

Adding More Intelligence to the Network

Where and Why?

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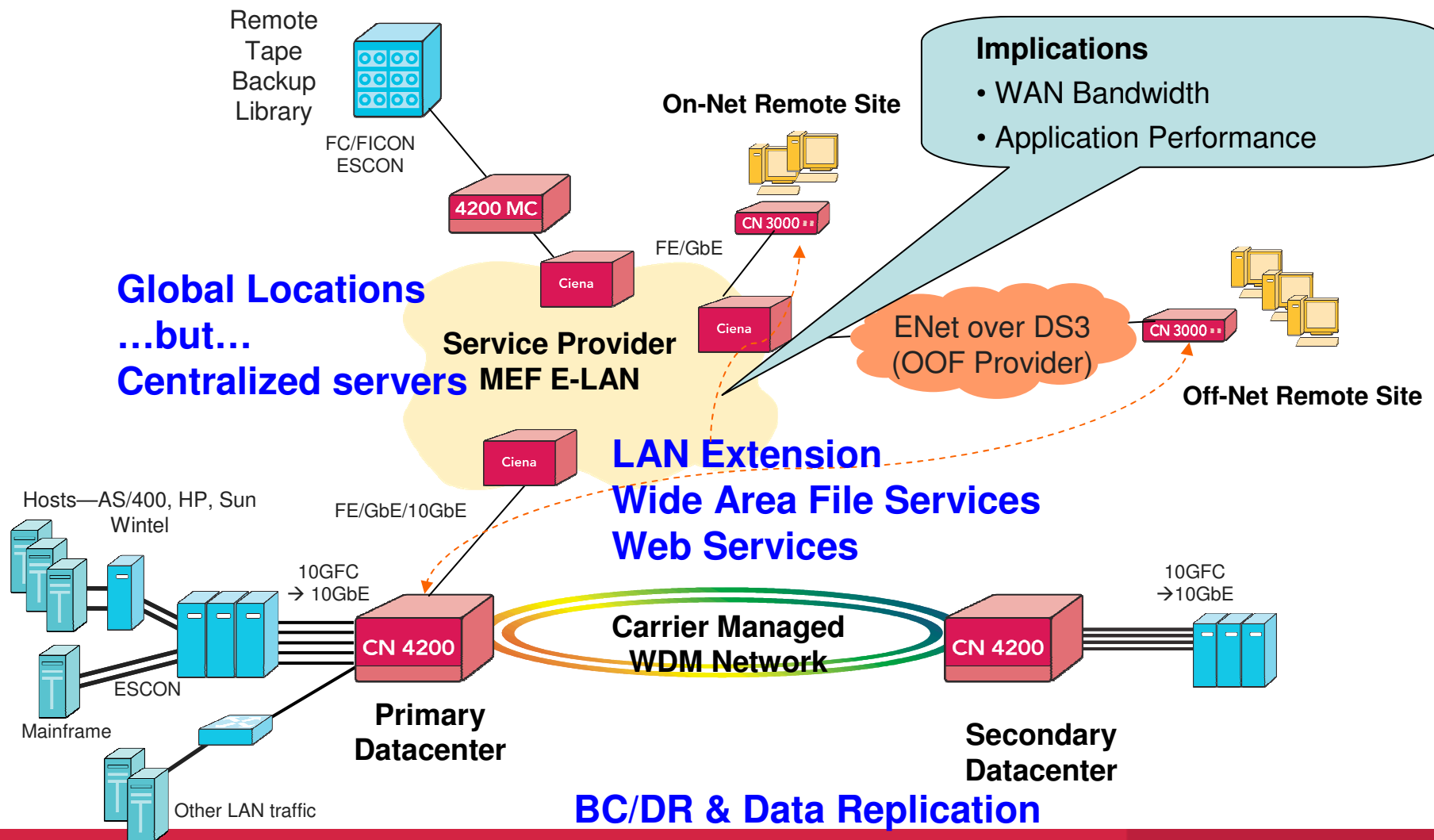
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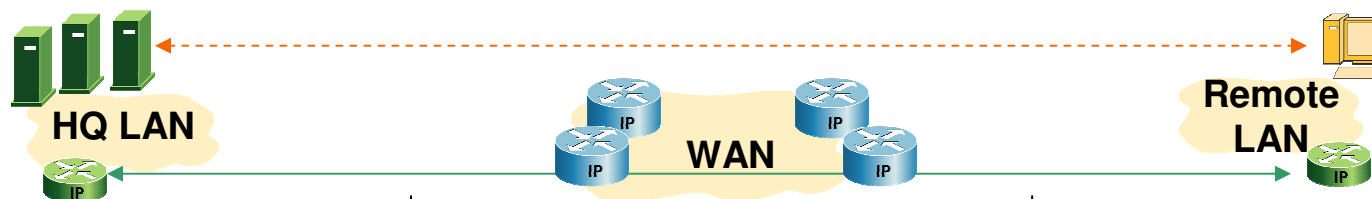
Outline

