

Server Link Lengths for ToR/Cabinet-to-Cabinet & EoR/Centralised Switching

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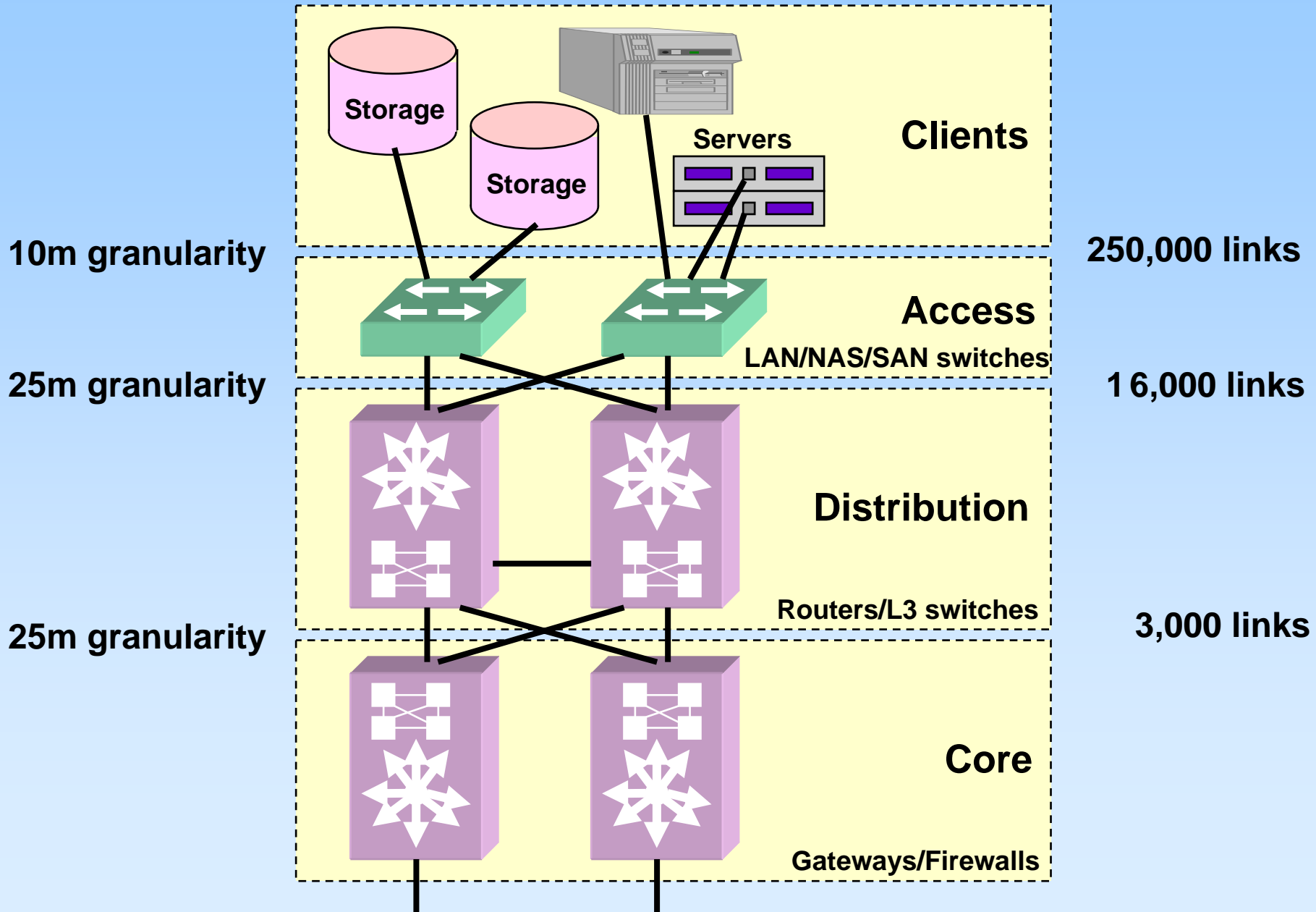
Historical Reference of Flatman Cabling Surveys & Market Analysis for IEEE 802.3 Projects

- July 1999** In-premises Optical Fibre Deployment to 2000
- Jan 2003** Installed Copper Cabling Forecast to end 2005
- July 2003** Installed Horizontal Cabling Length Distribution (office & medium-sized data centre)
- Mar 2004** In-premises Optical Fibre Installed Base to 2007
- Jan 2008** Enterprise Data Centre Link Survey

Flatman Data Centre Cabling Survey

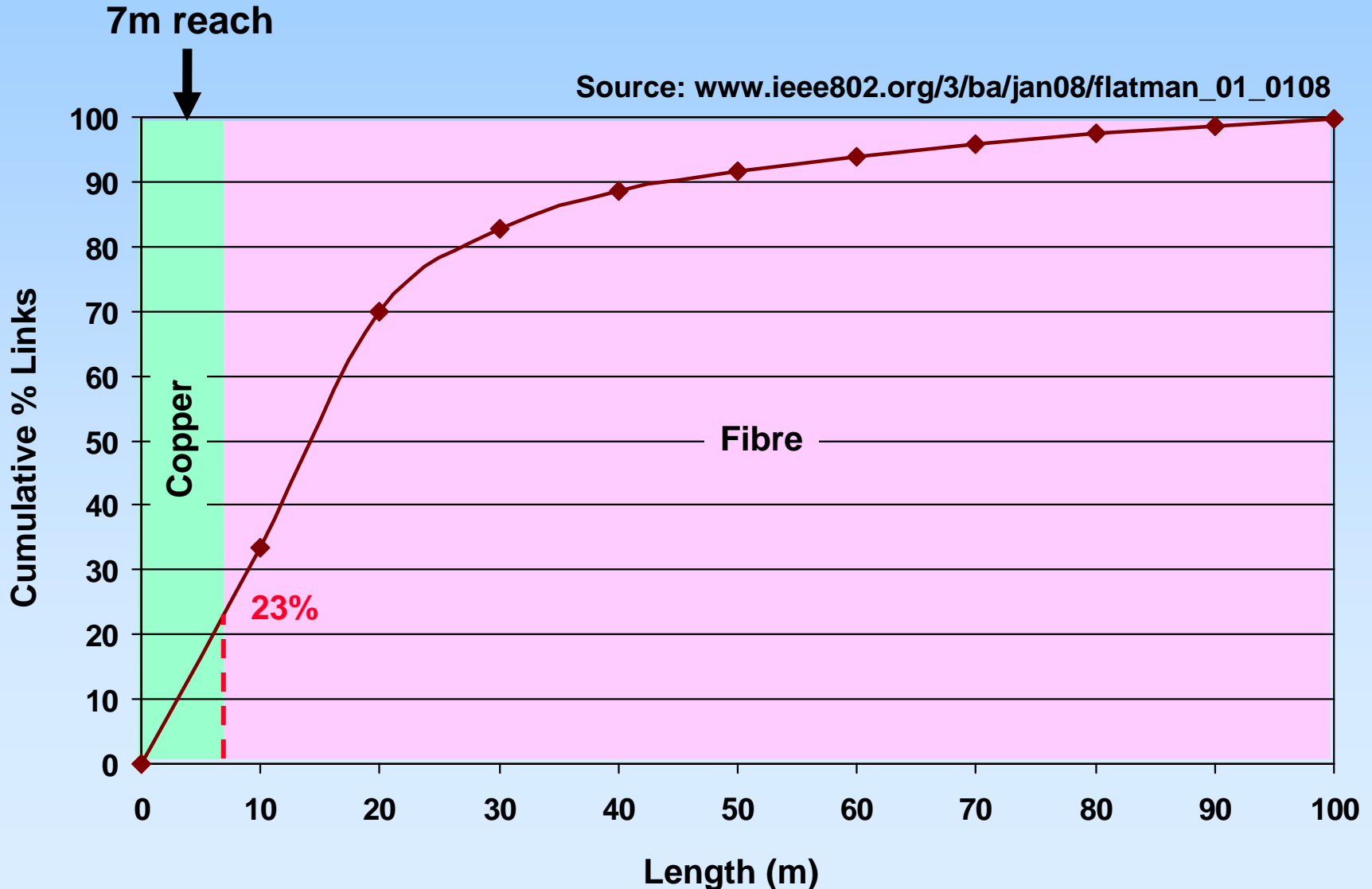
- **summary presented to IEEE 802.3ba in Jan 2008**
 - www.ieee802.org/3/ba/jan08/flatman_01_0108
- **9 enterprise data centres from US, UK, Germany**
- **total data centre floor space = 715,000 square feet**
- **small, medium, large, v. large sizes (IDC classes)**
- **Flatman data good for EoR/centralised switching**
 - **expected to continue for small/medium data centres**
- **but now needs to take account of ToR switching & cabinet-to-cabinet links**
 - **being deployed mainly in large/v.large data centres**
 - **with much shorter server links than before**

