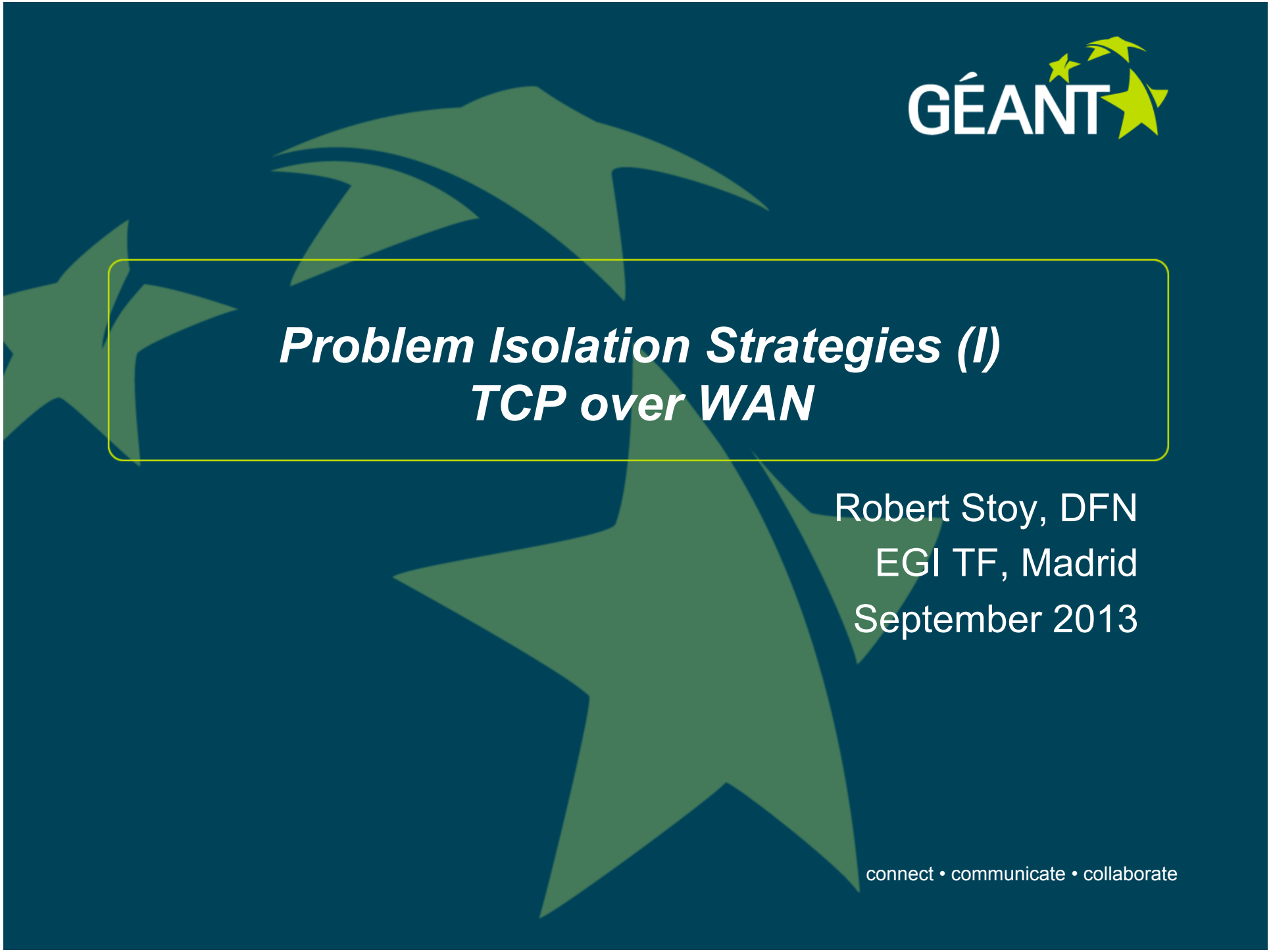


Problem Isolation Strategies (I)
TCP over WAN

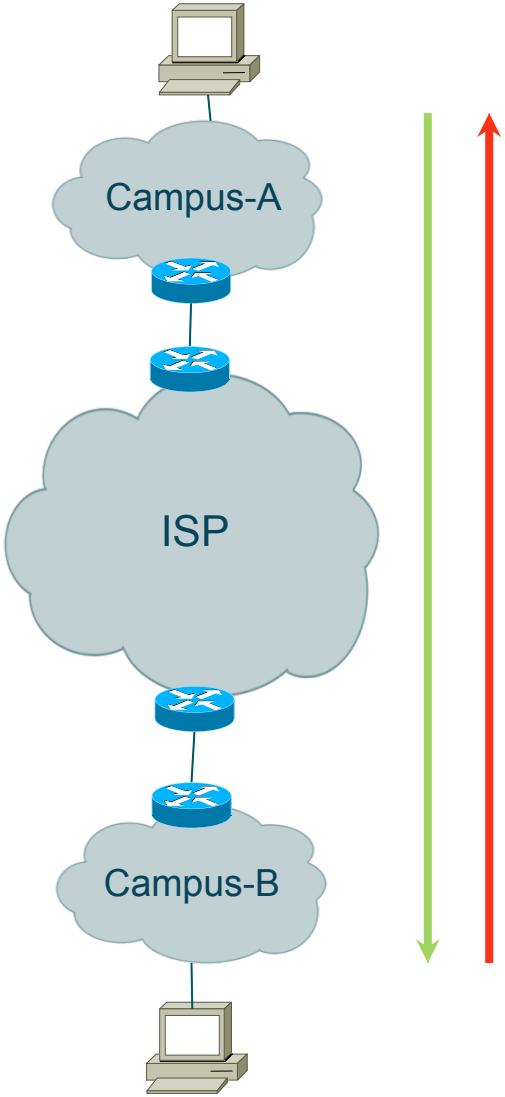
Robert Stoy, DFN

EGI TF, Madrid

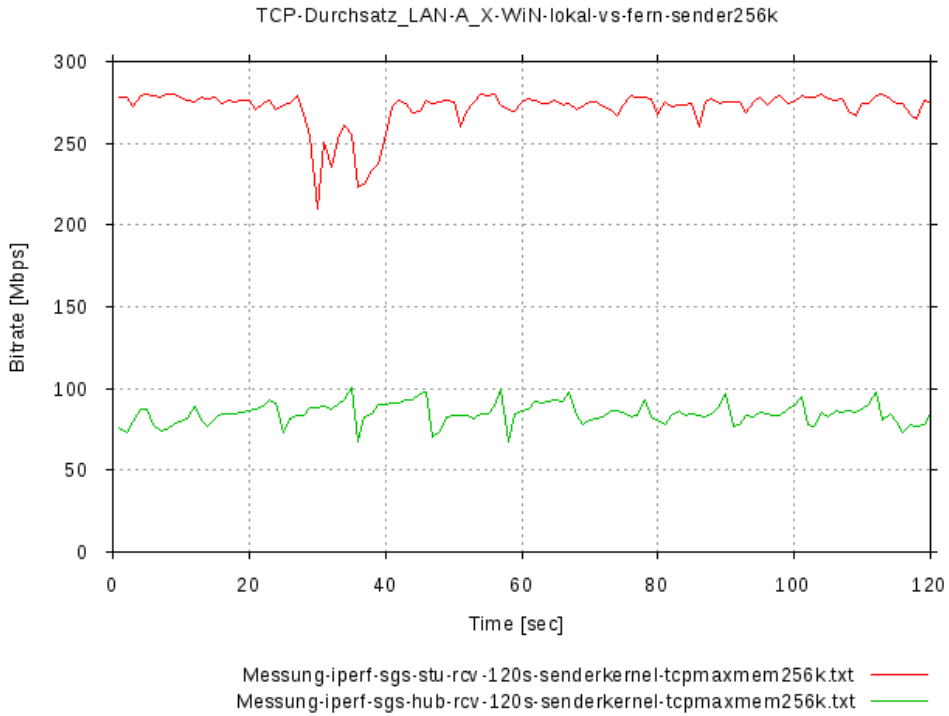
September 2013

connect • communicate • collaborate

Example



- Bad file transfer data rate between end systems

