62
-	Steps -
7	10 A
0	evento topology as shown in the tique
0	create topology as shown in the figure
0	set the in addices for a ved and the rose
	configure all the Pela and notions with each of
0	configure all the Pe's and souterd with each of using commands—
0	cet the ip address for a real and material with each of using commands—
0	cot the ip address for a real and multiple such of using commands—  # substitute seed  # substitute seed  # spendages
0	cet the ip address for a red and must each of using commands—  # who per cond  # op address  # op address  # enropsulation per
0	cet the ip address for a red and must each of  configure all the re's and review with each of  using commands—  # who pre cerial  # 9p address  # encapsulation per  It clock water 64000
8	cet the ip address for a real and must each of configure all the re's and souters with each of using commands— # subospice serial # sp address # encopsulation rep # clock into 64000 for all respectively (Roster 0, 1, 2)
0	configure all the Pe's and rectord with each of using commands—  # whompre serial  # 9p address  # encapsulation pel  It clock sale 64000  for all respectively (Kouler 0, 1, 2)  Now#Postor NP
3	configure all the Pe's and routered with each of using commands—  # who where seenal  # op address  # checopoulation per  # checopoulation per  # checopoulation per  # notwork 10 0.0.10
3	cet the ip address for a real and more rest of configure all the re's and notions with each of using commands—  # interpret serial  # ap address  # encapsulation per  # clack sate 64000  for all respectfully (Roder 0, 1, 2)  Now#Poster Ap #  # notwork 10 0, 0, 10  network soon to
3	configure all the Fe's and routers with each of using commands—  # interpret serial  # openables serial  # chaptulation per  # clack rate 64000  for all respectfully (Koder 0, 1, 2)  Now # Postor Mp &  # notwork 10 0, 0, 10  network 10 0, 20
3	configure all the Fe's and rectord with each of using commands—  # whompre serial  # op address  # chropoulation per  # chropoulation per  # chropoulation per  # chropoulation per  # network 1000.000  # network 1000.000  # network 1000.000
3	configure all the Fe's and rectord with each of using commands—  # interpret cerial  # op address  # chaptulation per  # chaptulation per  # chaptulation per  # chaptulation per  # chaptulation of the content of the



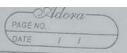






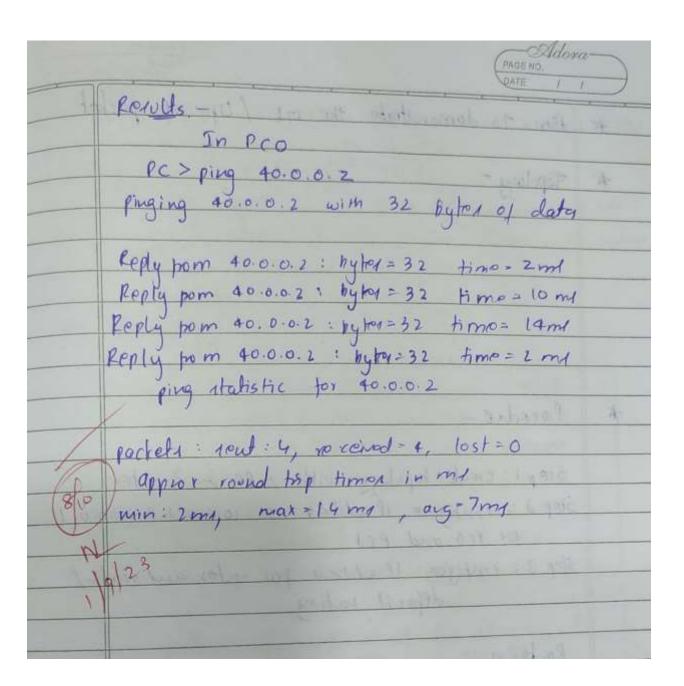
Configure OSPF routing protocol.

	THE L. I
-	To configure DIFF, ranking Protocol and connect
*	
	arPas
	14.4.0-2 1 10 10 10 10 10 10 10 10 10 10 10 10 1
*	Seder Les Jeson
-	Partie C Partie 2
	1 6/25 2
-	The state of the s
	THE A LINES
	11 5 5 2 1 1 1 1 5 1 1 1 1 1 1 1 1 1 1 1
	All the later and the same of
4	Procedure -
-	1/scecture -
141	Alen L. La to a to a to a
1	step 1: create a topology of shown using 2 PC
	and a router
	Sten 2: Course 10 - 11
	Step 2: Configure 18 address and gateway to, PC 25 10.0.0. 2 & 10.0.0.1 for PCO and 40.0.0.2
	and so o a 1 for PCI map
	to ret mil
	Step 3: configure up addresses to all rater interport.
	Porter RO, " Leavening to all rator interface.
	(RO (coups) # interpace postethered 0/0
_/	to (rough 1) + 10 all of of o
-/1	Ed ( centra +) + 10 ceddres 10-0.0.1 750 0.0.0
1	THE PLANT
	# interport revial 2/0
	# 10 colding 20 000
-	# encapalation 188
	telect rate 10000
	# 40 shut