Flatman Data Centre Survey Data



Data Centre Server-to-Switch Link Lengths for EoR/Centralised Switching

Source: www.ieee802.org/3/ba/jan08/flatman_01_0108



IDC Data Centre Size Classification

IDC₍₂₀₀₆₎ identifies 4 different types, distinguished by size:

Small Data Centre

- ~15,000 ft² raised floor
- 350-500 volume servers
- 1-3 high end servers

Medium Data Centre

- ~20,000 ft² raised floor
- 1,500-1,700 volume servers
- 4-5 high end servers

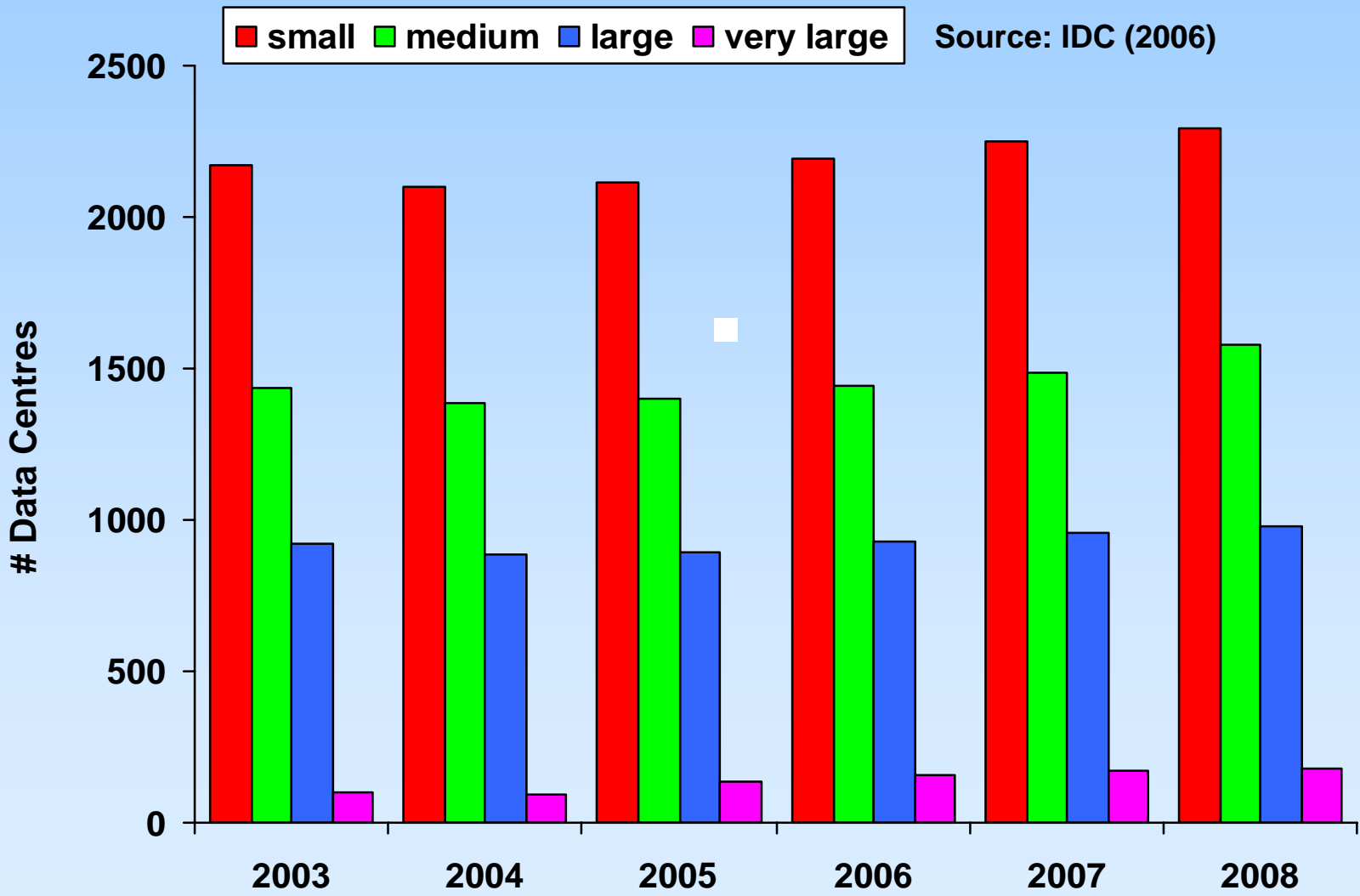
Large Data Centre

- ~35,000 ft² raised floor
- 2,000-2,500 volume servers
- 6-7 high end servers

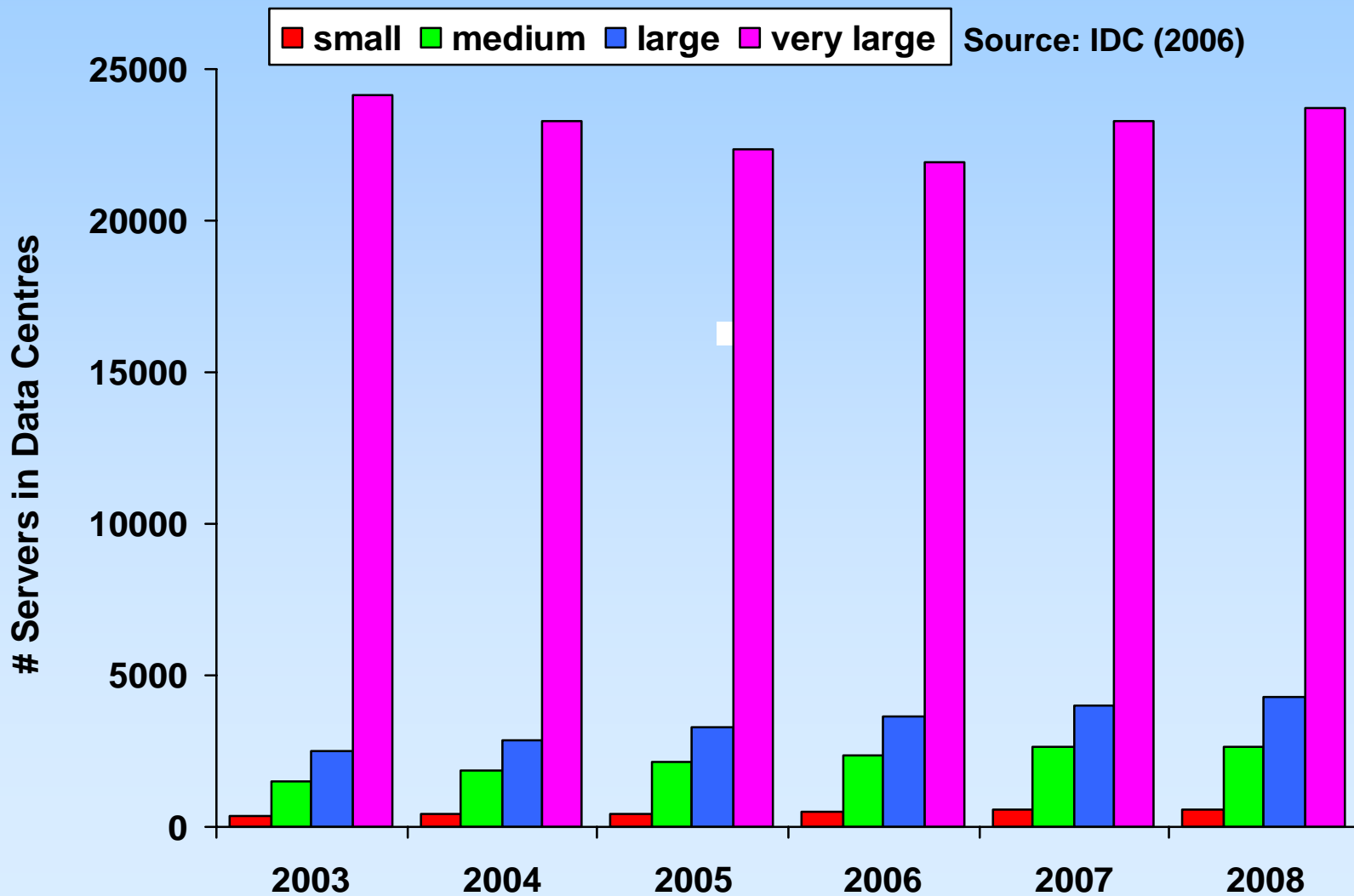
Very Large Data Centre

- >100,000 ft² raised floor
- <25,000 volume servers
- >8 high end servers