- Enterprise LAN performance impact
- Application problem vs Network problem
- Intelligence in the Network (LAN vs. WAN)
- Conclusion: Fix the Application and Keep the Network Simple

Reality Check: Enterprise Network



Issues for “LAN” across a WAN?



Application	<p>HQ Servers/Storage</p> <ul style="list-style-type: none"> → Chatty protocols → “White space” → Multiple Servers → Application DoS → Authentication 	<p>WAN</p> <ul style="list-style-type: none"> → Application DoS 	<p>Remote Desktop</p> <ul style="list-style-type: none"> → Chatty Protocols → “Repeated” data
Network	<p>HQ LAN < > WAN</p> <ul style="list-style-type: none"> → Shared WAN Link → TCP/IP Window → Flow QoS → IP (TCP/UDP) DoS → Security 	<p>WAN</p> <ul style="list-style-type: none"> → (Shared / Dedicated) WAN → Multi-site Aggregation → Deterministic QoS → IP (TCP/UDP) DoS → Security 	<p>WAN < > Remote LAN</p> <ul style="list-style-type: none"> → Low speed WAN Link → TCP/IP Window

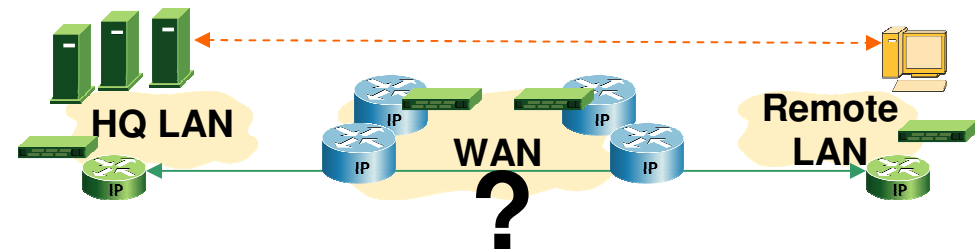
Defining Intelligence

→ Application: Client <> Server Interaction

→ **Context:** Web Services, Database Mirroring, WAFS, Internet, Email

→ **Protocols:** SOAP, FCIP, SQL, CIFS, HTML, MAPI, IMAP/SMTP/POP

→ **Intelligence:** Layer 4-7 aware, Protocol spoof, File cache, Load balance



→ LAN/WAN Connectivity

→ **Context:** Packet behavior & Network performance

→ **Protocols:** TCP/IP, Ethernet, Control plane signaling & routing

→ **Intelligence:** L2/L3 aware, TCP optimize, Deterministic QoS,

Application Intelligence in Network (WAN)?

→ Unnecessary bind.

→ Why couple ever evolving applications with stable network elements?

→ Why get penalized with cost and performance of packet inspection?

