

SCTE Event
Metro Network Alternatives
5/22/2013

A Review of Metro Network Alternatives

- Enterprise needs more bandwidth
- Enterprise options: T1 or fiber based offerings up to Metro-Ethernet
- Price-for- performance considerations
- Service Level Agreements with different services and applications
- Rights of entry considerations when build is determined

Exploding Bandwidth Demands

Network traffic growth is stressing current infrastructure

MORE DEVICES



MORE CONTENT



MORE APPLICATIONS



MORE ON-DEMAND ACCESS



Driving need for the ultimate in high performance networking

Cloud Services Adoption

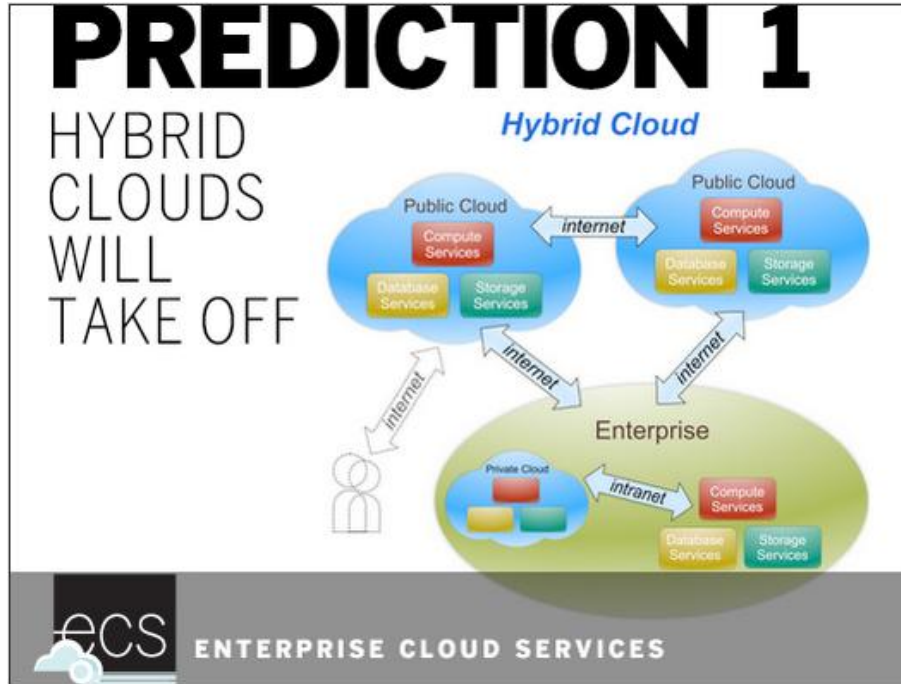
According to a recent report,

74%

of enterprise application deployments will be
cloud-based within five years

*Source: IDC October 2012: "Enterprise Cloud Public and Private End-User Adoption
Signals Continued Shifts in IT Spending"*

2013 will be the year of the hybrid cloud



Source: *Network World*

As enterprises analyze which apps are right for **public vs. private cloud**, they will realize that **a hybrid cloud makes the most sense.**

