



10 GIGABIT ETHERNET ALLIANCE

10 GbE is Here!

**NetWorld+Interop 2002
Las Vegas
May 2002**

- About the Alliance
- 10 GbE benefits
- Interoperability Demo
- 10 GbE port types and technology
- 10 GbE in the LAN, MAN, and WAN

10 Gigabit Ethernet Alliance

80+ Members

Founding and Charter Members

3 Com Corporation
Agilent Technologies, Inc.
AVICI SYSTEMS
Blaze Network Products
Cable Design Technologies
Cisco Systems
Corning Incorporated
E2O Communications, Inc.
Enterasys Networks
Extreme Networks
Foundry Networks, Inc.
Hewlett- Packard Co.
Infineon Technologies Corporation
Intel Corporation
Ixia
JDS Uniphase
Lantern Communications, Inc.
Molex Incorporated
Nortel Networks
Paion Co. Ltd.
Q Logic Corporation
Riverstone Networks
Spirent Communications
Sun Microsystems
SwitchCore AB
World Wide Packets

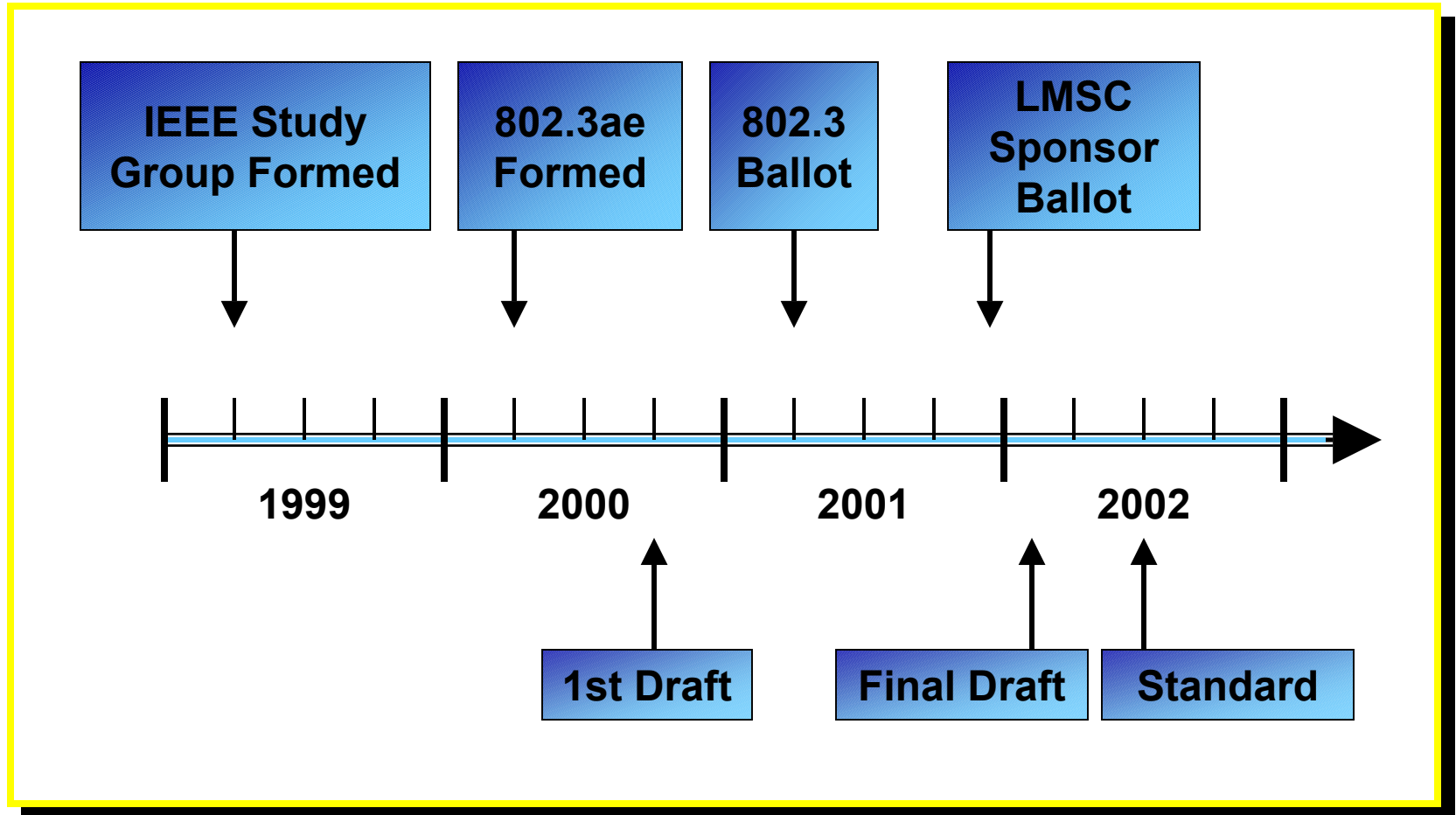
Principal and Participating Members

Alacritech	Luminent
Alcatel	Marconi
AMCC	Marvell Semiconductor, Inc.
ATRICA	Mindspeed
Avaya Communications	National Semiconductor
BATM Advanced Communications, Ltd.	Network Appliance
Bravara Corp.	Network Elements, Inc..
Broadcom Corp.	Nippon Telegraph and Telephone Co.
CELION Networks	ONI Systems
Centillum Communications	Optillion
Chip Engines	PICOLIGHT. INC.
Cicada Semiconductor	PMC-Sierra
CIELO Communications, Inc.	PRIMARION
Compaq	Quake Technologies, Inc.
Crosslayer Networks, Inc.	Sistolic
Delta Electronics, Inc.	Solidum Systems Corp.
Electronics and Telecommunications Research Institute	STRATOS Lightwave
Emulex	Tality Corp.
Finisar Corp.	Tektronix, Inc.
Force10 Networks, Inc.	Terago Communications
