

40GbE Market: Timing and Opportunity

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Topics and Objective of the Presentation

- A system vendor perspective on the 40G SMF serial vs. CWDM dilemma:
 - The big picture: assessing the 40G market time line and opportunity for switch ports and transceivers
 - Market opportunity for 40G SMF interfaces
 - Why 40G Serial is not worth the risk

Data Center Architecture

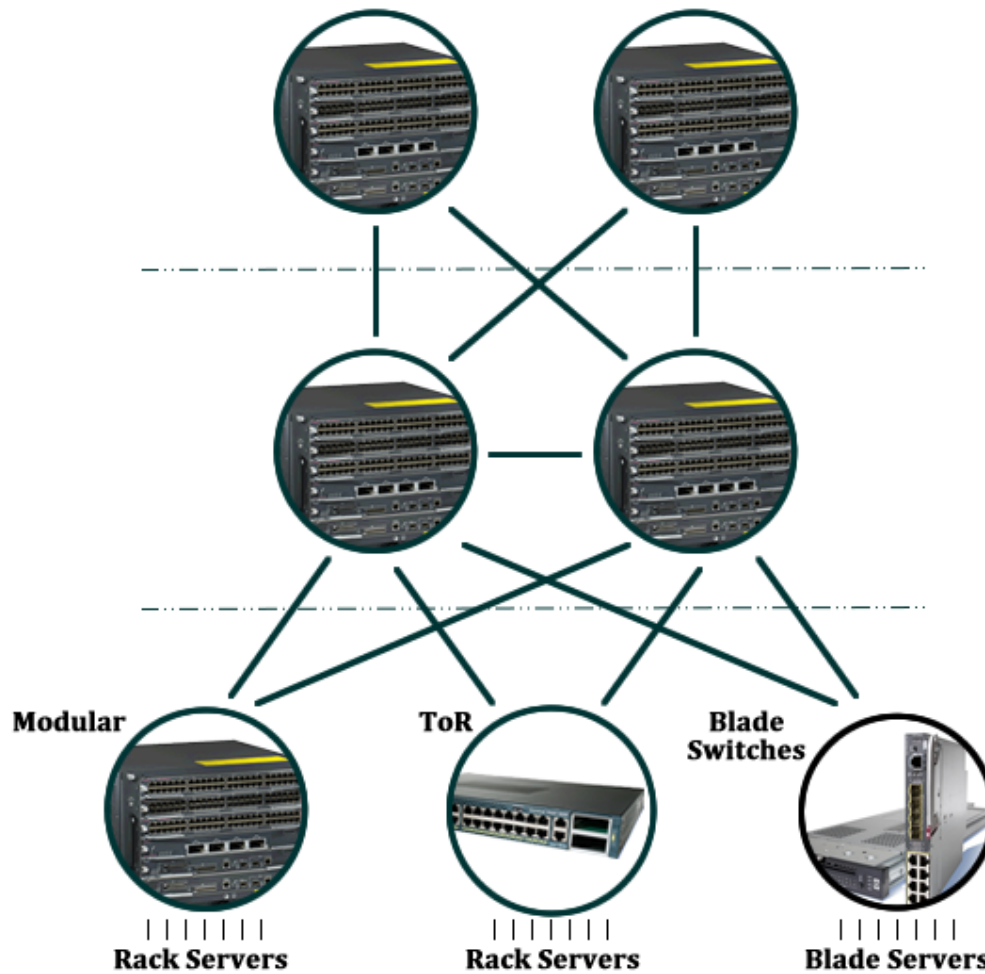
Metro/WAN

Core

Distribution

Access

Server



Fiber

Fiber

Copper

10G Fiber Ports is a mature market in DC core and aggregation: >>1.5M ports (Based on Dell'Oro - July 2008)

