



# 40G SMF Ad-Hoc Summary

**Alessandro Barbieri**  
**[abarbier@cisco.com](mailto:abarbier@cisco.com)**

# Agenda

- Material presented during the Ad-Hoc meetings
  - Broad Market Potential
  - Technical Feasibility
  - Economic Feasibility
- PAR and 5 Criteria

# 40GbE SMF PMD Ad-hoc presentations recap

- 4 ad-hoc teleconferences were held with ~20-30 attendees per call.
- A total of 8 presentations (before this one) were reviewed around the topics of Technical Feasibility, Economic Feasibility and Broad Market Potential:

## **TF:**

[http://www.ieee802.org/3/ba/public/AdHoc/40GSMF/Tsumura\\_40\\_01\\_0208.pdf](http://www.ieee802.org/3/ba/public/AdHoc/40GSMF/Tsumura_40_01_0208.pdf)

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## **EF:**

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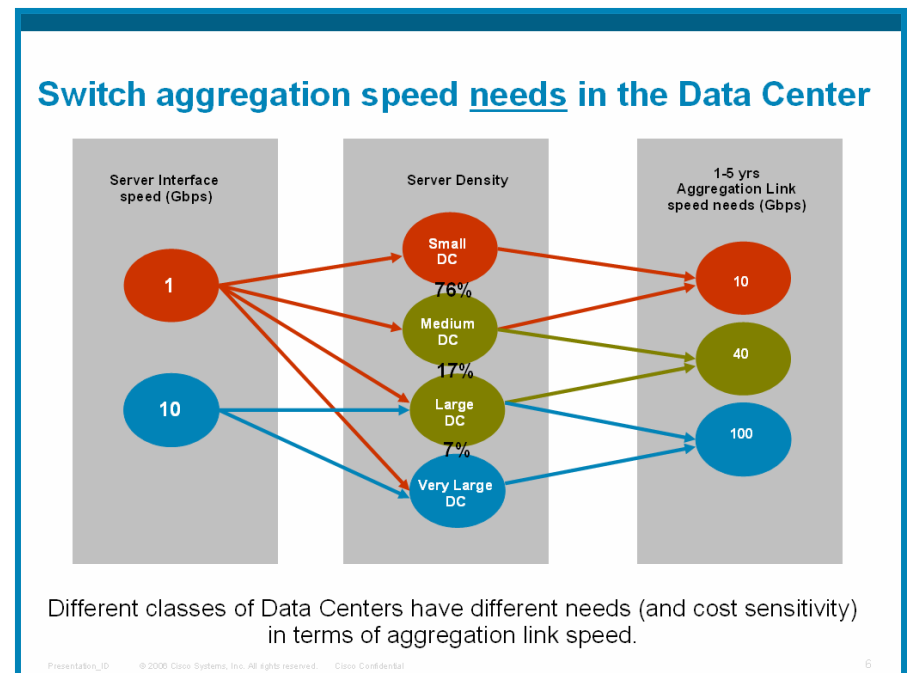
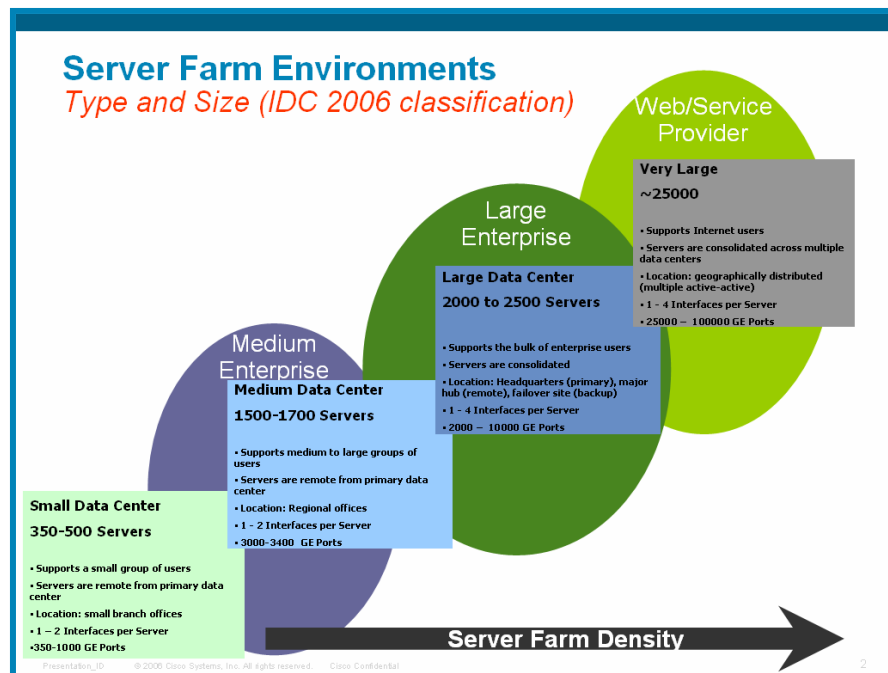
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# 40GbE SMF Broad Market Potential