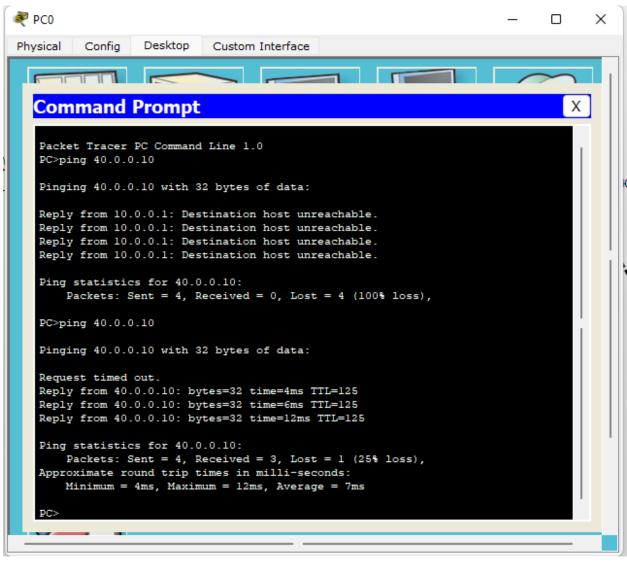


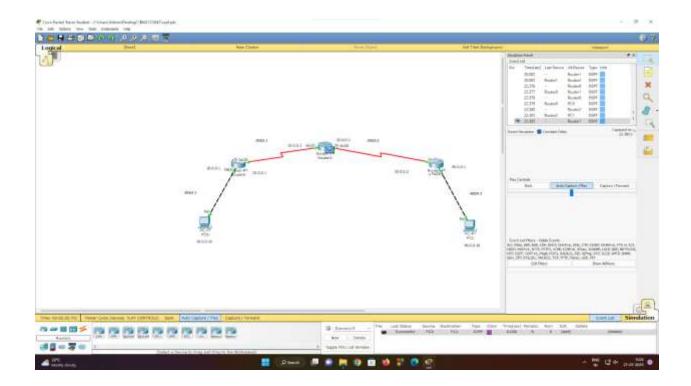
	PAGE NO.  DATE / /
	1114 for R1 and R2
	PS they would
	Step 4: Now, enable op rocking by configuring osper
	routing protocol
	als m 32'31'30'
	Router RO,
	# rator ospt 1
	the roctor id 1.1.1.1
	# network 10.0.0.0 0.255.255.255.256 9-01.3
	# network 20.0.0.0 0.257-215 170 ang 1
0	# exit  #router ospt 2 0
	1111'9 for R1 & R3 #water id 2.2.2.2 and #network 30.0.0.0 1558645
	# network days of 11. 225 15
	Step 5: Now check routing table for route # 1 how ip wer
	(- cannocted
	C COMMCDA 9
	c - 10.0.0.0 le is directly connected, fallo
	( 20.0.D.D/Q _ 11 _ 10-10
	D. Th 10.0.0/2 via 20.0.0. 2,00:04:23 keeps
	IN 30. 0. 0.018 19 20.0.00, 00.07:29.
	Here RI known area o. Network 20.0.0.0 connected
	to RI from RO, RO learns network through
	If lo neal 7
	1 1 1 1 1 - 6 (5 35 )
B. T.	There cannot be come propose
/	10 (15 6 15 CH 1) 3 CH 1
	RO (confis-if) # interface (cop back 0 RO (confis-if) # ip add 172.16.1.252 255.255.0.0
	Ro (confis-11) # ip add 177.16.1-252
13/4	2110140 400015 PH 919 00 10

Step 6. Now check routing fable for R3 B# 1how ip rate codes: 0-05pl c-connected 0 1A 20.0.0.0/8 via 30.0.0.2, 00:18:58, 10:20 c 40.0.0.018 directly connected ( 30.0.0. 0/8 11 dispoly connected, 104/ Step? create intel tink blu RO, RI by Rus we create a cirtual link in and 380 IN RO to (config) # roctor Ospf 1 RO (config-rules) # area I whole Ciak 2.2.2.2 tu 121 RI (roupg) # roctor OSPH 1 Al (config-rates) # amo I intral Cink 1.1.1. Step 8: RI & RZ get updates about area 5. Now check why table for RZ R2#1how ip noute. Coder: 0-0spt 1-connected 0 1A 20.0.0.0[8 via 30.0.0.2, 00:01:05 pello C to.o.o.ole is directly connected tast expernet olo 0 FA 10.0.0.0/8 via 30.0.0.2 00:01:06 de210