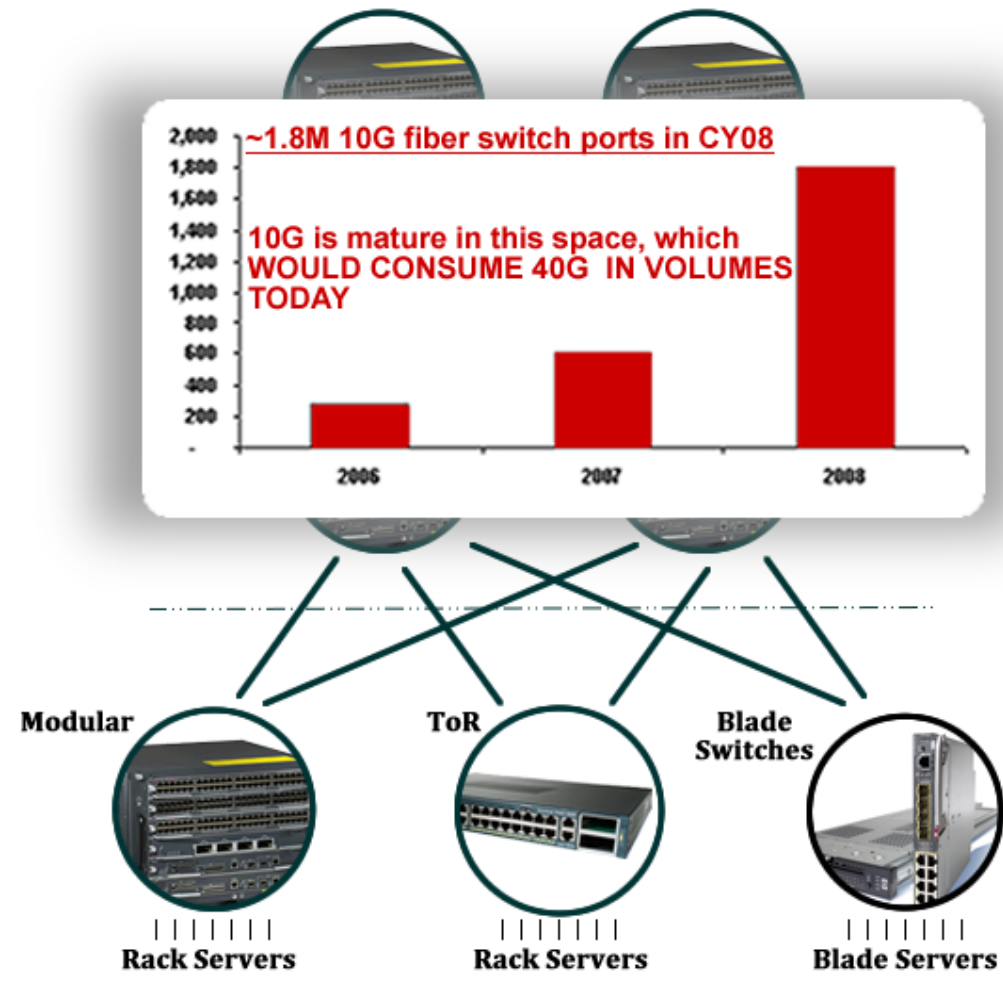
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Timeframe for 10G/40G to the server

(Based on chart from hays_01_0407)

Metro/WAN

Core

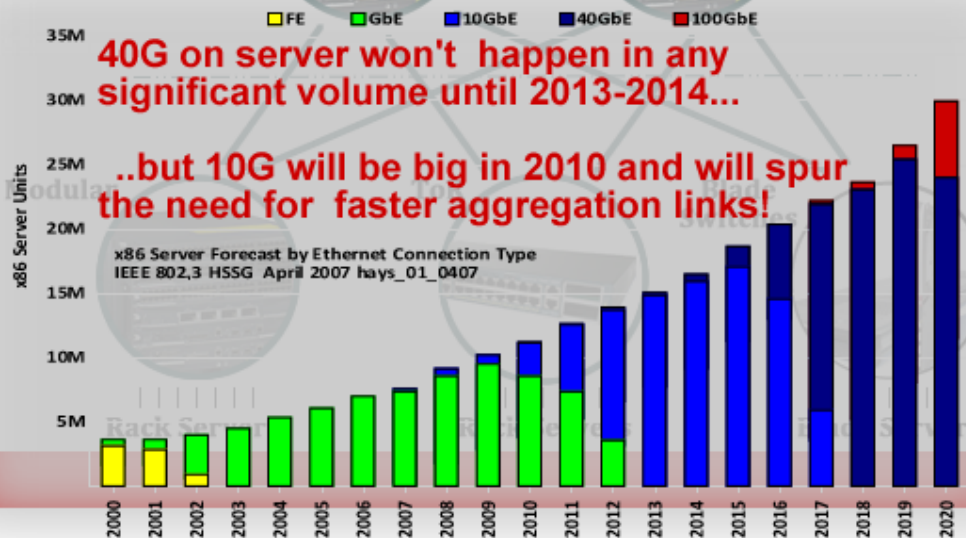
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Switch Form Factor Effect on 40G