Fujikura	Texas Instruments
Hitachi Cable, LTD.	Toshiba America Electronics Corp.
Honeywell Sensing and Control	Tyco Electronics
HYPERCHIP, Inc.	Velio Communications, Inc.
Industrial Technology Research Institute	W.L. Gore & Associates
Juniper Networks	Xilinx, Inc.
LSI Logic Corp.	XYRATEX
	Zuma Networks, Inc.

10 GEA Mission

- Promote industry awareness, acceptance, and advancement of technology and products based on the emerging 10 Gigabit Ethernet standard
- Accelerate industry adoption by driving technical consensus and providing technical contributions to the IEEE 802.3ae Task Force
- Provide resources to establish and demonstrate multi-vendor interoperability of 10 Gigabit Ethernet products

10 GbE Progress



10 GbE and Its Benefits

- Brings Ethernet cost model to 10 Gbps networks
- Scales LAN backbones
- Aggregates 1 GbE
- Leverages 250 million Ethernet ports
- Supports all services
- Supports local, metro and wide area in one seamless network
- Compatibility with the installed base of SONET OC-192c / SDH VC-4-64c

10 GbE Cost of Ownership

- 83% interface cost savings vs. SONET/SDH*
- 30-60% savings to end-users*
 - Ethernet transport as a managed service
- 10X bandwidth and fiber relief improvement vs. 1 GbE
- Large savings in provisioning and operating
 - At least 30-50% cost and time to market savings

**Source: The Yankee Group – July 2001*

Customer Challenges

Enterprises

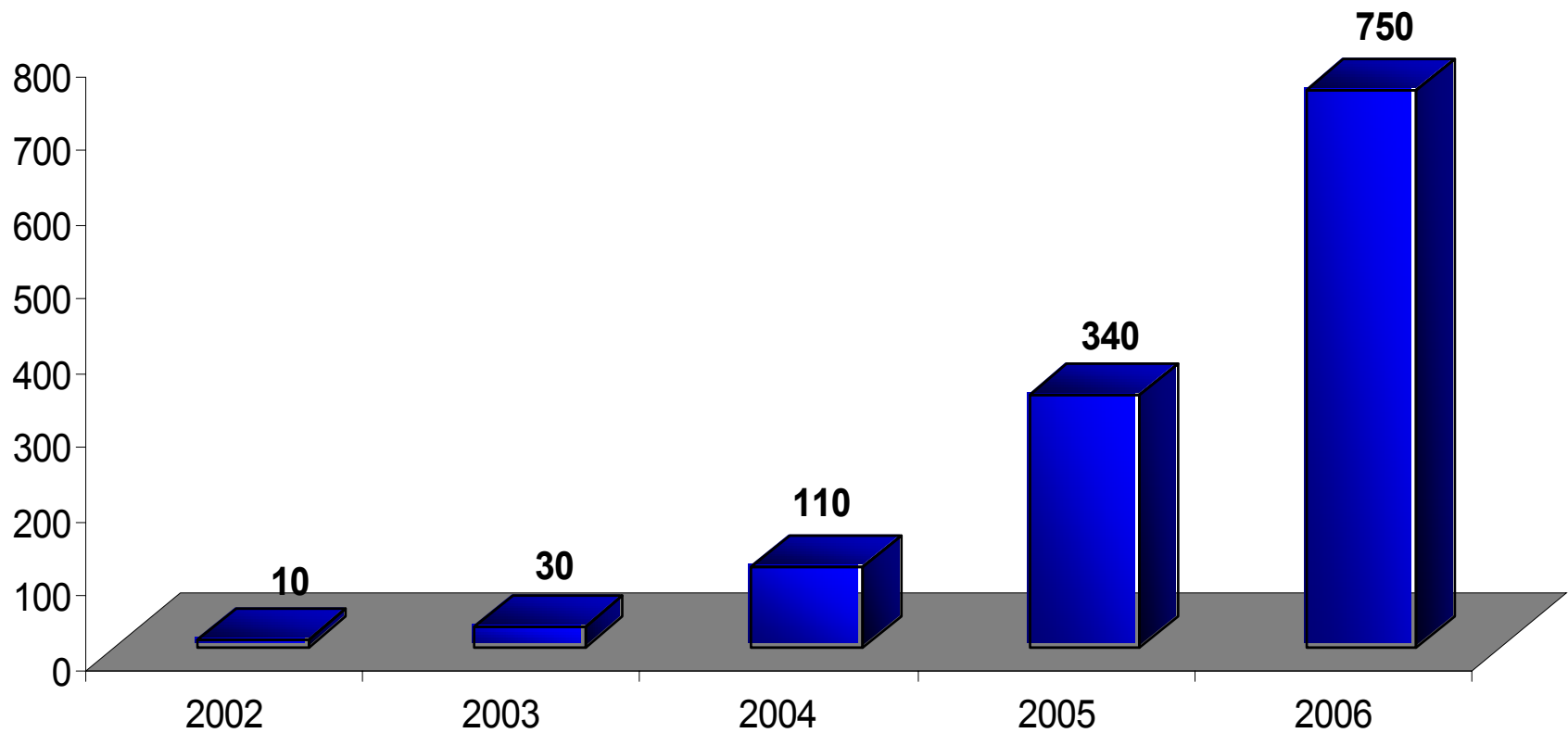
- Multiple locations in one metro area
- Need to support high-bandwidth applications: imaging, CAD/CAM, storage

