

Breakout applications for 50G and 200G Ethernet

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Data Center Requirements

- Need to consider breakout as a key feature of any data center variant

What reaches should be considered for data center?

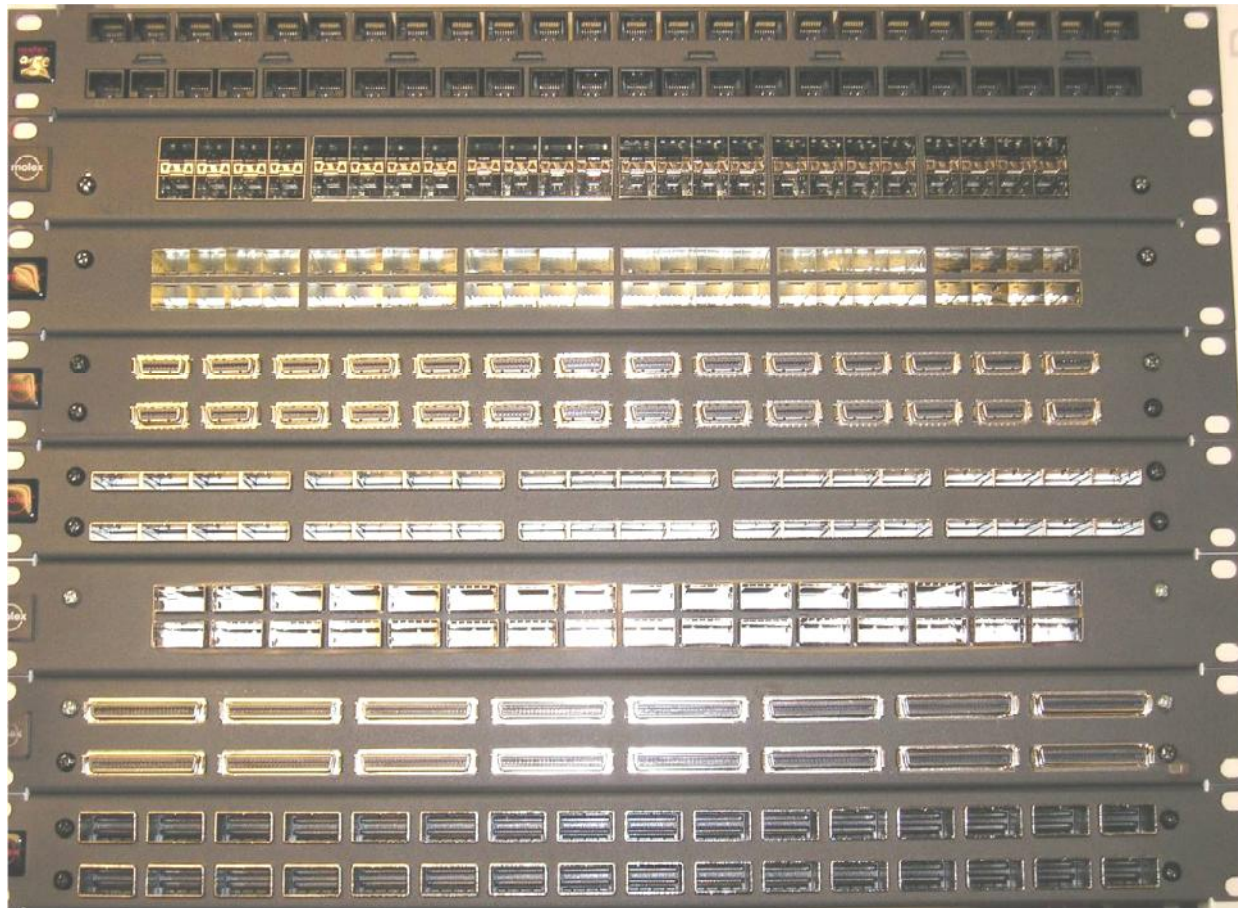
- 3m over passive copper
- 30m Active cables
- 30-100m over MMF
- 500m over SMF
- 2km over SMF

What are the requirements for broad market potential?

- High density/small form factor for shorter reaches
 - Quad lane or higher is required to meet density needs
- Low power
 - Passive copper or active cables