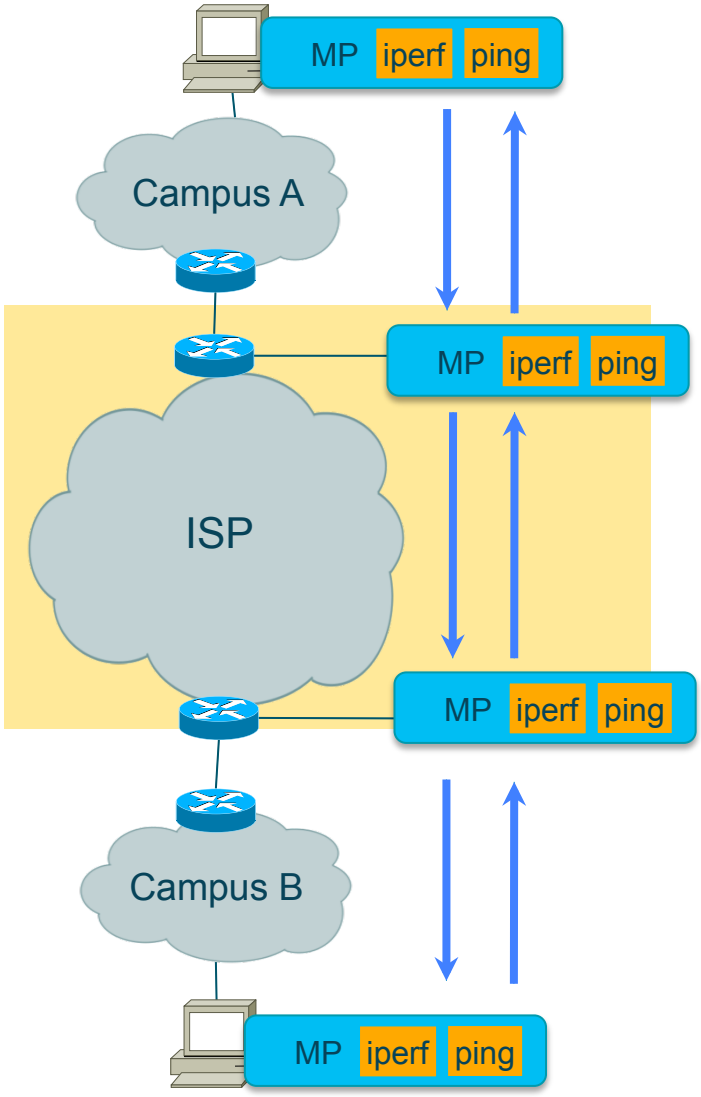


Troubleshooting Procedure

- Get Information from end user sysadmins
  - Performance problem as seen from application perspective
  - IP addresses from representative endsystems on both sides, A, B
  - Traceroute outputs from A to B and vice versa

