

## Problem Set - 1

BHALLAJI VENKATESAN KULATHUVENDARAM

Problem 1

A. a) Distance of the link =  $385,000 \text{ km} = 3.85 \times 10^8 \text{ m}$   
 Speed of light = data speed =  $3 \times 10^8 \text{ m/s}$

$$\begin{aligned} RTT_{\min} &= 2 \times \frac{\text{Distance of the link}}{\text{Speed of light}} = 2 \times \frac{3.85 \times 10^8}{3 \times 10^8} \\ &= 2.566666667 \text{ s} \end{aligned}$$

A. b)

$$\text{delay} \times \text{bandwidth} = RTT_{\min} \times \text{bandwidth}.$$

$$\begin{aligned} RTT_{\min} &= 2.566666667; \text{bandwidth} = 2 \text{ Gbps} = 2 \times 10^9 \text{ bps} \\ \therefore \text{BW} \times \text{delay} &= 2.566666667 \text{ s} \times 2 \times 10^9 \text{ bps} \\ &= 513333334 \text{ bits} \end{aligned}$$

A. c)

It denotes the maximum physical limit of data transfer per second in the link. [Max. capacity of the pipe].

A. d)

$$\begin{aligned} \text{File size} &= 30 \text{ MB} = 30 \times 1024 \times 1024 \times 8 \\ &= 251658240 \text{ bits.} \end{aligned}$$

$$\text{File Transfer Time} = \frac{\text{File size}}{\text{Bandwidth}} = 0.12582912 \text{ s}$$

$$\text{Time for request} = \text{Time for response} = \frac{1}{2} RTT$$

$$\begin{aligned} \text{Total Transfer Time} &= \text{File Transfer Time} + \text{Time for request} \\ &\quad + \text{Time for response.} \\ &= 0.12582912 + RTT \\ &= 2.69249 \text{ s.} \end{aligned}$$

### Problem 2 :

A. 2.a) Throughput =  $\frac{\text{File size}}{((\text{Bit Rate}) + \text{Req time} + \text{Resp time})}$

$$\Rightarrow \text{File size} = 4 \text{ MB} = 4 \times 1024 \times 1024 \times 8 = 33554432 \text{ bits}$$

$$\text{Bit rate} = 4 \text{ MB}/1 \text{ Gbps} = \frac{33554432}{1 \times 10^9} = 33.5 \text{ ms}$$

$$\text{Req time} = \text{Response Time} = \frac{1}{2} \text{ RTT} = 7.5 \text{ ms}$$

$$\therefore \text{Throughput} = \frac{33554432}{33.5 + 7.5 + 7.5} = 183357551.913 \text{ bit/sec}$$

b) Since there is no request, there won't be any time needed for throughput.

$$\therefore \text{Throughput} = \frac{33554432}{(33.5 + 7.5) \text{ ms}} = 309257437.788 \text{ bit/sec.}$$

### Problem 3 :

A. 3 a) File size = 2000 KB = 16384000 bits  
 Total time = 2 RTT (handshaking) +  $\frac{\text{File size}}{\text{Bandwidth}}$  + propagation delay.  
 $= 200 \text{ ms} + \frac{16384000}{1000000} + 50 \text{ ms}$   
 $= 0.25 + 16.384 = 16.634 \text{ s}$

b) Total No. of packets =  $\frac{2000 \text{ KB}}{1 \text{ KB}} = 2000$   
~~Reading the~~ Total time = Handshake time + last packet time  
 $+ 1999 \times (\text{RTT} + \text{Transfer time/packet})$   
 $= 2 \text{ RTT} + \frac{16384000}{1024 \times 8 / (1.5 \times 10^6)} + 1999 \left( 0.1 + \frac{1024 \times 8}{1.5 \times 10^6} \right)$   
 $= 0.2 + 5.4613 \times 10^{-3} + 210.817 = 211.02266 \text{ s}$

A-3-c)

40 packets / RTT.

 $\therefore$  for 2000 packets, ideally  $\frac{2000}{40} = 50 \text{ RTTs}$ but since for the last packet, there is only 1 way delay. Total delay =  $49.5 \text{ RTT}$ .

$$\begin{aligned}\therefore \text{Total Time} &= \text{Handshake Time} + \text{Total delay} \\ &= 51.5 \text{ RTT} = 51.5 \text{ s}\end{aligned}$$

A-3-d)

Total no. of packets  $\geq 2000$ 

$$1+2+4+\dots+2^{n+1} = \frac{2^{n+1}-1}{2-1} = 2^{n+1}-1 \geq 2000$$

$$\therefore n+1 \geq 12$$

$$\Rightarrow n \geq 11$$

$$\therefore \text{Total time} = 11 \text{ RTTs} + 2 \text{ Initial RTTs} = 13 \text{ s}$$

Problem 4

A-4)

width of a bit =  $\frac{\text{speed of propagation}}{\text{bandwidth}}$ 

$$= \frac{2.3 \times 10^8 \text{ m/s}}{20 \times 10^9 \text{ bps}} = 0.0115 \text{ m/bit}$$

Problem 5

A-5)

successful rate  $\cong$  successful transmission.Let  $P(s)$  be probability of successful transmission.

$$\therefore P(s) = \text{No. of stations} * P(\text{only 1 station transmits on 1 bus}) * P(\text{no other station transmits on that bus})$$

If probability of a transmission is  $P$ , since 4 stations on 2 buses

$$P(\text{only 1 station transmits on 1 bus}) = \left(\frac{3}{4}\right)P = \frac{1}{2}P$$

$$P(\text{no other station transmits on that bus}) =$$

$$P(3 \text{ other stations not transmitting on the bus})$$

$P(3 \text{ other stations not transmitting on the bus}) =$   
 $P(2^{\text{nd}} \text{ station not transmitting on the bus}) * \cancel{P(3^{\text{rd}} \text{ station not transmitting on the bus})} *$   
 $\cancel{P(4^{\text{th}} \text{ station not transmitting on the bus})}$

$$P(S) = 4 * \left(\frac{1}{2}\right) P * \left(1 - \frac{1}{2}\right)^3$$

$$P(S) = 2P \left(1 - \frac{1}{2}\right)^3$$

Taking derivative w.r.t  $P$  and evaluating to find to find maximum

$$\frac{\partial P(S)}{\partial P} = 2\left(1 - \frac{1}{2}\right)^3 - 3P\left(1 - \frac{1}{2}\right)^2$$

$$\Rightarrow P = \frac{1}{2}$$

### Problem 6

6.a)

~~Probability~~

$$\begin{aligned} \text{Propagation Delay} &= \text{Distance of link} / \text{propagation speed} \\ &= (3.6 \times 10^7) / (2.4 \times 10^8) = 0.15 \text{ sec} \end{aligned}$$

6.b)

bandwidth-delay product

$$= 10 \times 10^6 \times 0.15 = 1.5 \times 10^6 \text{ bits}$$

6.c)

$$\text{Rate} = 10 \times 10^6 \text{ bps}$$

1 photo per minute

$$X = 1 \text{ minute} \times 10^7 \text{ bps} = 60,000,000 \text{ bits}$$

### Problem 7

- 7.a) The receiver is now expecting a packet with sequence number  $K$ , which means the receiver has received up to packet  $K-1$  and has acknowledged all of the previous packets. Since the sender's window size = 4,

7 a) continue;

Case 1: If sender has received all of the receiver's ACK messages, then the sender's window slides to  $K$  till  $K+3 \Rightarrow [K, K+3]$

Case 2: If sender does not receive any of receiver's ACK then window can be  $[K-4, K-1]$ .

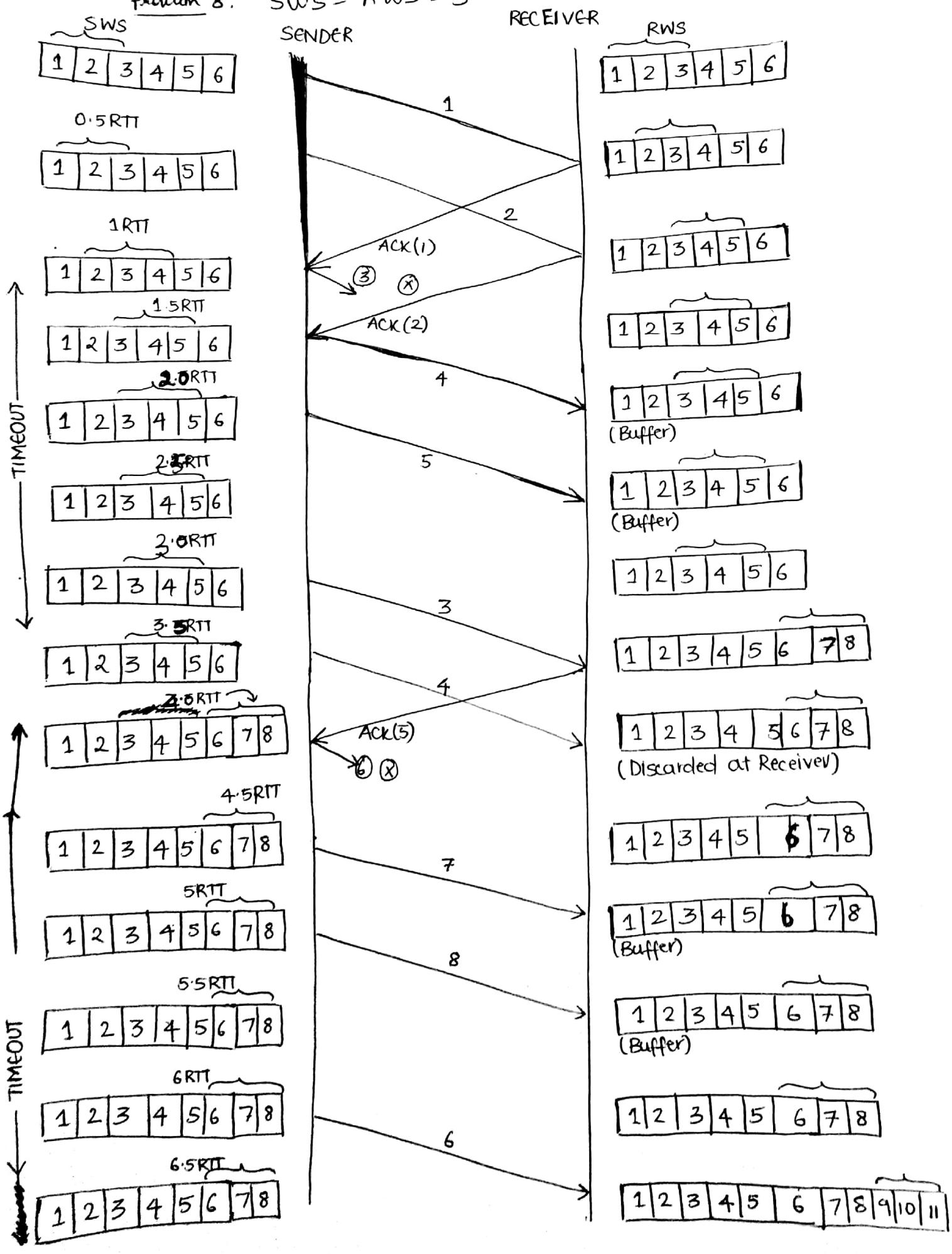
∴ the set of possible sequence numbers will be  $[K-4, K-1]$  or  $[K, K+3]$