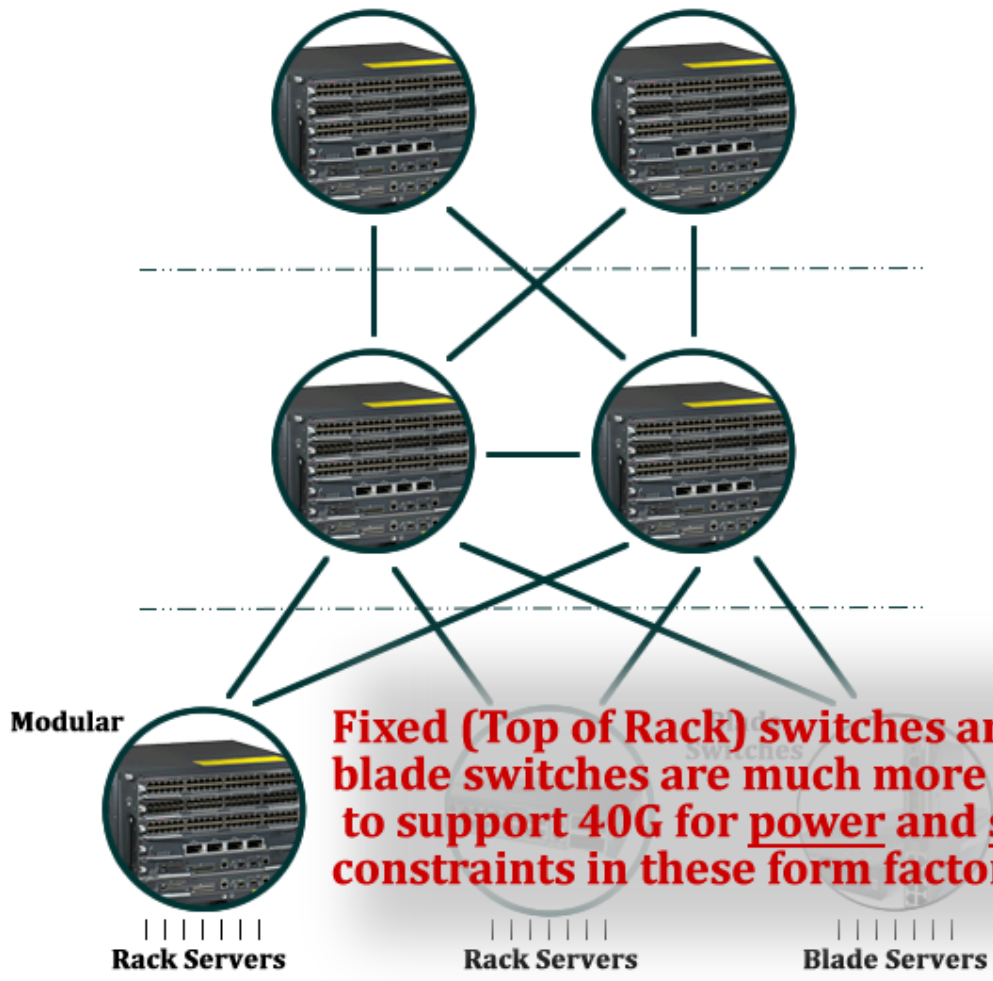
Metro/WAN

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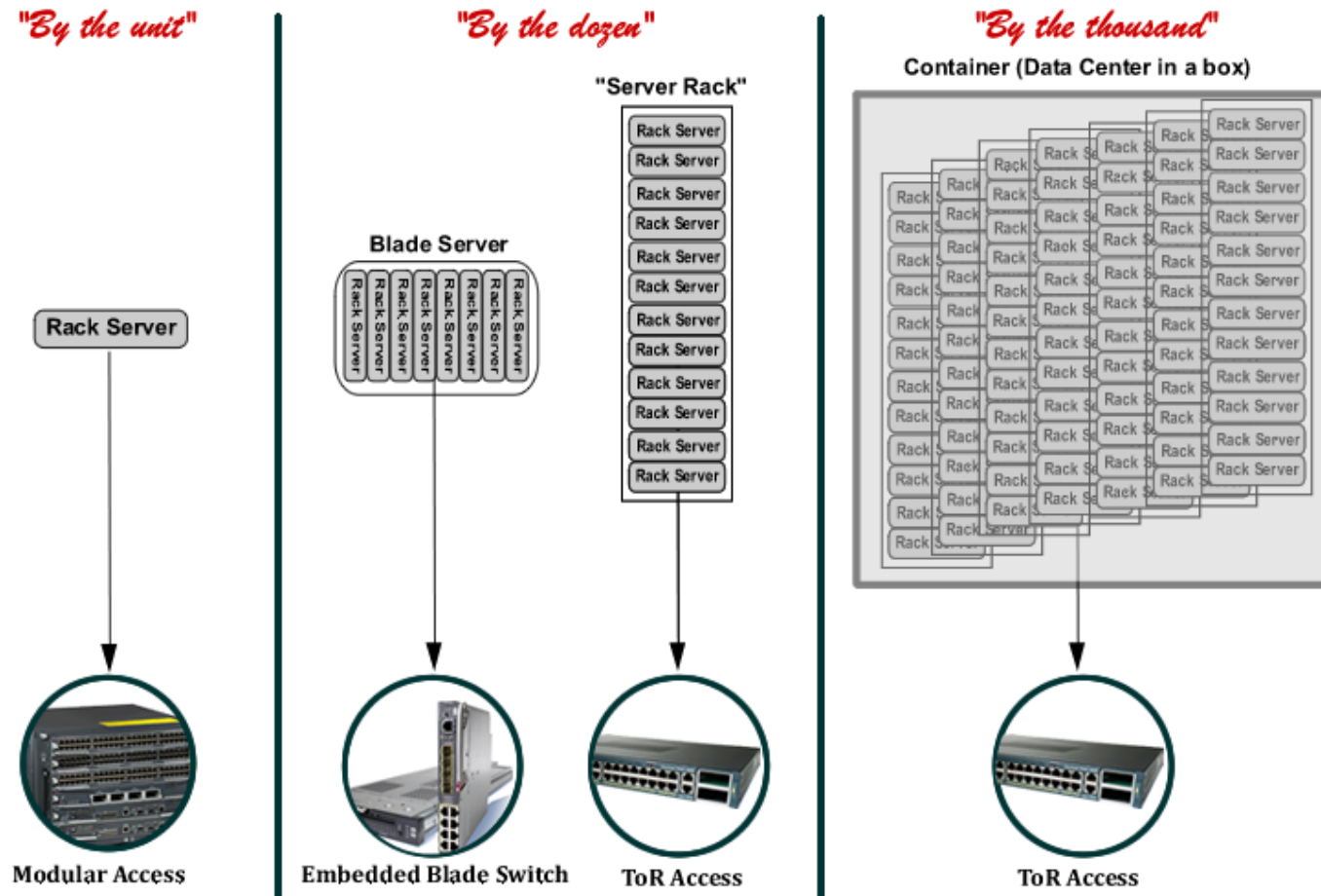


Fiber

Fiber

Copper

The concept of “computing unit” is changing... ...and so is the access switch that goes with it

