



Packet Optical Transmission

Examining Verizon's Transition to a Packet Optical Infrastructure

Thomas Sims
Transmission Design Engineering
Verizon Business
March 30th 2010

© 2009 Verizon. All Rights Reserved. #18200001 0009

PROPRIETARY STATEMENT

This document and any attached materials are the sole property of Verizon and are not to be used by you other than to evaluate Verizon's service.

This document and any attached materials are not to be disseminated, distributed, or otherwise conveyed throughout your organization to employees without a need for this information or to any third parties without the express written permission of Verizon.

The Verizon and Verizon Business names and logos and all other names, logos, and slogans identifying Verizon's products and services are trademarks and service marks or registered trademarks and servicemarks of Verizon Trademark Services LLC, or its affiliates in the United States and/or other countries. All other trademarks and servicemarks are the property of their respective owners.

2



Agenda: Verizon Packet Optical Transmission



- Verizon's Global Capability - 1 slide
Introduction to Verizon's network reach and capability
- Carrier Networks & Convergence - 2 slides
Typical Carrier network & Convergence of layers
- Signal and Protocol Mapping - 2 slides
Analysing the protocols in the network
- Packet Optical Transmission - 3 slides
Summary of Packet Optical Transmission
- Automation and Core Router design - 2 slides
Some drivers & application of POTP
- P-OTP Deployment Strategy - 2 slides
Target implementation of system and network
- Conclusion - 2 slides
Conclusions & Questions



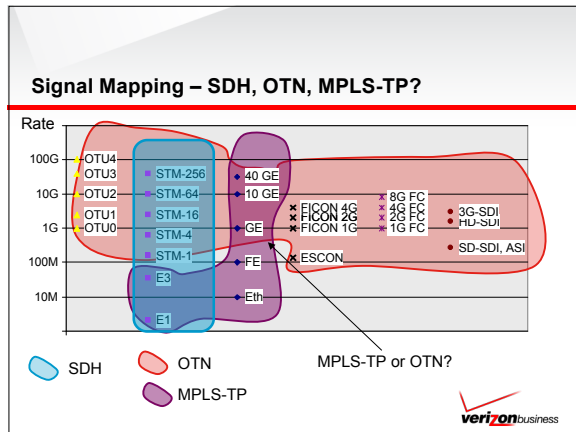
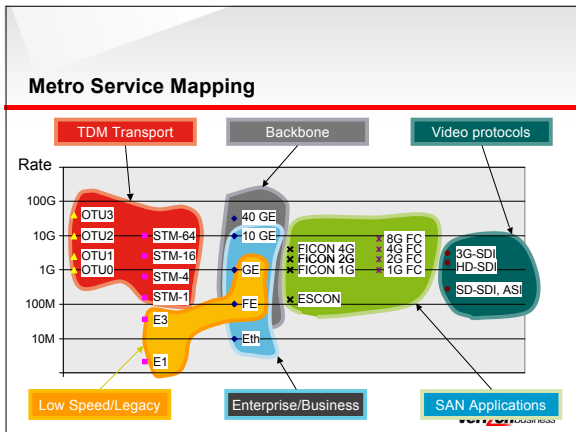
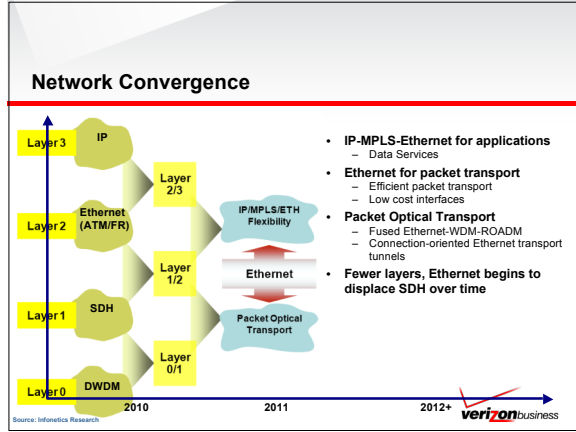
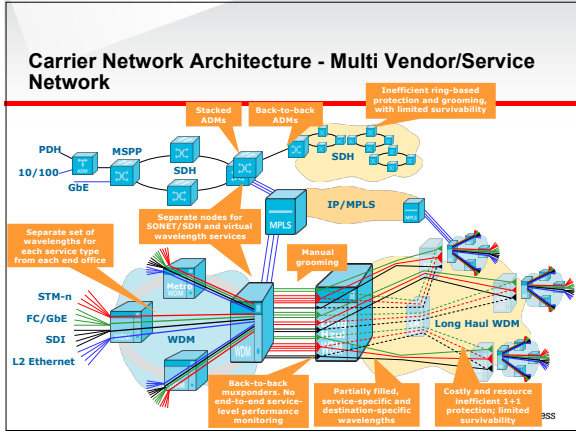
Verizon's Global Network Capabilities & Operations