Service Providers

- Need high-speed connections between POPs
- Need flexible bandwidth, just-in-time provisioning
- Adapt to service provider management architectures

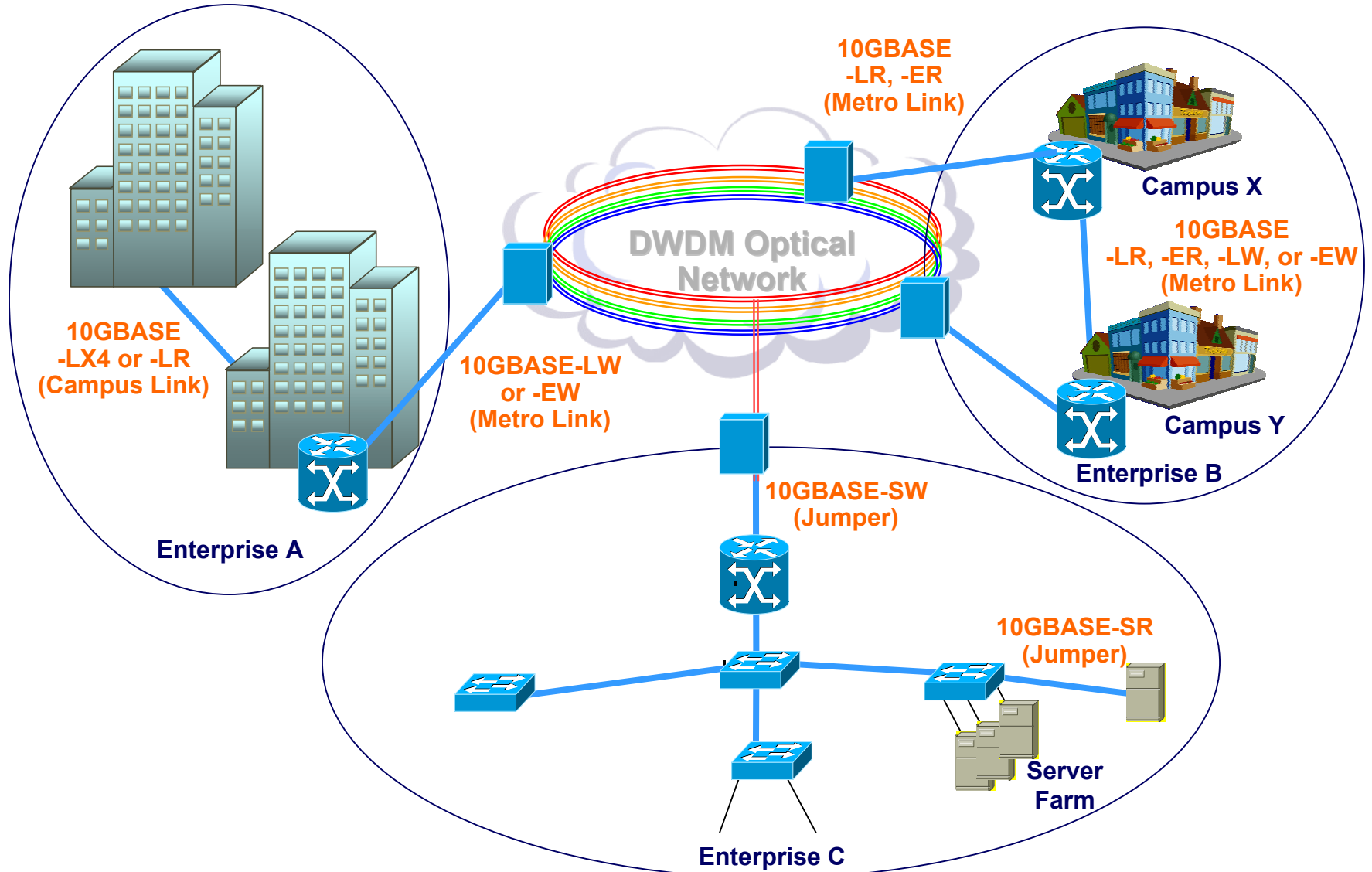
10 Gigabit Ethernet Forecast

Projected Port Shipments (000's)