Ethernet is Transforming the MAN/WAN

Legacy solutions cannot support exploding bandwidth requirements

Private line, Frame Relay, ATM, and SONET

Bandwidth is limited and expensive

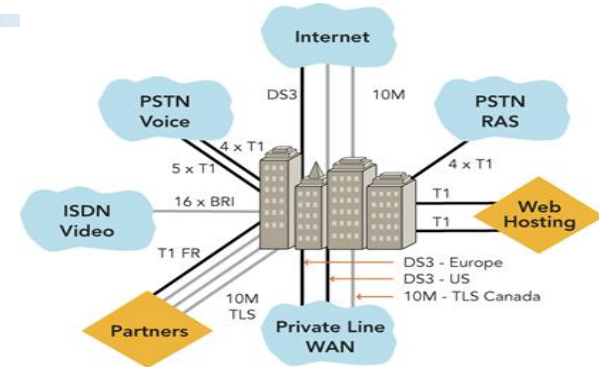
App-specific networks are not scalable

Ethernet has emerged as the leading next-generation technology

Scalable with service up to 10 Gbps

Standardized technology is natively data-friendly and simple to manage

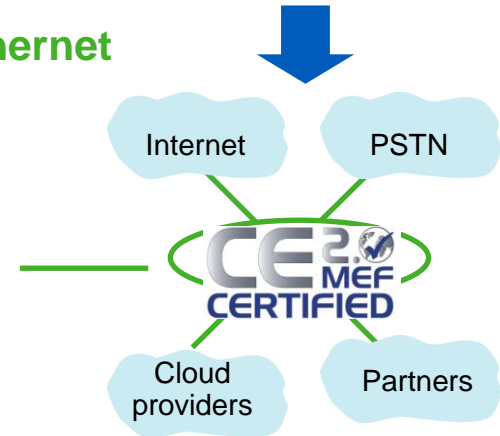
Legacy



Carrier Ethernet



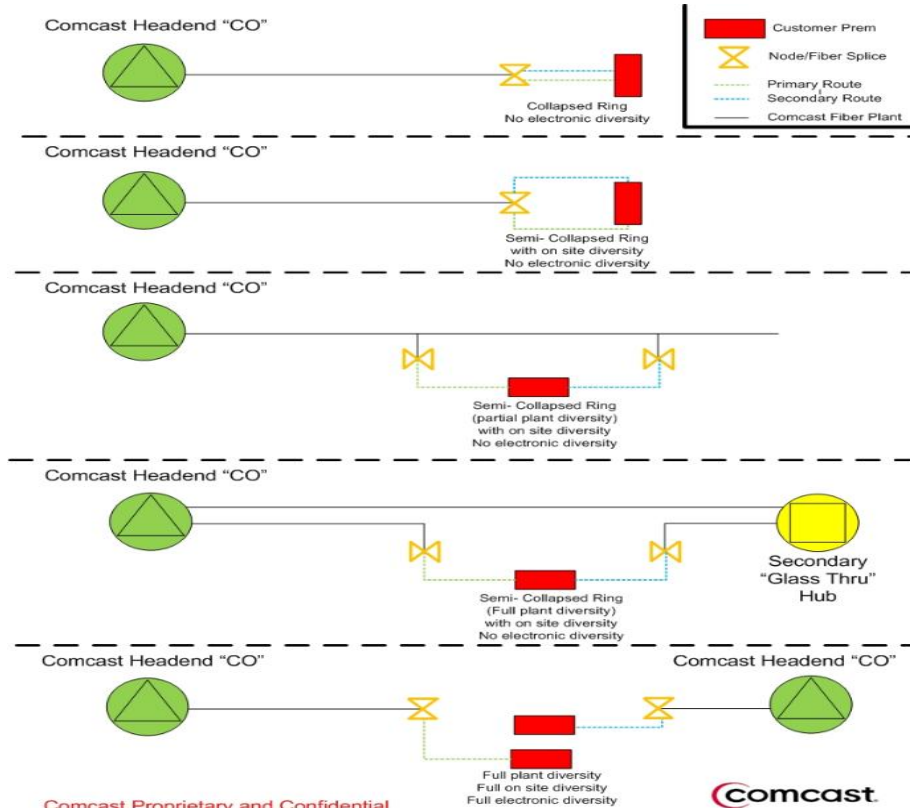
Carrier Ethernet



Fiber based service offerings

- Dark Fiber
 - Consolidated campus environments and customized needs
- Wave Services
 - Routed or switched terminations
 - Low latency demands
 - High aggregated bandwidth needs
 - Synchronous replication
 - Financial trading applications requiring low latency
- Managed wave services
 - Easier to provision augmented bandwidth with DWDM/CWDM systems
- Metro-Ethernet
 - Highly networked needs
 - Easy LAN/WAN Integration
 - Most prevalent option for most businesses meeting majority of app. req.