b) since the receiver is waiting for ' $K$ ', it has ACKed the  $K-1$  packets or  $A$  packets before that. In case, if none of ~~the~~ ACK packets are received by sender, then ACK messages with values  $[K-4, K-1]$  may still be propagating back.

As sender has sent  $[K-4, K-1]$ , it must be the case that sender has already received an ACK for  $K-3$ . Once the receiver has sent an ACK for  $K-3$ , it will never send an ACK that is less than  $K-N-1$ . Thus the range of ACKs can be  $[K-4, K-1]$ ;

c) Yes. For eg: if SWS = 3, and sends packets 1, 2 and 3 at  $t_0$ . At  $t_1$ , the receiver ACKs packets 1, 2 and 3. At  $t_2$ , the sender times out and resends 1, 2 and 3. At  $t_3$ , the receiver receives the duplicates and re-acknowledges 1, 2 and 3. At  $t_4$ , the sender receives the ACKs that the receiver sent at and advances its window to packets 4, 5 and 6. Finally at  $t_5$ , the sender receives the ACKs that the receiver sent at  $t_2$ . These are outside window.

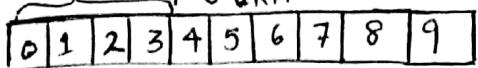
problem 8: SWS = RWS = 3



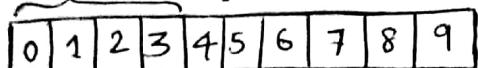
4

Problem 9:

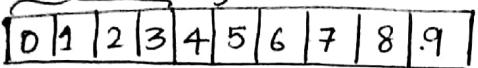
SWS=4 0.0RTT



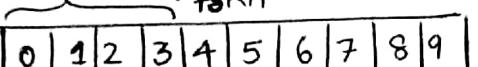
0.25RTT



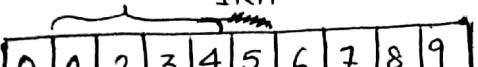
0.5RTT



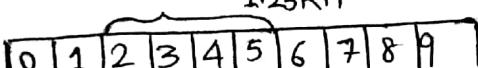
0.75RTT



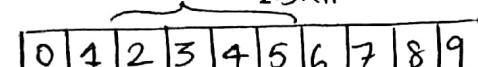
1RTT



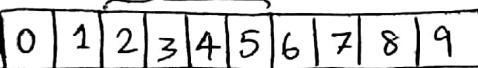
1.25RTT



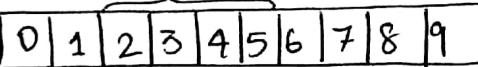
1.5RTT



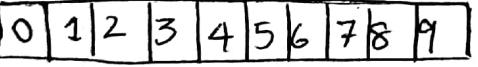
1.75RTT



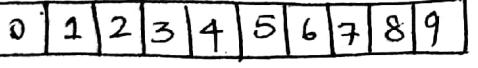
2.0RTT



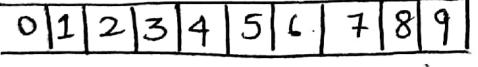
2.25RTT



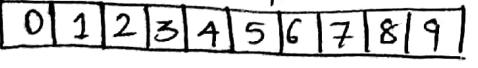
2.5RTT



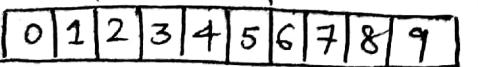
2.75RTT



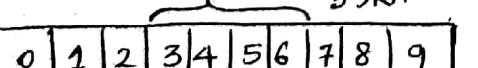
3.0RTT



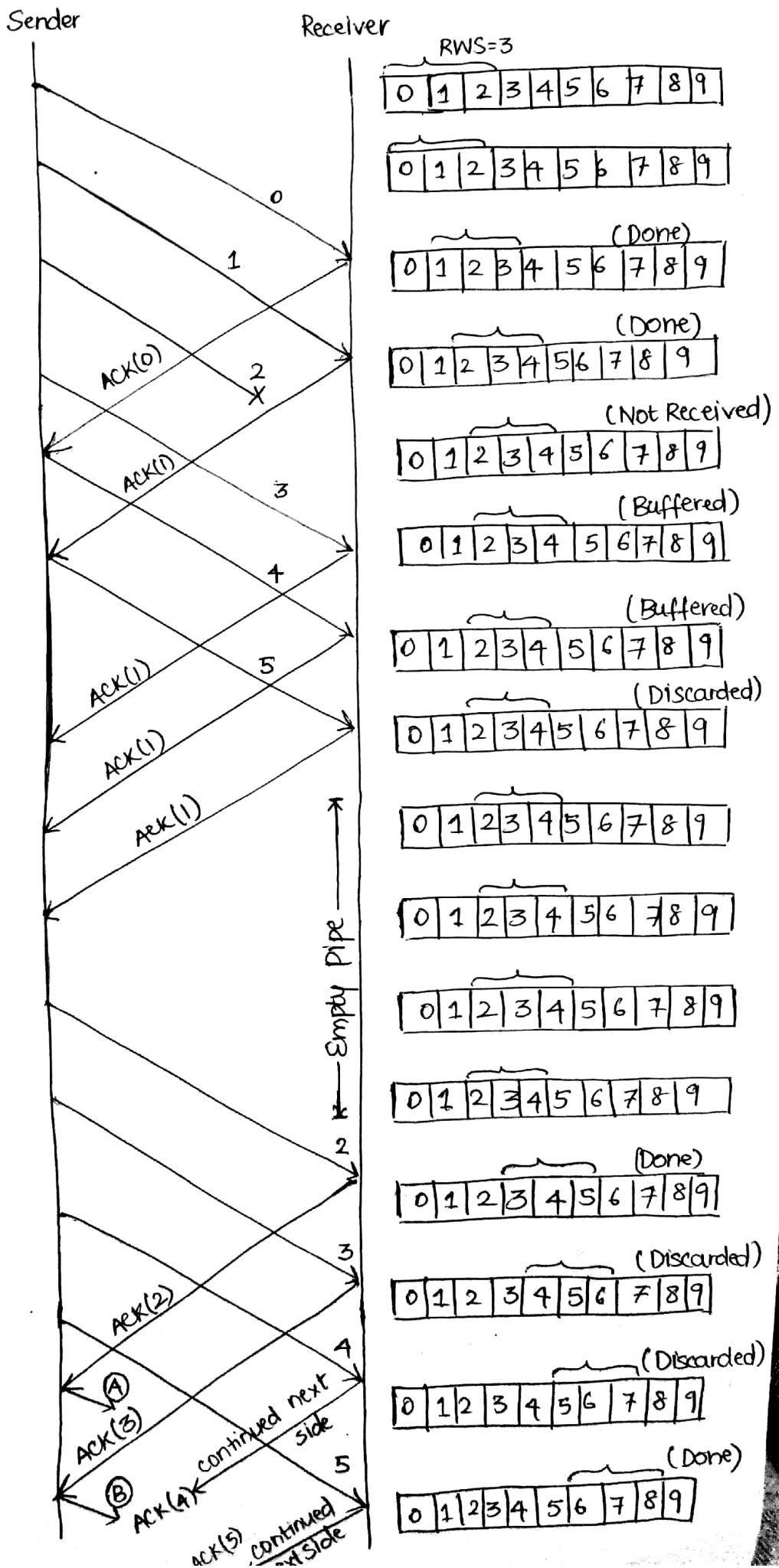
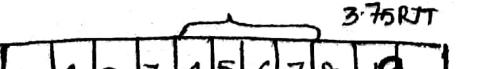
3.25RTT