Source: Dell'Oro Group
Worldwide Ethernet Switch Market

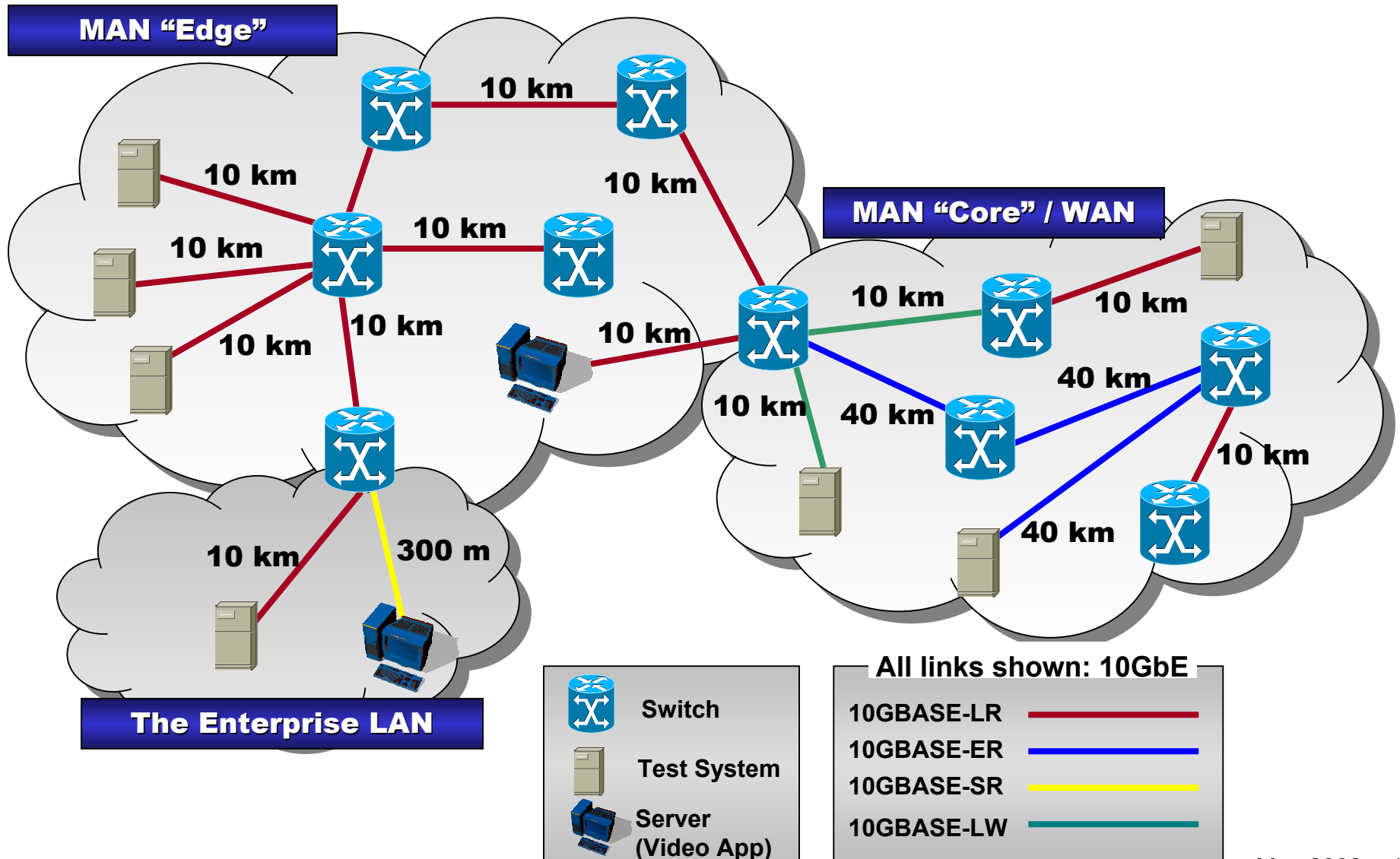
10 GbE Applications



World's Largest 10 GbE Interoperability Demonstration

- Products from 24 vendors on display
- 22 live demo participants
- 200+ km end-to-end 10GbE network
- 19 devices connected via 10 hops
- XAUI chip-to-chip interface demo
 - 12 live participants
- 5 of 7 port types: 10GBASE-LR, 10GBASE-ER, 10GBASE-SR, 10GBASE-LW, 10GBASE-LX4
- Wide range of products represented: network systems, test equipment, components, and fiber optic cabling