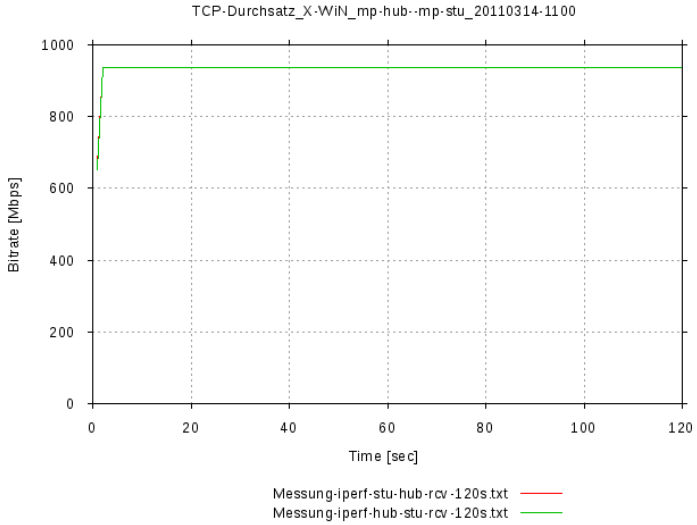
- Strategy: Separate and Isolate
  - Analyse end-to-end path
  - Identifiy network administratition domains, measurement domains
  - Analyse each domain separately
  - Analyse from from center domain(s) in direction to network path edges