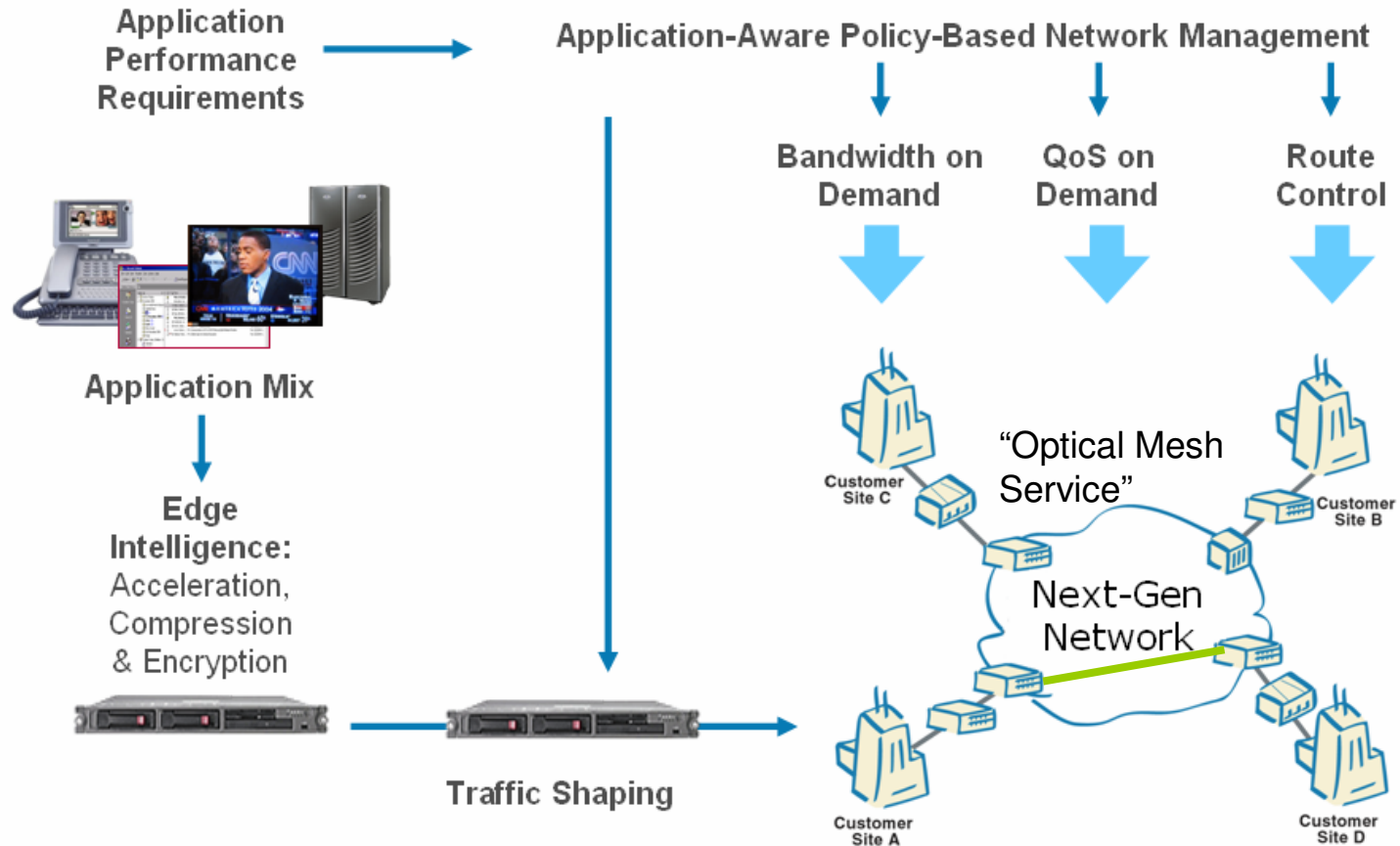
→ Business flexibility.

→ Can enterprise afford to lose their agility in responding to user needs?

→ Operational complexity.

→ Why force enterprise to spend time for application performance tweaking?

End-to-End Optimization

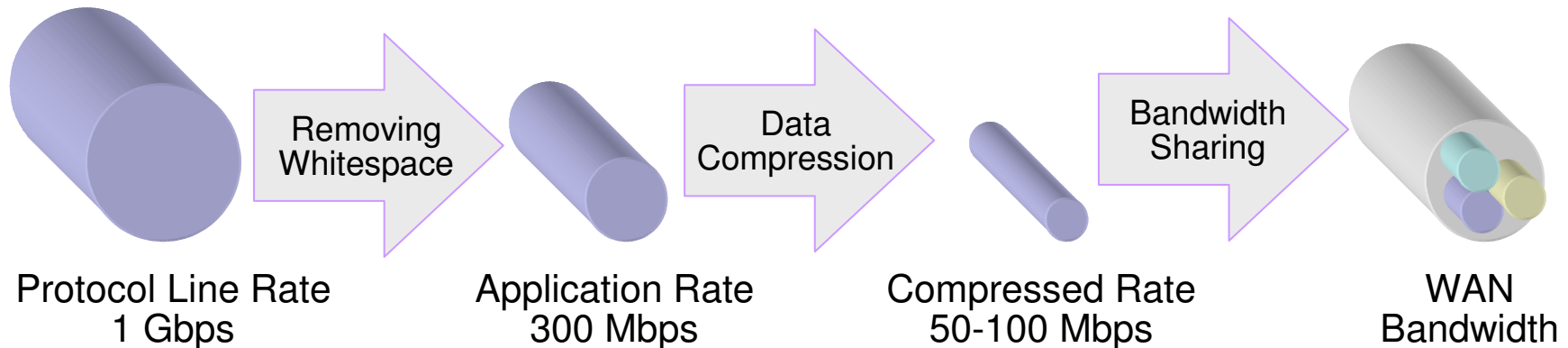


Source:
Light Reading Master Class Lecture Series
 Joe Weinman, AT&T Strategy and Emerging Services