World's Largest 10 GbE Interoperability Demonstration

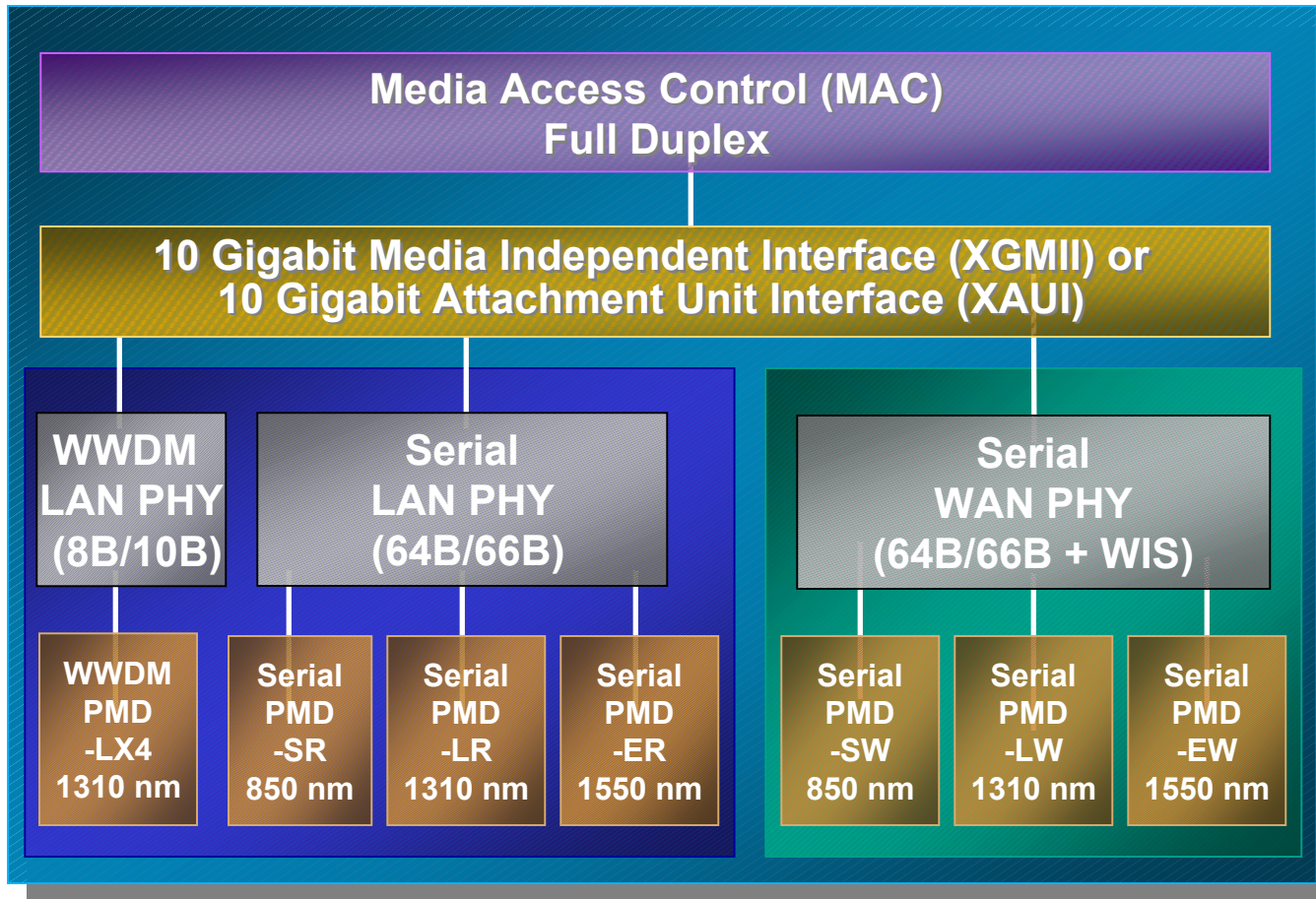


- XAUI reduces the 74 pin XGMII to 16 pins
- Multiple independent implementations are able to interoperate
- A path for cost reduction of system products
 - Enables pluggable optical transceivers (e.g., XENPAK)
 - Enables lower IC costs (i.e., pins = cost)
 - Longer trace lengths enable higher density ICs (e.g., multiple MACs) and greater flexibility in board layout
- XAUI demo – 12 participating companies:
 - Agilent, Blaze, Infineon, Intel, Ixia, JDS Uniphase, Marvell, Mindspeed, Molex, Optillion, PMC-Sierra, Velio

10GEA Demo Participants

- Agilent Technologies Inc.
- Blaze Network Products
- Cable Design Technologies (CDT)
- Cisco Systems
- Corning, Inc.
- Enterasys Networks
- Extreme Networks
- Force10 Networks Inc.
- Foundry Networks Inc.
- Infineon Technologies
- Intel Corporation
- Ixia
- JDS Uniphase
- Marvell Semiconductor
- Mindspeed Technologies
- Molex, Inc.
- Nortel Networks
- OFS Optics
- Optillion
- PMC-Sierra
- Primarion
- Quake Technologies Inc.
- Spirent Communications
- Velio Communications

10 GbE Layer Diagram



Interface Names (IEEE 802.3ae Port Types)

