



MPLS VPN Challenge

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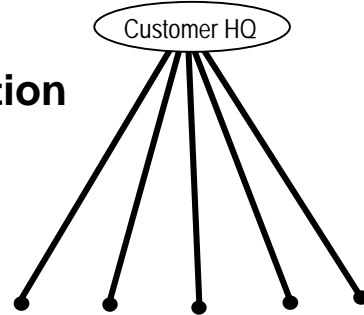
Agenda

- WAN Evolution to MPLS
- Key Challenge
- Key to MPLS Success

Evolution of WAN Solutions

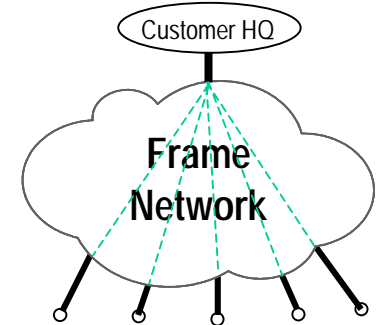
Private Lines

Cost of no Aggregation
Distance Sensitive
Prices
Global Reach
(via part circuits)
QOS



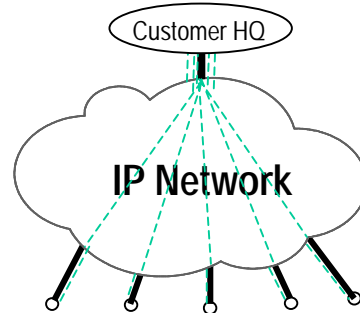
Frame Relay

'Cloud' Concept
(Aggregation)
Distance Sensitive
Prices
Global Reach
(Limited via NNI)
Network QOS



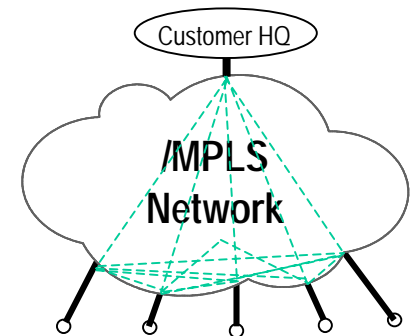
IP VPN

'Cloud' Concept
NON Distance
Sensitive Prices
Global Reach
(Ubiquitous via
Peering or IX)
Limited Multi Provider QOS



MPLS VPN

'Cloud' Concept
NON Distance
Sensitive Prices
Global Reach
(Limited via NNI)
End-to-end
Application QOS

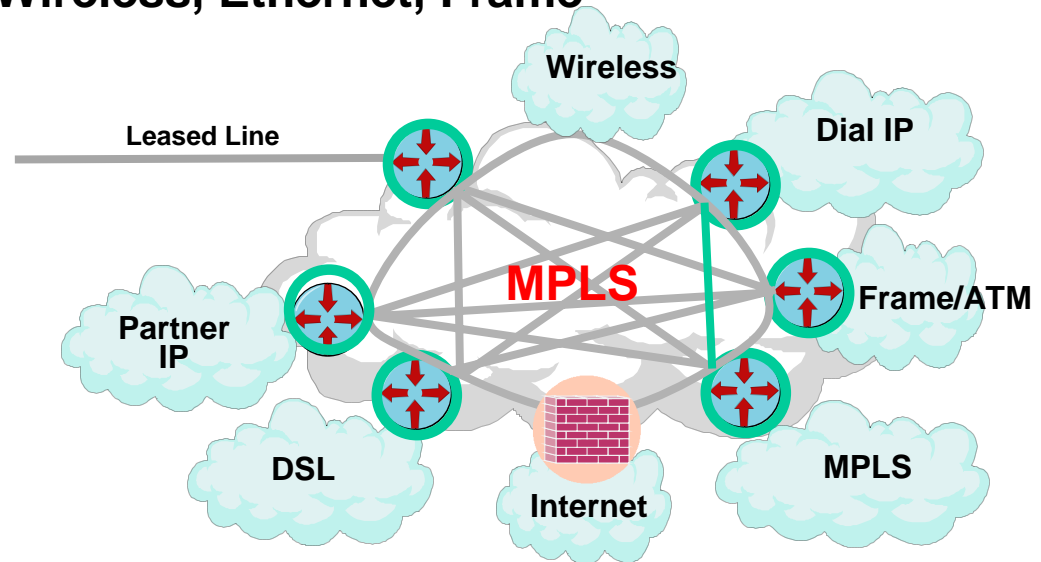


Single Provider Reach Challenge

- **Breadth**
 - Economics of number of countries covered globally
- **Depth**
 - In country reach
- **Technology**
 - How many technologies in how many countries and what coverage
 - ADSL, SDSL, VDSL, Wireless, Ethernet, Frame

