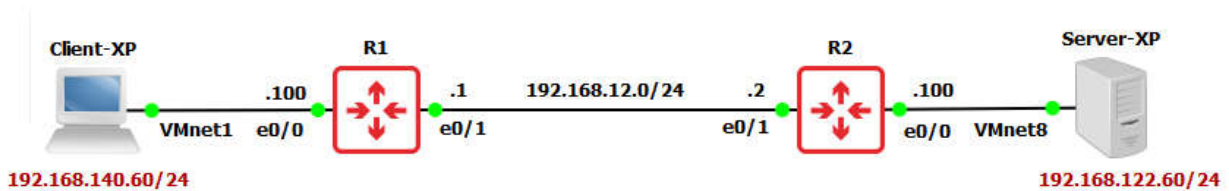


Shaping Lab:

- o ISP sold fiber connection with traffic contract & guaranteed bandwidth of 10 Mbit.
- o While, we know fiber interface however is capable of sending 100 Mbit per second.
- o Most ISPs configure policing to drop all traffic above 10 Mbit so you can't get more.
- o It's also possible they shape it down to 10 Mbit but shaping means to buffer data.
- o It's is possible they are policing, while policing means they can just throw it away.
- o The 10 Mbit that we pay for it to ISP is called the CIR (**Committed Information Rate**).
- o Instead of waiting for policer of the ISP to drop your traffic, you might want to shape.
- o You can shape on the outgoing traffic towards the ISP so that they do not drop them.
- o When we go from high-speed interface to low speed interface might get packet loss.
- o We can use the shaping to make sure that everything will be sent until its buffer is full.



R1 Basic Configuration

```
R1(config)#interface Ethernet0/0
R1(config-if)#ip address 192.168.140.100 255.255.255.0
R1(config-if)#no shutdown
R1(config)#interface Ethernet0/1
R1(config-if)#ip address 192.168.12.1 255.255.255.0
R1(config-if)#no shutdown
R1(config)#ip route 0.0.0.0 0.0.0.0 192.168.12.2
```

R2 Basic Configuration

```
R2(config)#interface Ethernet0/0
R2(config-if)#ip address 192.168.122.100 255.255.255.0
R2(config-if)#no shutdown
R2(config)#interface Ethernet0/1
R2(config-if)#ip address 192.168.12.2 255.255.255.0
R2(config-if)#no shutdown
R2(config)#ip route 0.0.0.0 0.0.0.0 192.168.12.1
```

Client-XP Basic Configuration

```
IP Address. . . . . : 192.168.140.60
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.140.100
```

Server-XP Basic Configuration

```
IP Address. . . . . : 192.168.122.60
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.122.100
```

Shaping Lab:

First go to **XP-Server**

C:\Documents and Settings\Administrator\Desktop\iperf>iperf3 -s

```
C:\Documents and Settings\Administrator\Desktop\iperf>iperf3 -s
warning: this system does not seem to support IPv6 - trying IPv4
-----
Server listening on 5201
-----
```

Now go to **XP-Client**

C:\Documents and Settings\Administrator\Desktop\iperf>iperf3 -c 192.168.122.60 -P 8

```
Command Prompt
[SUM] 9.00-10.00 sec 756 KBytes 6.19 Mbits/sec
[ ID] Interval          Transfer      Bandwidth
[ 41] 0.00-10.00 sec    756 KBytes   619 Kbits/sec  sender
[ 41] 0.00-10.00 sec    709 KBytes   581 Kbits/sec  receiver
[ 61] 0.00-10.00 sec    882 KBytes   723 Kbits/sec  sender
[ 61] 0.00-10.00 sec    865 KBytes   708 Kbits/sec  receiver
[ 81] 0.00-10.00 sec    1.29 MBytes  1.08 Mbits/sec  sender
[ 81] 0.00-10.00 sec    1.24 MBytes  1.04 Mbits/sec  receiver
[ 101] 0.00-10.00 sec   1.35 MBytes  1.14 Mbits/sec  sender
[ 101] 0.00-10.00 sec   1.35 MBytes  1.13 Mbits/sec  receiver
[ 121] 0.00-10.00 sec    945 KBytes   774 Kbits/sec  sender
[ 121] 0.00-10.00 sec    933 KBytes   765 Kbits/sec  receiver
[ 141] 0.00-10.00 sec    630 KBytes   516 Kbits/sec  sender
[ 141] 0.00-10.00 sec    590 KBytes   483 Kbits/sec  receiver
[ 161] 0.00-10.00 sec    504 KBytes   413 Kbits/sec  sender
[ 161] 0.00-10.00 sec    471 KBytes   386 Kbits/sec  receiver
[ 181] 0.00-10.00 sec    630 KBytes   516 Kbits/sec  sender
[ 181] 0.00-10.00 sec    617 KBytes   505 Kbits/sec  receiver
[SUM] 0.00-10.00 sec   6.89 MBytes  5.78 Mbits/sec  sender
[SUM] 0.00-10.00 sec   6.67 MBytes  5.60 Mbits/sec  receiver
```