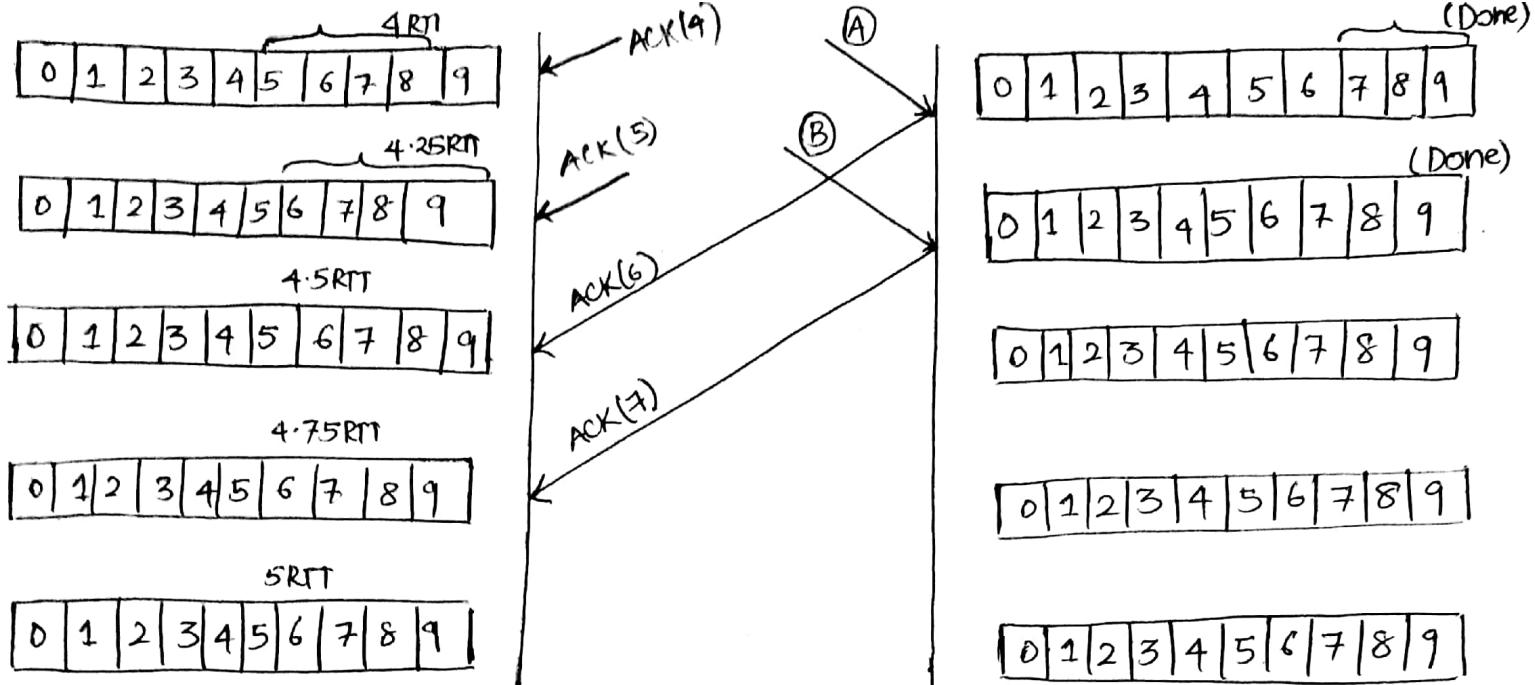


3.5RTT

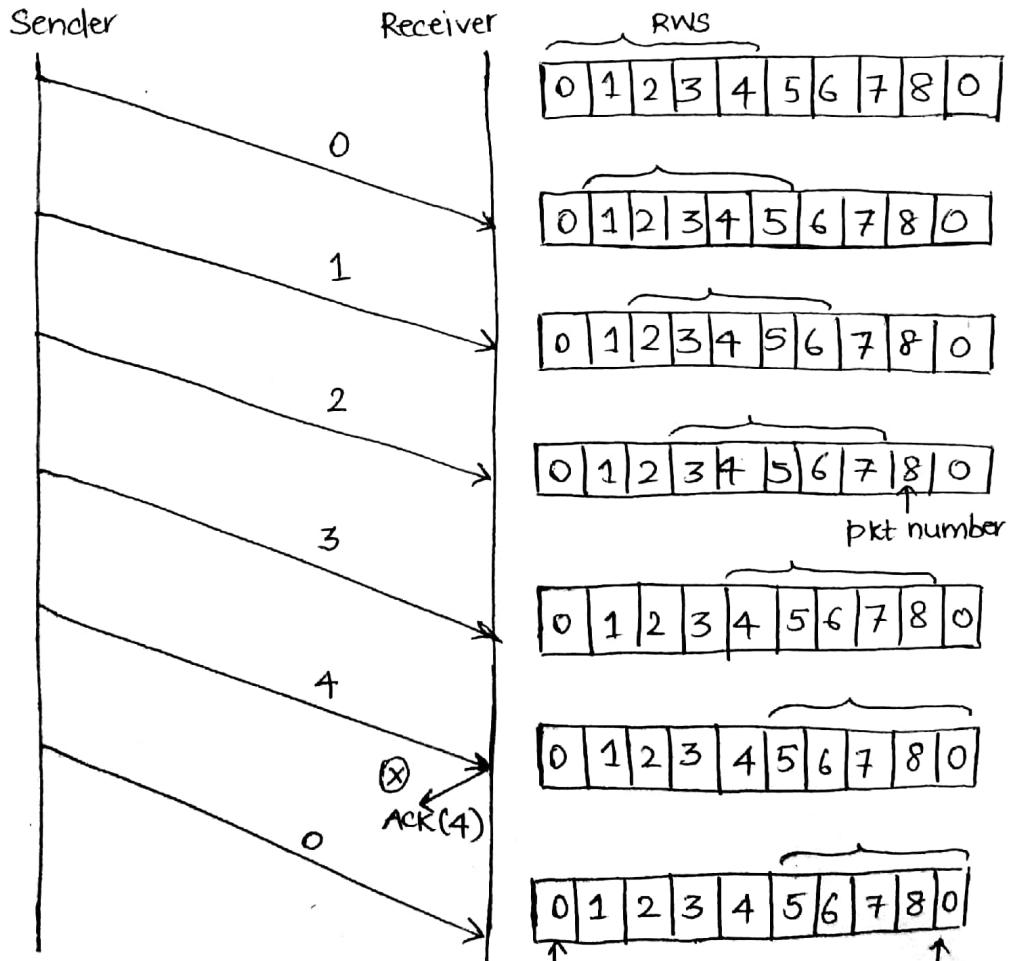
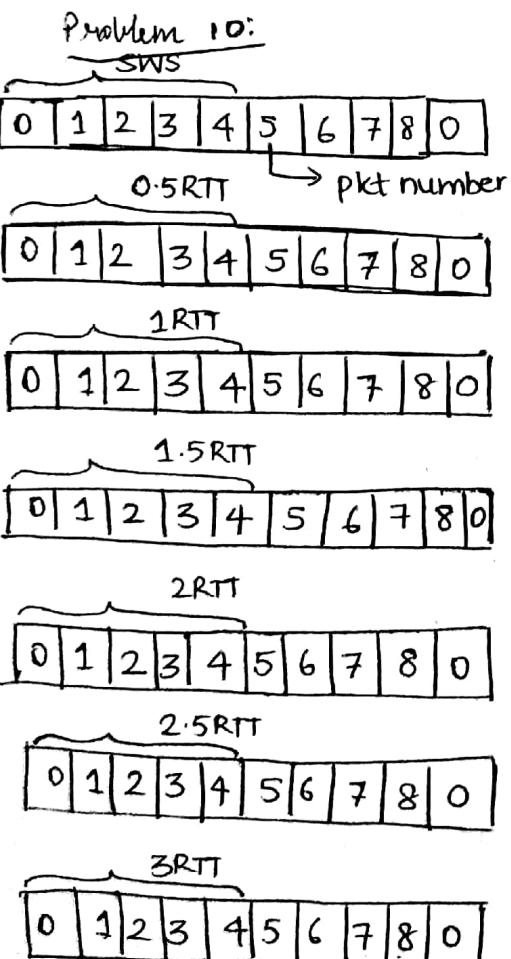


3.75RTT





Here, since SWS = 4 & RWS = 3, in implementations the SWS =  $\min\{4, 3\}$  but for timing diagram purposes, have used SWS = 4 & RWS = 3 as the question is asked for buffered, discarded packets as well.