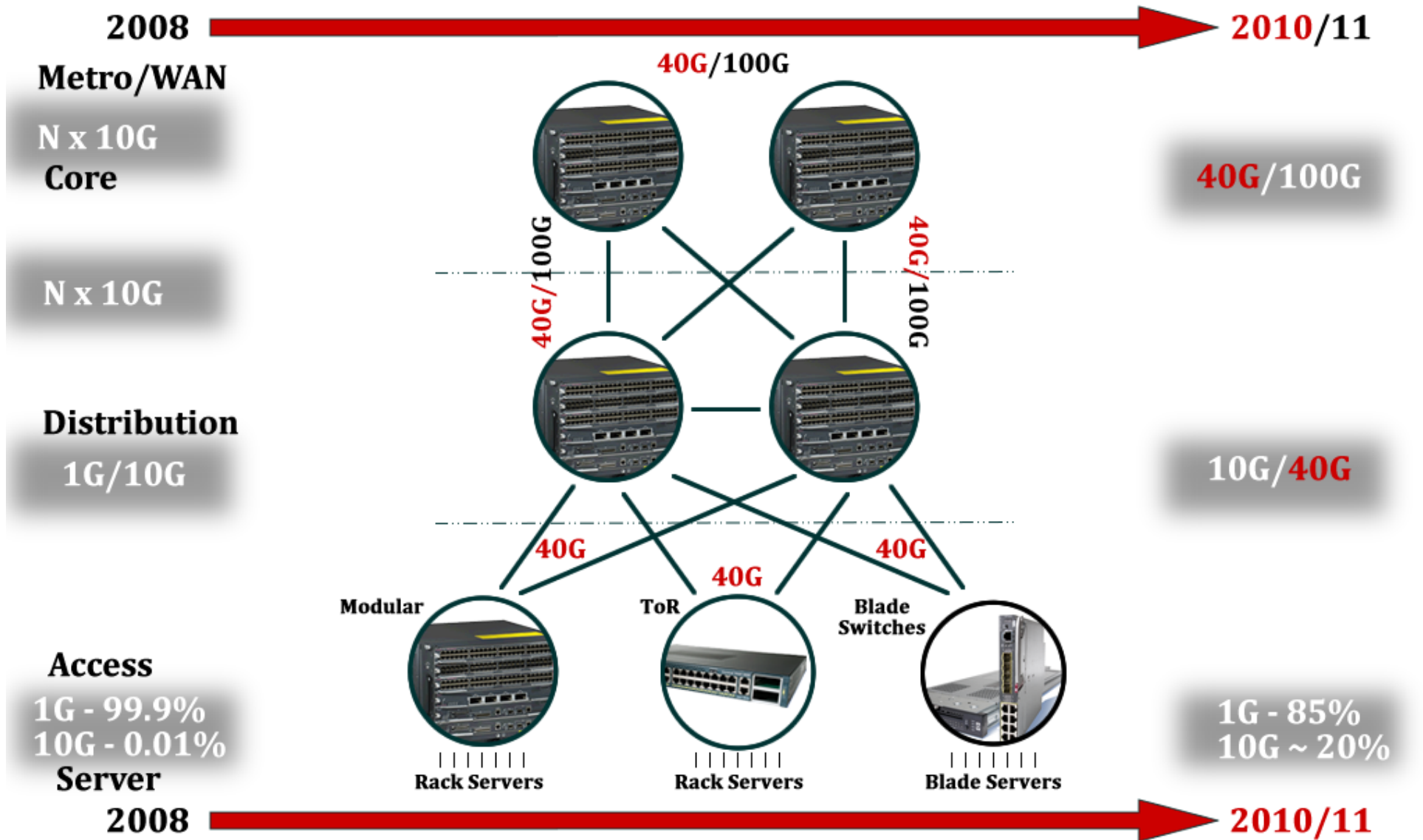


TOR and Blade Switches are the **fastest growing segment of Data Center access**

The uplinks of these switches are **driving the adoption of 10GbE** in the distribution/core **TODAY...**