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What makes sense: Improving WAN Performance



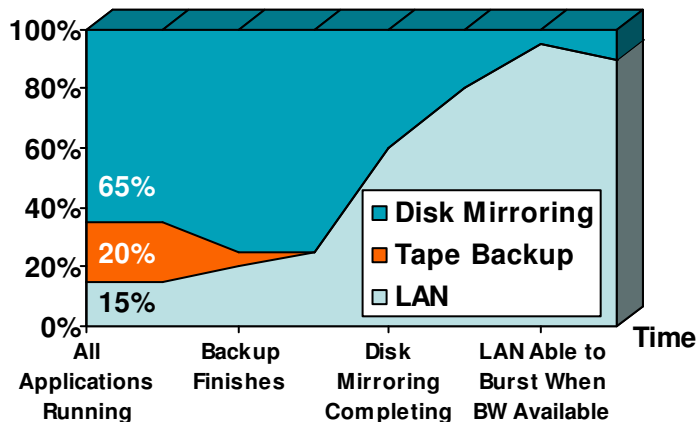
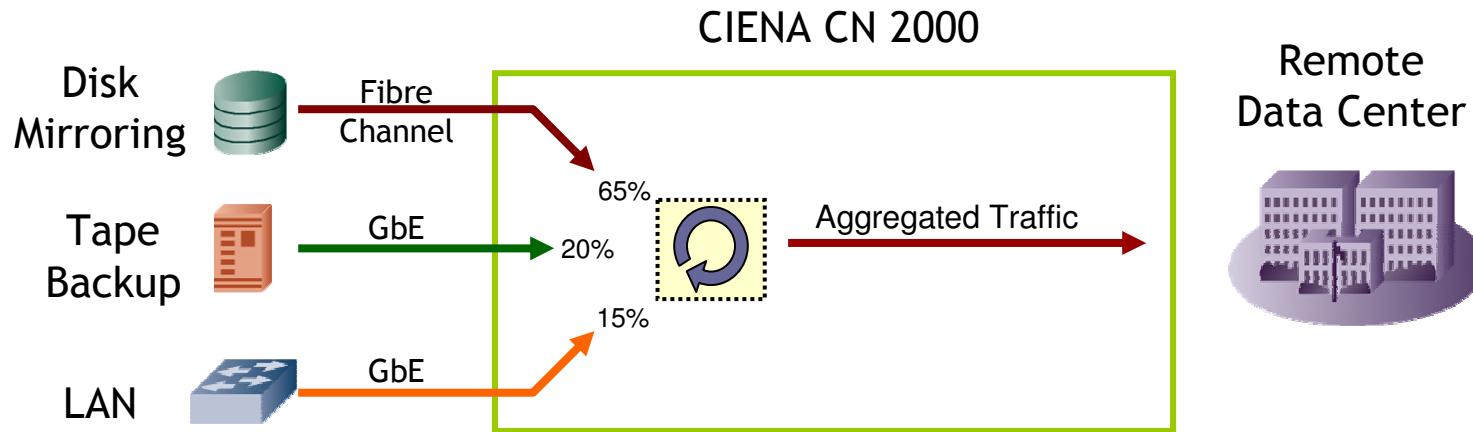
→ Reduce WAN bandwidth consumption by

1. Removing unused portion of protocol line rate (whitespace)
2. Using dedicated compression chips on each client port to compress data 3x to 5x
3. Allowing multiple applications to share the same WAN facility

→ For all client protocols and WAN interfaces

→ Work at the block level and be transparent to all applications and protocols used (as opposed to WAFS appliances)