FIBER DIVERSITY OPTIONS



Comcast Business Ethernet Services

Secure, scalable, high-performance point-to-point and multipoint connectivity

Optimized for businesses with multiple locations in a metropolitan area or region

Fully managed and delivered over Comcast's national, private, fiber-optic network

Four Distinct Offerings to Fit Your Business

1

Ethernet Private Line Service

Point-to-point connectivity between two sites for bandwidth-intensive apps

2

Ethernet Virtual Private Line Service

Point-to-multipoint connection that lets customers tailor bandwidth, performance characteristics, and cost based on applications

3

Ethernet Network Service

Multipoint-to-multipoint connectivity for businesses with high-bandwidth requirements and multiple locations

4

Ethernet Dedicated Internet Access Service

High-bandwidth connectivity between customer LAN and public Internet

Comcast Business Ethernet Benefits Comparison

Benefits of Carrier Ethernet	Impact of Carrier Ethernet	Legacy
Faster application deployment	Customer satisfaction	No
Data center and server consolidation	Saves duplicated costs	No
Unprecedented reach	Saves application costs and overhead	No
High bandwidth, on-demand	Save costs, enables new applications	No
Ideal for converged networks	Low latency, jitter	No
Certified services, predictability	Risk reduction, dependable QoS	No
Independently-certified performance	Reliable planning, deployment	No
Simple implementation	Saves resources, stress	No
Service-level management	User control	No
Cost trend	Down	Up

Case Study: Boston Celtics

Situation

- Team modernizes and expands administrative offices
- Existing service not designed for seamless collaboration between office and separate practice facility
- Disparate IT environments at each facility difficult to manage

Challenge

- Use one vendor for data, Internet service
- Add reliable, data and high-speed Internet connection between facilities

Solution

- Comcast Business Ethernet Dedicated Internet and Ethernet Private Line

Results

- Seamless data, Internet connectivity between offices
- Faster upload and download times
- Unified management of separate IT environments



Case Study: Sarris Candies

Situation

- Growing specialty chocolate and candies company relies on Internet to support payment, ordering, fulfillment, shipping and marketing efforts

Challenge

- Existing T1 connections could not scale to support operations and outbound marketing efforts

Solution

- Comcast Business Ethernet Dedicated Internet

Results

- Reliable, scalable Internet connectivity



Case Study: Atlantic Cape Community College

Situation

- Community college needed to connect multiple campuses and cloud-based apps
- Reliable Internet service critical to support planned WiFi expansion

Challenge

- Boost capacity between campuses to improve collaboration, support new services
- Establish fast, reliable Internet connection across scalable campus-wide network
- Manage operating expenses

Solution

- Comcast Business Ethernet Dedicated Internet and Ethernet Private Line

Results

- Reliable, high-speed Internet service
- Cost-effective, scalable connectivity



Service Level Agreements

	Class of Service (CoS)		
	Premium	Priority	Basic
Latency (one way)	< 12ms	< 23ms	< 45ms
Jitter (one way)	< 2ms	< 23ms	< 45ms
Packet Loss (one way)	< 0.001%	< 0.01%	< 1%
Availability	> 99.99%	> 99.99%	> 99.99%

Application Service Level Tolerance

- VOIP
 - 250ms RT latency and low jitter
- Video conferencing
 - Packet Loss less than 1%
 - 250ms latency
 - Less than 100ms jitter
- Synchronous database replication
 - 1-85ms tolerance. RPO=0
 - Fibre Channel Protocol is very latency sensitive where the practical distance for synchronous replication for a busy system is about 35km to 50km or 20 miles to 30 miles

Rights of Entry for Fiber Build Activity

- Single story facility owned, managed and maintained by one tenant
- Single story facility with one tenant but owned, managed and maintained by 3rd party
- Multi-Story with variability on ownership
- Multi-story with riser management
- 3rd party data center
- Telco hotel

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