THE CASE FOR 100G OVER 2 LANES

Rob Stone

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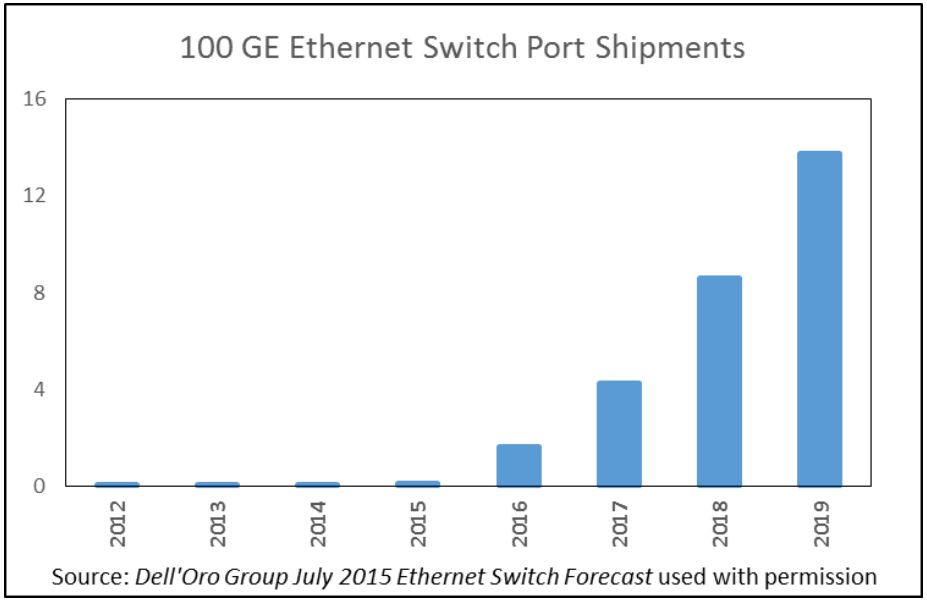
SUPPORTERS

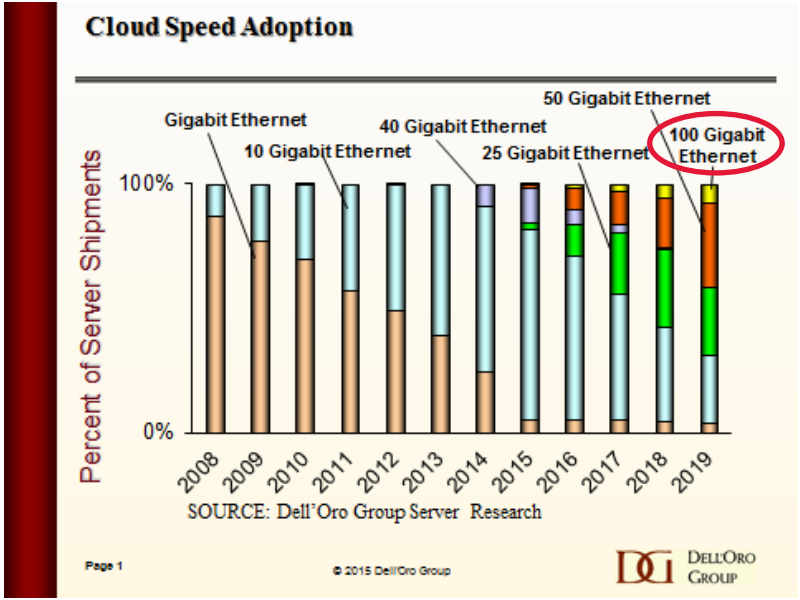
- Vasu Parthasarthy, Broadcom
- Scott Kipp, Brocade
- Tom Palkert, Molex
- Scott Somers, Molex
- Eric Baden, Broadcom
- Mark Gustlin, Xilinx
- Greg McSorley, Amphenol
- Chris Cole, Finisar
- Brad Booth, Microsoft
- Kent Lusted, Intel

MARKET

- **100G currently is and will remain an important port speed**
  - Network Spine - forecast > 13M ports in 2019
  - Server Attach (Migration from 1G → 10G → 25G → 50G → 100G)



