

8th International Conference

«Distributed Computing and GRID-technologies in Science and Education»

10 – 14 September 2018

Network Infrastructure of heterogeneous platform «HYBRILIT»

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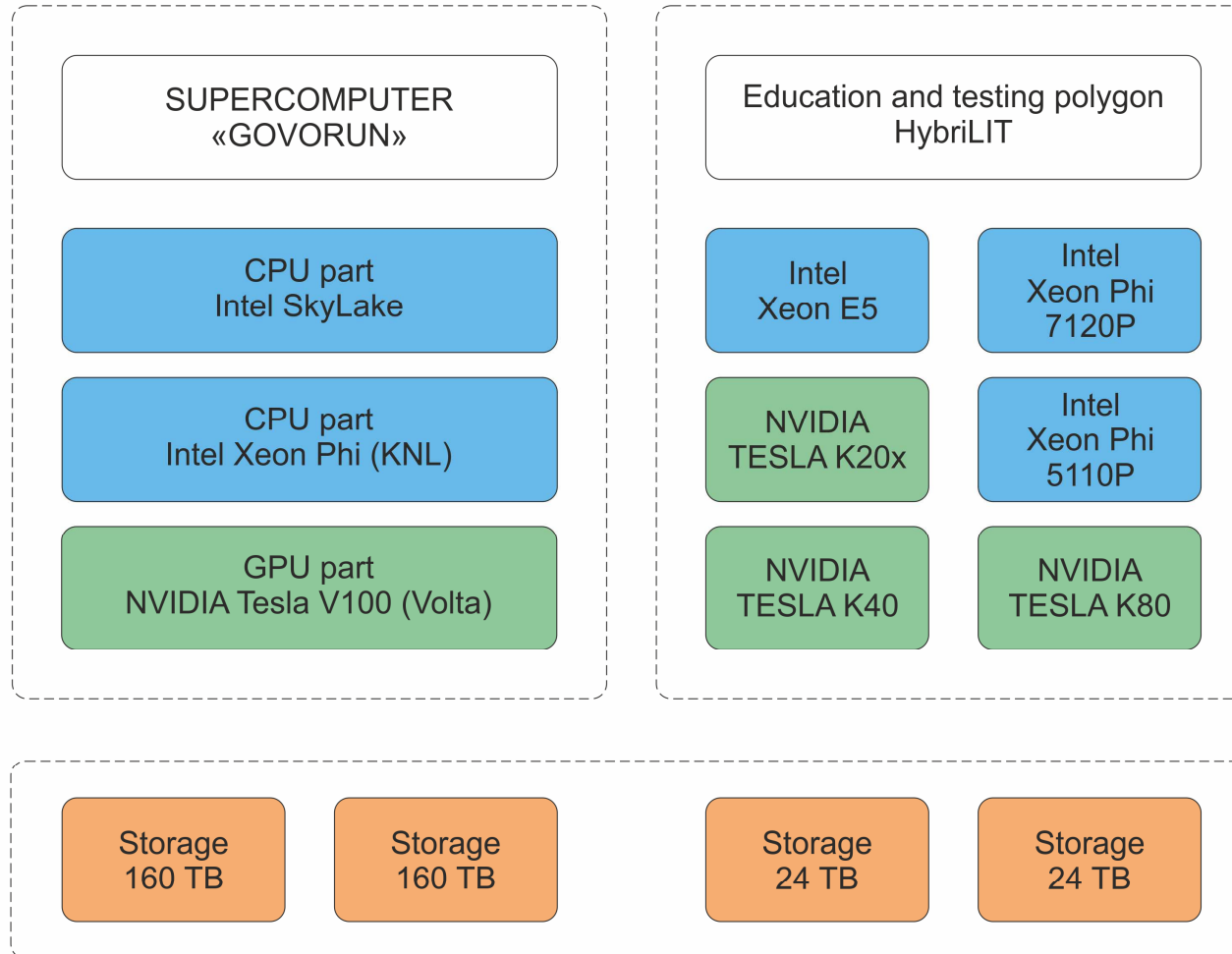
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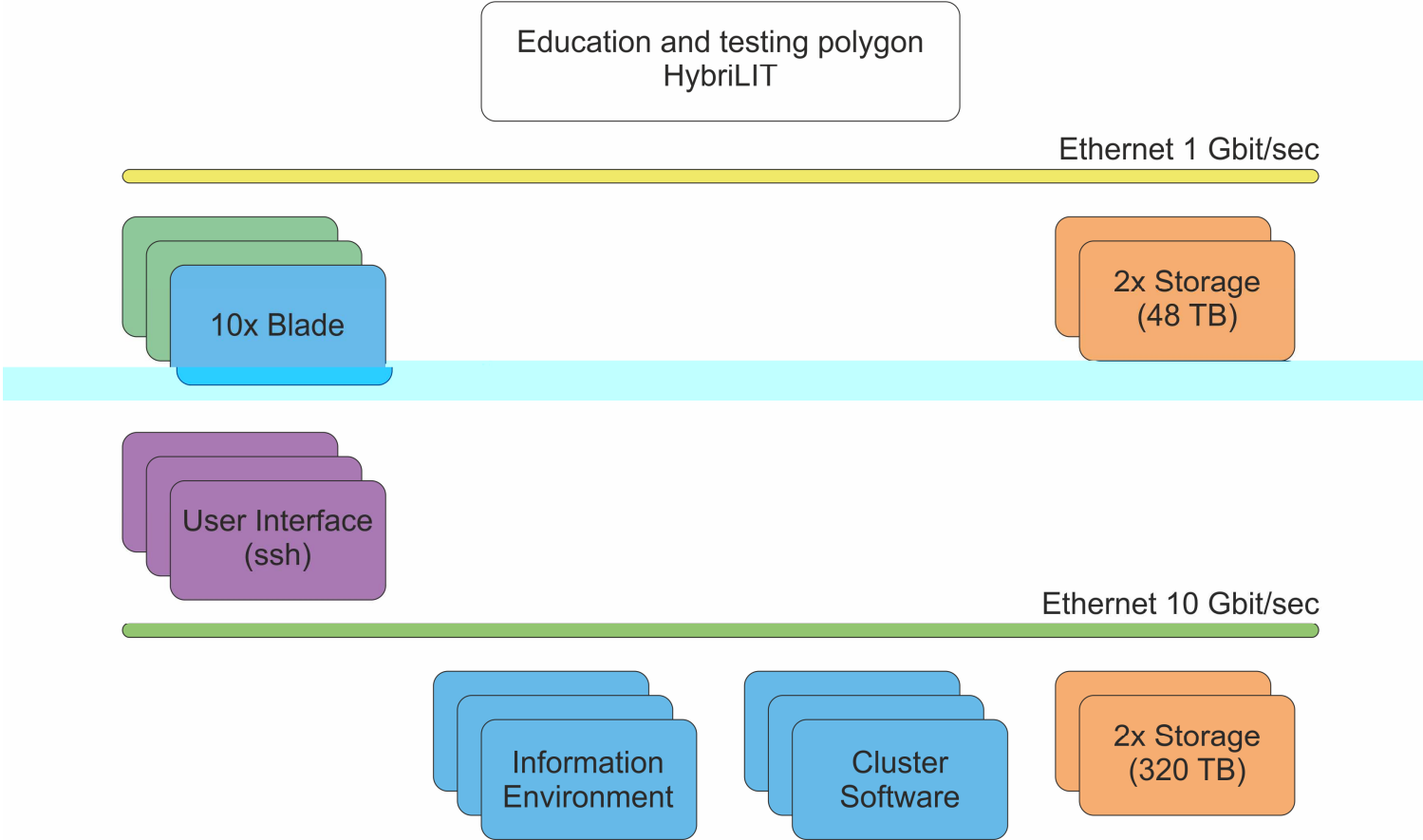
Dubna

