Analysis

Data Rate vs File Size

Rate = Filesize/Time taken to transfer. So according to formula Rate should increase with increase in file size. From the readings obtained below this can be verified. Rate increases with increase in files size mostly. For 50 mB Rate is high. This could be because of network parameters like traffic.

Packet size constant:1000 bytes

filesize	Tx	Rx
1024bytes	71234782.608696 bits/second	28543554.006969 bits/second
1536bytes	113777777.777778 bits/second	45680297.397770 bits/second
10240bytes	564965517.241379bits/second	96150234.741784 bits/second
524288bytes	564965517.241379 bits/second	96150234.741784 bits/second
50MB	104627863.369008 bits/second	104425253.344839 bits/second
70MB	87243159.383138 bits/second	87111120.341738 bits/second
100MB	101229802.268648 bits/second	101098383.001083 bits/second
150MB	107488185.229160 bits/second	107397487.941277 bits/second
200MB	115961244.270180 bits/second	115881941.602939 bits/second

Data Rate vs Packet Size

With increase in packet size more data can be transferred at a time so rate should increase. There would be less iterations, less send and receive for entire file transfer. In my case also the same is happening. Readings are following

File size:200 MB

Packet size	Tx	Rx
100	13156648.131352 bits/second	13147924.772519 bits/second
300	36438330.553889 bits/second	36417725.403380 bits/second
500	60504188.103898 bits/second	60475541.352219 bits/second
700	82091028.320135 bits/second	82042619.264310 bits/second
900	94155244.099533 bits/second	94107917.286841 bits/second
1100	118537016.145824 bits/second	118464055.656559 bits/second
1300	140080652.419932 bits/second	140006656.009485 bits/second

Data Rate vs Load Variation

With increase in load rate should decrease since there will be traffic and competition for resources. I am getting expected results. My readings are following

File size 70Mb and Packet Size 1000 bytes

Initial transmission rates were

Tx Rate:25228215.539448 bits/second
Tx Rate:44536542.862898 bits/second
Tx Rate:24710854.801636 bits/second

With increasing in load the values are-

Tx: embankment.cse.buffalo.edu -> euston.cse.buffalo.edu, File Size :73400320 bytes, Time Taken: 23.762940 seconds, Tx Rate:24710854.801636 bits/second

Rx: embankment.cse.buffalo.edu -> euston.cse.buffalo.edu, File Size :73400320 bytes, Time Taken: 23.768051 seconds, Rx Rate:24705541.064347 bits/second

Tx: highgate.cse.buffalo.edu -> underground.cse.buffalo.edu, File Size :73400320 bytes, Time Taken: 23.275628 seconds, Tx Rate:25228215.539448 bits/second

Rx: highgate.cse.buffalo.edu -> underground.cse.buffalo.edu, File Size :73400320 bytes, Time Taken: 23.282262 seconds, Rx Rate:25221027.063436 bits/second

Tx: embankment.cse.buffalo.edu -> highgate.cse.buffalo.edu, File Size :73400320 bytes, Time Taken: 13.184736 seconds, Tx Rate:44536542.862898 bits/second

Rx: embankment.cse.buffalo.edu -> highgate.cse.buffalo.edu, File Size :73400320 bytes, Time Taken: 13.192125 seconds, Rx Rate:44511597.638743 bits/second

Iperf

Server Output

Server listening on TCP port 5001

TCP window size: 85.3 KByte (default)

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[4] local 128.205.36.32 port 5001 connected with 128.205.36.35 port 43733

[ID] Interval Transfer Bandwidth

[4] 0.0-10.0 sec 1.10 GBytes 939 Mbits/sec

[5] local 128.205.36.32 port 5001 connected with 128.205.36.36 port 36742

[4] local 128.205.36.32 port 5001 connected with 128.205.36.34 port 37331

[6] local 128.205.36.32 port 5001 connected with 128.205.36.33 port 47279

[5] 0.0-10.0 sec 1.03 GBytes 884 Mbits/sec

[4] 0.0-10.0 sec 382 MBytes 320 Mbits/sec

[6] 0.0-10.0 sec 545 MBytes 457 Mbits/sec

Client Output

underground {/local/Fall_2014/tanvivij} > ./iperf -c dokken.cse.buffalo.edu

---

Client connecting to dokken.cse.buffalo.edu, TCP port 5001

TCP window size: 16.0 KByte (default)

---

[3] local 128.205.36.36 port 36742 connected with 128.205.36.32 port 5001

[ID] Interval Transfer Bandwidth

[3] 0.0-10.0 sec 1.03 GBytes 886 Mbits/sec

underground {/local/Fall_2014/tanvivij} >

underground {/local/Fall_2014/tanvivij} >

euston {/local/Fall_2014/tanvivij} > ./iperf -c dokken.cse.buffalo.edu

---

Client connecting to dokken.cse.buffalo.edu, TCP port 5001

TCP window size: 16.0 KByte (default)

---

[3] local 128.205.36.34 port 37331 connected with 128.205.36.32 port 5001

[ID] Interval Transfer Bandwidth

[3] 0.0-10.0 sec 382 MBytes 320 Mbits/sec

euston {/local/Fall_2014/tanvivij} >

2014-09-29 23:23:02 (26.5 MB/s) - “iperf” saved [87368/87368]

highgate {/local/Fall_2014/tanvivij} > chmod +x iperf

highgate {/local/Fall_2014/tanvivij} > ./iperf -c dokken.cse.buffalo.edu

---

Client connecting to dokken.cse.buffalo.edu, TCP port 5001

TCP window size: 19.3 KByte (default)

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[3] local 128.205.36.33 port 47279 connected with 128.205.36.32 port 5001

[ID] Interval Transfer Bandwidth

[3] 0.0-10.0 sec 545 MBytes 457 Mbits/sec

highgate {/local/Fall_2014/tanvivij} >

embankment {/local/Fall_2014/tanvivij} > chmod +x iperf

embankment {/local/Fall_2014/tanvivij} > ./iperf -c dokken.cse.buffalo.edu

---

Client connecting to dokken.cse.buffalo.edu, TCP port 5001

TCP window size: 16.0 KByte (default)

---

[3] local 128.205.36.35 port 43733 connected with 128.205.36.32 port 5001

[ID] Interval Transfer Bandwidth

[3] 0.0-10.0 sec 1.10 GBytes 941 Mbits/sec

We can see that when load increase rate decreases. As more client comes data rate increases.

In my program also rate decrease with increase in load.