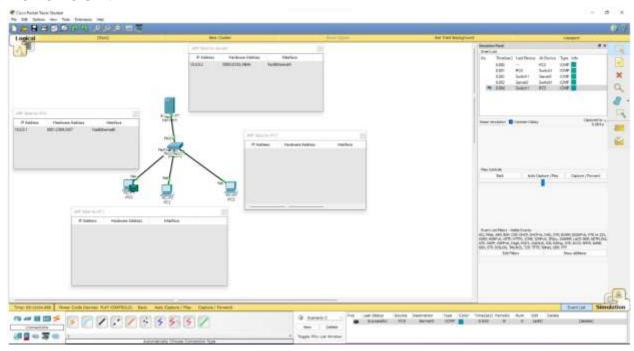


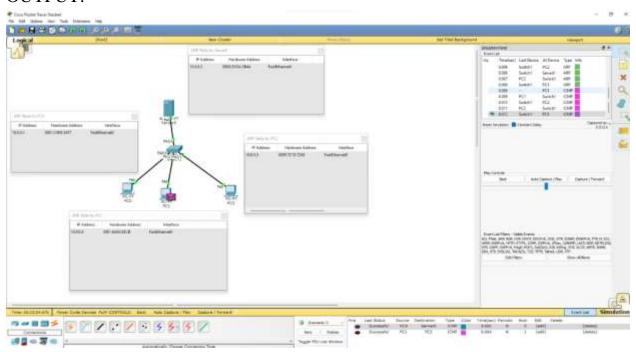


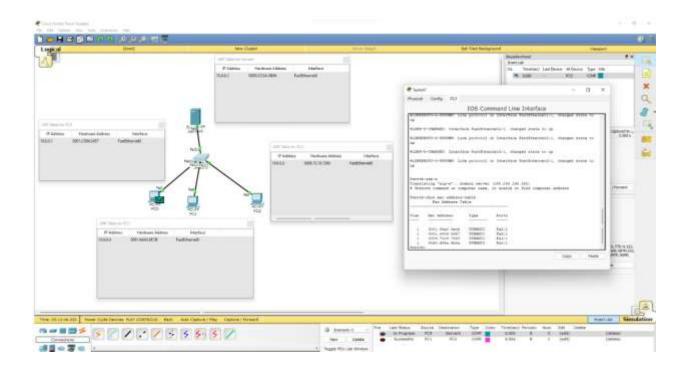
To construct a simple LAN and understand the concept and operation of Address Resolution Protocol (ARP).

Dim To condition of Concepts and of	husteh	and	condenstand the Revelution Between
Topology -	Assilteh .		
Topology -	1 tall	Fa211	160
£ 40	1 tall	Fa211	60
	fall.	Fa211	V 600
GAO	FoD		4500
		-	
77		1	
6-6-	[]		102
800	661	-	
10.0.0.1	10.5.0	2	10.0.03
Pro Com	(0)		
-2 arp	- (0.0.0	9	
7 91	-4		E NEW TOWN
-7 0-71	- d		LI BOLL
Output -			
No AK	e artifer		
reply from 10.	o.b. it hyller	-32 h	MIR 0 mg 171 > 12
11		-11	The last
aup - a internet add	tro physical	ted A	How type
	Consiste IP -  Pro (cm	Configure 1P -  Pro (cmo)  Taxp - a  Taxp - a  Taxp - a  Taxp - d  Cutput -  ap - a  Pro par - a  Prop par 10000 a hybri  Teply par 10000 a hybri	Configure 1P -  Pro (CMD)  Taxp - a  Taxp - a  Taxp - d  Cap - a  Taxp - d  Cap - a  Pro Ace artises found  Prop 10 00 0 2 hybri - 32 h

## TOPOLOGY:





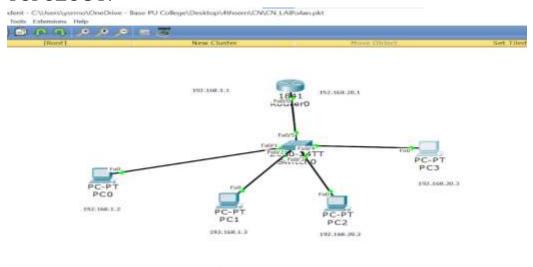


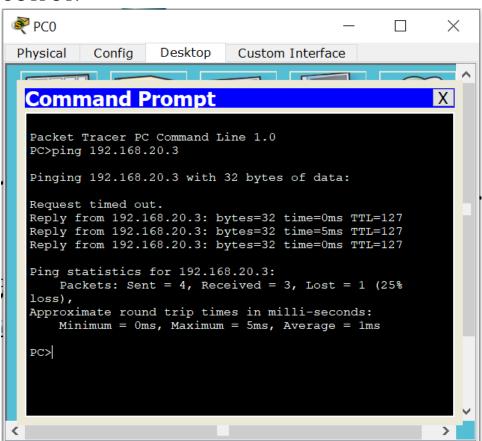
To construct a VLAN and make a pc communicate among VLAN.