11 September 2018

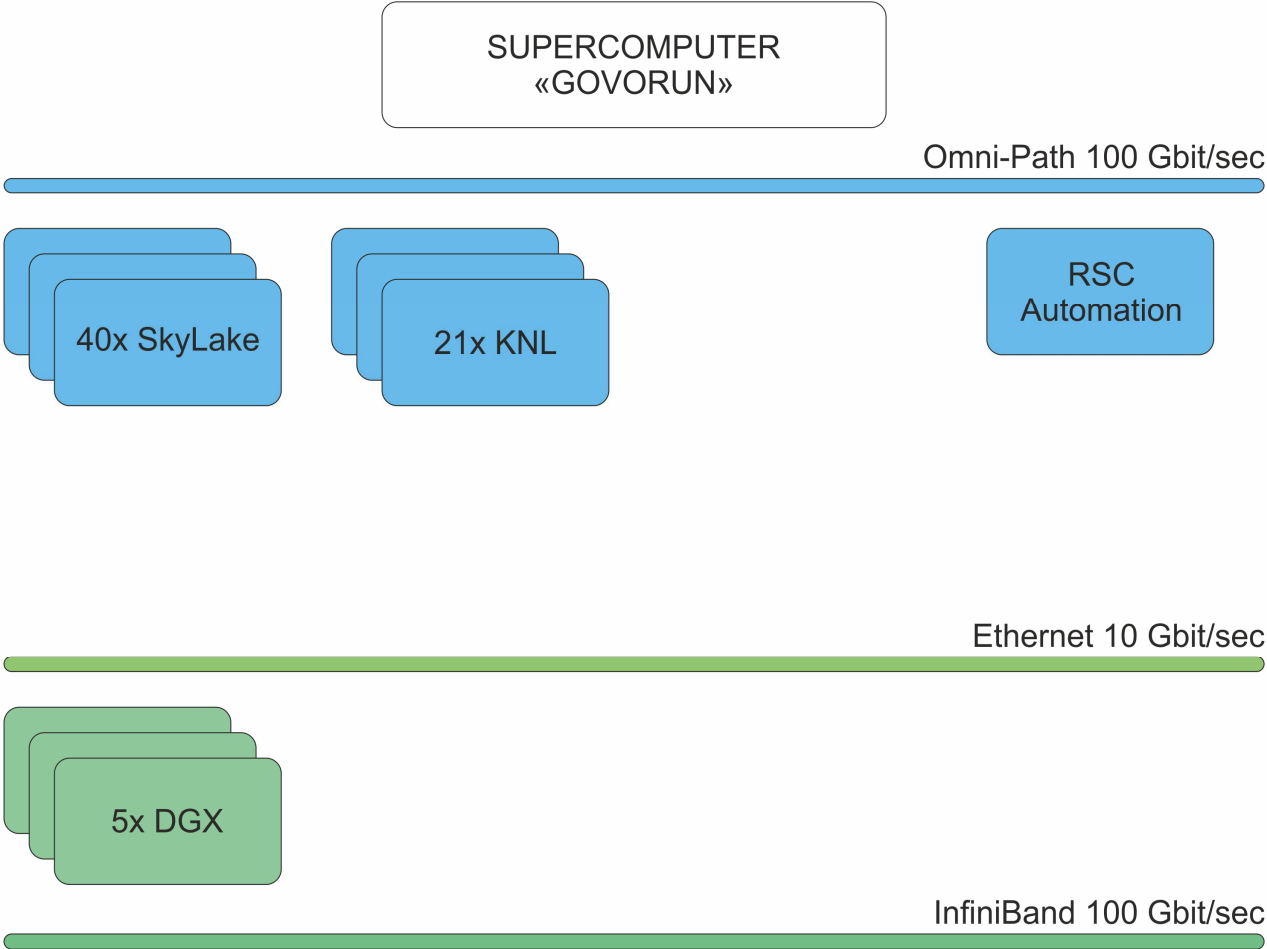
COMPUTING COMPONENTS OF HETEROGENEOUS PLATFORM



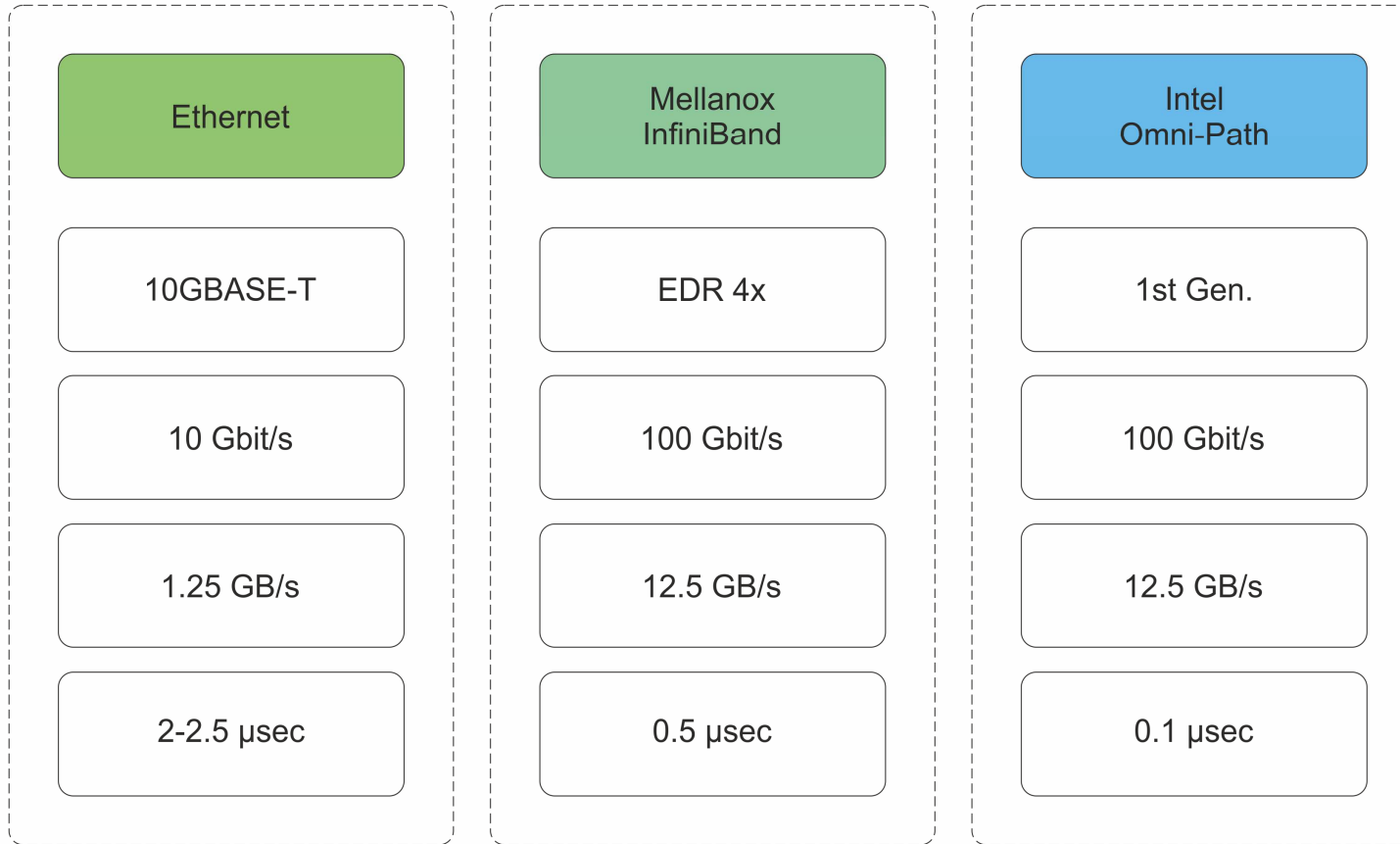
NETWORK INFRASTRUCTURE OF HETEROGENEOUS PLATFORM



NETWORK INFRASTRUCTURE OF HETEROGENEOUS PLATFORM



NETWORK INTERFACE'S FEATURES



TESTS OF NETWORK INFRASTRUCTURE

- IPERF v3

This program is intended for measure maximum bandwidth of TCP/IP network.

It's developed at the Lawrence Berkeley National Laboratory (LBNL).
It's released under the BSD license.

