

Name	Rohit Ashiwal
Enr. no.	17114064
Dept	CSE
Batch	CS 2
Class	B. Tech 3rd yr

Lab Assignment 3

This assignment aims to make the students familiar with the hardware and software aspects of computer networking and extracting information related to computer networking using C programs, TCL programs and NS2.

Problem Statement 1

Q: Write a socket program in C to determine class, Network and Host ID of an IPv4 address.

```

r1walz@ar135: /tmp/csn361
File Edit View Search Terminal Help
→ csn361 gcc src/q1.c -o nid
→ csn361 ./nid
usage: nid <address>
→ csn361 ./nid 10.42.0.1
Given IP address belongs to Class A
Network ID is 10
Host ID is 42.0.1
```

No special data structures or algorithms were used. Simple switch-case was used to get the required information.

Problem Statement 2

Q: Write a C program to demonstrate File Transfer using UDP.

./server
File Edit View Search Terminal Help
→ csn361 gcc src/q2_server.c -o server
→ csn361 ./server
Waiting for file name...

File Name Received: client
File Successfully opened!
Waiting for file name...

File Name Received: server
File Successfully opened!
Waiting for file name...

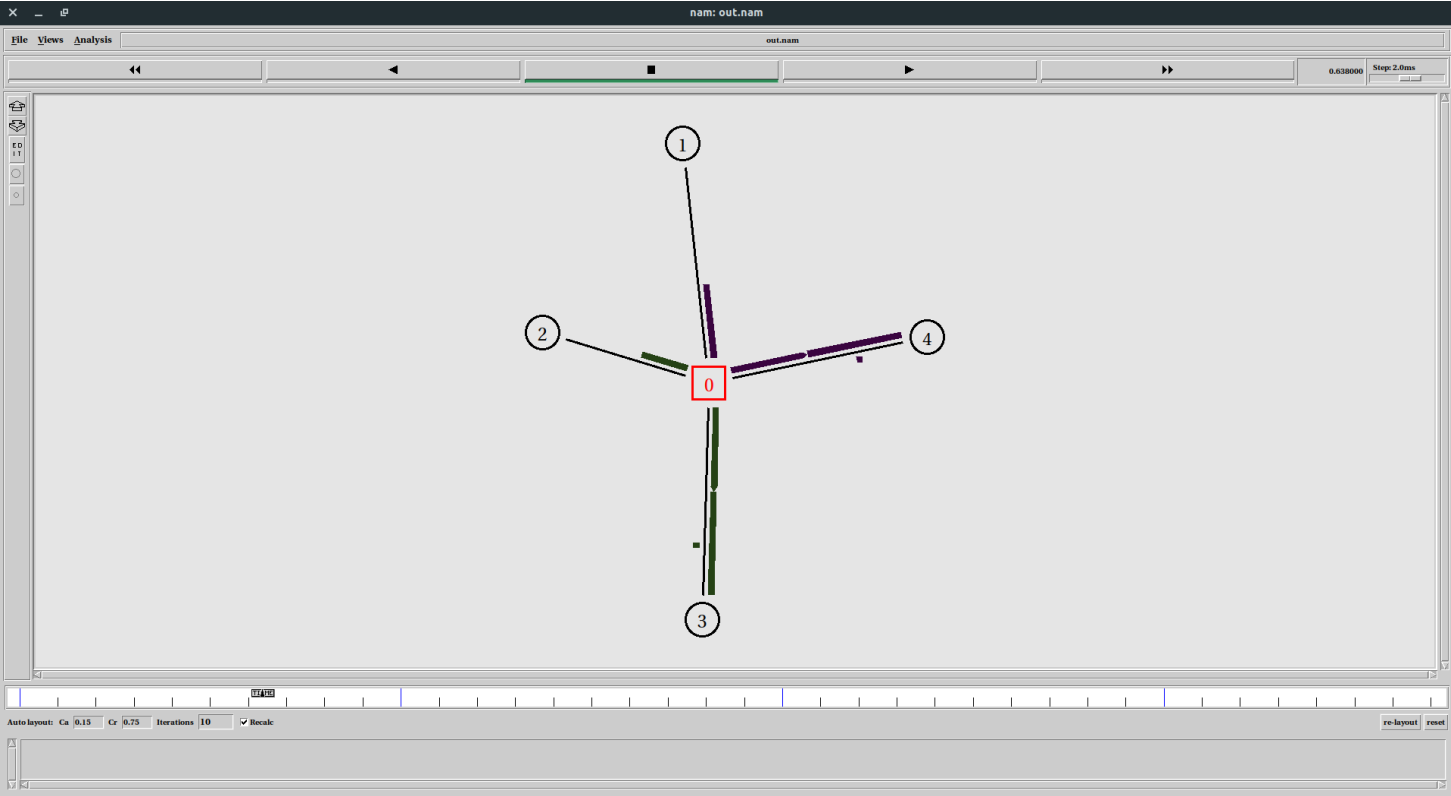
./client
File Edit View Search Terminal Help
→ csn361 gcc src/q2_client.c -o client
→ csn361 ./client
Please enter file name to receive: client
-----Start-----
ELF...p+08 @ ... h h x x
DD...td
@
\\...td h h lib64/ld-linux-x86-64.so.2GNU
UeI5u0...#... h... 3... Q... a"
libc.so.6socketexithtons
perror_isoc99_scanfputsputcprinfnet_addrrecvfrcsendto_cxa_finalize_li
bc_start_mainGLIBC 2.7GLIBC 2.2.5 ITM_deregisterTMCloneTable__gmon_start__ITM
...te h 0onep ...
...
...H...H...
-----End-----
Please enter file name to receive: server
-----Start-----
ELF...p+08 @ ... ` ` p p
\\...td ` ` lib64/ld-linux-x86-64.so.2GNUGNU3<w,#<
5eSHRR>... *... H... X"
libc.so.6socketexithtonsfpopenperro
rputsprintfgetcbindfclosercvfrmsendto_cxa_finalize_libc_start_mainGLIBC 2
.2.5 ITM_deregisterTMCloneTable__gmon_start__ITM_registerTMCloneTable
...` P h
...
...H...H...
-----End-----