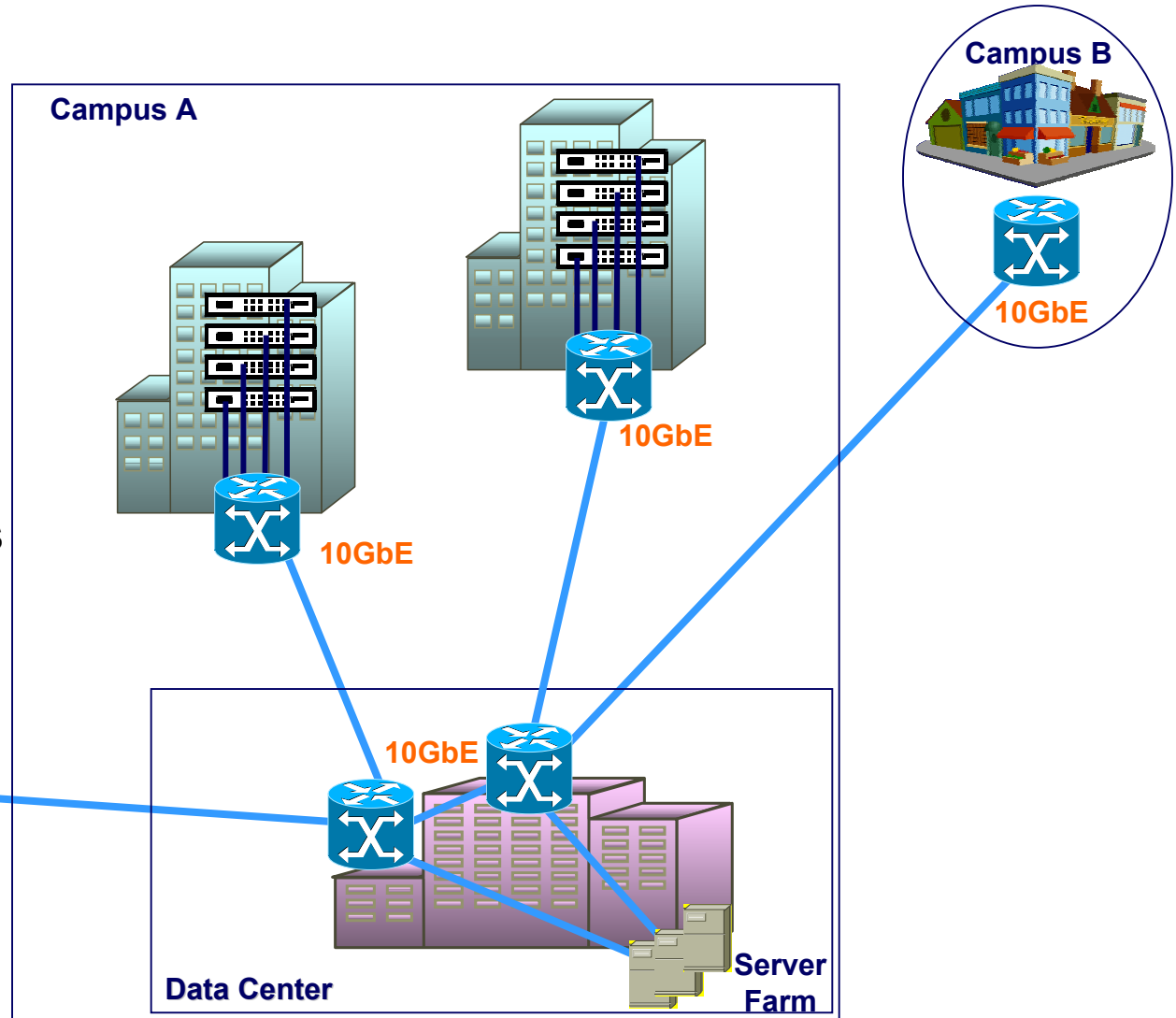
Device	8B/10B PCS	64B/66B PCS	WIS	850nm Serial	1310nm WWDM	1310nm Serial	1550nm Serial
10GBASE-SR		✓		✓			
10GBASE-SW		✓	✓	✓			
10GBASE-LX4	✓				✓		
10GBASE-LR		✓				✓	
10GBASE-LW		✓	✓			✓	
10GBASE-ER		✓					✓
10GBASE-EW		✓	✓				✓

Transceivers (PMDs), Supported Fiber & Distances

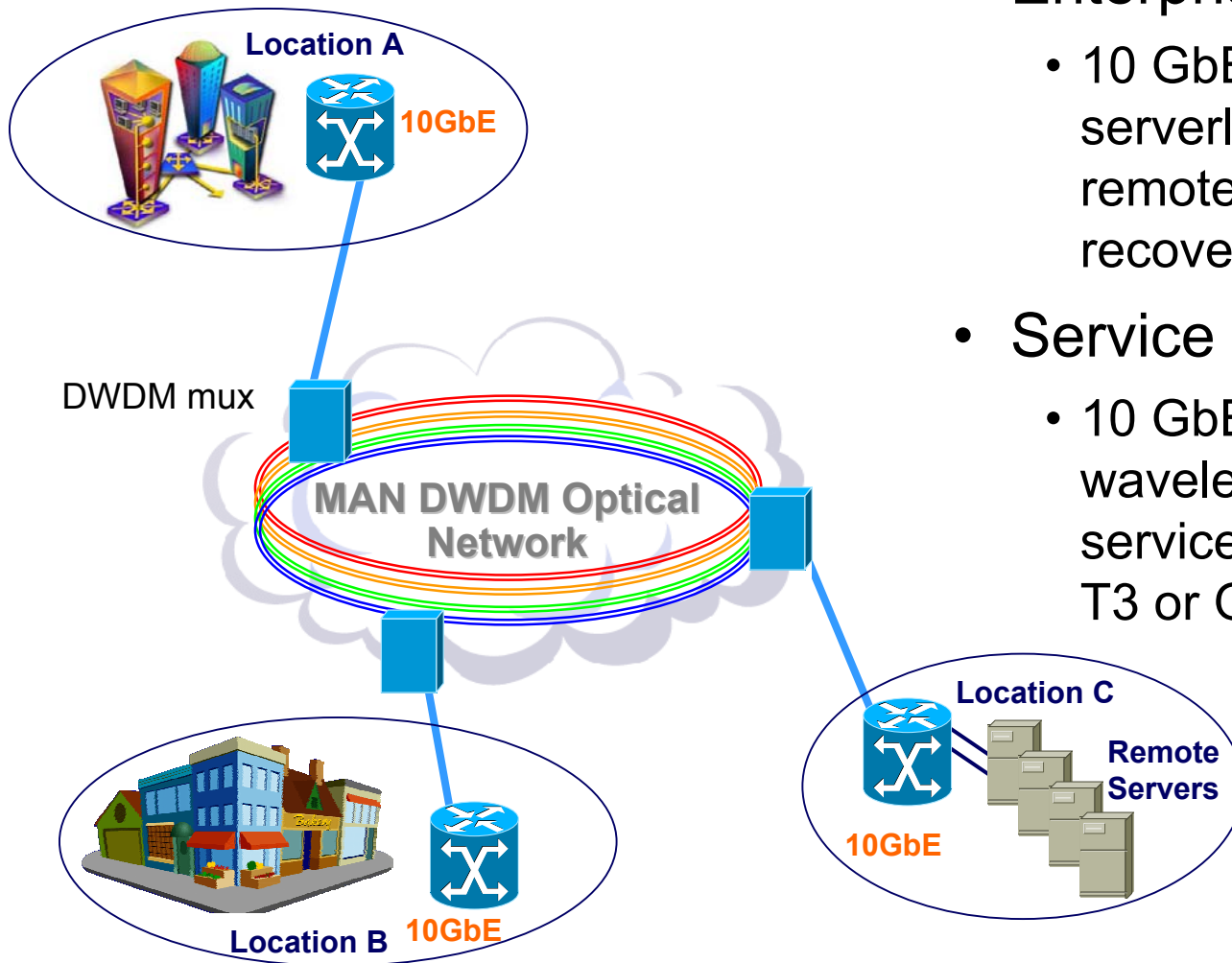
Fiber	62.5 MMF		50 MMF			SMF
	MHz*km					
SR/SW 850 nm	26m	33m	66m	82m	300m	-
LR/LW 1310 nm	-	-	-	-	-	10 km
ER/EW 1550 nm	-	-	-	-	-	40 km
LX4 1310 nm	300m @500MHz*km		240	300m	-	10 km