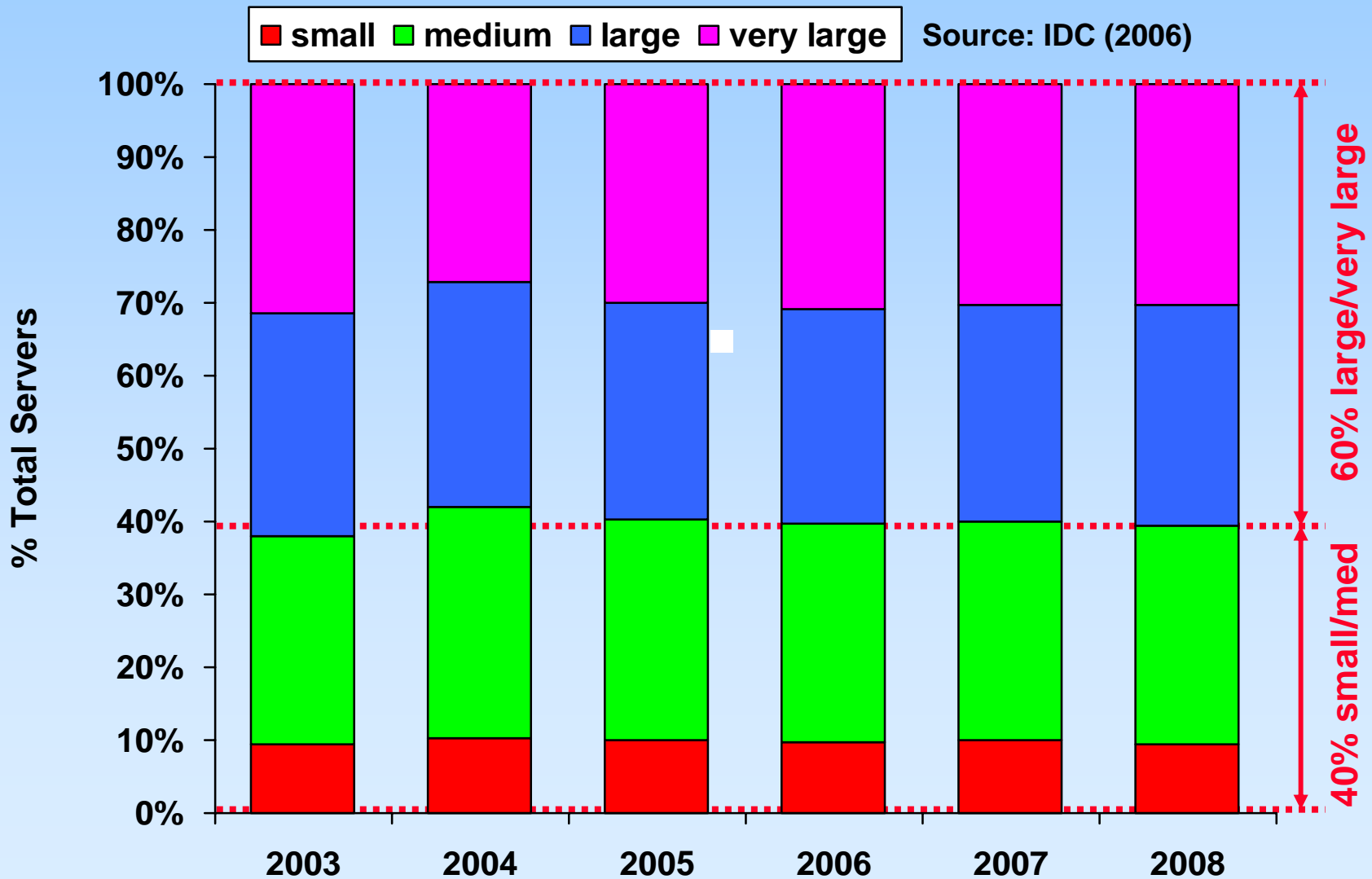
US Enterprise Data Centres by Size



US Enterprise Data Centres by Server Count

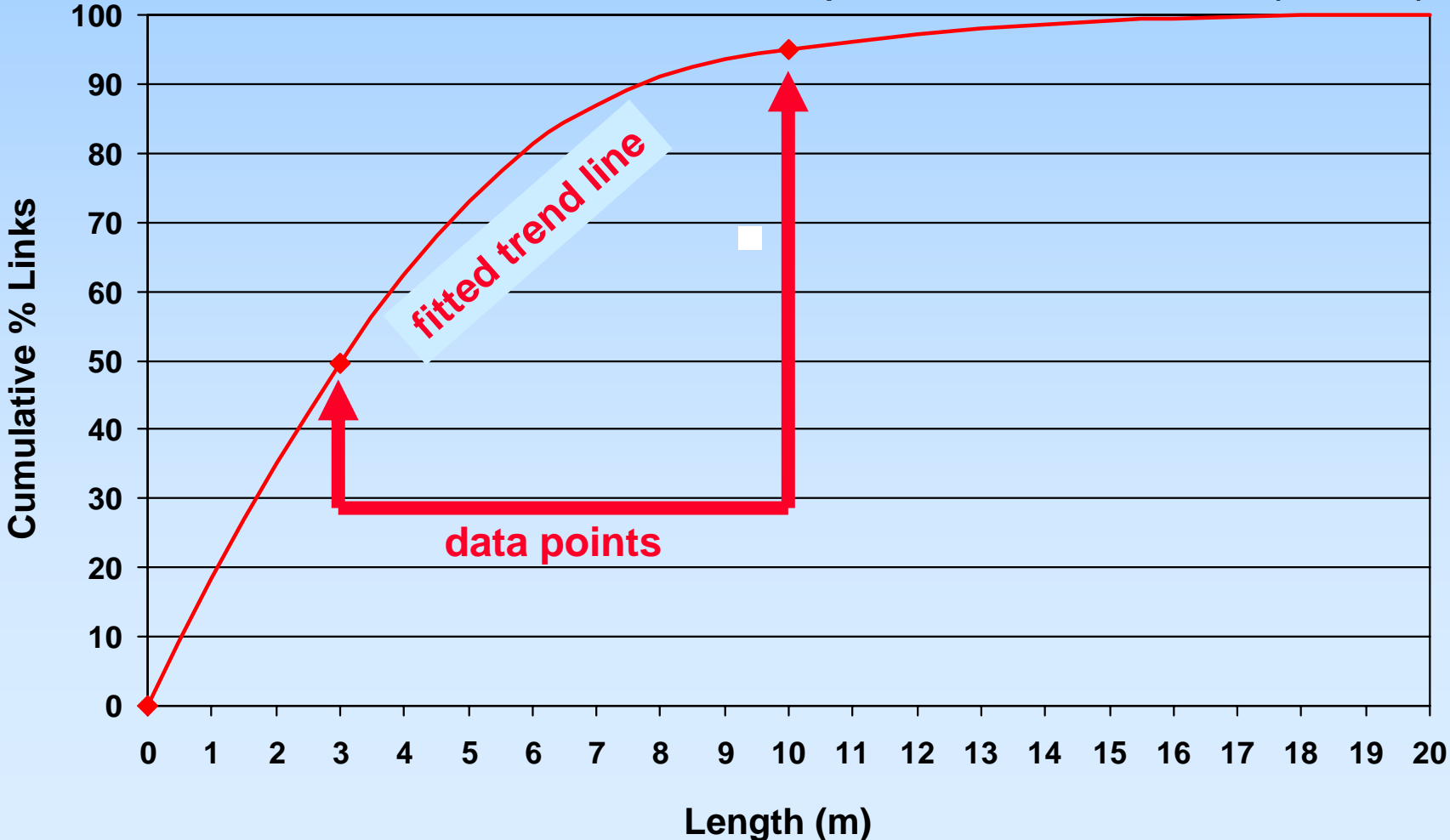


Total Servers in US Enterprise Data Centres

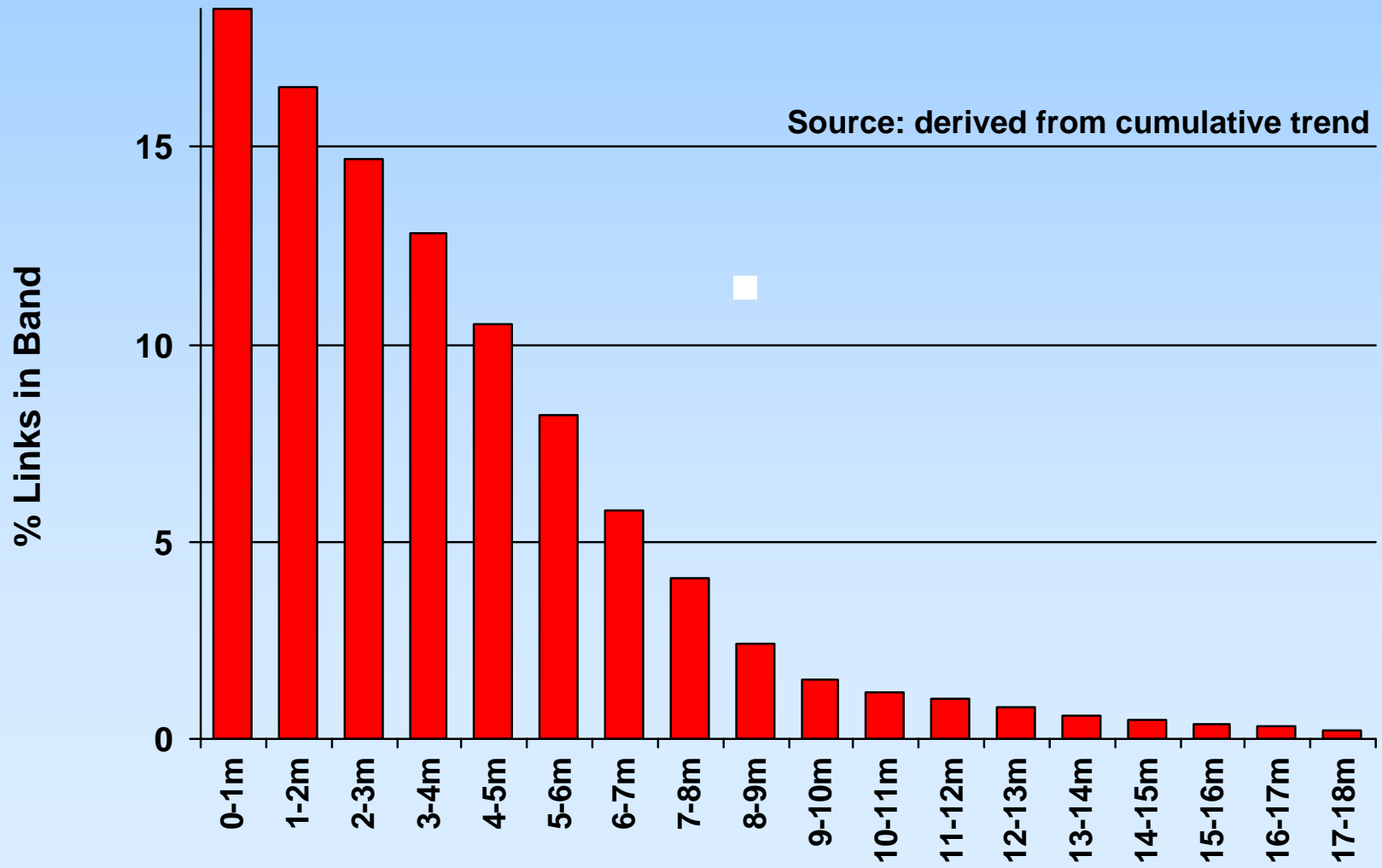


Data Centre Server-to-Switch Link Lengths for ToR/Cabinet-to-Cabinet Switching

Source: data points from J+M Consultants (Feb 2011)