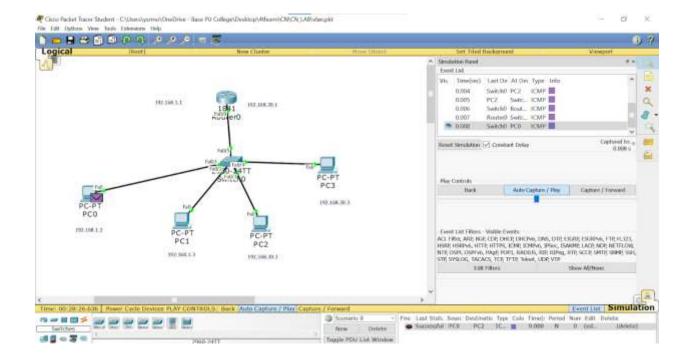
lal-s	G - ? a VLAN and make the
1 8 23	Am To construct Emple Amend of communicate among van
*	Topology - 192,102,20,1
	111 6 111 6 111 6 111 6 11 10 10 10 10 10 10 10 10 10 10 10 10
	Create topology of 4PC1, one suith and one rater.  Configure the PC1 with each other.  For PC2 & PC3 give galaxy 192.188.1.1  For PC2 & PC3 give galaxy 192.188.30.1  Ideal VIAN For database In and put VIAN number and VIAN rame for both switch and rautor.
	forteller of > Invan: fastellered of > configur VIAN fastellered of > configur VIAN
	CLI of rates  confist  surrogace just element do. 1  every field of 119 20
	sp what 192 105 40.1 205.255.255.0

=		William 1	FAGE NO.  DATE
tologe.	vuenconfigures	6 features	of - in h   W
*	Output -		
	pinging 192.168.20.3	in the 32 by	to of dat:
	Legly from 192.16 e. 20	3 = by har = 32	time = 0 ms Ttl = 12
		- 0	
	ping 1 tulistics for packets: 1 ent-4, Rea	192.168.20.3 ceived-4, lost	=0 (04.1011)
18			- Surely t
	NVI II I	the toplan	Maria de la companya della companya
	9 23	Ampth	BAN B-IC.
	West Control of the C		

#### TOPOLOGY:







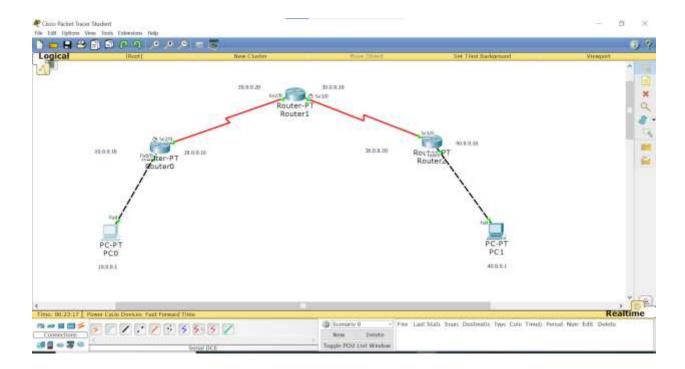
Demonstrate the TTL/ Life of a Packet.

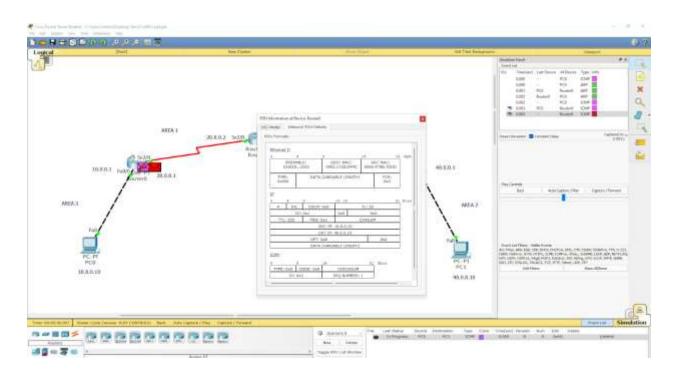
	Carre 1
	1 time at parket
×	Am - To domonstrate the ITL / life of parket
*	Topology - dealer 3 dealer 2 dealer 3
	1000 1 1et
*	Procedus -
	Step 1: create topology with 2 PC & 3 router.  Step 3: contigue if address as 100,0: 1 & 20,0: 0.  for fco and pc1  Step 3: contigue if address por router and static)  default senting
	Router o:  #county t  # interpace pasternound alo
	# ip address 10.0.0.2 255.0.0.0 # no shut # exit
	thinterfore resid 2/0  Air addien 30.0.0. 1 755-0.0.0  He no that  He exit