10 GbE in the LAN

- 10 GbE in service provider data centers and enterprise LANs
 - Switch to switch
 - Switch to server
 - Data centers
 - Between buildings
 - Storage interconnect

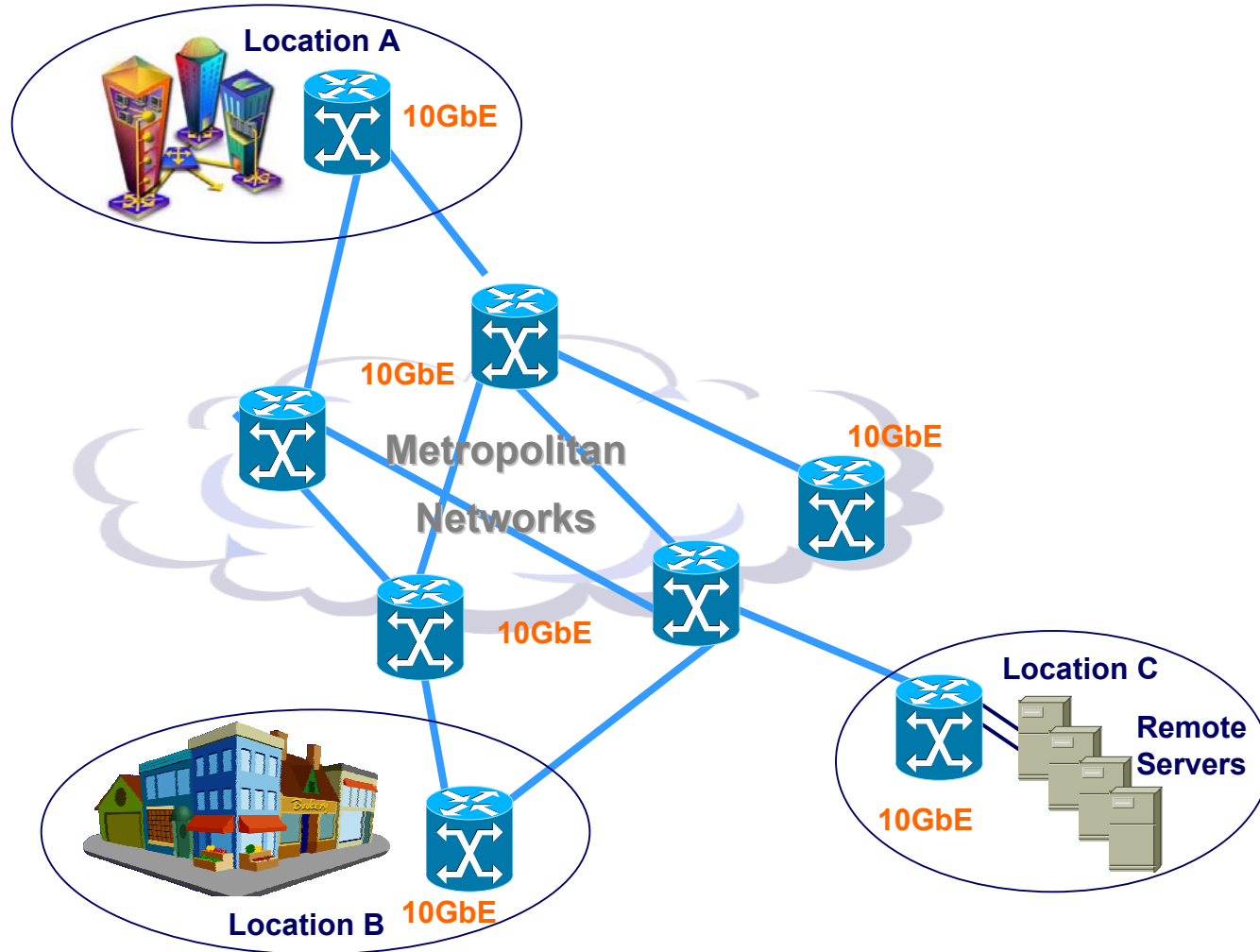


10 GbE in the MAN over DWDM



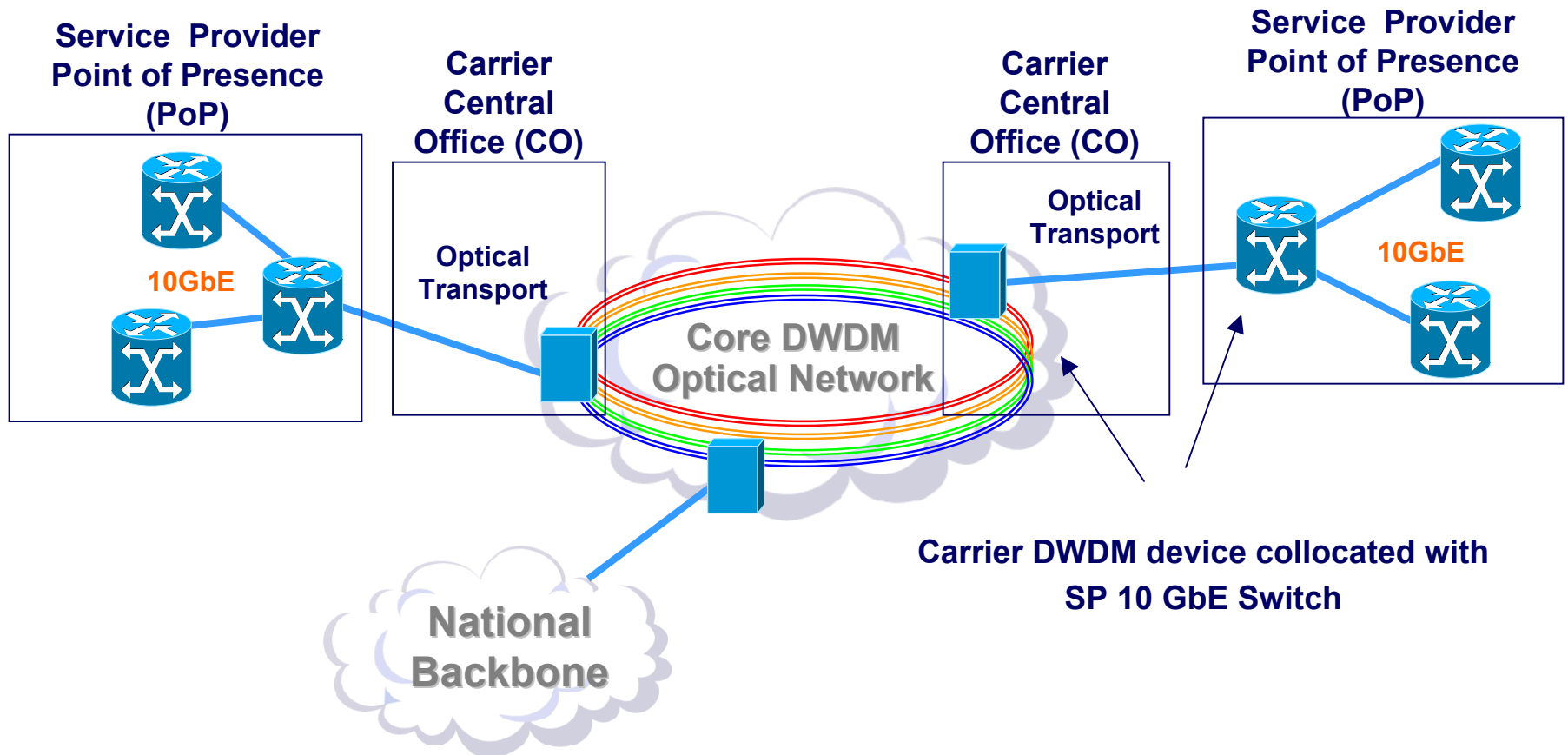
- Enterprises:
 - 10 GbE enables serverless buildings, remote backup, disaster recovery
- Service providers:
 - 10 GbE enables dark wavelength Gigabit services at costs less than T3 or OC-3

10 GbE in the MAN over Dark Fiber



10 GbE in the WAN

- Attachment to SONET/SDH access gear
- Compatibility with the installed base of SONET STS-192c/SDH VC-4-64c



Summary: 10 Gigabit Ethernet

- Continues Ethernet's reputation for cost-effectiveness and simplicity
- Supports LAN, MAN and WAN, dark fiber, dark wavelength, and access to SONET/TDM equipment
- Interoperability demo – 24 participants
- Industry commitment: multiple vendors
 - 10 Gigabit Ethernet is Here!
- IEEE 802.3ae on track for ratification next month



10 GIGABIT ETHERNET ALLIANCE

www.10gea.org