Example:

```
server> iperf3 -s  
client> iperf3 -c server_ip
```

TESTS OF NETWORK INFRASTRUCTURE

- PERFTTEST v3.4

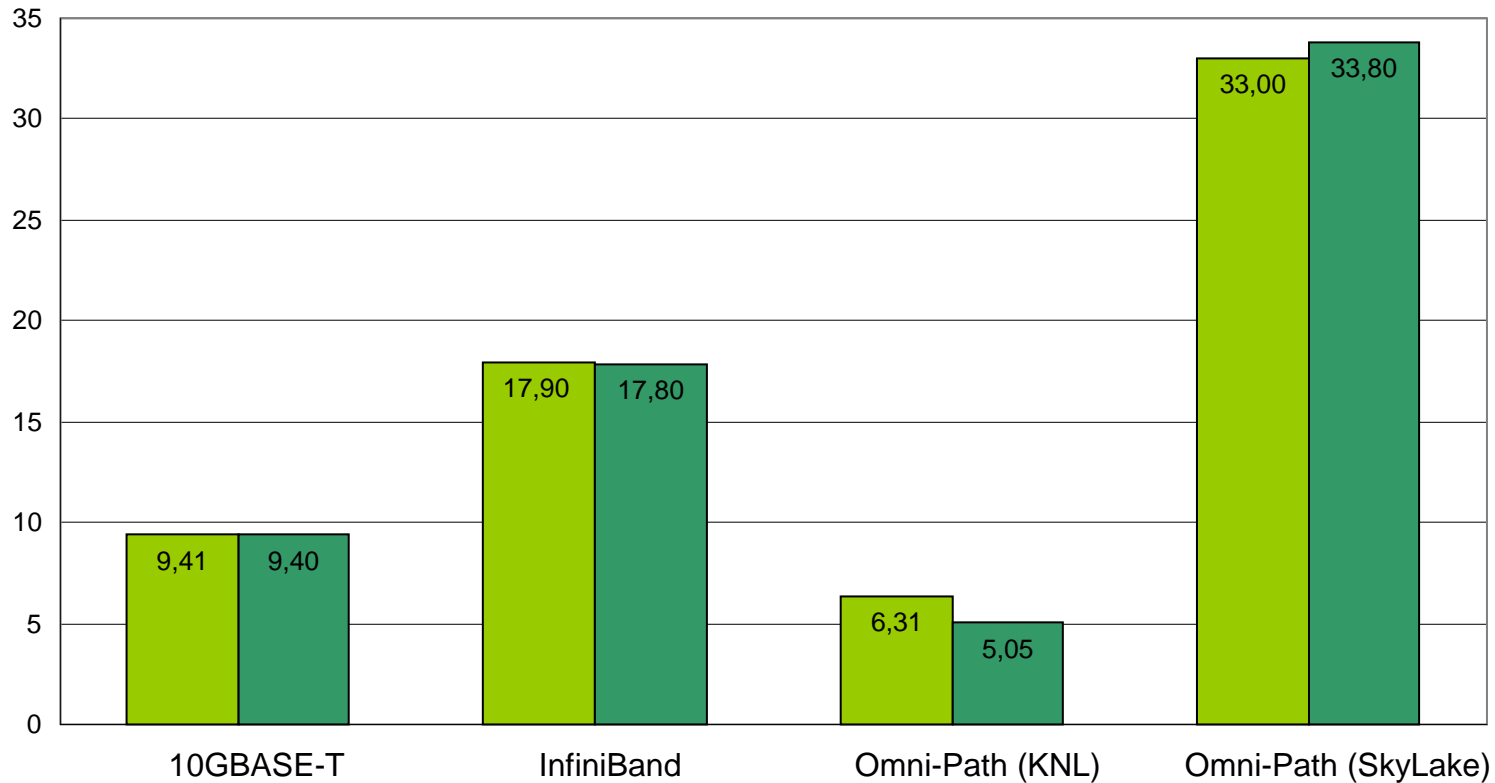
The set of programs is intended for measure of bandwidth and latency of InfiniBand network. It's a part of the OpenFabrics Enterprise Distribution (OFED) package.

Send		ib_send_bw	lb_send_lat
RDMA	Read	ib_read_bw	ib_read_lat
	Write	ib_write_bw	ib_write_lat
	Atomic	ib_atomic_bw	ib_atomic_lat
Native Ethernet		raw_ethernet_bw	raw_ethernet_lat

Example:

```
server> ib_send_bw -a -c RC -F {-R} --report_gbits
client> ib_send_bw -a -c RC -F {-R} server_ip --report_gbits
```

