Iperf

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2022-06-17

Contents

The iperf tool can be used to measure network performance. The current version is iperf3. Iperf is a cross platform tool for active measurements of the maximum achievable bandwidth on IP network protocols TCP, UDP and SCTP with IPv4 and IPv6. iperf3 is a new implementation from scratch, with the goal of a smaller, simpler code base, and a library version of the functionality that can be used in other programs.

1 Features

TCP and SCTP	UDP
Bandwidth measurement	creation of dedicated bandwidth streams
Report MSS/MTU size	measure package loss
Observe MSS/MTU size	measure delay jitter
Support TCP window size	use multicast

iperf3 and specially iperf3.1 has additional features compared to iperf2. However the following features are not available:

- -d/-r: Bidirectional testing
- -I: Data transmitted from stdin
- -T: Time-to-live (TTL), for multicast
- -x: Exclude C(connection) D(data) M(multicast) S(settings) V(server) reports
- -y: Report as a Comma-Separated Values
- -C: Compatibility mode allows for use with older version of iPerf

The iperf2 has a nice brief comparison table which compares iperf2 and iperf3.

2 Debian Versions

Debian	iperf	iperf3
Bullseye 11	2.0.14a+dfsg1-1	3.9-1
Buster 10	2.0.12+dfsg1-2	3.6-2
Stretch 9	2.0.9+dfsg1-1	3.1.3-1

3 Installation of Iperf 2.x

```
aptitude install iperf
```

4 Installation of Iperf 3.x

```
aptitude install iperf3
```

5 Command Line Completion

For command line completion `bash` can be used. If there is the file `/usr/share/bash-completion/completi` most likely completion will work for `bash`.

6 Mailinglist

- Mailing list
- Mailing list archive

7 Usage Of Iperf

iperf is a client and server application and used on two computers. One takes the role as server the other the role as client. iperf then send packages over the network and measure the link or links in between the server and the client. Usually on would limit the link count between server and client to understand which link has what performance. Many operations are similar between iperf2 and iperf3.

7.1 Simple Iperf2 Example

This is a simple TCP client server bandwidth test.

Server:

```
iperf -s
```

Client:

```
iperf -c 192.168.168.32
------------------------------------------------------------
Client connecting to 192.168.168.32, TCP port 5001
TCP window size: 85.0 KByte (default)
------------------------------------------------------------
[  3] local 192.168.168.33 port 42152 connected with 192.168.168.32 port
 ↪  5001
```

```
[ ID] Interval       Transfer     Bandwidth
[  3]  0.0-10.0 sec  1.09 GBytes   939 Mbits/sec
```

7.2 MSS Iperf2 Example

Maximum Segment Size (-m argument) display:

The Maximum Segment Size (MSS) is the largest amount of data (often measured in bytes) that a computer can transfer in a single, unfragmented TCP segment.

It can be calculated as follows:

- `MSS = MTU - TCP + IP headers`
- The `TCP + IP headers` are equal to 40 bytes.
- The Maximum Transmission Unit (MTU) is the greatest amount of data that can be transferred in a frame.

Some default MTU sizes for different network topologies:

- Ethernet - 1500 bytes: used in a LAN
- PPPoE - 1492 bytes: used on ADSL links

Generally speaking, higher MTU (and MSS) brings higher bandwidth efficiency

Server:

```
iperf -s
```

Client side:

```
iperf -c 192.167.168.32 -m
------------------------------------------------------------
Client connecting to 192.168.168.32, TCP port 5001
TCP window size: 16.0 KByte (default)
------------------------------------------------------------
[ 3] local 192.168.168.33 port 42384 connected with 192.168.168.32 port
 ↪  5001
[ 3]   0.0-10.2 sec   1.27 MBytes   1.04 Mbits/sec
[ 3] MSS size 1448 bytes (MTU 1500 bytes, ethernet)
```

Here the MSS is not equal to `1500 - 40` but to `1500 - 40 - 12 (Timestamps option) = 1448`

7.3 Simple Iperf3 Example

This is a simple TCP client server bandwidth test.

Server:

```
iperf3 -s
```

Client:

```
iperf3 -c 192.168.168.32
Connecting to host 192.168.168.32, port 5201
[  5] local 192.168.168.33 port 53614 connected to 192.168.168.32 port 5201
[ ID] Interval           Transfer     Bitrate         Retr  Cwnd
[  5]   0.00-1.00   sec   113 MBytes   951 Mbits/sec    0    378 KBytes
[  5]   1.00-2.00   sec   111 MBytes   931 Mbits/sec    0    428 KBytes
[  5]   2.00-3.00   sec   112 MBytes   944 Mbits/sec    0    455 KBytes
[  5]   3.00-4.00   sec   112 MBytes   938 Mbits/sec    0    455 KBytes
[  5]   4.00-5.00   sec   112 MBytes   938 Mbits/sec    0    455 KBytes
[  5]   5.00-6.00   sec   111 MBytes   930 Mbits/sec    0    455 KBytes
[  5]   6.00-7.00   sec   112 MBytes   943 Mbits/sec    0    477 KBytes
[  5]   7.00-8.00   sec   112 MBytes   942 Mbits/sec    0    477 KBytes
[  5]   8.00-9.00   sec   111 MBytes   933 Mbits/sec    0    477 KBytes
[  5]   9.00-10.00  sec   111 MBytes   934 Mbits/sec    0    477 KBytes
- - - - - - - - - - - - - - - - - - - - - - - - -
[ ID] Interval           Transfer     Bitrate         Retr
[  5]   0.00-10.00  sec  1.09 GBytes   938 Mbits/sec    0             sender
[  5]   0.00-10.00  sec  1.09 GBytes   937 Mbits/sec
 ↪  receiver
```

8 Links

- documentation
- home ESnet
- home
- IP
- iperf2
- iperf3
- iperf3.1
- Mailing list
- Mailing list archive
- SCTP
- source iperf3
- TCP
- UDP

9 History

Version	Date	Notes
0.1.2	2022-06-17	Shell->bash, add Bullseye version, Typo
0.1.1	2021-06-06	Add comparison table link, MSS example
0.1.0	2021-06-05	Initial release

10 Disclaimer of Warranty

11 Limitation of Liability