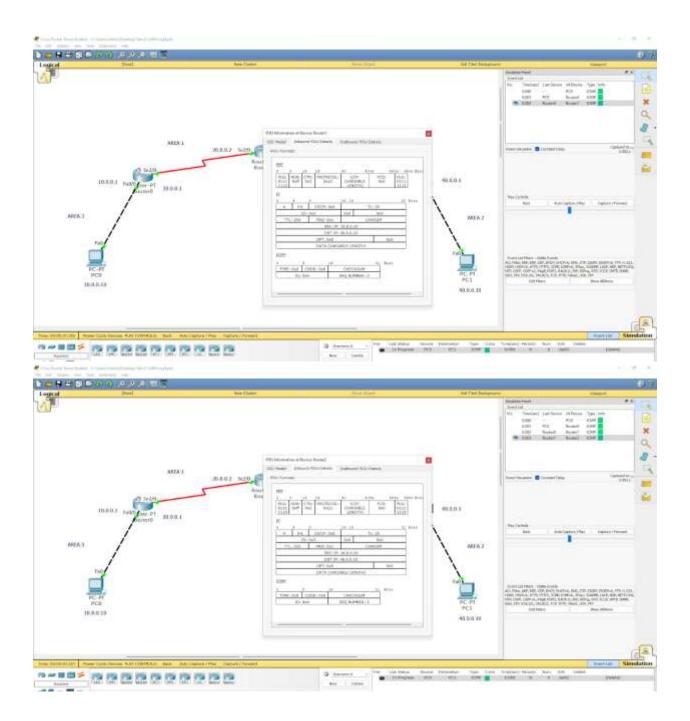
Step 4: in Atmulation made, read a simple PPU nom one ec to anomor seven to read had the restrict of the re Step (: click on env dring every bunger to 100 the inbound & outbound env details, who replans helton to capture every transfer \* Objernation 0 4 8 16 19 31 4 INL OICE HE 281 1P:0x6 6x OXO TI 1: 255 PRO: 0 X 1 cubsom SEC IP protocol 1 D47 19 50:000,1 01:000 000 pata (variable tengt) 0 4 8 16 19 31 TL= 28 4 \$ INL DICP oro 18:0x6 0x4
711:254 860:0x1 chkd SEC 19:10.0.01 on . ox o oxo

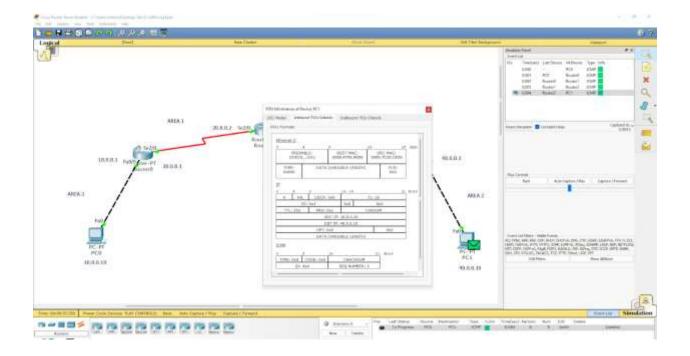
Data (variable length). Waste Follow you