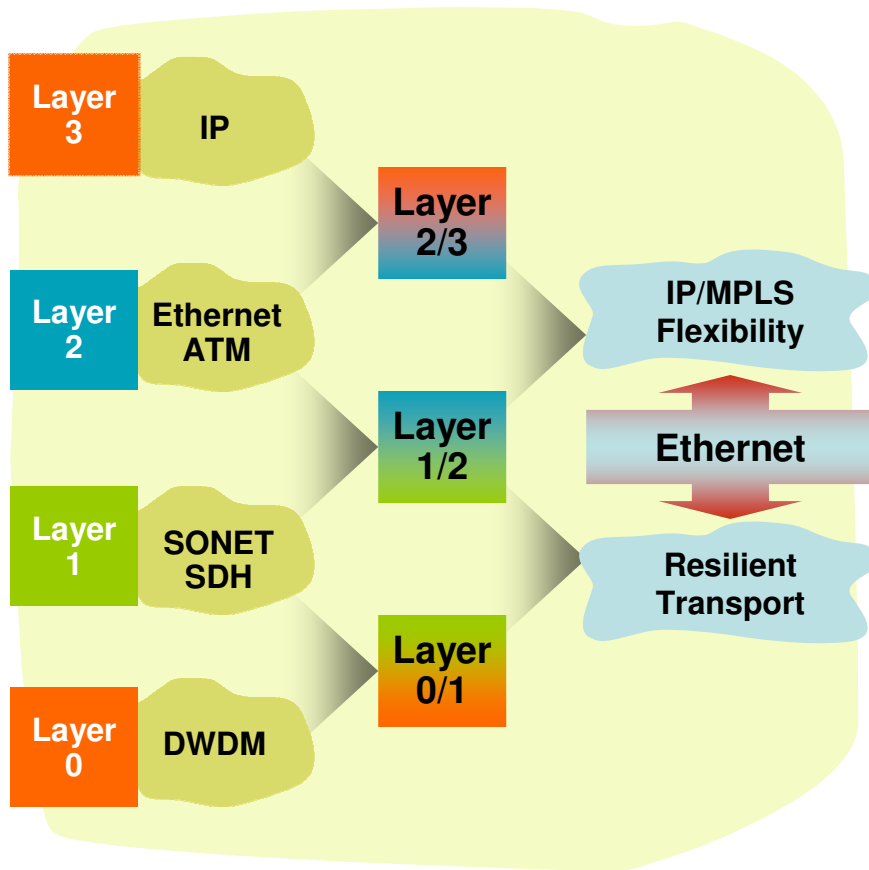
What makes sense: Dynamic Bandwidth Assignment



- Each port is assigned a guaranteed minimum percentage of the bandwidth
- IT WAN managers can assign bandwidth to different applications (e.g. to the Storage guys) without having to tweak IP router QoS
- Applications remain physically isolated, guaranteeing security and performance

Performance Ethernet for Network (WAN)

