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

2013 will be the year of the hybrid cloud

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

Source: Network World
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
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.
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

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

<table>
<thead>
<tr>
<th>Class of Service (CoS)</th>
<th>Premium</th>
<th>Priority</th>
<th>Basic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latency (one way)</td>
<td>&lt; 12ms</td>
<td>&lt; 23ms</td>
<td>&lt; 45ms</td>
</tr>
<tr>
<td>Jitter (one way)</td>
<td>&lt; 2ms</td>
<td>&lt; 23ms</td>
<td>&lt; 45ms</td>
</tr>
<tr>
<td>Packet Loss (one way)</td>
<td>&lt; 0.001%</td>
<td>&lt; 0.01%</td>
<td>&lt; 1%</td>
</tr>
<tr>
<td>Availability</td>
<td>&gt; 99.99%</td>
<td>&gt; 99.99%</td>
<td>&gt; 99.99%</td>
</tr>
</tbody>
</table>

**Comcast Business Class**
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
More at
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