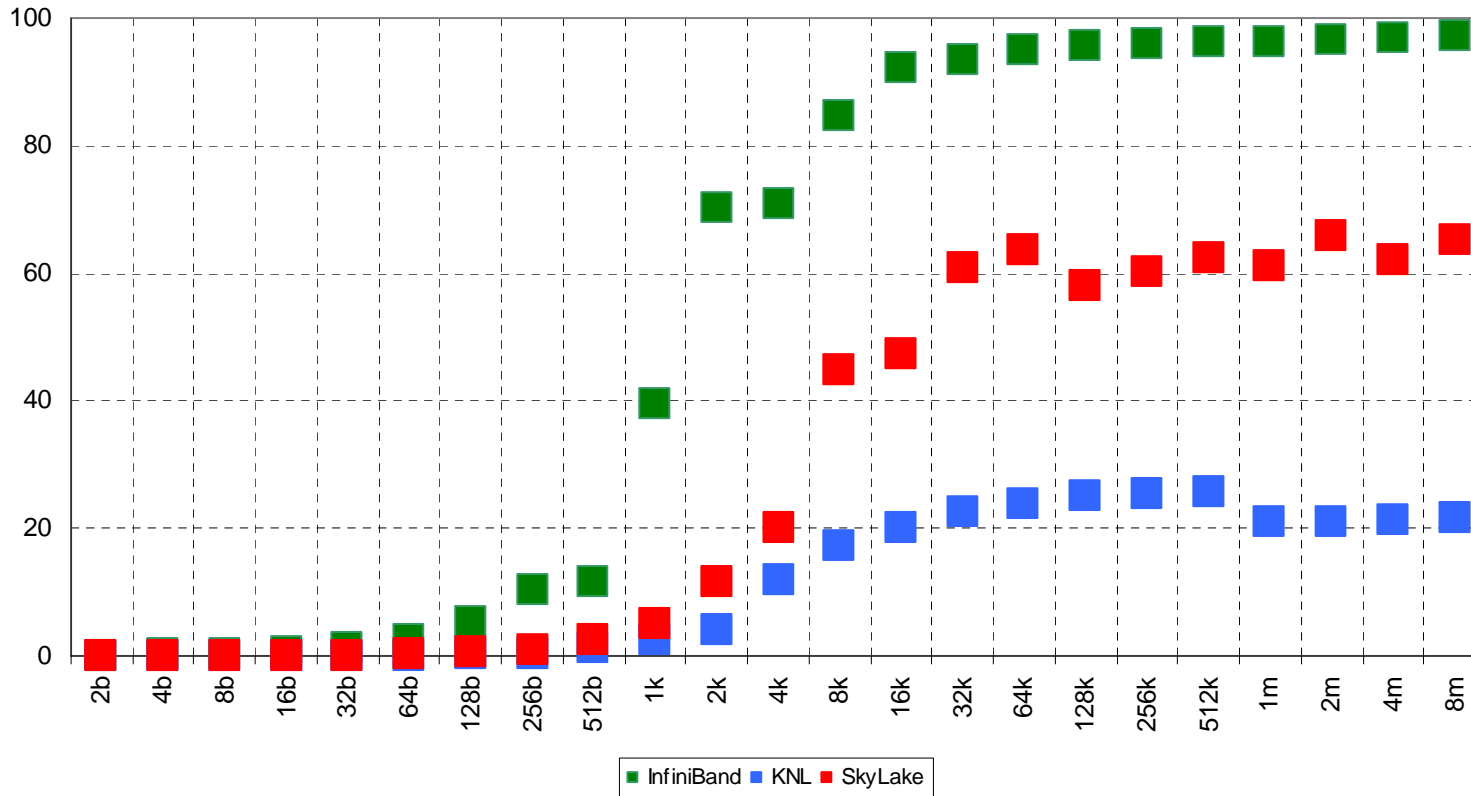
RESULTS OF IPERF v3 iperf3 (data exchange method: «IP-over-IB»)



The results are shown in the forward and backward directions for each type of network.
The data is shown in: Gigabit per seconds (Gbps).