Here, the receiver ~~interprets~~ waits for the 10th value. It interprets the 1st bit as 10th value, but confused.

confusion as both have same sequence number and gets

(5)

Problem 11:

A. 11-a) Assuming speed =  $3 \times 10^8$  m/s

$$\text{propagation delay} = \frac{3 \times 10^8 \times 1000}{3 \times 10^8}$$

$$= 0.1 \text{ sec.}$$

$$\text{Window size} = \frac{\text{BW} * \text{PD}}{\text{framesize}} = \frac{100,000}{(1024 \times 8)}$$

$$= 12.207 \approx 13 \text{ packets one way}$$

A. 11-b)

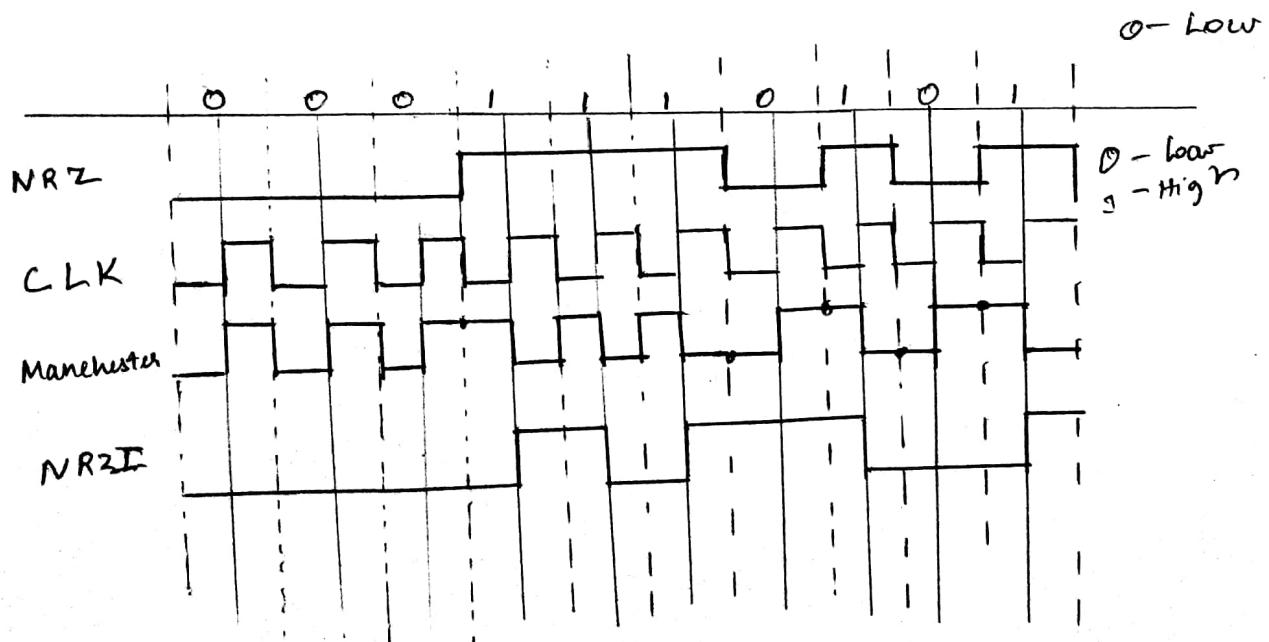
~~size~~ data rate is tripled,  
~~BW~~ BW is tripled.

$3 * \text{No. of packets in } (a)$

$$= 36.62 \approx 37 \text{ packets one way}$$

Problem 12:

NRZ, manchester  $\rightarrow$  NRZI  $\rightarrow$  0001110101



Problem 13:

13.a)  $RWS = 1$ , Assuming speed =  $3 \times 10^8 \text{ m/s}$

Distance of link =  $9 \times 10^7 \text{ m}$

Size = 4 KB

Bandwidth = 4 Mbps

The SWS should have enough frames to hold the packets to maximum capacity of pipe.

$BDP \cong \text{no. of frames it takes to fill pipe completely.}$

$$RTT = 2 * \frac{\text{Distance}}{3 \times 10^8 \text{ m/s}} = 0.6 \text{ s}$$

$$\text{Frames/second} = \frac{\text{Bandwidth}}{\text{Size}}$$

$$F = \frac{4 \text{ Mbps}}{4 \text{ KB}} = 122.07 \text{ f/s}$$

$$\therefore \text{No. of frames} = F \times RTT \cong 73.24 \cong 74 \text{ frames}$$

$\therefore$  To have 44 unique frames, we need 7 bits.

b)  $SWS = RWS$

since sender can send twice as many frames since the receiver can now store frames as well. Thus we can send as many as 148 frames to fully utilize the link. Thus we need 8 bits.

c) In stop and wait ARQ, at most 1 frame is in flight; but according to BDP, we can have 74 frames in transit, thus the efficiency =  $1/74 = 0.014$  or 1.4%.

(6)

## Trace and ping Assignment

A. 1 a)

	HOP 1	HOP 2	HOP 3	Average
Average RTT (ms)	48.3583	47.4651	48.0268	47.95
SD RTT (ms)	23.875	24.1778	24.102	24.05

Morning

	HOP 1	HOP 2	HOP 3	Average
Average RTT (ms)	53.6386	52.1994	50.197	52.01
SD RTT (ms)	25.5589	27.767	29.554	27.63

Afternoon

	HOP 1	HOP 2	HOP 3	Average
Average RTT (ms)	51.6745	47.176	49.633	49.49
SD RTT (ms)	29.4183	30.25	30.159	29.94

2. ~~E~~

Avg RTT	International		Local
	<del>Local</del>	National	
Morning	311.2	69	39.662
Afternoon	333.3	74	52.031
Late night	302.3	63.28	36.124

- a) Yes, the average RTT has a variation over the course of the day. It was very less during night, very high during afternoon and medium during morning mainly due to traffic / congestion in the network. Since afternoon is the peak time it has max. Avg. RTT.
- b) There was never a packet loss. If it would have been true, then the average packet loss ~~for~~ would be maximum for afternoon when compared to night and morning due to traffic?
- c) Yes, the longer the destination server, the more the Avg. RTT, as RTT  $\propto$  Distance.
- d)
- $$\text{International} = \frac{\text{RTT}}{2} = 157.8 \text{ ms}$$
- $$\text{National} = \frac{\text{RTT}}{2} = 34.38 \text{ ms}$$
- $$\text{Local} = \frac{\text{RTT}}{2} = 21.30$$
- predicted International  $\leq \frac{\text{Distance}}{\text{speed}}$ .

## Trace Route and Ping Assignment

Traceroute Performed during Morning, Afternoon and Night times on [www.bu.edu](http://www.bu.edu)

```
bhallaji@bhallaaji-Aspire-R5-571T:~$ traceroute www.bu.edu
traceroute to www.bu.edu (128.197.26.4), 30 hops max, 60 byte packets
1 10.0.0.1 (10.0.0.1) 7.612 ms 7.575 ms 8.374 ms
2 96.120.12.133 (96.120.12.133) 26.257 ms 27.787 ms 28.472 ms
3 ae-205-sur02.boulder.co.denver.comcast.net (68.85.220.237) 27.837 ms 28.041 ms 28.195 ms
4 ae-10-sur03.boulder.co.denver.comcast.net (162.151.51.33) 29.690 ms 28.967 ms 29.946 ms
5 ae-29-aro1.denver.co.denver.comcast.net (162.151.50.249) 36.912 ms 38.144 ms 37.369 ms
6 * * *
7 ae-2-3.bear2.Boston1.Level3.net (4.69.159.189) 67.014 ms 72.900 ms 71.555 ms
8 BOSTON-UNIV.bear2.Boston1.Level3.net (4.43.56.6) 74.458 ms 75.088 ms 75.381 ms
9 cumm111-core-aca01-gi2-7-comm595-bdr-gw01-gi1-1.bu.edu (128.197.254.117) 74.637 ms comm595-core-aca01-gi2-16-comm595-bdr-gw01-gi1-2.bu.edu (128.197.254.113) 73.437 ms 72.723 ms
10 buic010-dist-aca01-te5-4-cumm111-core-aca01-te3-2.bu.edu (128.197.254.146) 73.469 ms 63.869 ms buic010-dist-aca01-te5-5-comm595-core-aca01-te3-2.bu.edu (128.197.254.158) 66.384 ms
11 www.bu.edu (128.197.26.4) 65.697 ms 59.643 ms 61.958 ms
```

```
bhallaji@bhallaaji-Aspire-R5-571T:~$ traceroute bu.edu
traceroute to bu.edu (128.197.236.4), 30 hops max, 60 byte packets
1 10.0.0.1 (10.0.0.1) 3.118 ms 3.965 ms 5.088 ms
2 96.120.12.133 (96.120.12.133) 22.984 ms 27.447 ms 28.850 ms
3 ae-205-sur02.boulder.co.denver.comcast.net (68.85.220.237) 29.168 ms 28.352 ms 29.372 ms
4 ae-10-sur03.boulder.co.denver.comcast.net (162.151.51.33) 29.773 ms 30.012 ms 30.321 ms
5 ae-29-aro1.denver.co.denver.comcast.net (162.151.50.249) 31.285 ms 31.623 ms 32.872 ms
6 lag-16.ear2.Denver1.Level3.net (4.68.63.165) 34.601 ms 14.039 ms 25.576 ms
7 ae-2-3.bear2.Boston1.Level3.net (4.69.159.189) 75.708 ms 74.589 ms 77.028 ms
8 BOSTON-UNIV.bear2.Boston1.Level3.net (4.43.56.6) 78.235 ms 78.926 ms 79.377 ms
9 cumm111-core-aca01-gi2-7-comm595-bdr-gw01-gi1-1.bu.edu (128.197.254.117) 77.929 ms comm595-core-aca01-gi2-16-comm595-bdr-gw01-gi1-2.bu.edu (128.197.254.113) 75.860 ms 76.181 ms
10 cumm111-dist-aca01-te5-5-comm595-core-aca01-te3-1.bu.edu (128.197.254.166) 76.596 ms cumm111-dist-aca01-te5-4-cumm111-core-aca01-te3-1.bu.edu (128.197.254.162) 80.779 ms cumm111-dist-aca01-te5-5-comm595-core-aca01-te3-1.bu.edu (128.197.254.166) 81.527 ms
11 bu.edu (128.197.236.4) 80.101 ms 80.367 ms 85.988 ms
```

```
bhallaji@bhallaaji-Aspire-R5-571T:~$ traceroute bu.edu
traceroute to bu.edu (128.197.236.4), 30 hops max, 60 byte packets
1 10.0.0.1 (10.0.0.1) 4.897 ms 5.547 ms 6.432 ms
2 96.120.12.133 (96.120.12.133) 24.150 ms 24.890 ms 25.260 ms
3 ae-205-sur02.boulder.co.denver.comcast.net (68.85.220.237) 25.597 ms 25.824 ms 26.403 ms
4 ae-10-sur03.boulder.co.denver.comcast.net (162.151.51.33) 27.154 ms 27.481 ms 27.682 ms
5 ae-29-aro1.denver.co.denver.comcast.net (162.151.50.249) 31.361 ms 32.311 ms 32.524 ms
6 lag-16.ear2.Denver1.Level3.net (4.68.63.165) 32.881 ms 13.668 ms 26.779 ms
7 ae-2-3.bear2.Boston1.Level3.net (4.69.159.189) 75.712 ms 74.035 ms 75.130 ms
8 BOSTON-UNIV.bear2.Boston1.Level3.net (4.43.56.6) 76.475 ms 76.909 ms 76.783 ms
9 cumm111-core-aca01-gi2-7-comm595-bdr-gw01-gi1-1.bu.edu (128.197.254.117) 80.909 ms comm595-core-aca01-gi2-16-comm595-bdr-gw01-gi1-2.bu.edu (128.197.254.113) 78.024 ms cumm111-core-aca01-gi2-7-comm595-bdr-gw01-gi1-1.bu.edu (128.197.254.117) 80.939 ms
10 cumm111-dist-aca01-te5-5-comm595-core-aca01-te3-1.bu.edu (128.197.254.166) 78.948 ms 78.435 ms cumm111-dist-aca01-te5-4-cumm111-core-aca01-te3-1.bu.edu (128.197.254.162) 89.725 ms
11 bu.edu (128.197.236.4) 81.027 ms 81.720 ms 81.231 ms
```