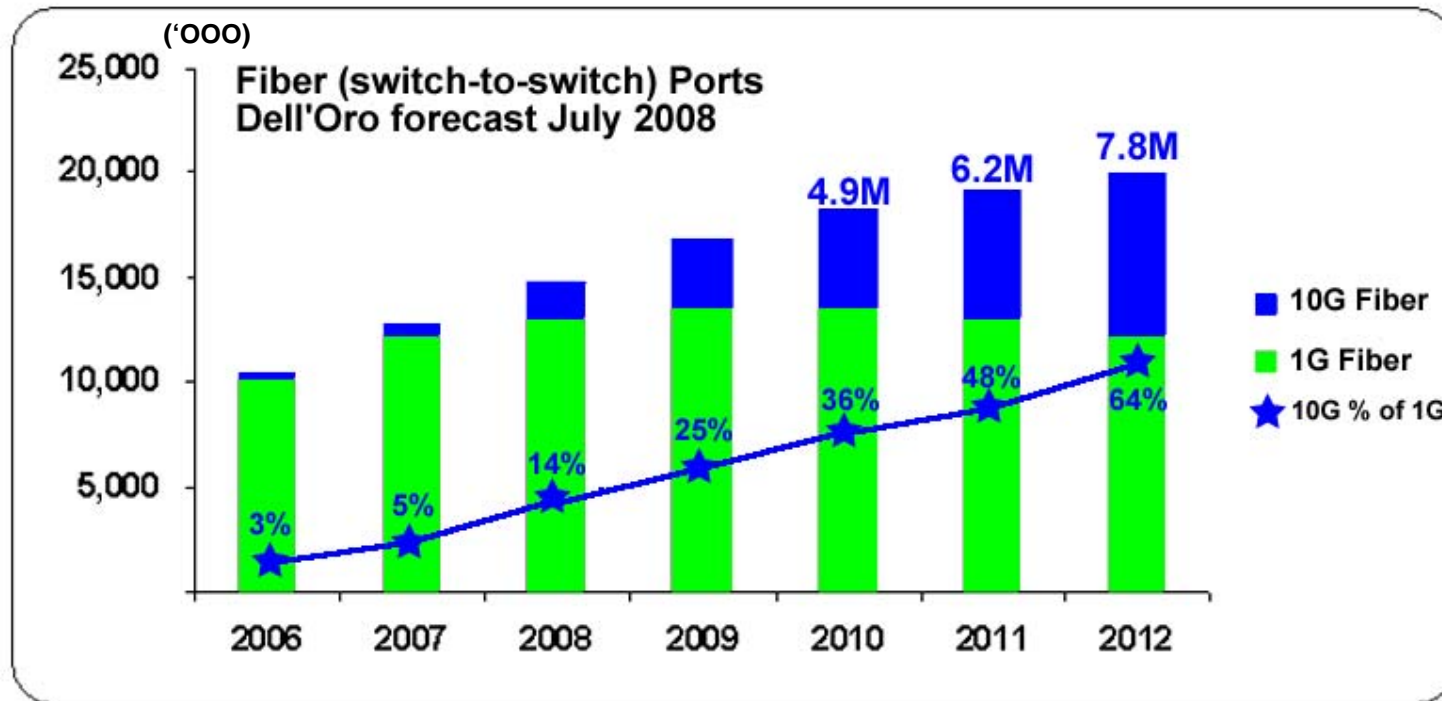
...and will **drive volumes of 40 GbE** in the Data Center from **2010**