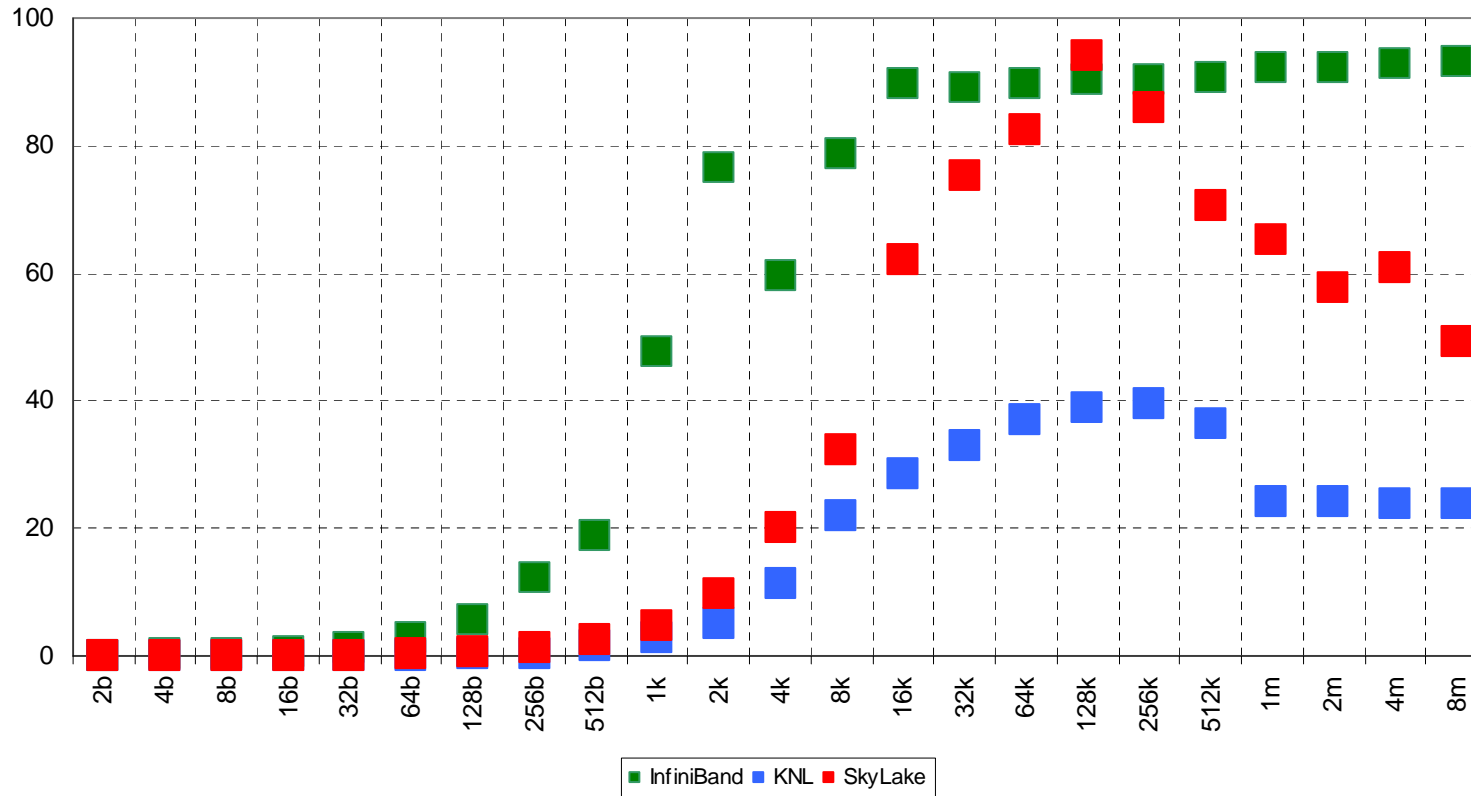
RESULTS OF PERFTEST

ib_send_bw (data exchange method: «Ethernet»)



The results are shown in the forward direction for each type of network.
The data is shown in: Gigabit per seconds (Gbps).

RESULTS OF PERFTEST ib_send_bw (data exchange method: «RDMA»)



The results are shown in the forward direction for each type of network.
The data is shown in: Gigabit per seconds (Gbps).

CONCLUSIONS

- Mellanox InfiniBand and Intel Omni-Path are comparable networks. In some cases they exceed the Ethernet (10GBASE-T) by 2-3 times in «IP-over-IB» mode.
- Mellanox InfiniBand shows maximum bandwidth in «RC» («Reliable Connected») mode for both data exchange modes (Ethernet and RDMA). It's about 93-97 Gbit/sec.
- Intel Omni-Path is dependent on the processor's type (KNL or SkyLake).

THANK YOU