We used infinite loops in both the server and client code to continuously run the sessions. We read the files and maintain a buffer to transfer the file.

Problem Statement 3

Q: Write a TCL code for network simulator NS2 to demonstrate the **star** topology among a set of computer nodes. Given N nodes, one node will be assigned as the central node and the other nodes will be connected to it to form the star. You have to set up a TCP connection between k pairs of nodes and demonstrate the packet transfer between them using Network Animator (NAM). Use File Transfer Protocol (FTP) for the same. Each link should have different color of packets to differentiate the packets transferred between each pair of nodes. The program should take the number of nodes (N) as input followed by k pairs of nodes.

```
r1walz@ar135: /tmp/csn361
File Edit View Search Terminal Help
→ ~ /tmp/csn361
→ csn361 ns src/q3.tcl
Enter number of nodes:
5
Enter number of connections:
2
Please enter connections as comma seperated pairs(for eg "2,3"):
1,4
2,3
```

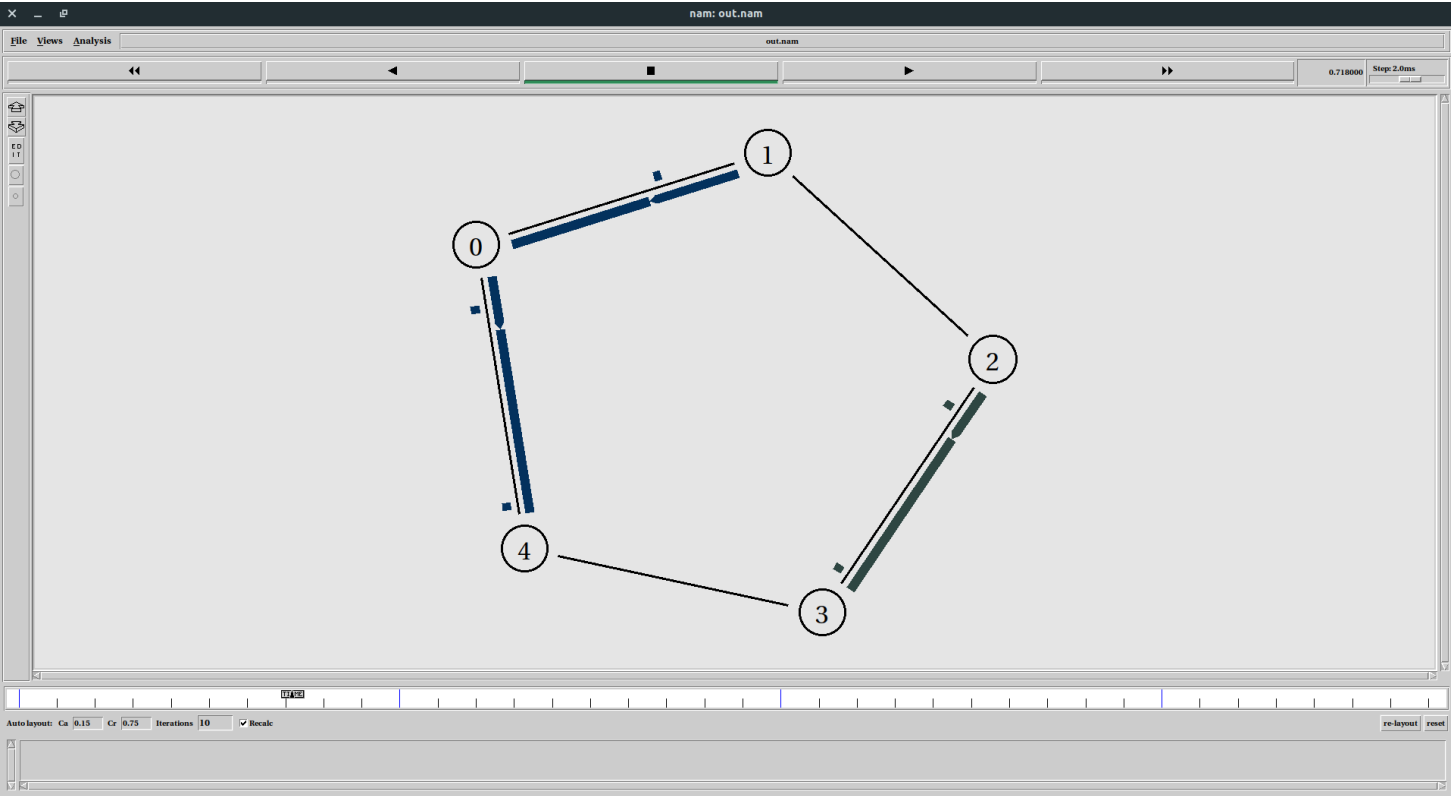


We make a list of N nodes after we get the value of N . We use a list of N colors randomly and uniquely chosen.

Problem Statement 4

Q: Write a TCL code for network simulator NS2 to demonstrate the ring topology among a set of computer nodes. Given N nodes, each node will be connected to two other nodes in the form of a ring. You have to set up a TCP connection between k pairs of nodes and demonstrate packet transfer between them using Network Animator (NAM). Use File Transfer protocol (FTP) for the same. Each link should have different color of packets to differentiate the packets transferred between each pair of nodes. The program should take the number of nodes (N) as input followed by k pairs of nodes.

```
r1walz@ar135: /tmp/csn361
File Edit View Search Terminal Help
→ csn361 ns src/q4.tcl
Enter number of nodes:
5
Enter number of connections:
2
Please enter connections as comma seperated pairs(for eg "2,3"):
1,4
2,3
```