Port density options

Note: Higher densities coming soon



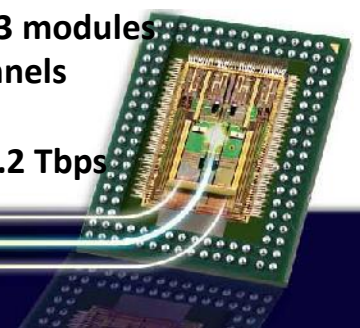
Channels/Bandwidth

RJ-45 – 48 Channels
10GBaseT = 480 Gbps

SFP+ – 48 Modules
48 Channels
1x50G
50GE = 2.4 Tbps

QSFP+ 36 modules
144 Channels
4x100G
400GE=14.4Tbps

CDFP – 13 modules
104 Channels
8X50G
400GE=5.2 Tbps

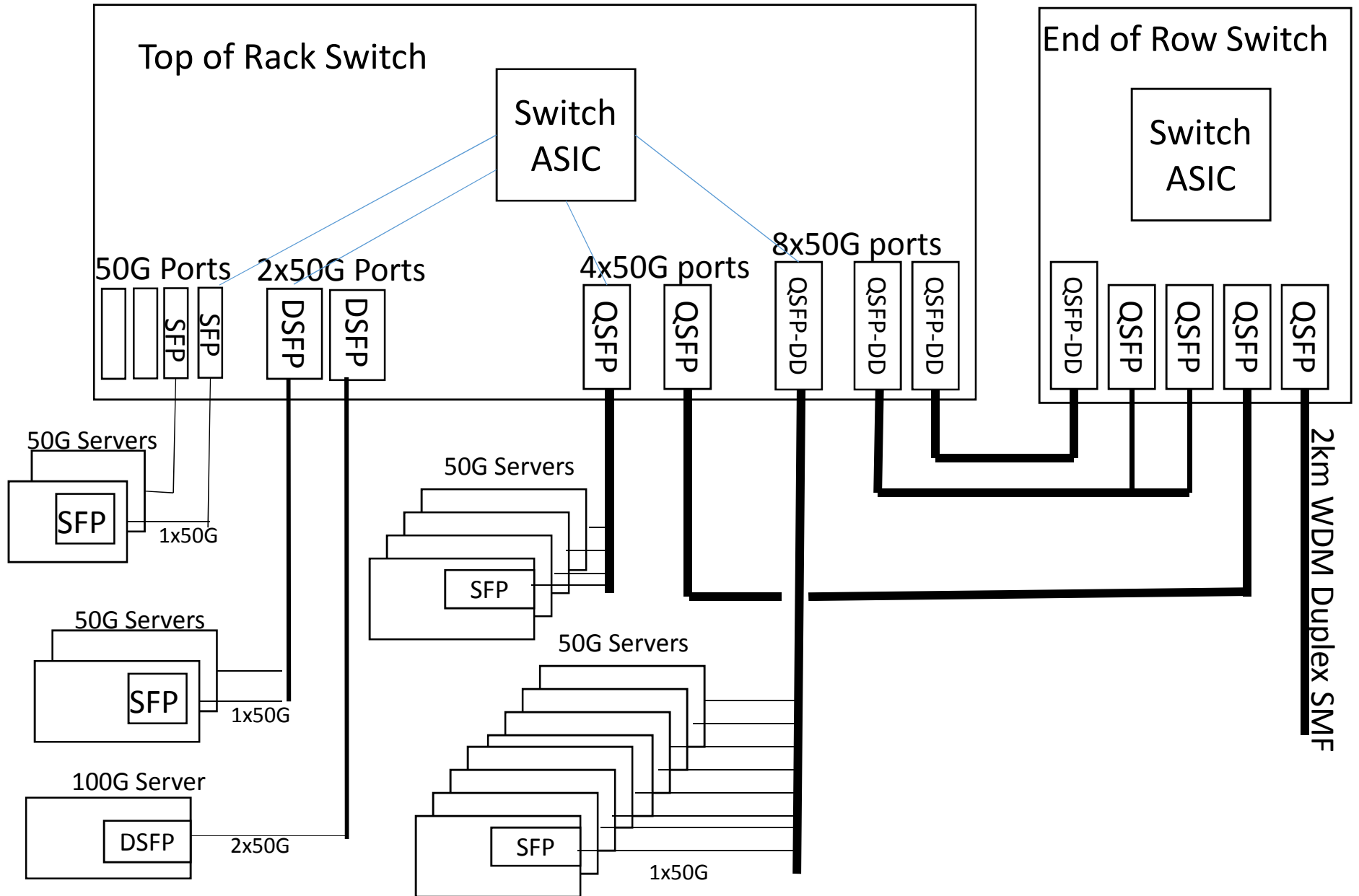


Infrastructure

- Copper cable
- Parallel fiber MMF
- Duplex SMF
- Parallel fiber SMF



Breakout options



Objective options for 50-100-200G

Electrical (AUI)

- 1x50G (LAUI?), 2x50G (CAUI2?), 4x50G (CCAUI4?)
- 2x100G (CCAUI2?)

Electrical (CR)

- 50G-CR1
- 200G-CR4

Optical

- Parallel MMF:
 - PMM4x50G
 - PMM8x25G
 - 400G-SR16 compatible
- Parallel SMF
 - PSM4x50G
 - PSM2x100G
 - 400G-DR4 compatible
- Duplex SMF
 - 8x25G/ lambda
 - 4x50G/ lambda
 - 2x100G/ lambda

Conclusions

- We need to support 1x50G, 4x50G and 8x50G chip to module electrical.
 - Can we just reference CDAUI-8?
- Need to have PMD objectives that support breakout
 - 1,4,8 lane passive copper
 - 1,4,8 lane active cables
 - 1,4,8 lane PSM for MMF and SMF
- If there is a 100G project it should include a single lane of 400G-DR4 to facilitate breakout.
- WDM should not be considered for 500m reach objective
 - Needed for 2km and above
- Need to consider no FEC solutions for HPC and data center switch to server interconnect
 - Support no FEC active cables?