

# 40GbE Host Controller Economics

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# Supporters

- Ali Ghiasi, Broadcom
- Howard Frazier, Broadcom
- Ilango Ganga, Intel
- Rob Hays, Intel
- David Martin, Nortel Networks
- Andy Bechtolsheim, Sun
- Shimon Muller, Sun



# Why not 4x10G Link Aggregation?

- 1x40GbE link will Cost Less than 4x10GbE links
  - 4 aggregated links cost 4 times as much as a single link
- 1x40GbE Link will be Lower Power and Smaller than 4x10GbE Links
- 4x10GbE Links Don't Provide Line Rate Performance
- Management complexity of load balancing 'N' ports in host & switch
- Cable management: Maze of cables in the data center

**4 x 10GbE is not efficient compared to a single 40GbE link**

# Why is 40GbE less cost than 4x 10GbE?

- The Network Controller has the following functions

- PHY interface
- Host Interface

- MAC

- Memory

- Logic (Packet processing, Queues, offload, etc.)

- Control and Management

} Fixed

} Shared

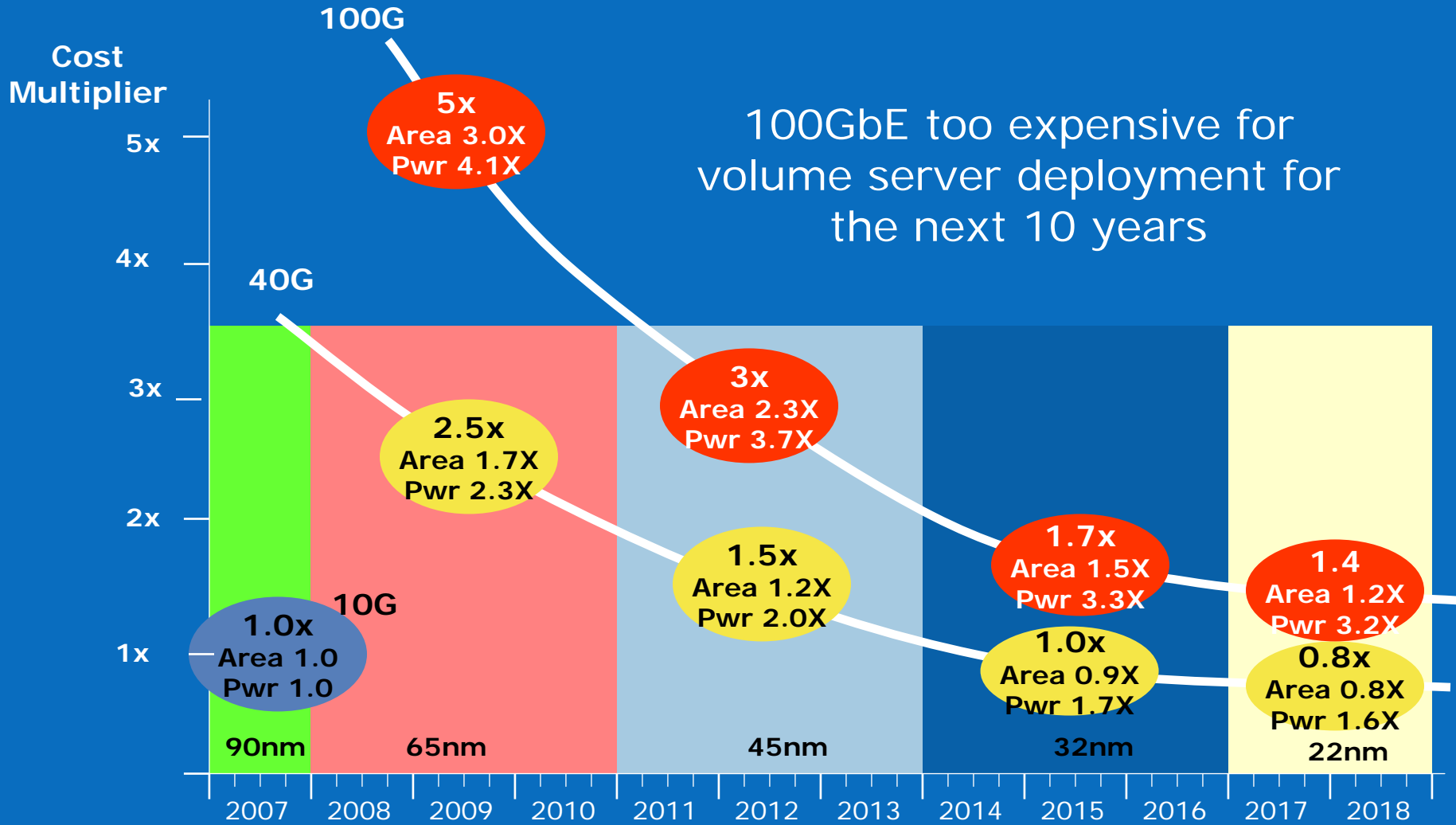


10G  
(blocks not to scale)

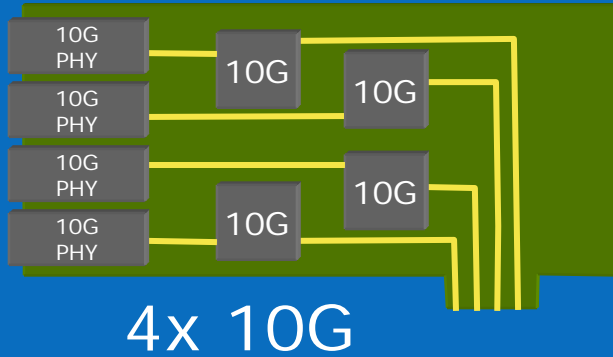
- In a 4 x 10G Link aggregation all functions are multiplied by 4
- In a 40GbE Controller many functions can be shared, reducing the die size

**Power and Cost can be lowered significantly for 1x40GbE**

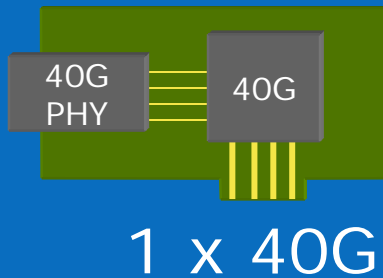
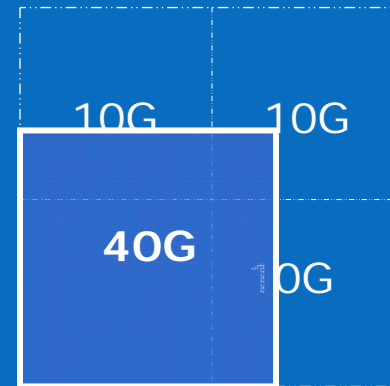
# Host Controller Cost Estimation



# Cost of 40GbE vs 4x 10GbE



40G < 1/2 (4x10G)  
Die Size



**40G is lower cost, lower power, and uses less board space**

