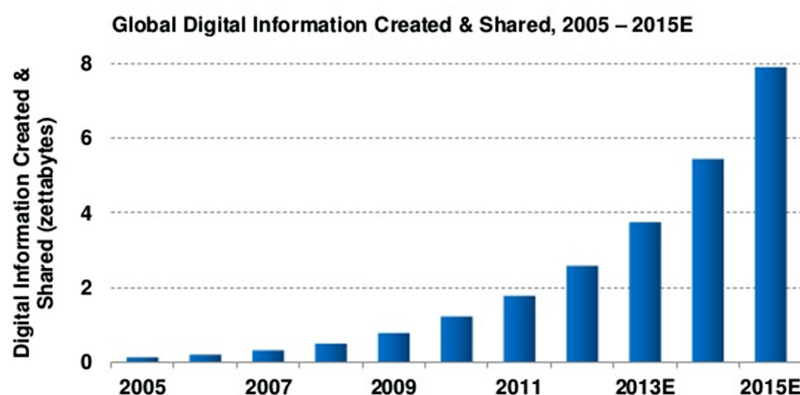


Introducing EDR 100Gb/s – Enabling the Use of Data

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Introduction

We are living in the age of data. Between millions of tweets and shares of photos, infograms, music, and video, the amount of global digital information created has grown by a factor of six in the past 5 years to nearly 6 zettabytes in 2014¹.



KPCB

Note: * 1 zettabyte = 1 trillion gigabytes. Source IDC report "Extracting Value From Chaos" 6/11.

Figure 1. *The Data Explosion*

Data consumption continues to grow every minute thanks to smartphones, social media, video streaming, and big data, all of which require big pipes to cope with the huge quantities of data that are being transferred. Twitter experiencing a massive slowdown when Ellen Degeneres posted her 2014 Oscars selfie is just one recent example of the need for more bandwidth.

With the exponential growth of data being generated around the world and the increase of applications that can take advantage of real-time massive data processing for high performance computing, data analytics, business intelligence, national security, and 'The Internet of Things' applications, the market demands faster and more efficient interconnect solutions.

¹ "Internet Trends 2013," Kleiner Perkins Caufield Byers, May, 2013.

Introducing Switch-IB™

Switch-IB™ is the seventh generation switching IC from Mellanox®, delivering 36-ports of 100Gb/s throughput per port. Switch-IB is the world's highest capacity switch, enabling application managers to use the power of data. With 144 integrated SerDes, which can operate at 1 Gb/s to 25 Gb/s speeds per lane to deliver 7.2Tb/s of switching capacity and 5.4 billion packets per second, Switch-IB is the best solution for high-performance computing, cloud, Web 2.0, database, and storage centers. Switch-IB enables these centers to deliver high application performance, to become more efficient, and to reduce their expenses.

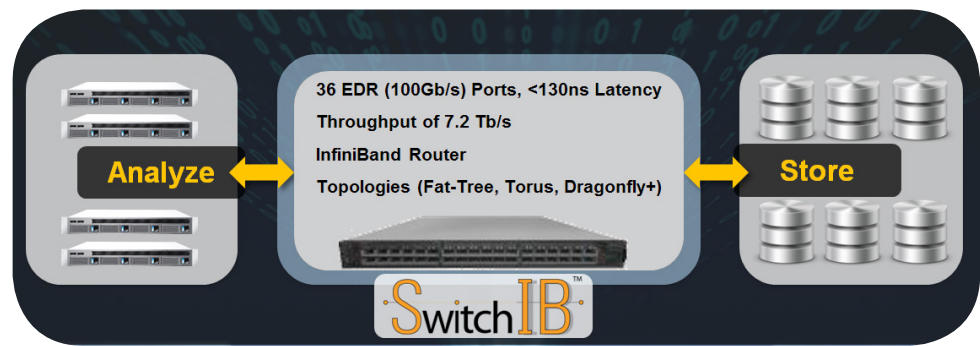


Figure 2. Mellanox Switch-IB Offers the Biggest Pipes on the Market

Partnering Mellanox's Switch-IB with Mellanox LinkX™ EDR 100Gb/s cables, introduced at OFC in March 2014, brings a real 100G solution enabler to the market. Switch-IB's high bandwidth pipes offer clear advantages in both OPEX and CAPEX on top of improved performance versus the competition available today in the market.

Using EDR Switches to Improve an FDR Fabric

A classic scenario for using the advantages of 100Gb/s links is the use of FDR connectivity toward servers while running EDR 100Gb/s uplinks between ToR and aggregation switches. This capitalizes on the highest capacity Switch-IB based aggregation, while enjoying a higher port count of FDR ports on the ToR by using a 2:1 ratio between downlink and uplink ports that achieves a non-blocking topology.