### TOPOLOGY:

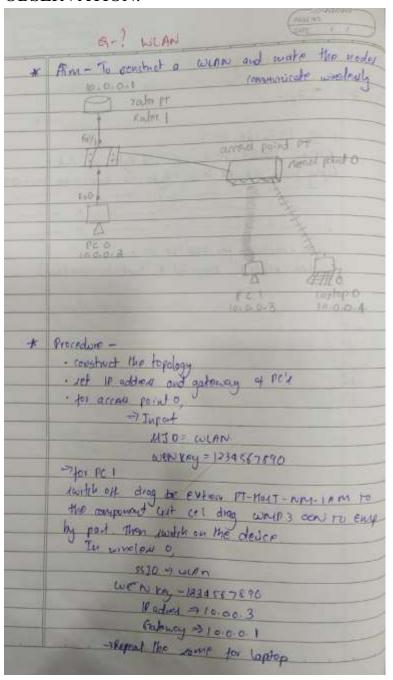






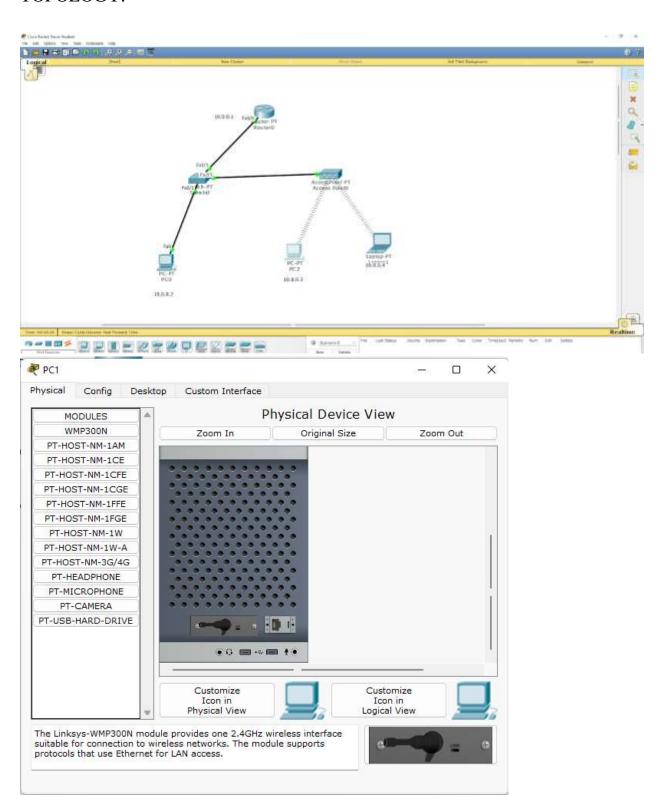


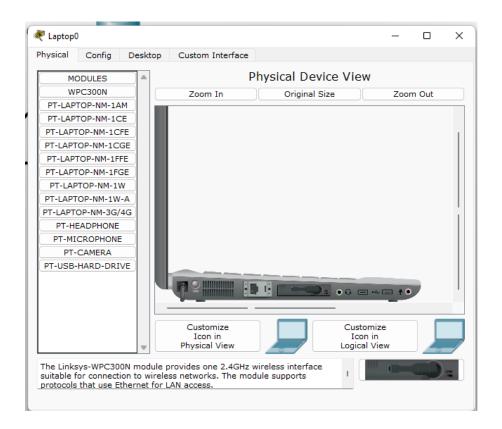
To construct a WLAN and make the nodes communicate wirelessly



16	PAGE NO.
*	Output -
	THE RESIDENCE OF THE PARTY OF T
	ping 10.0.0.3
	giveing 10.003 with 32 bytes of date:
-	Reply from 10.0.0.3 bytes = 3.2 bytes timo=15 ms 171:126
	ping statistics to 10.0.03
	partel: 1 put = 4 , Renoined = 4, Cont = 0
	approximate round hip time in williamonds:
	munum. (m), maximum = 15 ms, arrago lome
( 9/to	
N	
	The water of the second of the second of
	when the second
- 1000	the late of the sale of the sale of

### TOPOLOGY:





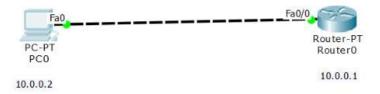
```
₹ PC0
                                                                                                                 ×
Physical Config Desktop Custom Interface
    Command Prompt
                                                                                                                     Χ
           Packets: Sent = 4, Received = U, Lost = 4 (100% loss),
    PC>ping 10.0.0.3
    Pinging 10.0.0.3 with 32 bytes of data:
     Request timed out.
    Request timed out.
Request timed out.
Request timed out.
    Ping statistics for 10.0.0.3:
           Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
    PC>ping 10.0.0.3
     Pinging 10.0.0.3 with 32 bytes of data:
    Reply from 10.0.0.3: bytes=32 time=21ms TTL=128
Reply from 10.0.0.3: bytes=32 time=7ms TTL=128
Reply from 10.0.0.3: bytes=32 time=9ms TTL=128
     Reply from 10.0.0.3: bytes=32 time=10ms TTL=128
    Ping statistics for 10.0.0.3:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 7ms, Maximum = 2lms, Average = 1lms
```

To understand the operation of TELNET by accessing the router in server room from a PC in IT office.

	QATE F. A
23	1: a) Tolped bu
*	Afron-To understand the operation of Telnet by racceding the route in sever room from a Re
*	Topologia
	FED FEELD STATE TO THE PERSON OF THE PERSON
	10.0.0.2
*	Proceduro -
	create a topology as shown above with a PC
,	Configure the PC and rowter normally afth.
- 66	rodding ex according to de probably
	Go to all of the roots and perform the following
	->confit
	7 hostnam RI
	-> enoble excel PI
-	7 substance to sletharnot of a
	-9 % odd med 10.0.01 257.0.00
	- ro that
	-> live vty 0.5 to allow whol formed ever
	- passand po
	7 exs4
	-9ent
	wi - to love change in rocker

1	*	Commands in PC -
1		्राष्ट्र अस्ति । प्रतिकार । प्रत
1		ping 10.0.0.1
7		Col. Ah 32 chelmite
1		Ping reputte ion -
1		( Let ) 2 to 1 2
1		PC>plug 10.0.0.1
1		pinging 10.0.0.1 with 32 bytes of data:
		(2014 ) 13 24 (1120 ) 138
		Reply from 10.0.0.1: by tol = 32 time=0ml 771 = 255
		Total frem 11 3 and 11
		- h - h
		E ill mostor
1		ping stablistics for 10.0.0. t
*		packets: 10nd = 4, leccival=4, loss = 0 [0.1. loss],
		Approximate rand the in mili-seconds.
		Minimum = Oml, Maximum = oml, Average = Oml.
f		Chit Tiday & Cally College
		Pc > telnet 10. 0. 0. 1 0 1 = 1. 1.
		trying 10.0.0.1 open.
		tender = [ ] govern
		vier accell venfication
	(10/	1 - File of 1 - Fi
	17/10	password: 10
		*, >enable
		pass word : PI
		rit show ip route
	LA	
_	A	1 10.0.0.018 is directly connected, fast eshornet do.
_	1	
-	1.	