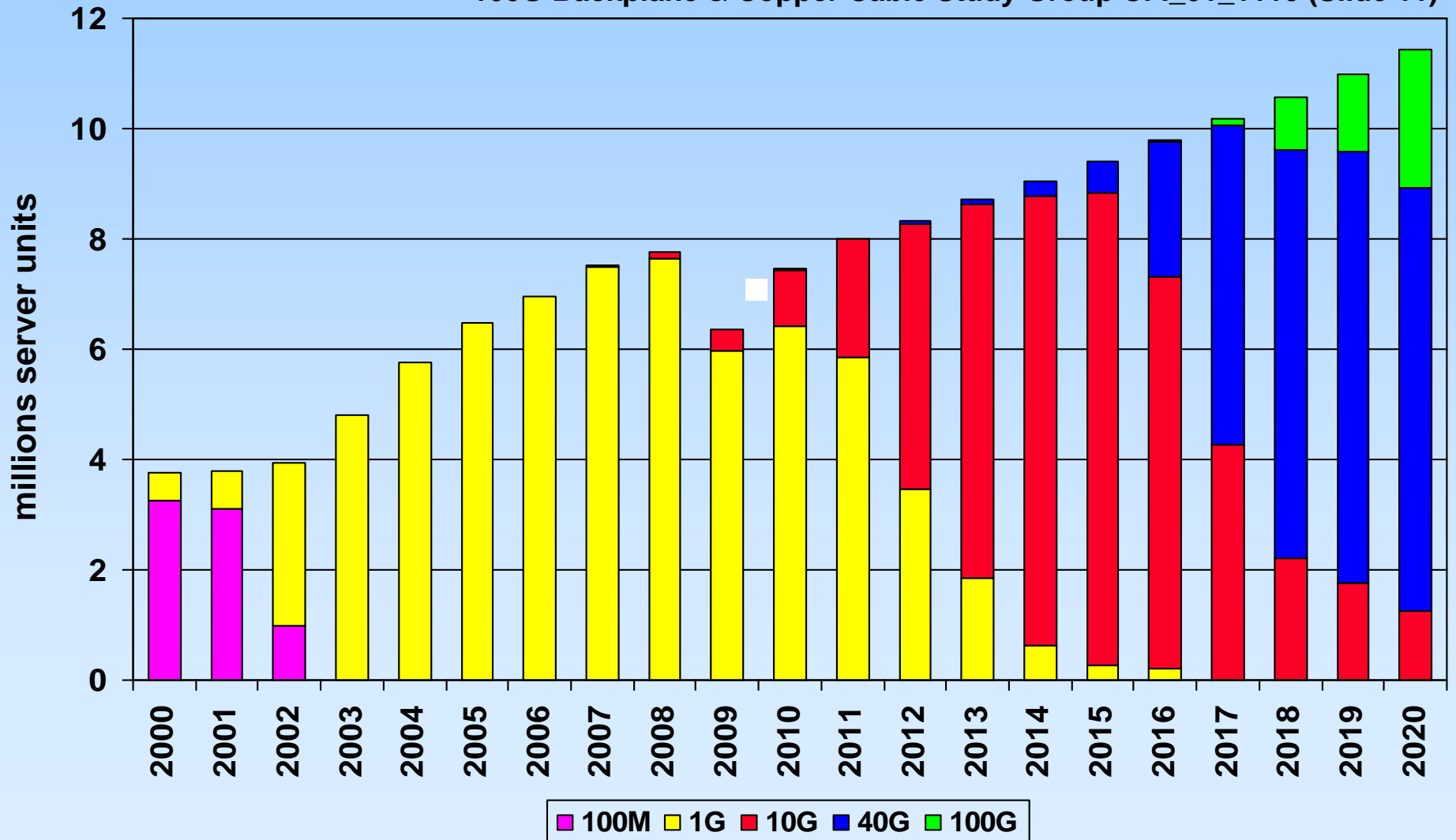


Data Centre Server-to-Switch Link Lengths for ToR/Cabinet-to-Cabinet Switching



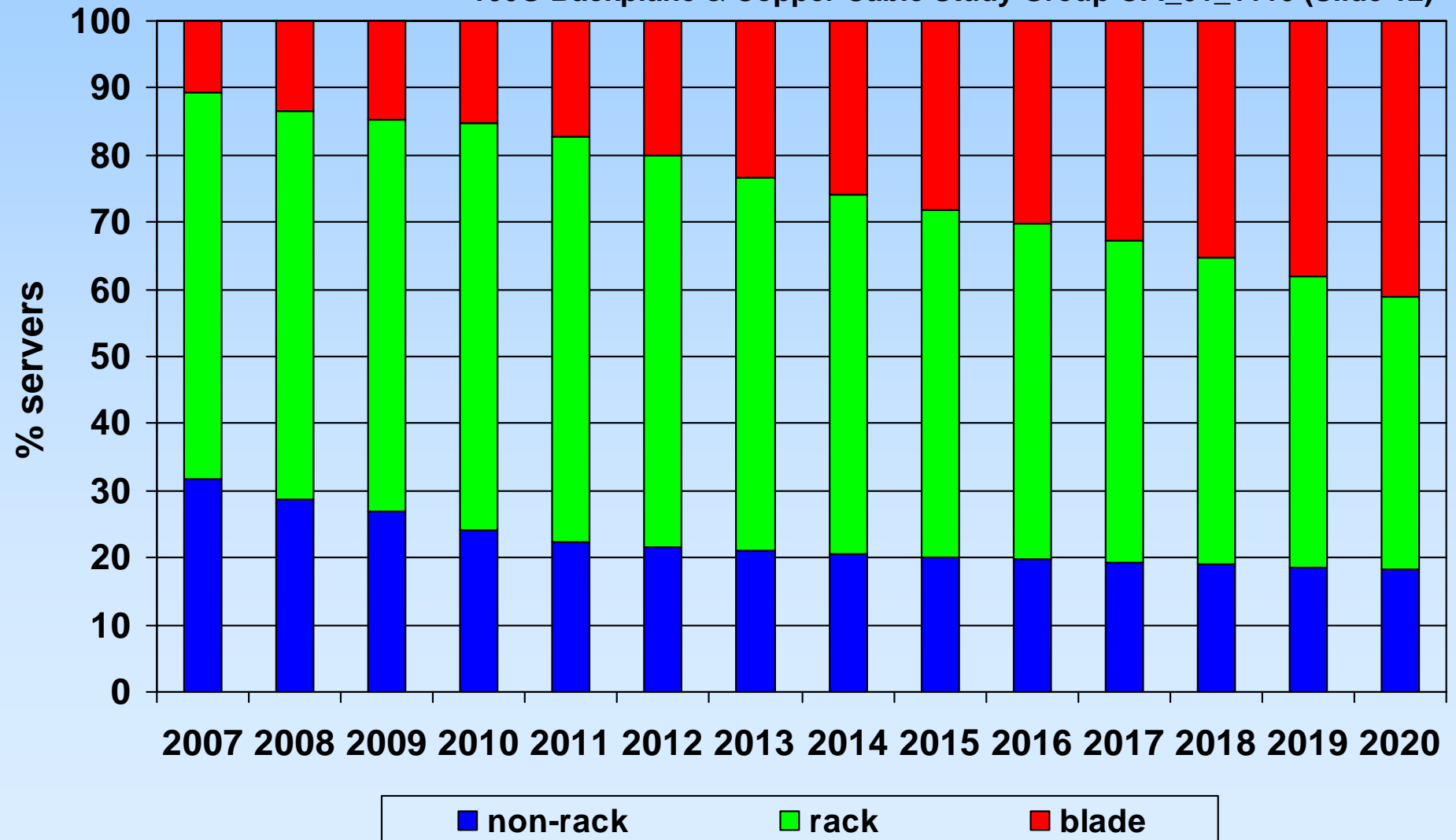
x.86 Servers by Ethernet Port Speed