Troubleshooting Procedure (2)

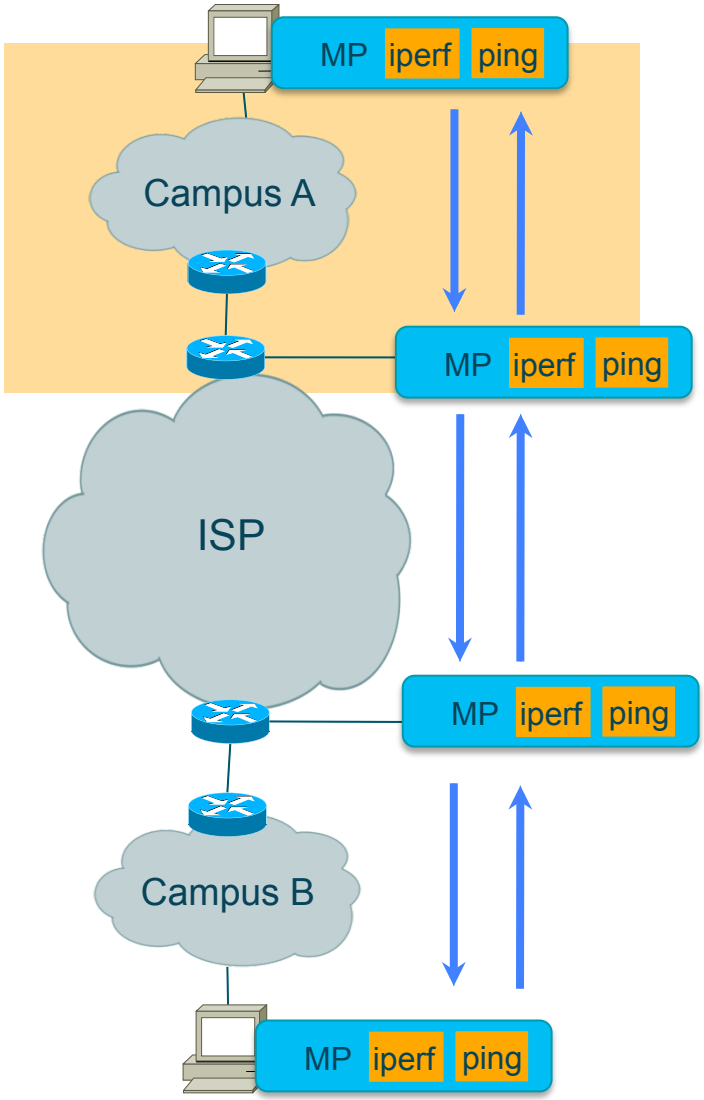


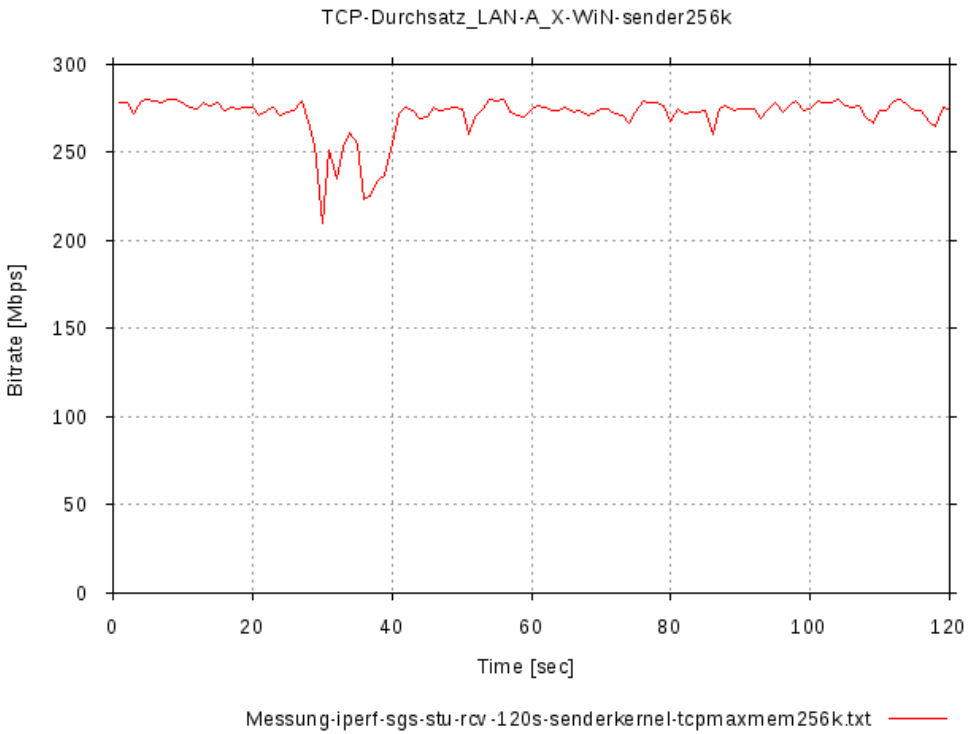

```
stoy@mp-stu1:~$ iperf -B 188.1.223.194 -c 188.1.223.130  -m -i 1 -t 120
------------------------------------------------------------
Client connecting to 188.1.223.130, TCP port 5001
Binding to local address 188.1.223.194
TCP window size:   128 KByte (default)
------------------------------------------------------------
[  3] local 188.1.223.194 port 5001 connected with 188.1.223.130 port 5001
..
```

```
stoy@mp-hub1:~$ iperf -s -B 188.1.223.130 -i 1 -m
------------------------------------------------------------
Server listening on TCP port 5001
Binding to local address 188.1.223.130
TCP window size:   128 KByte (default)
------------------------------------------------------------
[  4] local 188.1.223.130 port 5001 connected with 188.1.223.194 port 5001
[  4]  0.0- 1.0 sec  79.1 MBytes    664 Mbits/sec
[  4]  1.0- 2.0 sec    112 MBytes    937 Mbits/sec
[  4]  2.0- 3.0 sec    112 MBytes    937 Mbits/sec
[  4]  3.0- 4.0 sec    112 MBytes    937 Mbits/sec
[  4]  4.0- 5.0 sec    112 MBytes    937 Mbits/sec
..
```