## TOPOLOGY:



```
Command Prompt

Private Trainer DC Command Line 1.9

Private DC Co. 0.1 with 22 bytes of data:

Supply from 1.0.0.1. bytes byte Linemon Title18

Supply from 1.0.0.1. bytes bytes bytes
```

Write a program for error detecting code using CRC- CCITT (16-bits).

```
CODE:
#include<stdio.h>
int arr[17];
void xor(int x[], int y[])
  int k=0;
  for(int i=1;i<16;i++)
    if(x[i]==y[i])
       arr[k++]=0;
     else
       arr[i]=1;
}
void main()
  int dd[17],div[33],ze[17],i,k;
  printf("Enter the dataword \n");
  for(i=0;i<17;i++)
     scanf("%d",&div[i]);
  for(i=i;i<33;i++)
     div[i]=0;
  for(i=0;i<17;i++)
     ze[i]=0;
  printf("Enter dividend \n");
```

```
for(i=0;i<17;i++)
  scanf("%d",&dd[i]);
i=0;
k=0;
  for(i=i;i<17;i++)
     arr[k++]=div[i];
while(i<33)
  if(arr[0]==0)
     xor(arr,ze);
  else
     xor(arr,dd);
  arr[16]=div[i++];
}
k=0;
for(i=17;i<33;i++)
  div[i]=arr[k++];
printf("Codeword: ");
  for(i=0;i<33;i++)
     printf("%d",div[i]);
for(i=0;i<17;i++)
  arr[i]=0;
printf("\nAt receiver end \n");
k=0;
  for(i=i;i<17;i++)
     arr[k++]=div[i];
while(i<33)
  if(arr[0]==0)
```

```
xor(arr,ze);
else
    xor(arr,dd);

arr[16]=div[i++];

k=0;
for(i=17;i<33;i++)
    div[i]=arr[k++];

printf("Codeword: ");
for(i=0;i<33;i++)
    printf("%d",div[i]);
}</pre>
```

```
Wate a program for error detecting rade using
 CRC - CCITT
#Enclude < St dlo. h>
char m[so], q[so], q[so], temp[so];
   for (i = 0, icn, i+1)
          26]= '0';
```

```
void calram 1)
   por (i=1; ic=10; i++)
      r(i-1) = ((int) temp [i] - 48) 1
[(int) g(i) - 48) + 48;
  vord they ()
      for ( = 1; ic= 16 , 9++)
       v(i-1) = v(i)
   void zalteans (int n)
   9 ut i, k = 0 ,
m[i] = [liw] m[i] -48) ~ [liw+) ~ (KH]4-48) 48
   3 m[i] = 110';
    print["enter frame bit!");
while [Ich = getch (stdin))! = 'In')
m [itt] = (h)
      torli=o; icib; iH)
      m(n+1) = 10!

m(n) = 1.0!
```

```
pintf ("newage after appending 16 zeros 1/5", m);

for (i = 0; i < = 16; i++)

g[1] = '0';

g[0] = g[4] = g[1] = g[16] = '1'3

g[1] = '1'0';

puntf ("generator: '1's | '1'n, g|;

crc(n);

printf ("quo fort: "-1'5", g|;

(allteraula):
           (afferans(n);
pout ( transmutted trame : 1.5", m)

pout ( "enter - transmitte trame : ");

scant ( ".1.5", m);
point ("cre checkors In");
print | ["last remainder : "15", r)
  tor(i=0; ic 16; i4)
      if [+ [i]!='0')
 if I flag = = 111)
  print ("eno,");
 pint [" frome all corred");
```

16	PAGE NO.	)
-	0/p	
	La miles de la constante de la	
	enter trame bits: 1011	
	Menage after appending 16 zero	
	1011 0000 0000 0000 0000	
	generator: 10001000000100001	
	quotient: 1011	
	transmitted: 1011 1011 0001 0110 1011	
	Puter - transmitted frame	
	1011 1011 0001 0110 1011	
	105+ remainder 0000 0000 0000	
-	Received frame is correct	
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Write a program for congestion control using Leaky bucket algorithm.

```
CODE:
#include <stdio.h>
#include <stdlib.h> // Include this for the rand() function
int main()
  int buckets, outlets, k = 1, num, remaining;
  printf("Enter Bucket size and outstream size\n");
  scanf("%d %d", &buckets, &outlets);
  remaining = buckets;
  while (k)
  {
    num = rand() % 1000; // Generate a random number between 0 and 999
    if (num < remaining)
       remaining = remaining - num;
       printf("Packet of %d bytes accepted\n", num); // Added missing variable
    else
       printf("Packet of %d bytes is discarded\n", num);
    if (buckets - remaining > outlets)
       remaining += outlets; // Fixed the calculation
    else
```