On **XP-Server** the result is

```
Command Prompt - iperf3 -s
[SUM] 10.00-10.19 sec 84.1 KBytes 3.68 Mbits/sec
[ ID] Interval          Transfer      Bandwidth
[ 51] 0.00-10.19 sec     0.00 Bytes    0.00 bits/sec  sender
[ 51] 0.00-10.19 sec     709 KBytes   570 Kbits/sec  receiver
[ 71] 0.00-10.19 sec     0.00 Bytes    0.00 bits/sec  sender
[ 71] 0.00-10.19 sec     865 KBytes   695 Kbits/sec  receiver
[ 91] 0.00-10.19 sec     0.00 Bytes    0.00 bits/sec  sender
[ 91] 0.00-10.19 sec     1.24 MBytes  1.02 Mbits/sec  receiver
[ 111] 0.00-10.19 sec     0.00 Bytes    0.00 bits/sec  sender
[ 111] 0.00-10.19 sec     1.35 MBytes  1.11 Mbits/sec  receiver
[ 131] 0.00-10.19 sec     0.00 Bytes    0.00 bits/sec  sender
[ 131] 0.00-10.19 sec     933 KBytes   751 Kbits/sec  receiver
[ 151] 0.00-10.19 sec     0.00 Bytes    0.00 bits/sec  sender
[ 151] 0.00-10.19 sec     590 KBytes   474 Kbits/sec  receiver
[ 171] 0.00-10.19 sec     0.00 Bytes    0.00 bits/sec  sender
[ 171] 0.00-10.19 sec     471 KBytes   379 Kbits/sec  receiver
[ 191] 0.00-10.19 sec     0.00 Bytes    0.00 bits/sec  sender
[ 191] 0.00-10.19 sec     617 KBytes   496 Kbits/sec  receiver
[SUM] 0.00-10.19 sec   0.00 Bytes    0.00 bits/sec  sender
[SUM] 0.00-10.19 sec   6.67 MBytes  5.49 Mbits/sec  receiver
-----
Server listening on 5201
```

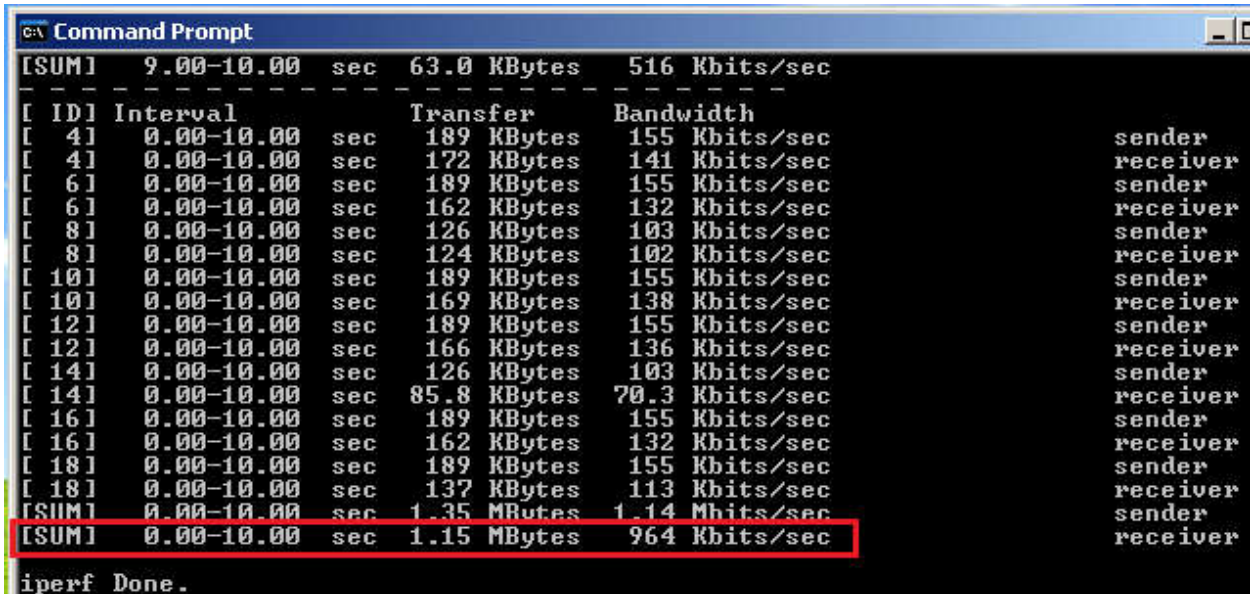
Let's Apply Shaping on R1 to limit it to 1 Mbit.