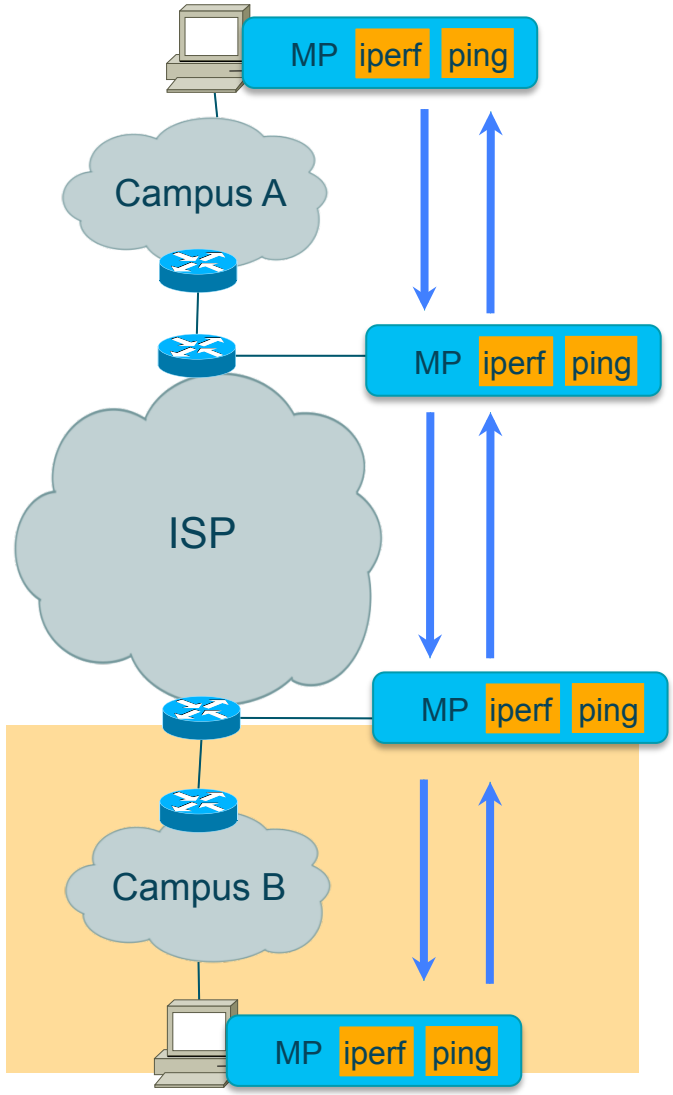


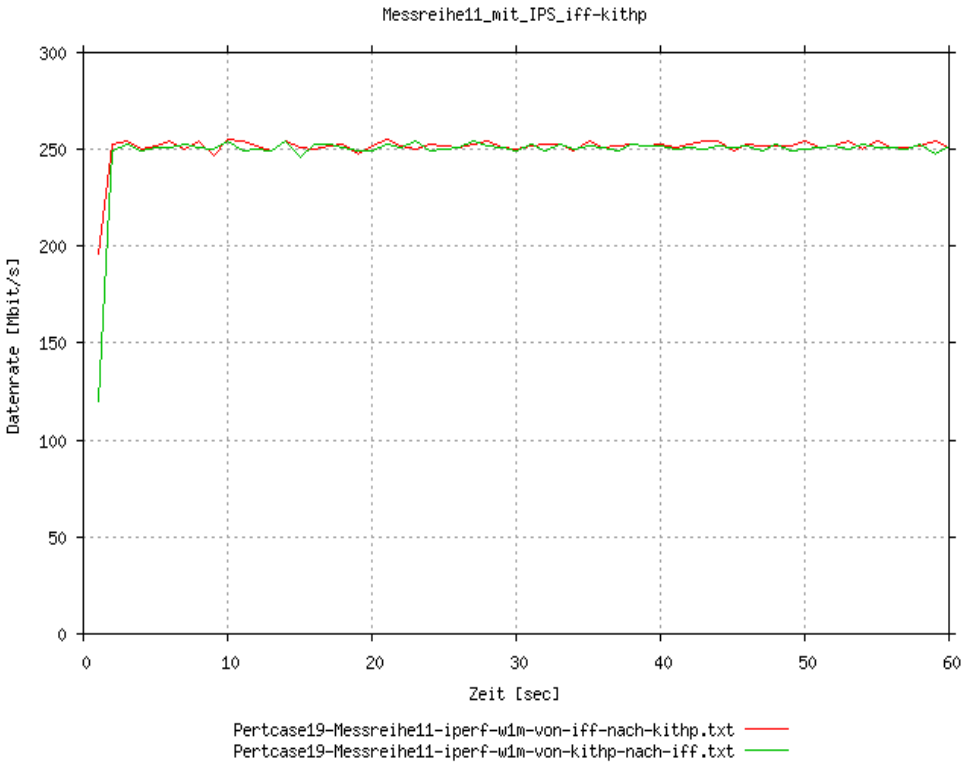
Troubleshooting Procedure (3)