remaining = buckets;

scanf("%d", &k);

printf("Remaining bytes: %d \n", remaining);

printf("If you want to stop input, press 0, otherwise, press 1\n");

```
while (remaining < buckets) // Fixed the condition
{
   if (buckets - remaining > outlets)
   {
      remaining += outlets; // Fixed the calculation
   }
   else
      remaining = buckets;
   printf("Remaining bytes: %d \n", remaining);
}
return 0; // Added a return statement to indicate successful completion
}
```

```
P5 D:\W5 Codeo cd "HT\W5 Code\U5\" : if ($\ell$) { gcc bucket.c \Rightarrow bucket } ; if ($\ell$) { .\bucket } Enter Bucket size and outstream size
Packet of 41 bytes accepted
Remaining bytes: 2000
If you want to stop input, press 0, otherwise, press 1
Packet of 467 bytes accepted
Remaining bytes: 1633
If you want to stop input, press 0, otherwise, press 1
Packet of 334 bytes accepted
Memaining bytes: 1399
If you want to stop input, press 0, otherwise, press 1
Packet of 500 bytes accepted
Remaining bytes: 999
If you want to stop input, press 0, otherwise, press 1
Packet of 169 bytes accepted
Remaining bytes: 930
If you want to stop input, press 0, otherwise, press 1
Packet of 724 bytes accepted
Memaining bytes: 306
If you want to stop input, press 0, otherwise, press 1
Packet of 478 bytes is discarded
Hemaining bytes: 406
If you want to stop input, press 0, otherwise, press 1
Packet of 358 bytes accepted
Remaining bytes: 148
If you want to stop input, press 8, otherwise, press 1
Packet of 962 bytes is discarded
Newsining bytes: 268
If you want to stop input, press 8, otherwise, press 1
```

```
Remaining bytes: 348
Remaining bytes: 448
Remaining bytes: 548
Remaining bytes: 648
Remaining bytes: 748
Remaining bytes: 848
Remaining bytes: 948
Remaining bytes: 1048
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PS D:\VS Code\OS> []
```

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enter bucket 1820, outgoing rate and vac of I/P Enter the encouring packet lize = 30

Incoming packet lize = 30

dropped to no. of packets

Bucket 1490 lize 0 od of 20 After ortgoing to packed left out so in hyper Encouring packet size=10

Encouring packet size=10

Bucket halfor size 10 and 20 After ortgoing 10 partell left out 20 in buffer.

Using TCP/IP sockets, write a client-server program to make client sending the file name and the server to send back the contents of the requested file if present.

### CODE:

```
ClientTCP.py
from socket import *
serverName = "127.0.0.1"
serverPort = 12000
clientSocket = socket(AF_INET, SOCK_STREAM)
clientSocket.connect((serverName,serverPort))
sentence = input("\nEnter file name: ")
clientSocket.send(sentence.encode())
filecontents = clientSocket.recv(1024).decode()
print ("\nFrom Server:\n")
print(filecontents)
clientSocket.close()
ServerTCP.py
from socket import *
serverName="127.0.0.1"
serverPort = 12000
serverSocket = socket(AF_INET,SOCK_STREAM)
serverSocket.bind((serverName,serverPort))
serverSocket.listen(1)
while 1:
print ("The server is ready to receive")
connectionSocket, addr = serverSocket.accept()
sentence = connectionSocket.recv(1024).decode()
file=open(sentence,"r")
l=file.read(1024)
connectionSocket.send(l.encode())
```

print ("\nSent contents of " + sentence)
file.close()
connectionSocket.close()



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	accept() - initials a connection with cloud
	closely- close, the commetion with client.
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Using UDP sockets, write a client-server program to make the client send the file name and the server to send back the contents of the requested file if present.

#### CODE:

```
ClientUDP.py
from socket import *
serverName = "127.0.0.1"
serverPort = 12000
clientSocket = socket(AF INET, SOCK DGRAM)
sentence = input("\nEnter file name: ")
clientSocket.sendto(bytes(sentence,"utf-8"),(serverName, serverPort))
filecontents, serverAddress = clientSocket.recvfrom(2048)
print ("\nReply from Server:\n")
print (filecontents.decode("utf-8"))
# for i in filecontents:
# print(str(i), end = "")
clientSocket.close()
clientSocket.close()
ServerUDP.py
from socket import *
serverPort = 12000
serverSocket = socket(AF_INET, SOCK_DGRAM)
serverSocket.bind(("127.0.0.1", serverPort))
print ("The server is ready to receive")
while 1:
sentence, clientAddress = serverSocket.recvfrom(2048)
sentence = sentence.decode("utf-8")
file=open(sentence,"r")
```

```
con=file.read(2048)
serverSocket.sendto(bytes(con,"utf-8"),clientAddress)
print ("\nSent contents of ", end = " ")
print (sentence)
# for i in sentence:
# print (str(i), end = " ")
file.close()
```

```
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