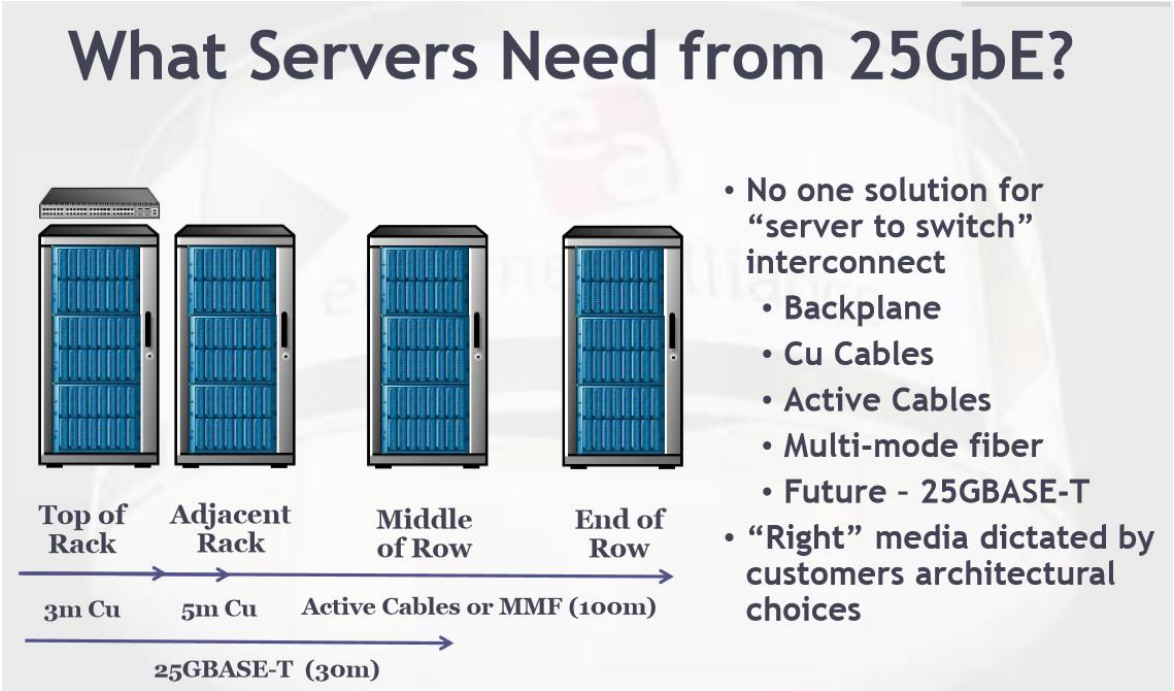
Source: *Dell'Oro Group July 2015 Ethernet Switch Forecast* used with permission



Source: Dell'Oro *Controller and Adapter Forecast July 2015* - Used with permission

PMD OPTIONS NEEDED

- **Server attach is evolving – *not just DAC / Backplane***
  - (Argument from 25GbE, but holds for higher server attach speeds)



Source: http://www.ethernetalliance.org/wp-content/uploads/2014/12/Introduction-to-25GbE-Webinar_D2p1.pdf

OBSERVATIONS – MULTI-LANE PORT CONFIGURATIONS

25G Serdes 4 Lane Port

Port Speed (Gb/s)	Lane Rate (Gb/s)	# Ports Possible in 4 lanes
100	25	1
50	25	2
25	25	4
40	10	1
10	10	4