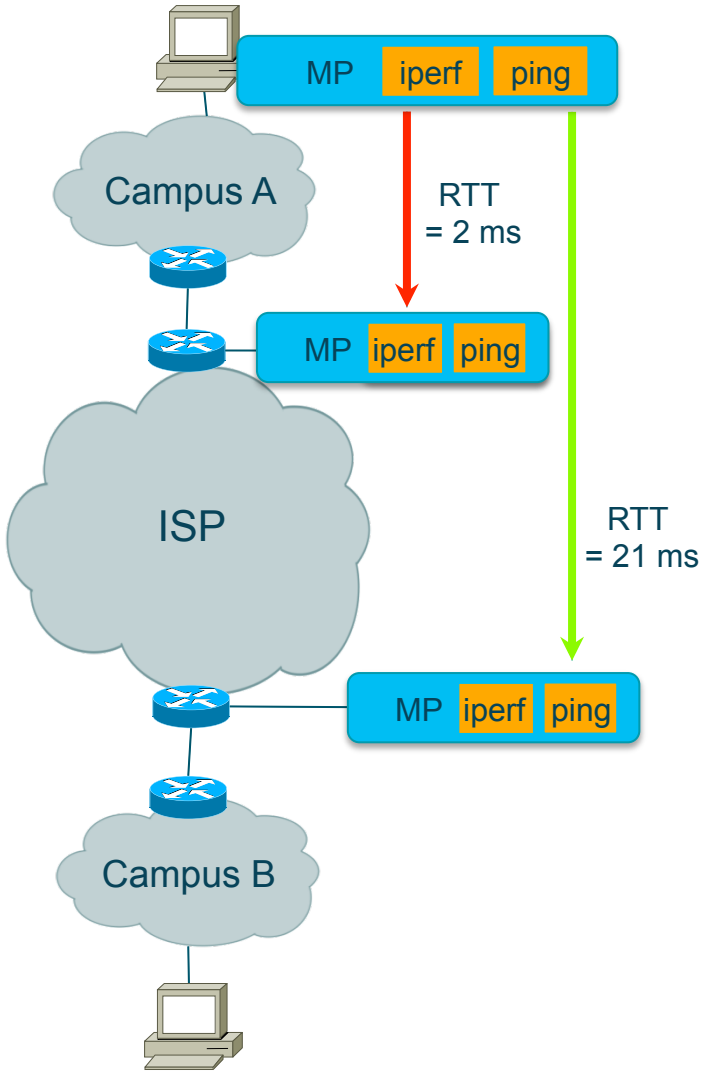


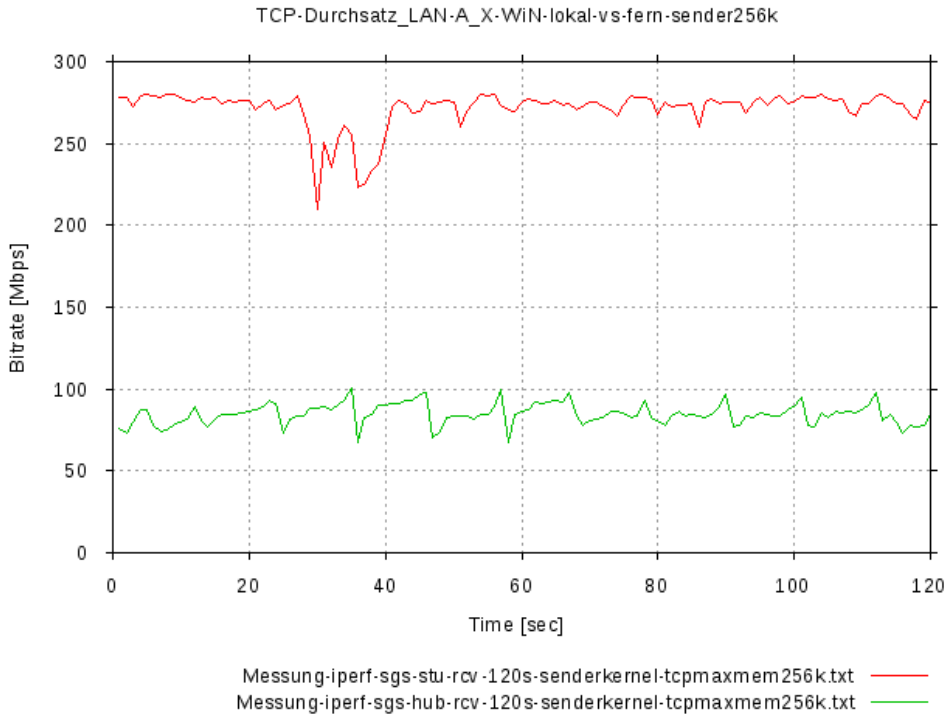
Troubleshooting Procedure (4)





Troubleshooting Procedure (5)