Ping was performed during Morning Afternoon and Night times on 3 different servers:

International : flipkart.com

National : umass.edu

Local : cu.edu

```
208 bytes from 163.53.78.128: icmp_seq=2 ttl=45 time=299 ms
208 bytes from 163.53.78.128: icmp_seq=3 ttl=45 time=321 ms
208 bytes from 163.53.78.128: icmp_seq=4 ttl=45 time=344 ms
208 bytes from 163.53.78.128: icmp_seq=5 ttl=45 time=264 ms
208 bytes from 163.53.78.128: icmp_seq=6 ttl=45 time=250 ms
208 bytes from 163.53.78.128: icmp_seq=7 ttl=45 time=309 ms
208 bytes from 163.53.78.128: icmp_seq=8 ttl=45 time=331 ms
208 bytes from 163.53.78.128: icmp_seq=9 ttl=45 time=354 ms
208 bytes from 163.53.78.128: icmp_seq=10 ttl=45 time=274 ms

--- flipkart.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9014ms
rtt min/avg/max/mdev = 250.603/302.798/354.355/33.526 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.flipkart.com
PING flipkart.com (163.53.78.128) 200(228) bytes of data.
208 bytes from 163.53.78.128: icmp_seq=1 ttl=45 time=303 ms
208 bytes from 163.53.78.128: icmp_seq=2 ttl=45 time=252 ms
208 bytes from 163.53.78.128: icmp_seq=3 ttl=45 time=350 ms
208 bytes from 163.53.78.128: icmp_seq=4 ttl=45 time=271 ms
208 bytes from 163.53.78.128: icmp_seq=5 ttl=45 time=279 ms
208 bytes from 163.53.78.128: icmp_seq=6 ttl=45 time=319 ms
208 bytes from 163.53.78.128: icmp_seq=7 ttl=45 time=327 ms
208 bytes from 163.53.78.128: icmp_seq=8 ttl=45 time=264 ms
208 bytes from 163.53.78.128: icmp_seq=9 ttl=45 time=288 ms
208 bytes from 163.53.78.128: icmp_seq=10 ttl=45 time=312 ms

--- flipkart.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9002ms
rtt min/avg/max/mdev = 252.754/296.865/350.060/29.302 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.flipkart.com
PING flipkart.com (163.53.78.128) 200(228) bytes of data.
208 bytes from 163.53.78.128: icmp_seq=1 ttl=45 time=283 ms
208 bytes from 163.53.78.128: icmp_seq=2 ttl=45 time=288 ms
208 bytes from 163.53.78.128: icmp_seq=3 ttl=45 time=328 ms
208 bytes from 163.53.78.128: icmp_seq=4 ttl=45 time=351 ms
208 bytes from 163.53.78.128: icmp_seq=5 ttl=45 time=271 ms
208 bytes from 163.53.78.128: icmp_seq=6 ttl=45 time=294 ms
208 bytes from 163.53.78.128: icmp_seq=7 ttl=45 time=317 ms
208 bytes from 163.53.78.128: icmp_seq=8 ttl=45 time=339 ms
208 bytes from 163.53.78.128: icmp_seq=9 ttl=45 time=362 ms
208 bytes from 163.53.78.128: icmp_seq=10 ttl=45 time=282 ms

--- flipkart.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9011ms
rtt min/avg/max/mdev = 271.262/311.824/362.230/30.546 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.flipkart.com
PING flipkart.com (163.53.78.128) 200(228) bytes of data.
208 bytes from 163.53.78.128: icmp_seq=1 ttl=45 time=388 ms
208 bytes from 163.53.78.128: icmp_seq=2 ttl=45 time=253 ms
208 bytes from 163.53.78.128: icmp_seq=3 ttl=45 time=331 ms
208 bytes from 163.53.78.128: icmp_seq=4 ttl=45 time=354 ms
208 bytes from 163.53.78.128: icmp_seq=5 ttl=45 time=252 ms
208 bytes from 163.53.78.128: icmp_seq=6 ttl=45 time=298 ms
208 bytes from 163.53.78.128: icmp_seq=7 ttl=45 time=321 ms
208 bytes from 163.53.78.128: icmp_seq=8 ttl=45 time=344 ms
208 bytes from 163.53.78.128: icmp_seq=9 ttl=45 time=366 ms
208 bytes from 163.53.78.128: icmp_seq=10 ttl=45 time=389 ms

--- flipkart.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9010ms
rtt min/avg/max/mdev = 252.049/330.126/389.292/47.042 ms
bhallaji@bhallaji-Aspire-R5-571T:~$
```

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208 bytes from 163.53.78.128: icmp_seq=1 ttl=45 time=305 ms
208 bytes from 163.53.78.128: icmp_seq=2 ttl=45 time=431 ms
208 bytes from 163.53.78.128: icmp_seq=3 ttl=45 time=352 ms
208 bytes from 163.53.78.128: icmp_seq=4 ttl=45 time=273 ms
208 bytes from 163.53.78.128: icmp_seq=5 ttl=45 time=279 ms
208 bytes from 163.53.78.128: icmp_seq=6 ttl=45 time=281 ms
208 bytes from 163.53.78.128: icmp_seq=7 ttl=45 time=281 ms
208 bytes from 163.53.78.128: icmp_seq=8 ttl=45 time=250 ms
208 bytes from 163.53.78.128: icmp_seq=9 ttl=45 time=288 ms
208 bytes from 163.53.78.128: icmp_seq=10 ttl=45 time=252 ms

--- flipkart.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9004ms
rtt min/avg/max/mdev = 250.592/299.622/431.309/51.660 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.flipkart.com
PING flipkart.com (163.53.78.128) 200(228) bytes of data.
208 bytes from 163.53.78.128: icmp_seq=1 ttl=45 time=361 ms
208 bytes from 163.53.78.128: icmp_seq=2 ttl=45 time=384 ms
208 bytes from 163.53.78.128: icmp_seq=3 ttl=45 time=304 ms
208 bytes from 163.53.78.128: icmp_seq=4 ttl=45 time=326 ms
208 bytes from 163.53.78.128: icmp_seq=5 ttl=45 time=348 ms
208 bytes from 163.53.78.128: icmp_seq=6 ttl=45 time=268 ms
208 bytes from 163.53.78.128: icmp_seq=7 ttl=45 time=290 ms
208 bytes from 163.53.78.128: icmp_seq=8 ttl=45 time=312 ms
208 bytes from 163.53.78.128: icmp_seq=9 ttl=45 time=262 ms
208 bytes from 163.53.78.128: icmp_seq=10 ttl=45 time=250 ms

--- flipkart.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9014ms
rtt min/avg/max/mdev = 250.813/311.114/384.323/42.288 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.flipkart.com
PING flipkart.com (163.53.78.128) 200(228) bytes of data.
208 bytes from 163.53.78.128: icmp_seq=1 ttl=45 time=313 ms
208 bytes from 163.53.78.128: icmp_seq=2 ttl=45 time=450 ms
208 bytes from 163.53.78.128: icmp_seq=3 ttl=45 time=269 ms
208 bytes from 163.53.78.128: icmp_seq=4 ttl=45 time=292 ms
208 bytes from 163.53.78.128: icmp_seq=5 ttl=45 time=316 ms
208 bytes from 163.53.78.128: icmp_seq=6 ttl=45 time=339 ms
208 bytes from 163.53.78.128: icmp_seq=7 ttl=45 time=362 ms
208 bytes from 163.53.78.128: icmp_seq=8 ttl=45 time=284 ms
208 bytes from 163.53.78.128: icmp_seq=9 ttl=45 time=303 ms
208 bytes from 163.53.78.128: icmp_seq=10 ttl=45 time=379 ms