100G Backplane & Copper Cable Study Group CFI_01_1110 (Slide 11)



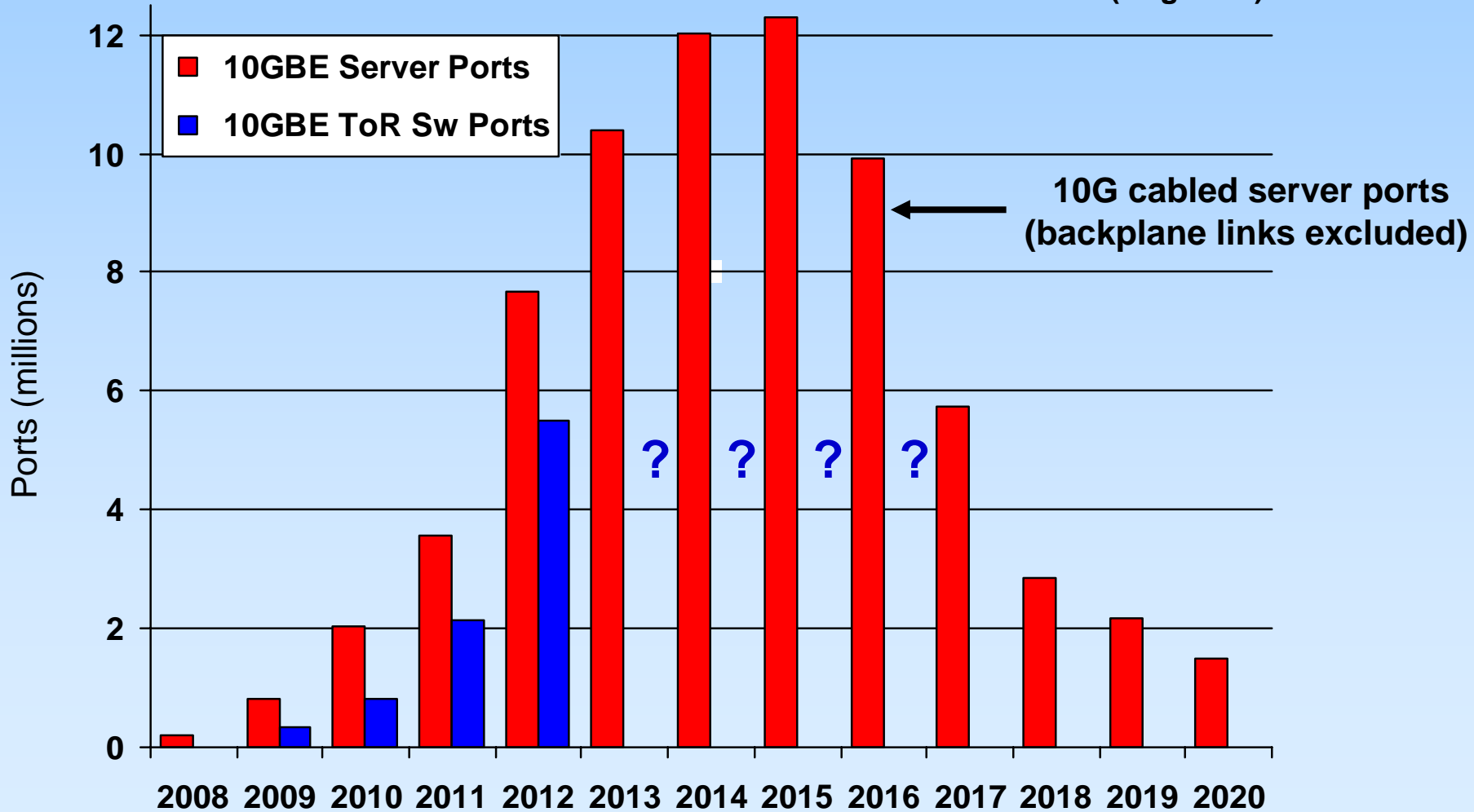
Trends in Server Form Factors

100G Backplane & Copper Cable Study Group CFI_01_1110 (Slide 12)