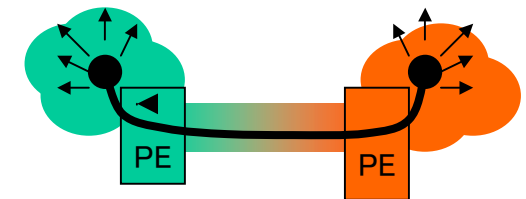
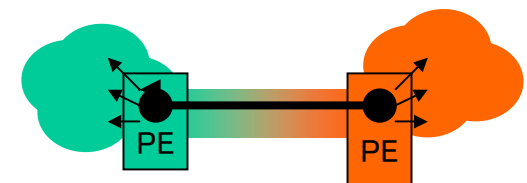
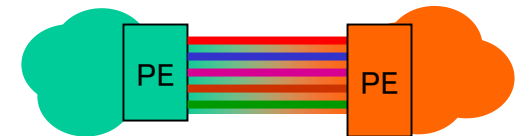
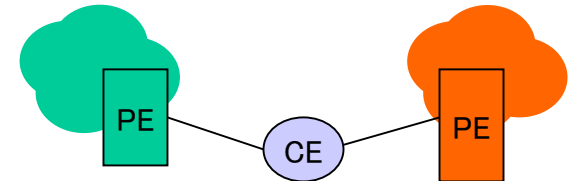
Solutions:

- Integrate with reach of IP
- Implement MPLS NNI Partnerships



Multi-provider MPLS VPN interconnection

- **Multi-homed CE**
 - Simplest configuration, no MPLS interaction
 - Additional access costs, single point of failures, no scalability
- **VRF to VRF PE interconnect**
 - One PE to PE connection per customer VPN, fine-tuning of interconnect parameters per customer VPN (e.g. custom QoS parameters)
 - Provides visibility of interconnection and individual customer VPN
 - How to increase scalability without impacting operational visibility
- **EBGP from AS to neighboring AS**
 - One PE to PE connection between Service Providers. High scalability
 - Limited operational visibility on single end-user VPN at the interconnection point
- **Multi-hop EBGP between source and destination ASes**
 - Same as above, increased scalability because of the centralized routing information management



Challenges of NNIs

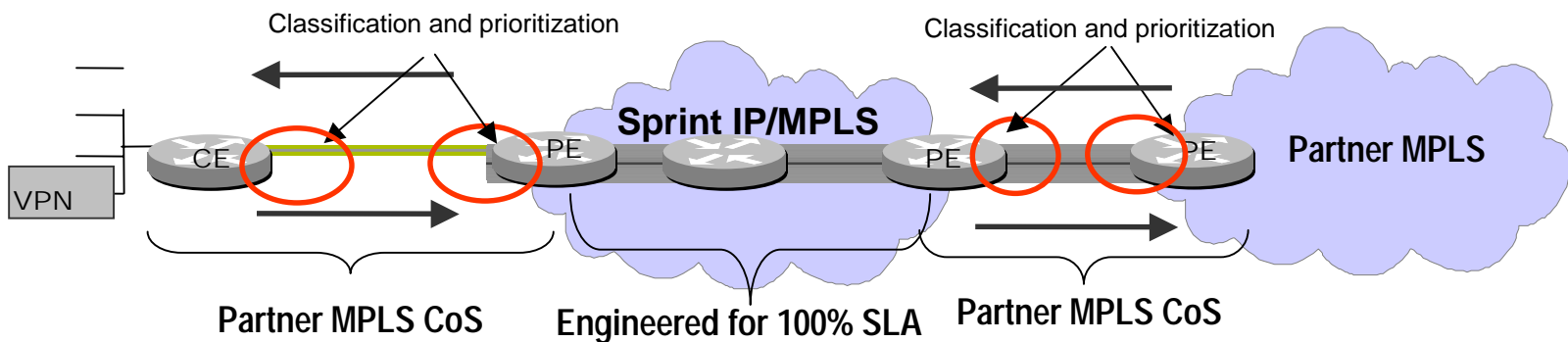
- How many Frame or ATM NNIs Today?
- What are the real challenges?
 - Technology Implementation
 - Operational Integration
 - Service Harmonization & Commercial Agreements



Complexity

Enabling MPLS NNIs through Service Simplicity

- High Quality backbone solution transparent to any Partner Provider MPLS & CoS profile
- Engineered to support SLA on full contracted bandwidth including jitter
- Eliminates need for QOS Mediation
- Ability to support multiple different providers with different QOS



Service Simplicity Advantage when Partnering

- Solution is commercially transparent to Partner MPLS Service
 - Service simplicity enhances the execution of the sales channel
- Provides for an unbundled MPLS service – CEs on Sprint network can be part of Partner Managed Service
- Partner operational & service changes requires little or no intervention from Sprint operations



Key to MPLS success is to provide the same ubiquitous reach as IP

- Reach is not purely network geography but how you get to the end user through:

Network
Technology
Universal Access Technologies
Applications
... and Partners

Selecting the right partner will be key to your success with MPLS



Questions & Answers