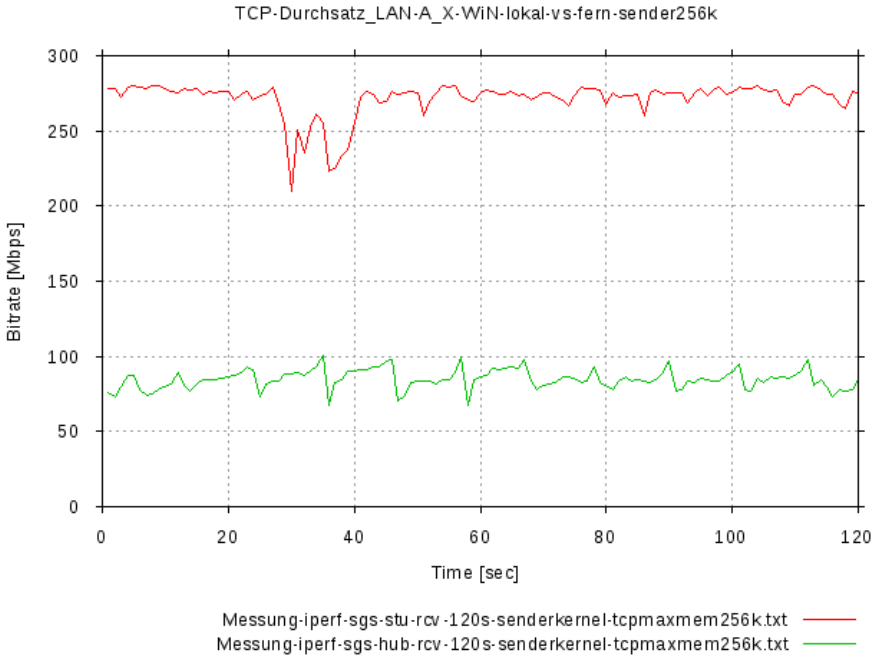


Solution here:

Increase Max TCP Buffer in Sending Endsystem

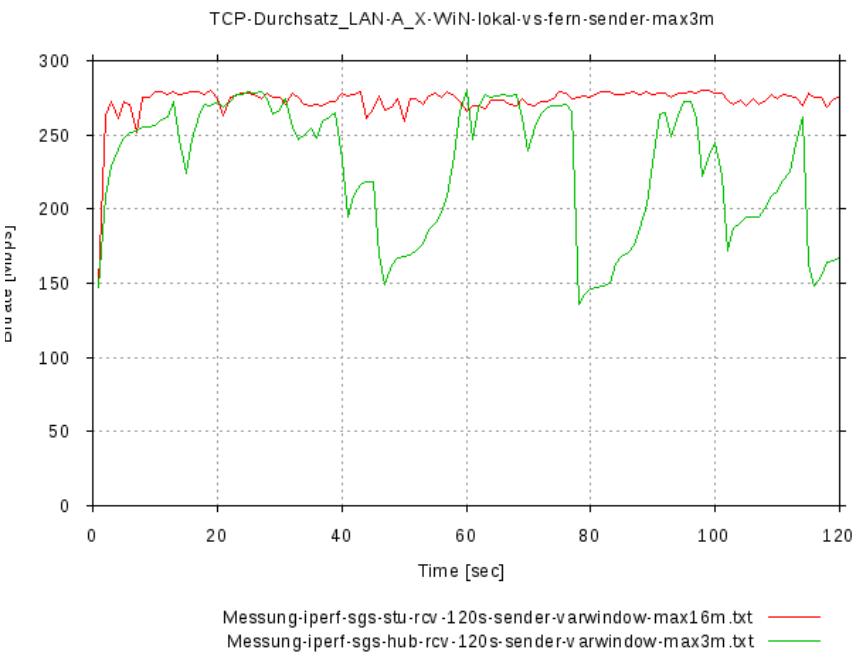
Before:

```
# Linux autotuning TCP buffer limits
# min, default, and max number of bytes to use
net.ipv4.tcp_rmem = 16384 131072 262144
net.ipv4.tcp_wmem = 16384 131072 262144
```



After:

```
# Linux autotuning TCP buffer limits
# min, default, and max number of bytes to use
net.ipv4.tcp_rmem = 16384 131072 3145728
net.ipv4.tcp_wmem = 16384 131072 3145728
```



TCP Throughput = f(Window-Size) @ RTT = 24 ms