--- flipkart.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9003ms
rtt min/avg/max/mdev = 269.169/331.332/450.632/51.418 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.flipkart.com
PING flipkart.com (163.53.78.128) 200(228) bytes of data.
208 bytes from 163.53.78.128: icmp_seq=1 ttl=45 time=388 ms
208 bytes from 163.53.78.128: icmp_seq=2 ttl=45 time=851 ms
208 bytes from 163.53.78.128: icmp_seq=3 ttl=45 time=250 ms
208 bytes from 163.53.78.128: icmp_seq=4 ttl=45 time=349 ms
208 bytes from 163.53.78.128: icmp_seq=5 ttl=45 time=269 ms
208 bytes from 163.53.78.128: icmp_seq=6 ttl=45 time=291 ms
208 bytes from 163.53.78.128: icmp_seq=7 ttl=45 time=313 ms
208 bytes from 163.53.78.128: icmp_seq=8 ttl=45 time=335 ms
208 bytes from 163.53.78.128: icmp_seq=9 ttl=45 time=358 ms
208 bytes from 163.53.78.128: icmp_seq=10 ttl=45 time=279 ms

--- flipkart.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9009ms
rtt min/avg/max/mdev = 250.706/368.932/851.966/166.193 ms
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208 bytes from 163.53.78.128: icmp_seq=2 ttl=45 time=290 ms
208 bytes from 163.53.78.128: icmp_seq=3 ttl=45 time=251 ms
208 bytes from 163.53.78.128: icmp_seq=4 ttl=45 time=286 ms
208 bytes from 163.53.78.128: icmp_seq=5 ttl=45 time=309 ms
208 bytes from 163.53.78.128: icmp_seq=6 ttl=45 time=316 ms
208 bytes from 163.53.78.128: icmp_seq=7 ttl=45 time=355 ms
208 bytes from 163.53.78.128: icmp_seq=8 ttl=45 time=276 ms
208 bytes from 163.53.78.128: icmp_seq=9 ttl=45 time=283 ms
208 bytes from 163.53.78.128: icmp_seq=10 ttl=45 time=321 ms

--- flipkart.com ping statistics ---
10 packets transmitted, 0% packet loss, time 9013ms
rtt min/avg/max/mdev = 251.822/301.118/355.228/27.820 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.flipkart.co
PING flipkart.com (163.53.78.128) 200(228) bytes of data.
208 bytes from 163.53.78.128: icmp_seq=1 ttl=45 time=344 ms
208 bytes from 163.53.78.128: icmp_seq=2 ttl=45 time=253 ms
208 bytes from 163.53.78.128: icmp_seq=3 ttl=45 time=289 ms
208 bytes from 163.53.78.128: icmp_seq=4 ttl=45 time=311 ms
208 bytes from 163.53.78.128: icmp_seq=5 ttl=45 time=322 ms
208 bytes from 163.53.78.128: icmp_seq=6 ttl=45 time=357 ms
208 bytes from 163.53.78.128: icmp_seq=7 ttl=45 time=279 ms
208 bytes from 163.53.78.128: icmp_seq=8 ttl=45 time=288 ms
208 bytes from 163.53.78.128: icmp_seq=9 ttl=45 time=324 ms
208 bytes from 163.53.78.128: icmp_seq=10 ttl=45 time=250 ms

--- flipkart.com ping statistics ---
10 packets transmitted, 0% packet loss, time 9011ms
rtt min/avg/max/mdev = 250.646/302.292/357.794/34.464 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.flipkart.co
PING flipkart.com (163.53.78.128) 200(228) bytes of data.
208 bytes from 163.53.78.128: icmp_seq=1 ttl=45 time=288 ms
208 bytes from 163.53.78.128: icmp_seq=2 ttl=45 time=312 ms
208 bytes from 163.53.78.128: icmp_seq=3 ttl=45 time=336 ms
208 bytes from 163.53.78.128: icmp_seq=4 ttl=45 time=360 ms
208 bytes from 163.53.78.128: icmp_seq=5 ttl=45 time=282 ms
208 bytes from 163.53.78.128: icmp_seq=6 ttl=45 time=306 ms
208 bytes from 163.53.78.128: icmp_seq=7 ttl=45 time=330 ms
208 bytes from 163.53.78.128: icmp_seq=8 ttl=45 time=308 ms
208 bytes from 163.53.78.128: icmp_seq=9 ttl=45 time=275 ms
208 bytes from 163.53.78.128: icmp_seq=10 ttl=45 time=299 ms

--- flipkart.com ping statistics ---
10 packets transmitted, 0% packet loss, time 9003ms
rtt min/avg/max/mdev = 275.642/309.999/360.331/24.869 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.flipkart.co
PING flipkart.com (163.53.78.128) 200(228) bytes of data.
208 bytes from 163.53.78.128: icmp_seq=1 ttl=45 time=306 ms
208 bytes from 163.53.78.128: icmp_seq=2 ttl=45 time=328 ms
208 bytes from 163.53.78.128: icmp_seq=3 ttl=45 time=351 ms
208 bytes from 163.53.78.128: icmp_seq=4 ttl=45 time=271 ms
208 bytes from 163.53.78.128: icmp_seq=5 ttl=45 time=294 ms
208 bytes from 163.53.78.128: icmp_seq=6 ttl=45 time=318 ms
208 bytes from 163.53.78.128: icmp_seq=7 ttl=45 time=303 ms
208 bytes from 163.53.78.128: icmp_seq=8 ttl=45 time=261 ms
208 bytes from 163.53.78.128: icmp_seq=9 ttl=45 time=284 ms
208 bytes from 163.53.78.128: icmp_seq=10 ttl=45 time=307 ms

--- flipkart.com ping statistics ---
10 packets transmitted, 0% packet loss, time 9012ms
rtt min/avg/max/mdev = 261.914/302.848/351.733/25.282 ms
bhallaji@bhallaji-Aspire-R5-571T:~$
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208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=2 ttl=241 time=64.1 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=3 ttl=241 time=65.4 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=4 ttl=241 time=62.9 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=5 ttl=241 time=71.1 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=6 ttl=241 time=69.2 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=7 ttl=241 time=72.3 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=8 ttl=241 time=61.9 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=9 ttl=241 time=62.0 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=10 ttl=241 time=62.4 ms

--- www.umass.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9011ms
rtt min/avg/max/mdev = 61.900/65.701/72.354/3.680 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.umass.edu
PING www.umass.edu (128.119.8.148) 200(228) bytes of data.
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=1 ttl=241 time=64.4 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=2 ttl=241 time=75.4 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=3 ttl=241 time=65.0 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=4 ttl=241 time=61.6 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=5 ttl=241 time=62.3 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=6 ttl=241 time=64.8 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=7 ttl=241 time=67.4 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=8 ttl=241 time=66.4 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=9 ttl=241 time=62.7 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=10 ttl=241 time=62.2 ms

--- www.umass.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9016ms
rtt min/avg/max/mdev = 61.634/65.261/75.458/3.849 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.umass.edu
PING www.umass.edu (128.119.8.148) 200(228) bytes of data.
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=1 ttl=241 time=63.7 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=2 ttl=241 time=108 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=3 ttl=241 time=182 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=4 ttl=241 time=207 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=5 ttl=241 time=231 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=6 ttl=241 time=270 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=7 ttl=241 time=294 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=8 ttl=241 time=61.2 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=9 ttl=241 time=64.8 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=10 ttl=241 time=62.2 ms

--- www.umass.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9010ms
rtt min/avg/max/mdev = 61.215/154.779/294.450/88.528 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.umass.edu
PING www.umass.edu (128.119.8.148) 200(228) bytes of data.
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=1 ttl=241 time=63.8 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=2 ttl=241 time=67.8 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=3 ttl=241 time=63.0 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=4 ttl=241 time=63.3 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=5 ttl=241 time=64.0 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=6 ttl=241 time=61.2 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=7 ttl=241 time=72.1 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=8 ttl=241 time=61.4 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=9 ttl=241 time=61.4 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=10 ttl=241 time=63.6 ms

--- www.umass.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9012ms
rtt min/avg/max/mdev = 61.293/64.198/72.148/3.224 ms
bhallaji@bhallaji-Aspire-R5-571T:~$

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208 bytes from netreg.oit.umass.edu (128.119.8.148): icmp_seq=1 ttl=241 time=65.8 ms
208 bytes from netreg.oit.umass.edu (128.119.8.148): icmp_seq=2 ttl=241 time=68.3 ms
208 bytes from netreg.oit.umass.edu (128.119.8.148): icmp_seq=3 ttl=241 time=65.2 ms
208 bytes from netreg.oit.umass.edu (128.119.8.148): icmp_seq=4 ttl=241 time=70.1 ms
208 bytes from netreg.oit.umass.edu (128.119.8.148): icmp_seq=5 ttl=241 time=68.9 ms
208 bytes from netreg.oit.umass.edu (128.119.8.148): icmp_seq=6 ttl=241 time=64.4 ms
208 bytes from netreg.oit.umass.edu (128.119.8.148): icmp_seq=7 ttl=241 time=64.4 ms
208 bytes from netreg.oit.umass.edu (128.119.8.148): icmp_seq=8 ttl=241 time=64.7 ms
208 bytes from netreg.oit.umass.edu (128.119.8.148): icmp_seq=9 ttl=241 time=62.3 ms
208 bytes from netreg.oit.umass.edu (128.119.8.148): icmp_seq=10 ttl=241 time=62.4 ms