For example, take a 3,888-node cluster. Configured as FDR, it requires six aggregation switch chassis and 216 Top-of-Rack switches (with 18 uplink and downlink ports) to create a 1:1 non-blocking scenario. But with Switch-IB, only three aggregation switch chassis (communicating at twice the bandwidth) and 162 Top-of-Rack switches (with 12 uplink and 24 downlink ports) are required to maintain a non-blocking (2:1 ratio) scenario. This saves 37% on real estate in the data center and 25% on power consumption from using fewer switches.

Cluster Size	Real Estate Advantage	Power Saving
648 nodes - 72Tb/s	28%	5%
1296 nodes - 145Tb/s	37%	25%
3888 nodes - 435Tb/s	37%	25%
11664 nodes - 1.3Pb/s	37%	25%

Figure 3. Benefits of Using EDR Switches

Switch-IB vs. the Competition

The advantages offered by Switch-IB are clear. Switch-IB brings improved latency, less power consumption, a much smaller physical footprint, and a sizeable price advantage. For example, a 1U Switch-IB switch platform running 36 EDR ports and delivering up to 7.2 Tb/s of data gives 4-10X the real estate savings compared to a solution reaching the same bandwidth with the 4U Cisco Nexus 6004 (running 96 ports of 40Gb/s), or with the Arista 10U solution (running 7050QX systems).

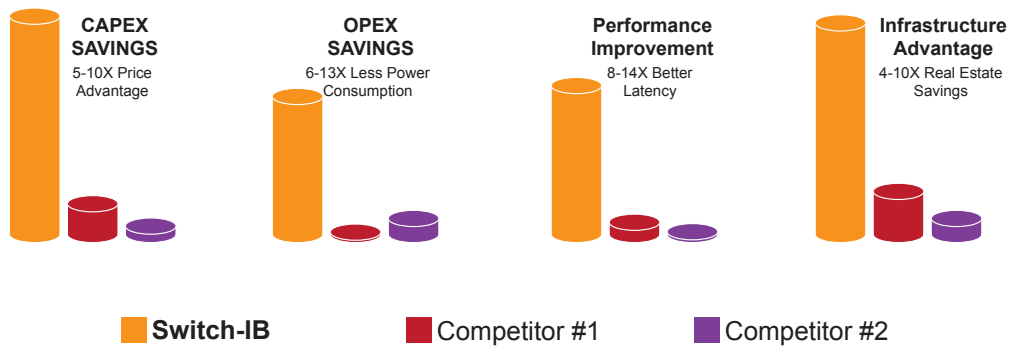


Figure 4. Switch-IB’s Advantages over the Competition

InfiniBand Routing

Moreover, Switch-IB offers InfiniBand Routing capabilities, enabling unlimited scalability from tens of thousands of nodes up to hundreds of thousands of nodes and beyond. InfiniBand Routing also seamlessly connects different topologies together. For example, it is now possible to connect between a compute cluster on a fat-tree topology and a storage cluster on a 3-Torus topology. Finally, InfiniBand Routing allows isolation between different subnets and brings security capabilities to large compute infrastructures.

▪ 100K nodes, 3 subnets, CBB 1:1

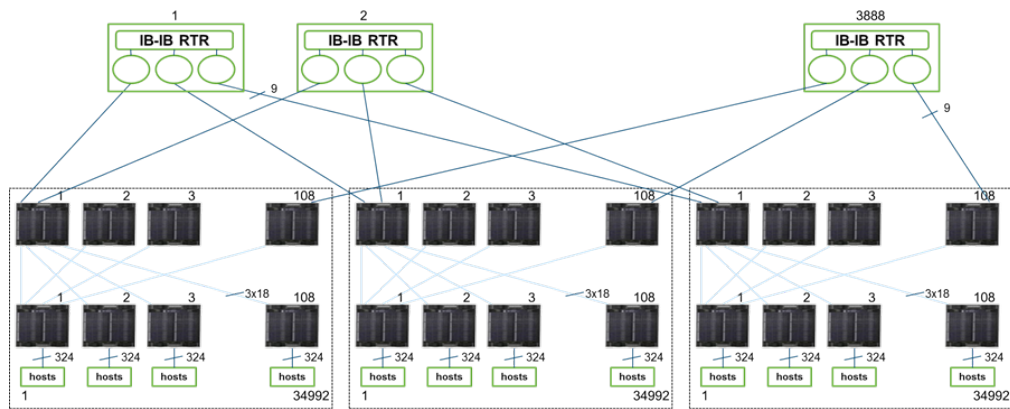


Figure 5. Switch-IB as an InfiniBand Router

Conclusion

Mellanox EDR 100Gb/s solutions answer a necessity and provide the tools to overcome not only today’s high bandwidth needs but also the needs of tomorrow. There is no better value to today’s IT centers than a single option that offers the highest bandwidth, extremely low latency, and the scalability needed to support HPC, Web2.0, and cloud applications. As data usage continues to grow, Mellanox Technologies remains one generation ahead of the competition.



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