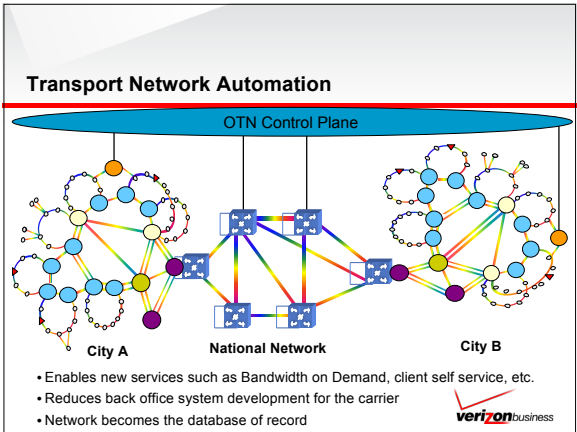
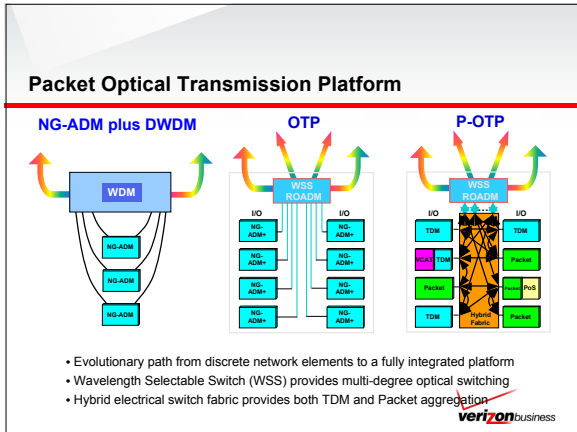
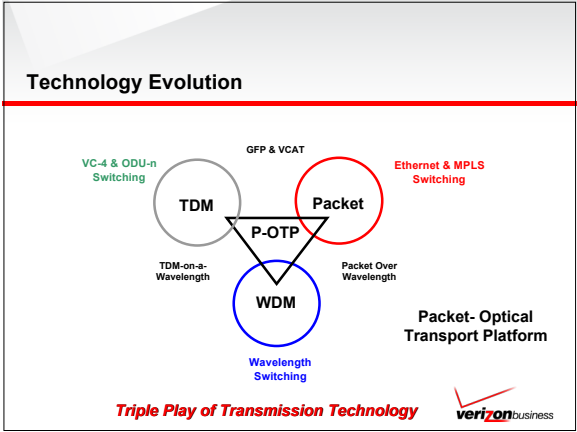
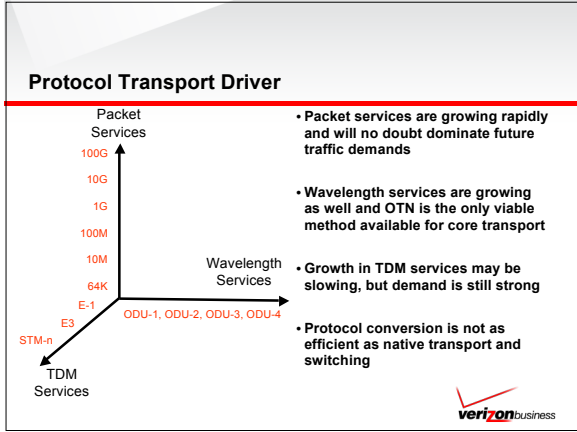
- 750K+ Fibre Route Kilometres & 80+ Submarine Cable Systems
- 40,000+ miles of ULH network in U.S./Asia/Europe
- 200+ Data Centres,
- 10,000+ On-net buildings globally
- 5 Major Global Network Operating Centres
- 4,000+ Managed Customer Networks



Most Connected Global IP Network

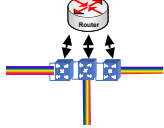






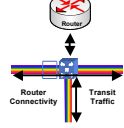
Core Router Connectivity

Current Architecture: Core Router Direct Connectivity



- Physical mesh connectivity is desired to reduce transit traffic
- Router port and transport utilization is limited due to granularity
- Reconfiguration flexibility is limited due to granularity, speed, and control plane interoperability

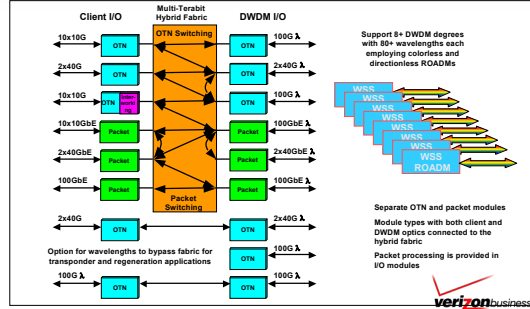
P-OTP Architecture: Core Router Connectivity via Transport MPLS



- Fewer router ports required to achieve full mesh connectivity
- Packet level granularity provides maximum utilization
- Higher speed ports between layers w/o channelization provides maximum flexibility

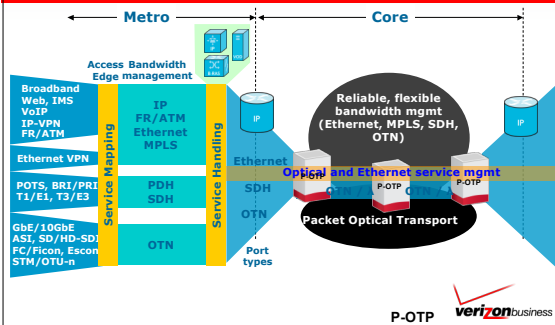
verizonbusiness

P-OTP Target Architecture



verizonbusiness

Summary Target Network Architecture



Conclusion

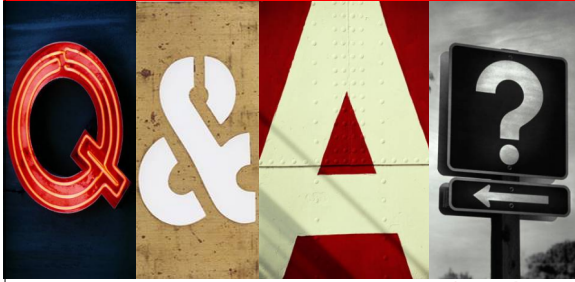
- Service mapping and protocol requirements are becoming more varied and complicated
- Transmission systems should support:

- Packet services natively
- Optical Wavelength services
- SDH services

Verizon's strategy is to deploy a Packet Optical Transmission Platform that supports all Services on one system.



Questions?



verizonbusiness