R1 Shaping Configuration

```
R1(config)#ip access-list extended test
R1(config-ext-nacl)#permit ip host 192.168.140.60 host 192.168.122.60
R1(config)#class-map match-all cmap
R1(config-cmap)#match access-group name test
R1(config)#policy-map pmap
R1(config-pmap)#class cmap
R1(config-pmap-c)#shape average 1m
R1(config)#interface Ethernet0/1
R1(config-if)#service-policy output pmap
R1# show policy-map interface e0/1
```

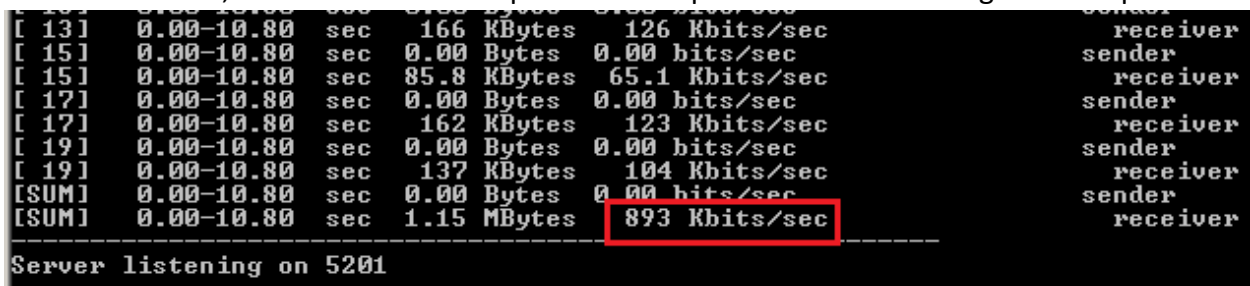
Now let's go back to **XP-Client** and run the same command again our traffic is shaped.

C:\Documents and Settings\Administrator\Desktop\iperf>iperf3 -c 192.168.122.60 -P 8



```
Command Prompt
[SUM] 9.00-10.00 sec 63.0 KBytes 516 Kbits/sec
[ ID] Interval Transfer Bandwidth
[ 4] 0.00-10.00 sec 189 KBytes 155 Kbits/sec sender
[ 4] 0.00-10.00 sec 172 KBytes 141 Kbits/sec receiver
[ 6] 0.00-10.00 sec 189 KBytes 155 Kbits/sec sender
[ 6] 0.00-10.00 sec 162 KBytes 132 Kbits/sec receiver
[ 8] 0.00-10.00 sec 126 KBytes 103 Kbits/sec sender
[ 8] 0.00-10.00 sec 124 KBytes 102 Kbits/sec receiver
[10] 0.00-10.00 sec 189 KBytes 155 Kbits/sec sender
[10] 0.00-10.00 sec 169 KBytes 138 Kbits/sec receiver
[12] 0.00-10.00 sec 189 KBytes 155 Kbits/sec sender
[12] 0.00-10.00 sec 166 KBytes 136 Kbits/sec receiver
[14] 0.00-10.00 sec 126 KBytes 103 Kbits/sec sender
[14] 0.00-10.00 sec 85.8 KBytes 70.3 Kbits/sec receiver
[16] 0.00-10.00 sec 189 KBytes 155 Kbits/sec sender
[16] 0.00-10.00 sec 162 KBytes 132 Kbits/sec receiver
[18] 0.00-10.00 sec 189 KBytes 155 Kbits/sec sender
[18] 0.00-10.00 sec 137 KBytes 113 Kbits/sec receiver
[SUM] 0.00-10.00 sec 1.35 MBytes 1.14 Mbits/sec sender
[SUM] 0.00-10.00 sec 1.15 MBytes 964 Kbits/sec receiver
iperf Done.
```

In **XP-Server** side, our traffic is now shaped to 893 Kbps which is close enough to 1 Mbps.



```
[13] 0.00-10.80 sec 166 KBytes 126 Kbits/sec receiver
[15] 0.00-10.80 sec 0.00 Bytes 0.00 bits/sec sender
[15] 0.00-10.80 sec 85.8 KBytes 65.1 Kbits/sec receiver
[17] 0.00-10.80 sec 0.00 Bytes 0.00 bits/sec sender
[17] 0.00-10.80 sec 162 KBytes 123 Kbits/sec receiver
[19] 0.00-10.80 sec 0.00 Bytes 0.00 bits/sec sender
[19] 0.00-10.80 sec 137 KBytes 104 Kbits/sec receiver
[SUM] 0.00-10.80 sec 0.00 Bytes 0.00 bits/sec sender
[SUM] 0.00-10.80 sec 1.15 MBytes 893 Kbits/sec receiver
Server listening on 5201
```