Putting it all together: Data Center Opportunity for 40G



40G Switch Ports Market Potential

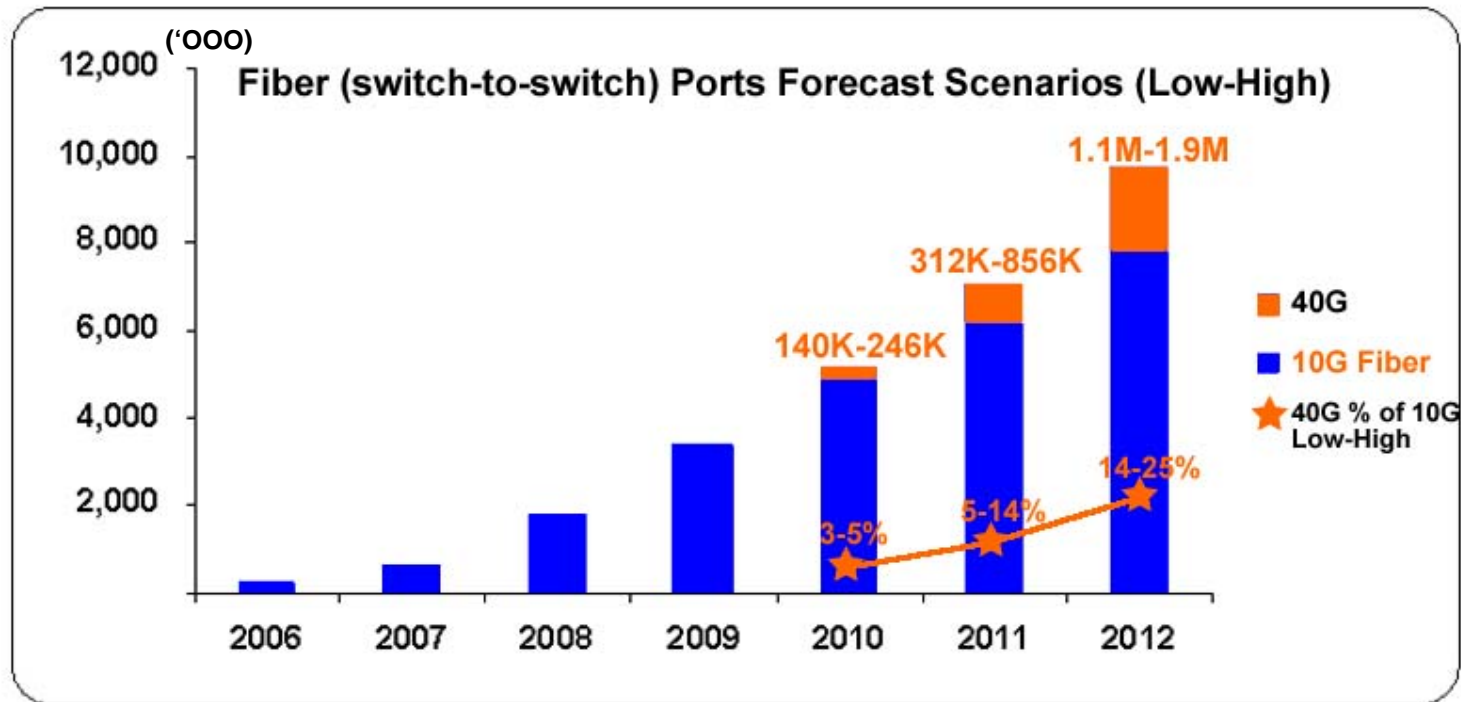
A look the 1G → 10G transition



NOTE: 10GBASE-L cost multiplier over 1000BASE-LX has been virtually unchanged since 2005-2006 at 10X!