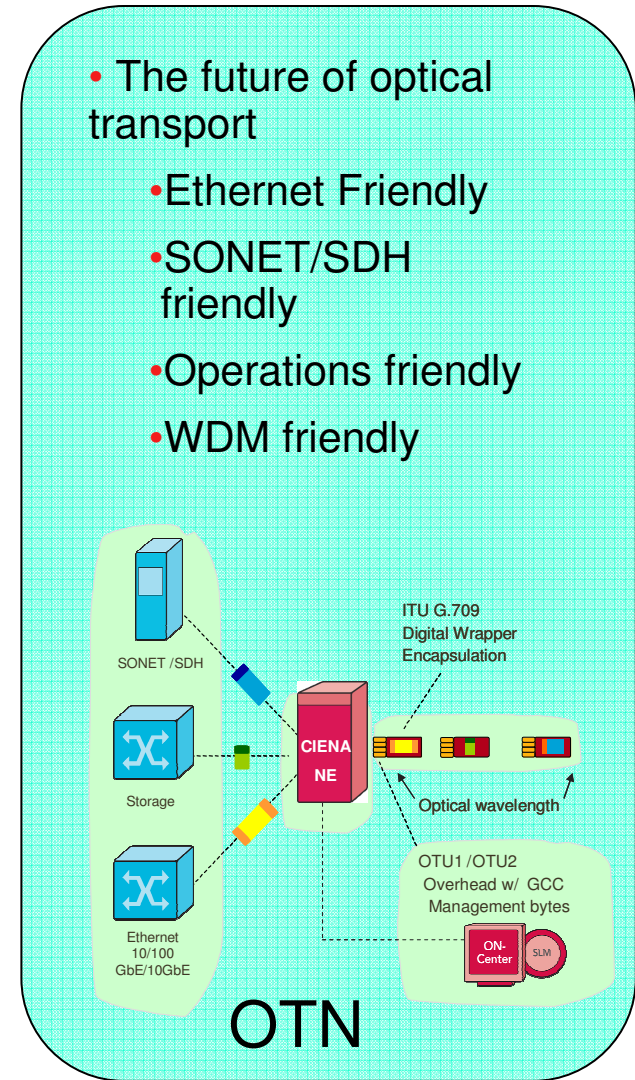
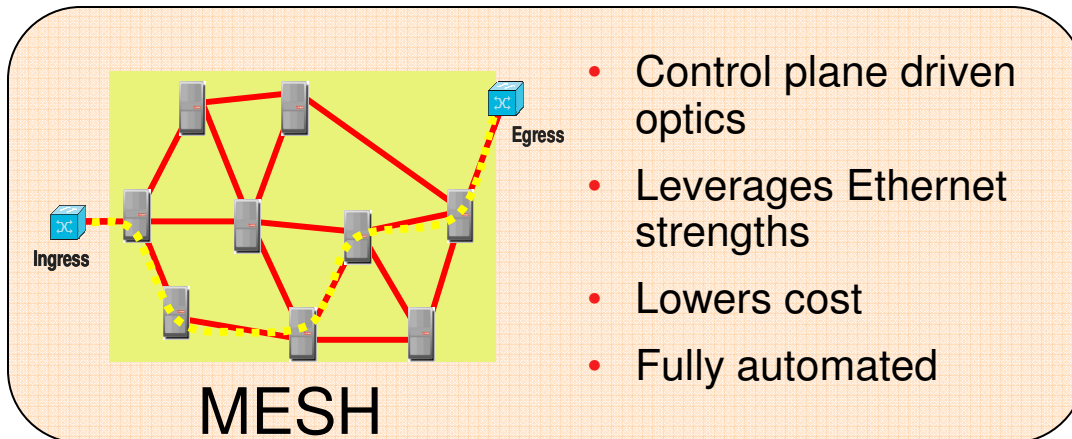
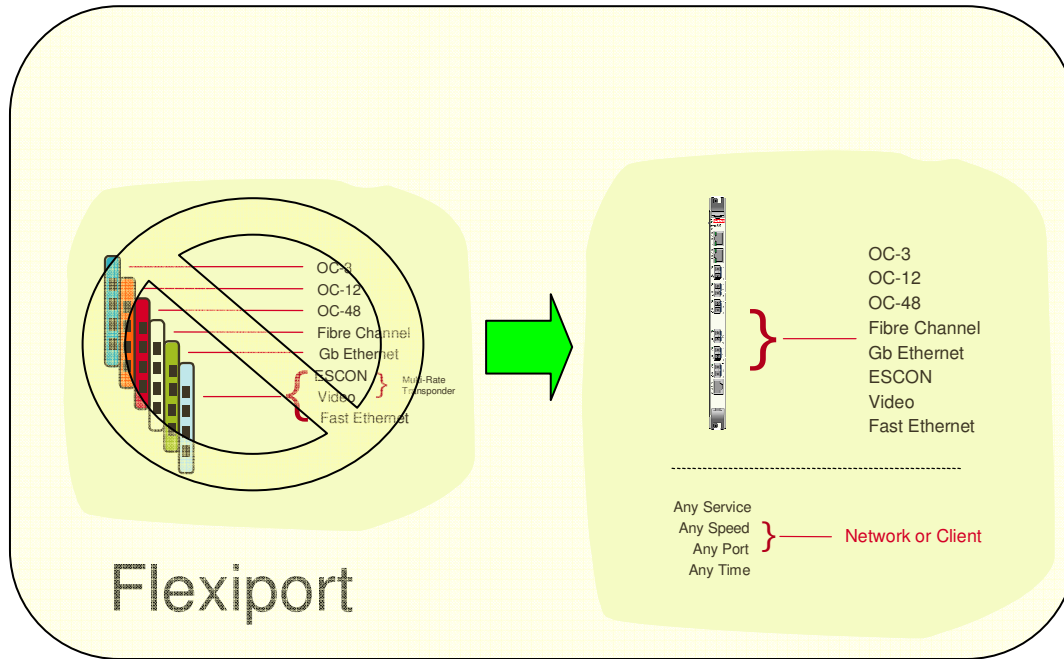
Drives simplification, enables cost-effective transition



→ What is performance Ethernet?

- Highly resilient transport for reliability
- Service-layer visibility for carrier-grade management and control
- Multiservice flexibility for practical transition
- Built on a universal, familiar standard

Flexible Technology for Adaptive WAN



Conclusion

- Enterprise IT face a real issue with degraded application performance
- Need to focus on application vs network related impact
 - Near term: mitigate with solutions in LAN
 - Caution: It takes only one application to spoil the party
 - Longer term: solve application/server protocol behavior
- Keep WAN simple
 - Deterministic transport that is robust and transparent