--- www.umass.edu ping statistics ---
10 packets transmitted, 0% packet loss, time 9014ms
rtt min/avg/max/mdev = 62.393/65.696/70.129/2.524 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.umass.edu
PING www.umass.edu (128.119.8.148) 200(228) bytes of data.
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=1 ttl=241 time=66.8 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=2 ttl=241 time=163 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=3 ttl=241 time=63.1 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=4 ttl=241 time=64.1 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=5 ttl=241 time=64.7 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=6 ttl=241 time=64.1 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=7 ttl=241 time=65.3 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=8 ttl=241 time=63.3 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=9 ttl=241 time=62.7 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=10 ttl=241 time=62.3 ms

--- www.umass.edu ping statistics ---
10 packets transmitted, 0% packet loss, time 9013ms
rtt min/avg/max/mdev = 62.372/74.059/163.699/29.907 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.umass.edu
PING www.umass.edu (128.119.8.148) 200(228) bytes of data.
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=1 ttl=241 time=66.5 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=2 ttl=241 time=215 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=3 ttl=241 time=68.5 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=4 ttl=241 time=62.1 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=5 ttl=241 time=61.5 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=6 ttl=241 time=63.2 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=7 ttl=241 time=67.3 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=8 ttl=241 time=62.0 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=9 ttl=241 time=69.9 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=10 ttl=241 time=62.6 ms

--- www.umass.edu ping statistics ---
10 packets transmitted, 0% packet loss, time 9013ms
rtt min/avg/max/mdev = 61.579/79.903/215.066/45.145 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.umass.edu
PING www.umass.edu (128.119.8.148) 200(228) bytes of data.
208 bytes from netreg.oit.umass.edu (128.119.8.148): icmp_seq=1 ttl=241 time=65.8 ms
208 bytes from netreg.oit.umass.edu (128.119.8.148): icmp_seq=2 ttl=241 time=241 ms
208 bytes from netreg.oit.umass.edu (128.119.8.148): icmp_seq=3 ttl=241 time=62.6 ms
208 bytes from netreg.oit.umass.edu (128.119.8.148): icmp_seq=4 ttl=241 time=62.0 ms
208 bytes from netreg.oit.umass.edu (128.119.8.148): icmp_seq=5 ttl=241 time=62.8 ms
208 bytes from netreg.oit.umass.edu (128.119.8.148): icmp_seq=6 ttl=241 time=64.9 ms
208 bytes from netreg.oit.umass.edu (128.119.8.148): icmp_seq=7 ttl=241 time=72.1 ms
208 bytes from netreg.oit.umass.edu (128.119.8.148): icmp_seq=8 ttl=241 time=64.7 ms
208 bytes from netreg.oit.umass.edu (128.119.8.148): icmp_seq=9 ttl=241 time=64.3 ms
208 bytes from netreg.oit.umass.edu (128.119.8.148): icmp_seq=10 ttl=241 time=64.3 ms

--- www.umass.edu ping statistics ---
10 packets transmitted, 0% packet loss, time 9013ms
rtt min/avg/max/mdev = 62.080/82.569/241.741/53.125 ms

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208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=2 ttl=241 time=67.2 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=3 ttl=241 time=65.0 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=4 ttl=241 time=62.9 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=5 ttl=241 time=62.3 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=6 ttl=241 time=62.7 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=7 ttl=241 time=64.5 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=8 ttl=241 time=62.1 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=9 ttl=241 time=62.1 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=10 ttl=241 time=63.8 ms

--- www.umass.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9012ms
rtt min/avg/max/mdev = 62.105/63.680/67.254/1.536 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.umass.edu
PING www.umass.edu (128.119.8.148) 200(228) bytes of data.
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=1 ttl=241 time=65.0 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=2 ttl=241 time=64.8 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=3 ttl=241 time=65.4 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=4 ttl=241 time=62.1 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=5 ttl=241 time=61.7 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=6 ttl=241 time=60.9 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=7 ttl=241 time=70.6 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=8 ttl=241 time=61.9 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=9 ttl=241 time=69.3 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=10 ttl=241 time=61.9 ms

--- www.umass.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9003ms
rtt min/avg/max/mdev = 60.997/64.408/70.604/3.176 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.umass.edu
PING www.umass.edu (128.119.8.148) 200(228) bytes of data.
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=1 ttl=241 time=65.0 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=2 ttl=241 time=65.0 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=3 ttl=241 time=65.1 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=4 ttl=241 time=62.7 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=5 ttl=241 time=70.2 ms
Terminal 208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=6 ttl=241 time=61.7 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=7 ttl=241 time=66.2 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=8 ttl=241 time=61.4 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=9 ttl=241 time=63.3 ms
208 bytes from netreg.it.umass.edu (128.119.8.148): icmp_seq=10 ttl=241 time=62.8 ms

--- www.umass.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9012ms
rtt min/avg/max/mdev = 61.449/64.389/70.271/2.483 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.umass.edu
PING www.umass.edu (128.119.8.148) 200(228) bytes of data.
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=1 ttl=241 time=64.4 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=2 ttl=241 time=66.2 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=3 ttl=241 time=66.2 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=4 ttl=241 time=64.1 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=5 ttl=241 time=61.5 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=6 ttl=241 time=61.8 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=7 ttl=241 time=65.7 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=8 ttl=241 time=62.0 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=9 ttl=241 time=62.7 ms
208 bytes from www.umass.edu (128.119.8.148): icmp_seq=10 ttl=241 time=61.9 ms

--- www.umass.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9013ms
rtt min/avg/max/mdev = 61.576/63.696/66.230/1.808 ms
bhallaji@bhallaji-Aspire-R5-571T:~$
```

```
208 bytes from 192.237.143.195: icmp_seq=2 ttl=52 time=40.0 ms
208 bytes from 192.237.143.195: icmp_seq=3 ttl=52 time=38.8 ms
208 bytes from 192.237.143.195: icmp_seq=4 ttl=52 time=79.9 ms
208 bytes from 192.237.143.195: icmp_seq=5 ttl=52 time=177 ms
208 bytes from 192.237.143.195: icmp_seq=6 ttl=52 time=35.1 ms
208 bytes from 192.237.143.195: icmp_seq=7 ttl=52 time=56.8 ms
208 bytes from 192.237.143.195: icmp_seq=8 ttl=52 time=79.3 ms
208 bytes from 192.237.143.195: icmp_seq=9 ttl=52 time=107 ms
208 bytes from 192.237.143.195: icmp_seq=10 ttl=52 time=131 ms

--- www.cu.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9007ms
rtt min/avg/max/mdev = 35.114/78.581/177.781/45.173 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.cu.edu
PING www.cu.edu (192.237.143.195) 200(228) bytes of data.
208 bytes from 192.237.143.195: icmp_seq=1 ttl=52 time=37.5 ms
208 bytes from 192.237.143.195: icmp_seq=2 ttl=52 time=39.9 ms
208 bytes from 192.237.143.195: icmp_seq=3 ttl=52 time=38.9 ms
208 bytes from 192.237.143.195: icmp_seq=4 ttl=52 time=36.8 ms
208 bytes from 192.237.143.195: icmp_seq=5 ttl=52 time=35.9 ms
208 bytes from 192.237.143.195: icmp_seq=6 ttl=52 time=36.4 ms
208 bytes from 192.237.143.195: icmp_seq=7 ttl=52 time=36.3 ms
208 bytes from 192.237.143.195: icmp_seq=8 ttl=52 time=35.3 ms
208 bytes from 192.237.143.195: icmp_seq=9 ttl=52 time=35.7 ms
208 bytes from 192.237.143.195: icmp_seq=10 ttl=52 time=35.3 ms

--- www.cu.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9014ms
rtt min/avg/max/mdev = 35.310/36.846/39.962/1.493 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.cu.edu
PING www.cu.edu (192.237.143.195) 200(228) bytes of data.
208 bytes from 192.237.143.195: icmp_seq=1 ttl=52 time=37.2 ms
208 bytes from 192.237.143.195: icmp_seq=2 ttl=52 time=37.8 ms
208 bytes from 192.237.143.195: icmp_seq=3 ttl=52 time=35.8 ms
208 bytes from 192.237.143.195: icmp_seq=4 ttl=52 time=34.5 ms
208 bytes from 192.237.143.195: icmp_seq=5 ttl=52 time=38.2 ms
208 bytes from 192.237.143.195: icmp_seq=6 ttl=52 time=34.7 ms
208 bytes from 192.237.143.195: icmp_seq=7 ttl=52 time=34.7 ms
208 bytes from 192.237.143.195: icmp_seq=8 ttl=52 time=35.5 ms
208 bytes from 192.237.143.195: icmp_seq=9 ttl=52 time=37.0 ms
208 bytes from 192.237.143.195: icmp_seq=10 ttl=52 time=35.1 ms

--- www.cu.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9014ms
rtt min/avg/max/mdev = 34.534/36.094/38.208/1.325 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.cu.edu
PING www.cu.edu (192.237.143.195) 200(228) bytes of data.
208 bytes from 192.237.143.195: icmp_seq=1 ttl=52 time=36.5 ms
208 bytes from 192.237.143.195: icmp_seq=2 ttl=52 time=43.3 ms
208 bytes from 192.237.143.195: icmp_seq=3 ttl=52 time=36.3 ms
208 bytes from 192.237.143.195: icmp_seq=4 ttl=52 time=35.6 ms
208 bytes from 192.237.143.195: icmp_seq=5 ttl=52 time=36.7 ms
208 bytes from 192.237.143.195: icmp_seq=6 ttl=52 time=34.4 ms
208 bytes from 192.237.143.195: icmp_seq=7 ttl=52 time=37.3 ms
208 bytes from 192.237.143.195: icmp_seq=8 ttl=52 time=36.2 ms
208 bytes from 192.237.143.195: icmp_seq=9 ttl=52 time=35.7 ms
208 bytes from 192.237.143.195: icmp_seq=10 ttl=52 time=35.8 ms