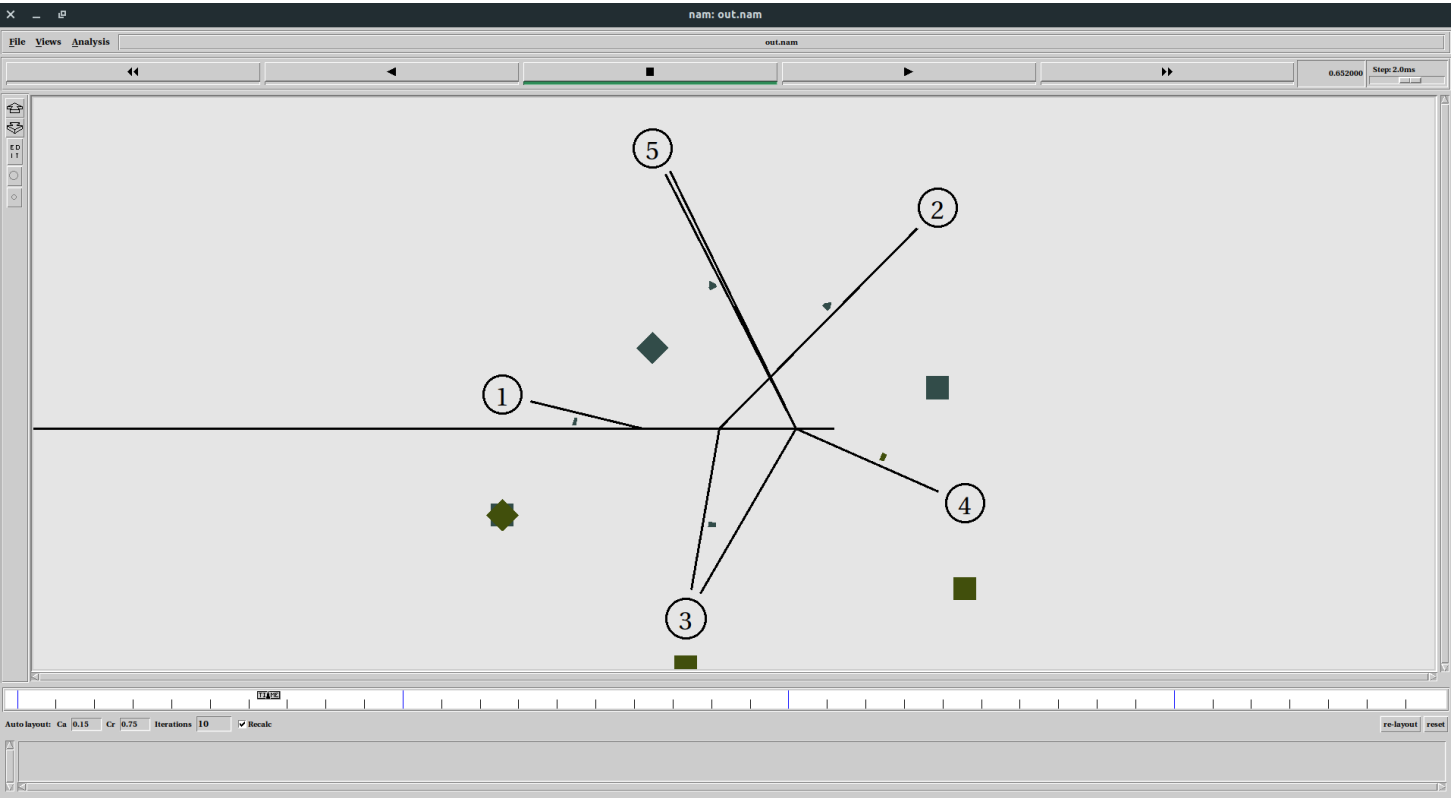


We make a list of N nodes of the we get the value of N . We use a list of N colors randomly and uniquely chosen.

Problem Statement 5

Q: Write a TCL code for network simulator NS2 to demonstrate the bus topology among a set of computer nodes. Given N nodes, each node will be connected to a common link. You have to set up a TCP connection between k pairs of nodes and demonstrate packet transfer between them using Network Animator (NAM). Use File Transfer protocol (FTP) for the same. Each link should have different color of packets to differentiate the packets transferred between each pair of nodes. The program should take the number of nodes (N) as input followed by k pairs of nodes.

```
r1walz@ar135: /tmp/csn361
File Edit View Search Terminal Help
→ csn361 ns src/q5.tcl 2>/dev/null
Enter number of nodes:
5
Enter number of connections:
2
Please enter connections as comma seperated pairs(for eg "2,3"):
1,4
2,3
```



We make a list of N nodes of the we get the value of N . We use a list of N colors randomly and uniquely chosen.