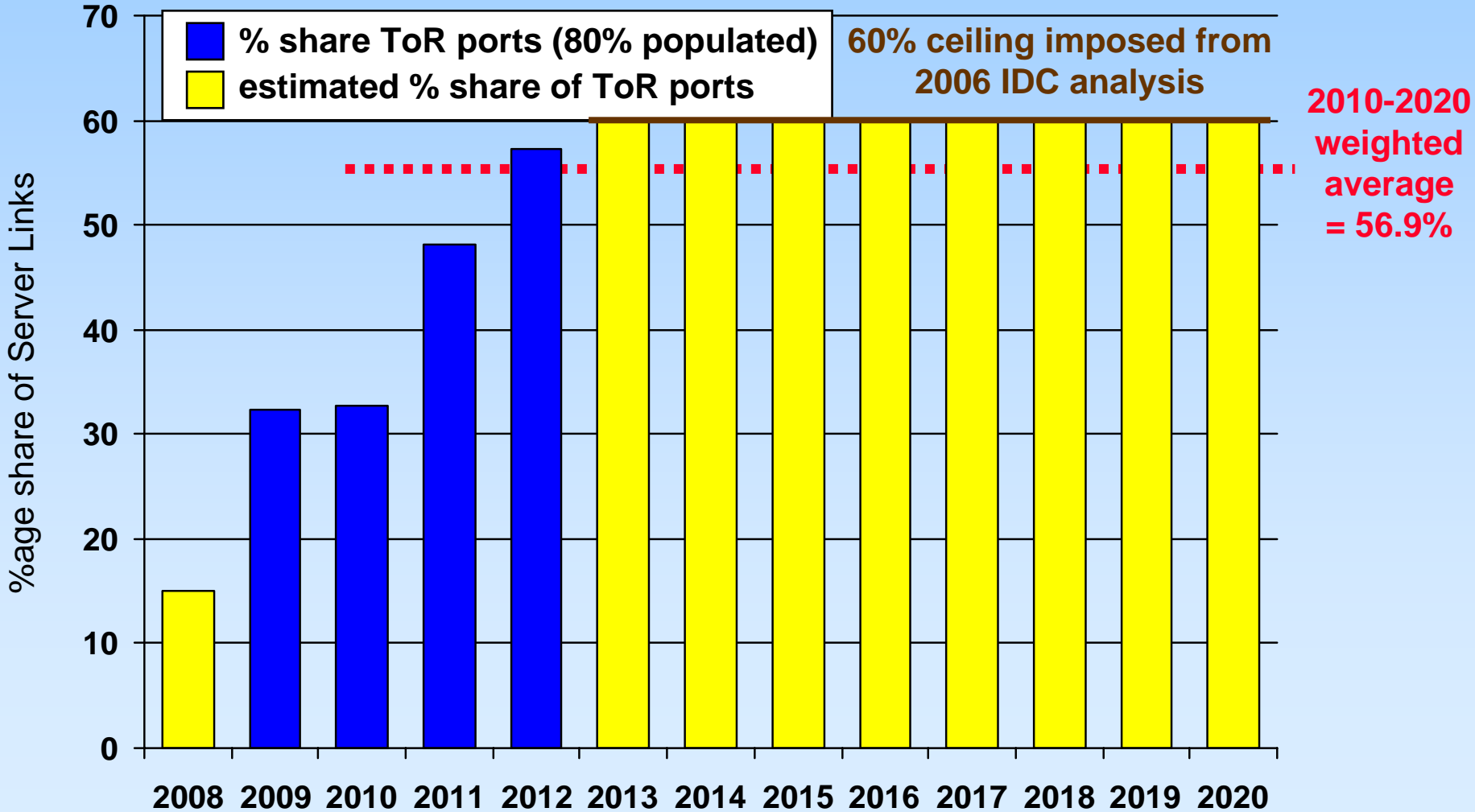
10G Server & ToR Switch Port Volumes

Source: Dell'Oro 10G ToR Switch Port Forecast (Aug 2010)

