

## Appendix A

### Case Study: TCP with IP network Topology

This case study will focus on the TCP with IP network topology. All three overall network on TCP Tahoe, overall network on TCP Reno and overall network on TCP NewReno is included in this case study. This network topology has fixed every IPTCP component with a fixed particular destination IPTCP component. There are two or three lost segments generated randomly at the ATMLSR1 and ATMLSR4 switches. The transmission size for each component is 200,000 bytes

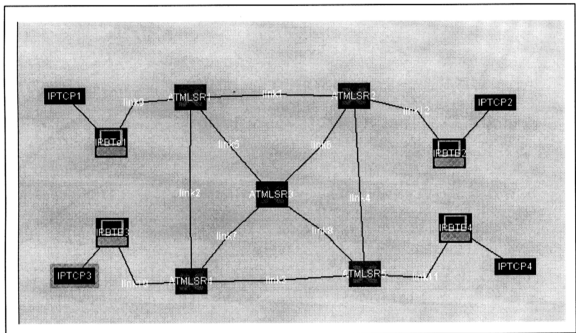


Figure A.1 TCP/IP Network Topology structure

Figure A.1 is the Overall TCP/IP Network Topology structure of all TCPIP component having the same TCP version. ATMLSR<sub>r</sub> are the network switches, where r is in the range of 1 to 5. IPBTE<sub>n</sub> are the IP Terminals, where n is in the range of 1 to 4. IPTCP<sub>m</sub> are the TCPIP components, where m is in the range of 1 to 4. link<sub>j</sub> are links between IP Terminals and the network switches, where j is in the range of 1 to 12. Refer to Section 5.1 for the network switch, IP Terminal and TCPIP component definitions.

<b>IPTCP</b>	<b>BTE</b>	<b>Source Address</b>	<b>Subnet Mask</b>
IPTCP1	BTE1	1.1.1.1	255.255.255.255
IPTCP2	BTE2	2.2.2.2	255.255.255.255
IPTCP3	BTE3	3.3.3.3	255.255.255.255
IPTCP4	BTE4	4.4.4.4	255.255.255.255

*Table A.1 Address Space for TCP with IP component (IPTCP)*

Table A.1 shows the source network addresses and subnet mask for each of the TCPIP component and Table A.2 shows TCPIP component destination network address.

<b>Source IPTCP</b>	<b>Destination IP</b>	<b>Destination IPTCP</b>
IPTCP1	2.2.2.2	IPTCP2
IPTCP2	1.1.1.1	IPTCP1
IPTCP3	4.4.4.4	IPTCP4
IPTCP4	3.3.3.3	IPTCP3

*Table A.2 Destination Address Space for TCP with IP component (IPTCP)*

There are three test runs using the overall network TCP version on Tahoe, overall network TCP version on Reno and overall network TCP version on NewReno, in this topology.

<b>IPTCP1</b> (Bits / Sec)	<b>IPTCP2</b> (Bits / Sec)	<b>IPTCP3</b> (Bits / Sec)	<b>IPTCP4</b> (Bits / Sec)
798149	804685	798149	804685

*Table A.3 Overall network IPTCP on Tahoe Average Throughput 1*

<b>IPTCP1</b> (Bits / Sec)	<b>IPTCP2</b> (Bits / Sec)	<b>IPTCP3</b> (Bits / Sec)	<b>IPTCP4</b> (Bits / Sec)
802631	800452	798419	804685

*Table A.4 Overall network IPTCP on Reno Average Throughput 2*

<b>IPTCP1</b> (Bits / Sec)	<b>IPTCP2</b> (Bits / Sec)	<b>IPTCP3</b> (Bits / Sec)	<b>IPTCP4</b> (Bits / Sec)
802631	804685	798419	804685

*Table A.5 Overall network IPTCP on NewReno Average Throughput*

Table A.3 shows the results collected for overall network on Tahoe. Table A.4 shows the results collected for overall network on Reno. Table A.5 shows the results collected for overall network on NewReno.

The simulation shows that three different types of overall same type network are able to have good average throughputs even having encountered lost segment(s). However, the simulation shows that in overall network TCP version on NewReno, its overall average throughput is the best among the three networks. This means that NewReno performed recovery from lost segment better than the other two types of TCP version.

## Appendix B

### TCP with IP component Configuration Guideline

This section provides guidelines to configure the TCP with IP component using the simulator. It assumes that the user is already familiar with the TCP with IP architecture before using the simulator. The following example shows how to setup a TCP with IP component for NewReno.

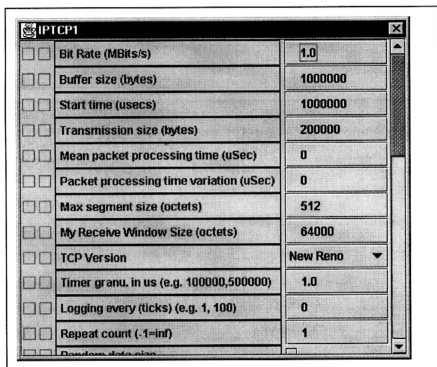


Figure B.1 Configure TCP with IP component (1)

Parameter	Value
Packet input queue	0
Peer Receive Window Size (octets)	0
cwnd in bytes	0
RTT (ticks)	0.0
Forward Trip Time FTI (uSecs)	0.0
TH (uSecs)	0.0
RTO (ticks)	5000000.0
RTO Current	5000000.0
Average throughput (Bits/Sec)	0
Retransmission percentage	0
Port number	1
Destination IP	2.2.2.2
Destination port number	1
Calls attempted	0
Calls accepted	0
Incoming Calls	0
Total Incoming Calls	0

Figure B.2 Configure TCP with IP component (2)

### Configure TCP with IP component

Before running the simulation, the TCP with IP component has to be configured first. The transmission bit rate, TCP buffer size, transmission size, TCP version, destination IP and destination port number have to be set up. The TCP version selection consists of Tahoe, Reno and NewReno. The configuration of TCP with IP component is shown in Figure B.1 and Figure B.2.