40G Switch Ports Market Potential

High and Low estimate



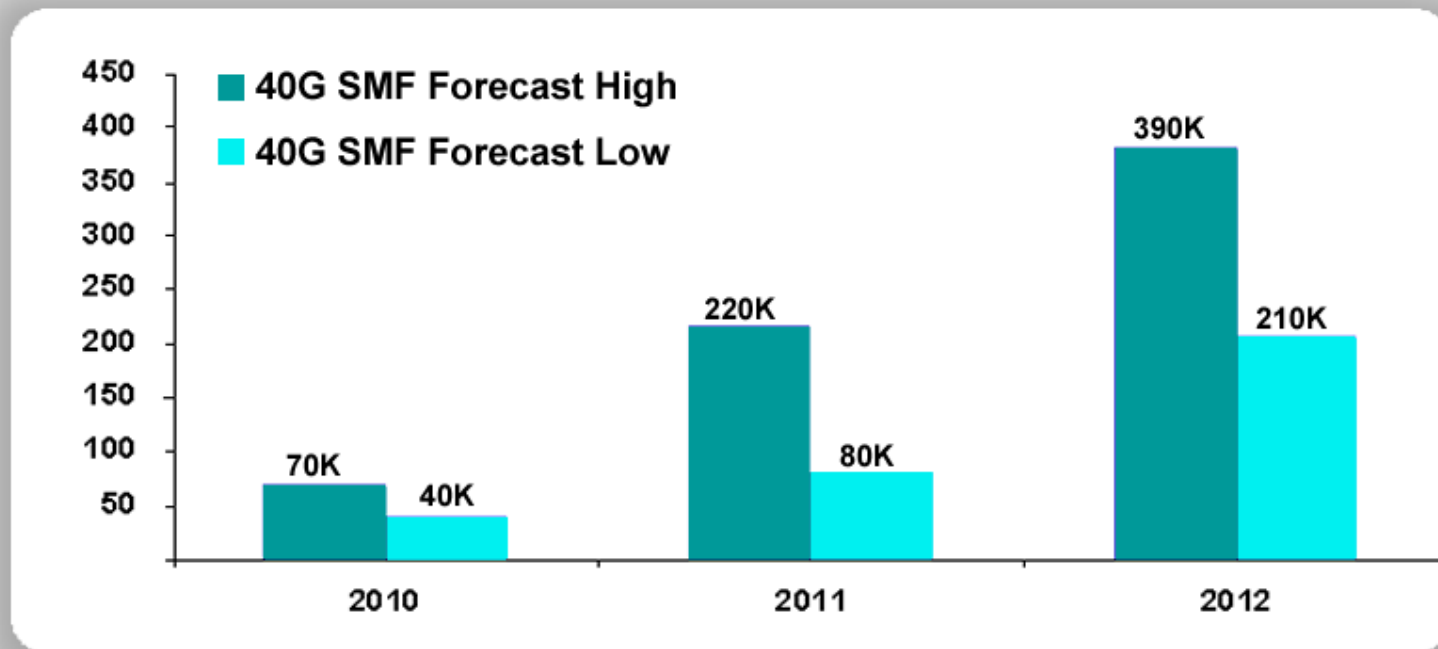
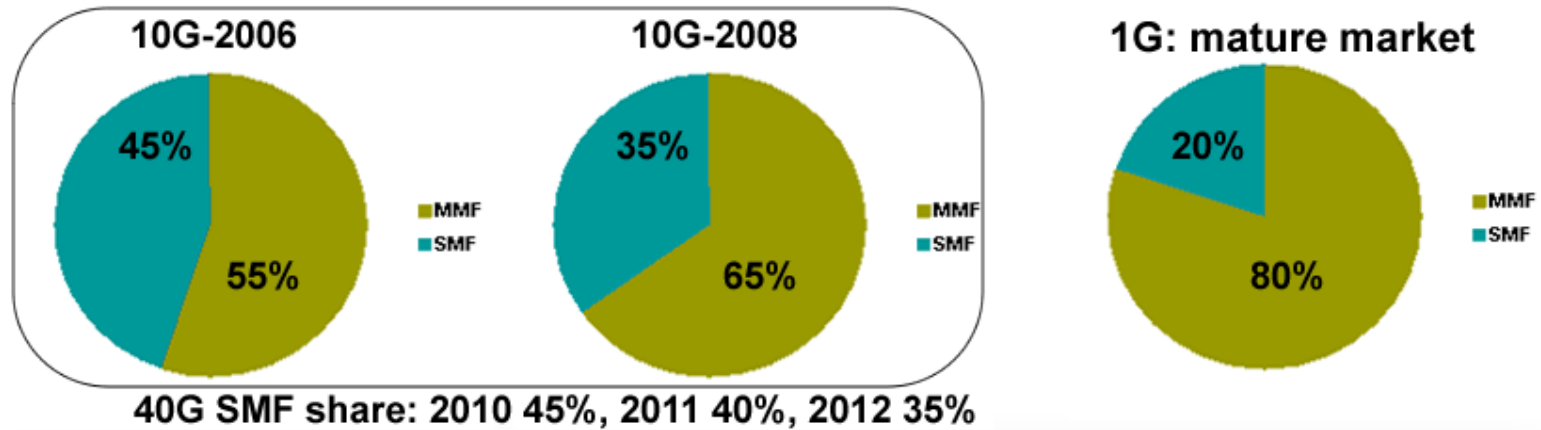
NOTE 1: the % assumption in 2010+ are taken from the 10G/1G transition in 2006+ (see previous slide).

NOTE 2: note all ports will be populated with an optical interface.

40G SMF Cost Assumptions

- The **1G→10G SMF** transition for volume adoption required **~10X the bandwidth at 10X the cost**.
- 40G Ethernet if it existed today, would be deployed in volumes → the bandwidth need, the operational and fiber savings are already in place for 40G.
- The following **40G SMF estimate assume a 6X-4X cost premium over 10G**. (6X in 2010 trending down to 4X).

40G SMF PMD market potential



“What if” 40G SMF Cost Scenario

- If 40G SMF comes out at **10X-15X** the following SMF market **estimate** would be **reduced by roughly 80%** (based on historical data presented in carter_40_01_0208)

Why 40G Serial it is NOT worth the risk

- 10G fiber is a mature market in data centers today and if 40G were available at the right cost it would be deployed in volumes TODAY.
- While there is no consensus of where 40G Serial cost will be in the short and medium term, CWDM has the right and well understood cost structure 6X→4X over 10G SMF.
The 10G SMF experience proves that bandwidth needs and operational savings justify a 10X premium for 10X the speed.
- From a switch vendor perspective CWDM is the best approach to balance risk and cost with the development time frame of the 40G SMF market.