50G Serdes 8 Lane Port

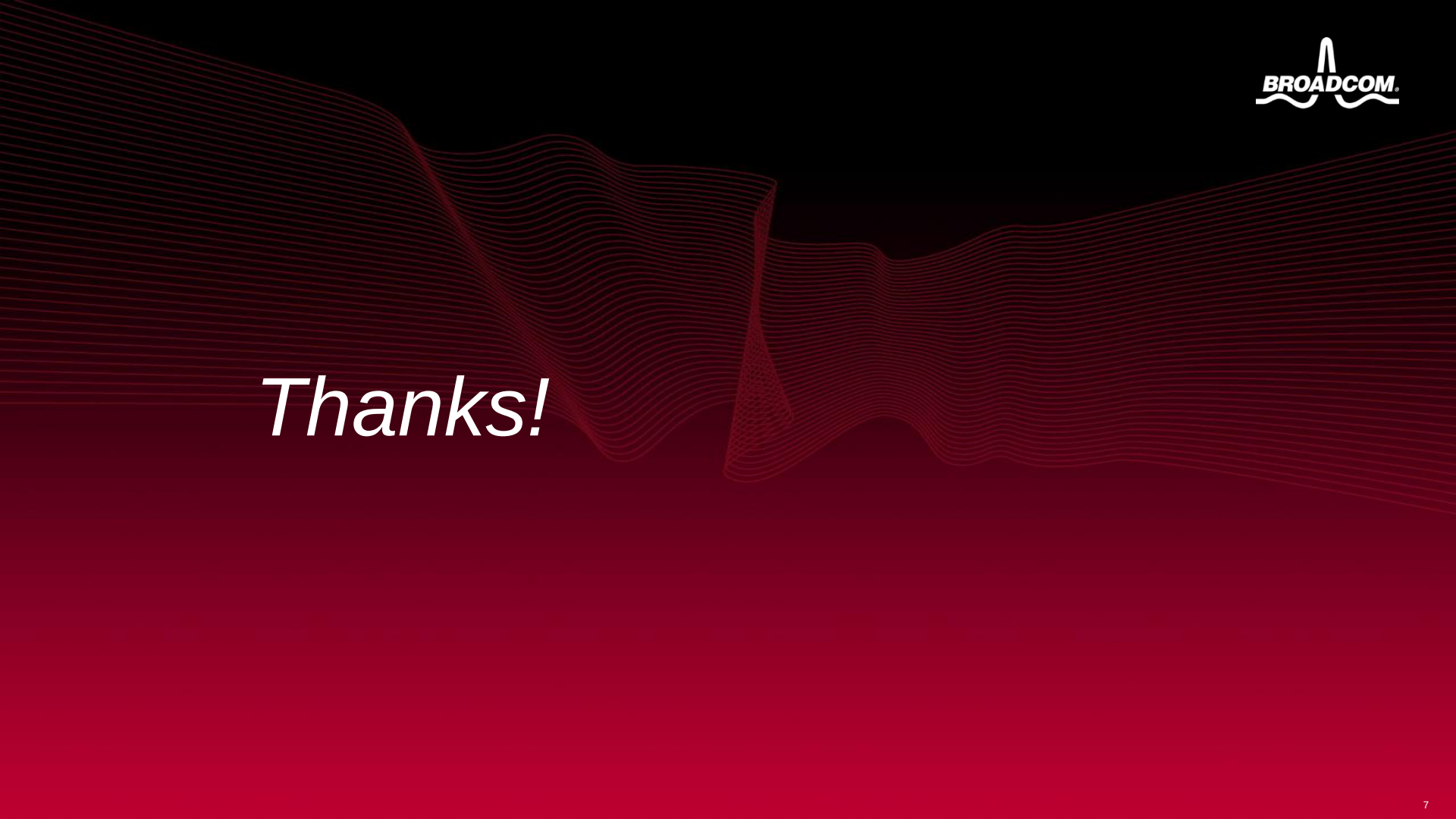
Port Speed (Gb/s)	Lane Rate (Gb/s)	# Ports Possible in 8 lanes
400	50	1
200	50	2
100	50	4
50	50	8
100	25	2
50	25	4
25	25	8

2 x more lanes needed in "downspeed" mode

- **Typically multi-lane ports can be configured to support different rates**
- **Optimal efficiency in terms of ASIC IO when operating at max serdes speed**
  - Least # lanes (lowest cost PMDs)
  - For switches – highest BW & Radix
    - → Lowest cost network

DISCUSSION

- **100GE is forecast to remain an high volume, important rate through at least 2019**
  - The industry will take advantage of opportunities to improve 100GE efficiency
    - Maximize ASIC bandwidth (run lanes at max serdes speed) – 2 x better
    - Minimize PMD width (lower cost) ~ 2 x lower cost (PMD dependent)
  - IEEE is the right venue to do this work!
- **100G over 2 lanes is a viable technology, bookended by 802.3bs and OIF-CEI-56G work**
  - In contrast 100G / lane electrical technology is still very early stage (too early for standardization)
- **It is highly probable that vendors developing multi-lane ports will implement the whole set of port speeds**
  - (For 50G serdes, this means 50, 100, 200 and 400GE)
  - If we undertake 50 and 200GE logic standardization, incremental effort to do 100G is small
- **Including 100G over 2 lanes in the 50 / NGOATH projects will enable beneficial architectural and logic consistency with other IEEE port speeds**



Thanks!