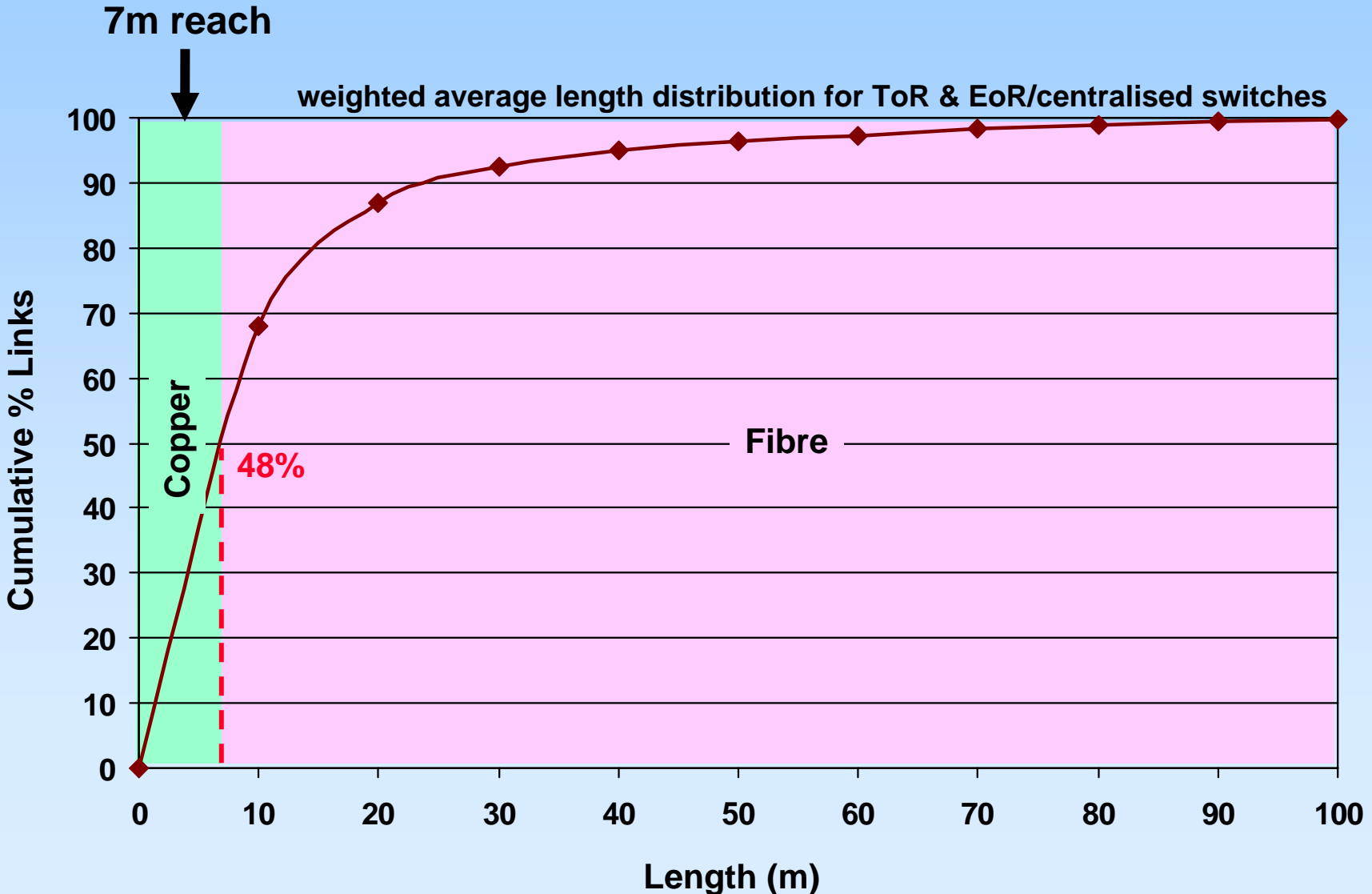


ToR vs. EoR/Centralised Switching

Source: IEEE 802 CFI_01_1110 (excluding blades)
Dell'Oro 2010 10G ToR Switch Port Forecast

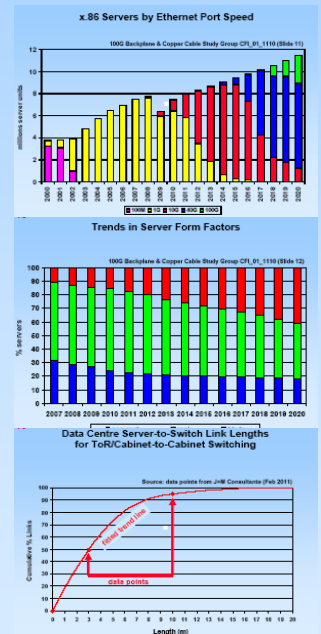


Data Centre Server-to-Switch Link Lengths for both ToR & EoR/Centralised Switching

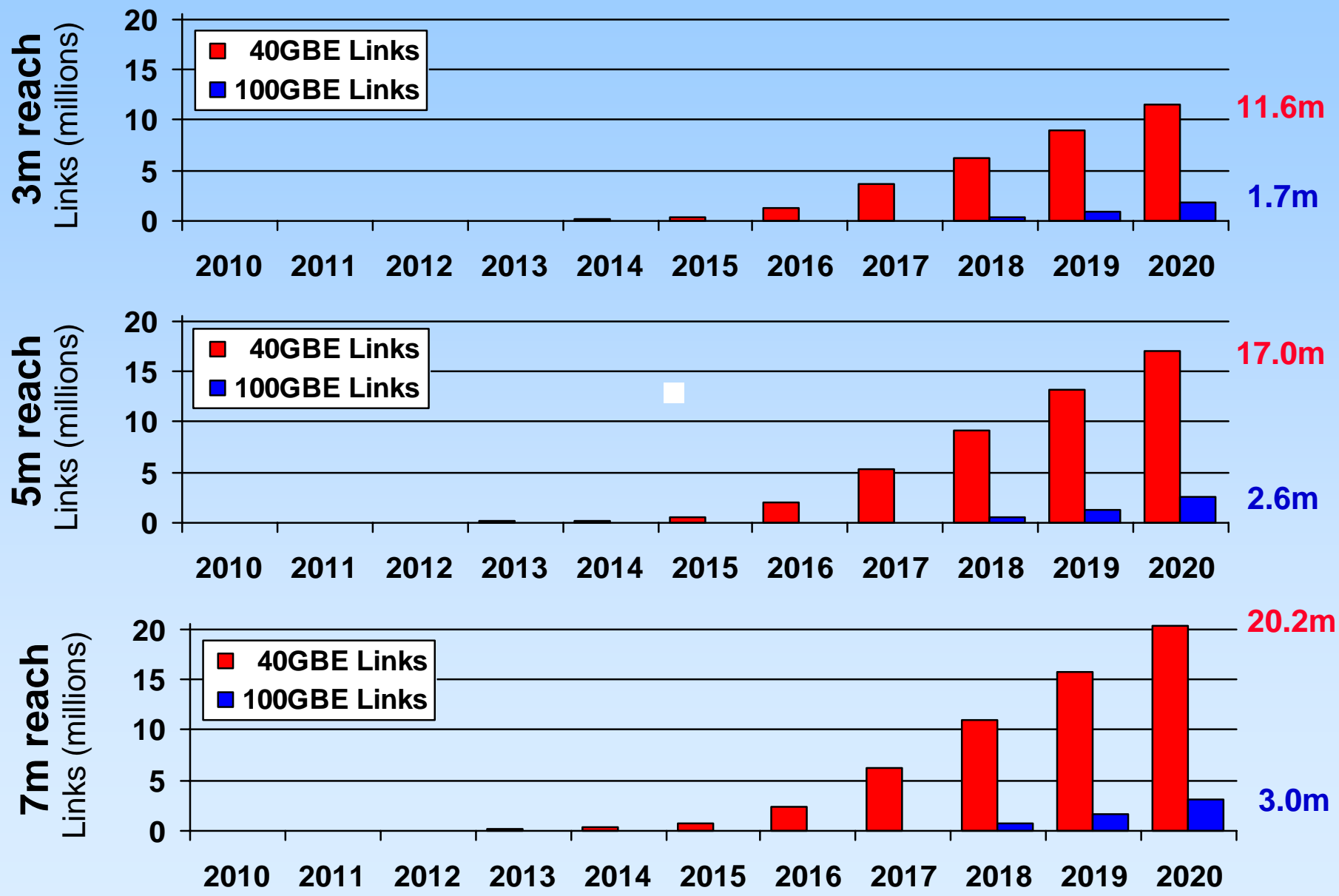


Server ToR Link Volume Modelling

- use latest server shipment forecast segmented by Ethernet port speed
 - CFI_01_1110 (Slide 11) →
- remove blade servers from analysis
 - CFI_01_1110 (Slide 12) →
- assume 2 Ethernet ports per server
- apply ToR link length distribution
 - J+M Associates (Feb 2011) →
- calculate volumes for 3m, 5m, 7m



40G & 100G Copper Server ToR Link Cumulative Volumes



But What About Local Aggregation Links?

- aggregation links for switch clusters
- uplinks for blade servers/switches
- earlier/important market requirement
- but difficult to model with accuracy
- aggregate 10G server links with 40G
- aggregate 40G server links with 100G
- assume 24:1 server:aggregation links
- **at least this will reflect market timing**

40G & 100G Copper ToR Link Cumulative Volumes