## *\*Data Center Core\* (carter\_40\_01\_0208.pdf)*

- Different classes of Data Centers have different needs in terms of aggregation link speed determined by different requirements for server speed and server density.
- There is a broad market for 40GbE SMF to address the needs of Tier 2 and Tier 3 data center core links.

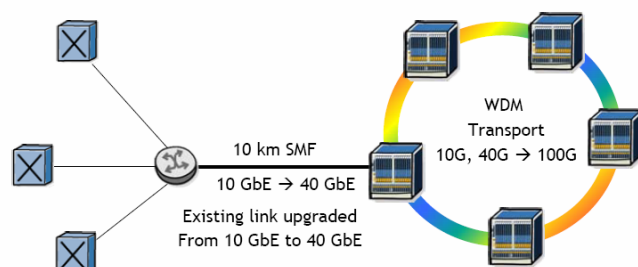


# 40GbE SMF Broad Market Potential

## *\*Carrier Networks\* (simsarian\_40\_01\_0308.pdf)*

- Data applications in carrier network can realize the benefits of 40GbE, while video applications will demand 100G.
- 40GbE overcome the inefficiencies of 4x10G.
- Respond to the OIF carrier group request to IEEE 802.3ba to support SMF.

### Difference in application bandwidth demands



- There will be a market for 100 GbE SMF driven by high-end applications - e.g. IPTV video on demand
- Web surfing: bandwidth per user ~ 100 kb/s vs. HD TV: bandwidth per MPEG4 HD stream ~ 8 Mb/s
- Metropolitan area network with 1 million households and 10% concurrency:
  - Video on demand generates ~800 Gb/s
  - Web surfing generates ~10 Gb/s
- Data applications can often be cost-effectively supported by 40 GbE switch interfaces
  - Connection from enterprise data center to 40 Gb/s WAN transport
- Need for 40GbE SMF comes from the diversity of applications
  - High-end, bandwidth intensive (e.g. entertainment networking) vs. cost-sensitive, data centric (e.g. computing)

### Problems with link aggregation

There are several reasons why link aggregation of 4 x 10 GbE is not satisfactory for many customers

- Fiber may not be available:



- Lower port density for multiple low-bitrate ports and increased OPEX from a larger number of managed ports



- Flow-based load balancing

## Why 10km for 40GbE SMF

- During a teleconference representatives from the Carrier community indicated that SMF is required to connect Enterprise customers to Central Office locations because the Enterprise and Carrier equipment is increasingly not co-located for Ethernet-based WAN interconnection to OTN/WDM transport services.
- 10km ensures adequate coverage from a Carrier perspective to reach a broad population of their Enterprise customers for shared WAN transport.

## Broad Market Potential for 40GbE

- 40GbE SMF meets the need of Tier 2 and Tier 3 end users (mid/large Enterprise), while 100GbE SMF meets the bandwidth requirements of Tier 1 end users (SPs, Web providers, High-end financial market)
- Given the well defined sets of end users and applications the impact of 40GbE SMF on the volumes of 100GbE SMF is going to be marginal.