--- www.cu.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9016ms
rtt min/avg/max/mdev = 34.435/36.830/43.365/2.314 ms
bhallaji@bhallaji-Aspire-R5-571T:~$
```

```
208 bytes from 192.237.143.195: icmp_seq=2 ttl=52 time=37.4 ms
208 bytes from 192.237.143.195: icmp_seq=3 ttl=52 time=35.1 ms
208 bytes from 192.237.143.195: icmp_seq=4 ttl=52 time=35.0 ms
208 bytes from 192.237.143.195: icmp_seq=5 ttl=52 time=36.5 ms
208 bytes from 192.237.143.195: icmp_seq=6 ttl=52 time=35.1 ms
208 bytes from 192.237.143.195: icmp_seq=7 ttl=52 time=35.2 ms
208 bytes from 192.237.143.195: icmp_seq=8 ttl=52 time=36.0 ms
208 bytes from 192.237.143.195: icmp_seq=9 ttl=52 time=35.5 ms
208 bytes from 192.237.143.195: icmp_seq=10 ttl=52 time=39.6 ms

--- www.cu.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9014ms
rtt min/avg/max/mdev = 35.087/36.320/39.623/1.401 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.cu.edu
PING www.cu.edu (192.237.143.195) 200(228) bytes of data.
208 bytes from 192.237.143.195: icmp_seq=1 ttl=52 time=37.9 ms
208 bytes from 192.237.143.195: icmp_seq=2 ttl=52 time=39.8 ms
208 bytes from 192.237.143.195: icmp_seq=3 ttl=52 time=37.9 ms
208 bytes from 192.237.143.195: icmp_seq=4 ttl=52 time=35.6 ms
208 bytes from 192.237.143.195: icmp_seq=5 ttl=52 time=35.0 ms
208 bytes from 192.237.143.195: icmp_seq=6 ttl=52 time=35.6 ms
208 bytes from 192.237.143.195: icmp_seq=7 ttl=52 time=38.2 ms
208 bytes from 192.237.143.195: icmp_seq=8 ttl=52 time=37.9 ms
208 bytes from 192.237.143.195: icmp_seq=9 ttl=52 time=35.0 ms
208 bytes from 192.237.143.195: icmp_seq=10 ttl=52 time=42.4 ms

--- www.cu.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9013ms
rtt min/avg/max/mdev = 35.024/37.577/42.463/2.248 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.cu.edu
PING www.cu.edu (192.237.143.195) 200(228) bytes of data.
208 bytes from 192.237.143.195: icmp_seq=1 ttl=52 time=37.6 ms
208 bytes from 192.237.143.195: icmp_seq=2 ttl=52 time=37.9 ms
208 bytes from 192.237.143.195: icmp_seq=3 ttl=52 time=36.9 ms
208 bytes from 192.237.143.195: icmp_seq=4 ttl=52 time=81.6 ms
208 bytes from 192.237.143.195: icmp_seq=5 ttl=52 time=191 ms
208 bytes from 192.237.143.195: icmp_seq=6 ttl=52 time=178 ms
208 bytes from 192.237.143.195: icmp_seq=7 ttl=52 time=34.8 ms
208 bytes from 192.237.143.195: icmp_seq=8 ttl=52 time=72.8 ms
208 bytes from 192.237.143.195: icmp_seq=9 ttl=52 time=34.6 ms
208 bytes from 192.237.143.195: icmp_seq=10 ttl=52 time=34.8 ms

--- www.cu.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9012ms
rtt min/avg/max/mdev = 34.692/74.194/191.549/57.884 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.cu.edu
PING www.cu.edu (192.237.143.195) 200(228) bytes of data.
208 bytes from 192.237.143.195: icmp_seq=1 ttl=52 time=39.9 ms
208 bytes from 192.237.143.195: icmp_seq=2 ttl=52 time=40.1 ms
208 bytes from 192.237.143.195: icmp_seq=3 ttl=52 time=37.7 ms
208 bytes from 192.237.143.195: icmp_seq=4 ttl=52 time=35.8 ms
208 bytes from 192.237.143.195: icmp_seq=5 ttl=52 time=36.4 ms
208 bytes from 192.237.143.195: icmp_seq=6 ttl=52 time=36.7 ms
208 bytes from 192.237.143.195: icmp_seq=7 ttl=52 time=37.1 ms
208 bytes from 192.237.143.195: icmp_seq=8 ttl=52 time=42.6 ms
208 bytes from 192.237.143.195: icmp_seq=9 ttl=52 time=35.4 ms
208 bytes from 192.237.143.195: icmp_seq=10 ttl=52 time=38.8 ms

--- www.cu.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9015ms
rtt min/avg/max/mdev = 35.419/38.090/42.626/2.169 ms
bhallaji@bhallaji-Aspire-R5-571T:~$
```

```
208 bytes from 192.237.143.195: icmp_seq=2 ttl=52 time=36.8 ms
208 bytes from 192.237.143.195: icmp_seq=3 ttl=52 time=34.9 ms
208 bytes from 192.237.143.195: icmp_seq=4 ttl=52 time=34.8 ms
208 bytes from 192.237.143.195: icmp_seq=5 ttl=52 time=37.4 ms
208 bytes from 192.237.143.195: icmp_seq=6 ttl=52 time=35.0 ms
208 bytes from 192.237.143.195: icmp_seq=7 ttl=52 time=35.4 ms
208 bytes from 192.237.143.195: icmp_seq=8 ttl=52 time=34.9 ms
208 bytes from 192.237.143.195: icmp_seq=9 ttl=52 time=37.2 ms
208 bytes from 192.237.143.195: icmp_seq=10 ttl=52 time=43.7 ms

--- www.cu.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9012ms
rtt min/avg/max/mdev = 34.811/36.863/43.799/2.593 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.cu.edu
PING www.cu.edu (192.237.143.195) 200(228) bytes of data.
208 bytes from 192.237.143.195: icmp_seq=1 ttl=52 time=43.8 ms
208 bytes from 192.237.143.195: icmp_seq=2 ttl=52 time=44.8 ms
208 bytes from 192.237.143.195: icmp_seq=3 ttl=52 time=34.5 ms
208 bytes from 192.237.143.195: icmp_seq=4 ttl=52 time=34.3 ms
208 bytes from 192.237.143.195: icmp_seq=5 ttl=52 time=34.7 ms
208 bytes from 192.237.143.195: icmp_seq=6 ttl=52 time=34.7 ms
208 bytes from 192.237.143.195: icmp_seq=7 ttl=52 time=34.6 ms
208 bytes from 192.237.143.195: icmp_seq=8 ttl=52 time=34.1 ms
208 bytes from 192.237.143.195: icmp_seq=9 ttl=52 time=34.7 ms
208 bytes from 192.237.143.195: icmp_seq=10 ttl=52 time=34.7 ms

--- www.cu.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9003ms
rtt min/avg/max/mdev = 34.141/36.551/44.887/3.929 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.cu.edu
PING www.cu.edu (192.237.143.195) 200(228) bytes of data.
208 bytes from 192.237.143.195: icmp_seq=1 ttl=52 time=37.1 ms
208 bytes from 192.237.143.195: icmp_seq=2 ttl=52 time=37.1 ms
208 bytes from 192.237.143.195: icmp_seq=3 ttl=52 time=37.4 ms
208 bytes from 192.237.143.195: icmp_seq=4 ttl=52 time=38.7 ms
208 bytes from 192.237.143.195: icmp_seq=5 ttl=52 time=35.3 ms
208 bytes from 192.237.143.195: icmp_seq=6 ttl=52 time=34.8 ms
208 bytes from 192.237.143.195: icmp_seq=7 ttl=52 time=34.5 ms
208 bytes from 192.237.143.195: icmp_seq=8 ttl=52 time=38.0 ms
208 bytes from 192.237.143.195: icmp_seq=9 ttl=52 time=36.4 ms
208 bytes from 192.237.143.195: icmp_seq=10 ttl=52 time=35.1 ms

--- www.cu.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9014ms
rtt min/avg/max/mdev = 34.521/36.493/38.786/1.410 ms
bhallaji@bhallaji-Aspire-R5-571T:~$ ping -c 10 -s 200 www.cu.edu
PING www.cu.edu (192.237.143.195) 200(228) bytes of data.
208 bytes from 192.237.143.195: icmp_seq=1 ttl=52 time=36.6 ms
208 bytes from 192.237.143.195: icmp_seq=2 ttl=52 time=44.2 ms
208 bytes from 192.237.143.195: icmp_seq=3 ttl=52 time=34.9 ms
208 bytes from 192.237.143.195: icmp_seq=4 ttl=52 time=36.3 ms
208 bytes from 192.237.143.195: icmp_seq=5 ttl=52 time=54.0 ms
208 bytes from 192.237.143.195: icmp_seq=6 ttl=52 time=33.9 ms
208 bytes from 192.237.143.195: icmp_seq=7 ttl=52 time=36.9 ms
208 bytes from 192.237.143.195: icmp_seq=8 ttl=52 time=35.7 ms
208 bytes from 192.237.143.195: icmp_seq=9 ttl=52 time=34.5 ms
208 bytes from 192.237.143.195: icmp_seq=10 ttl=52 time=37.5 ms

--- www.cu.edu ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9011ms
rtt min/avg/max/mdev = 33.984/38.503/54.088/5.865 ms
```