



AFCEA Solutions Series

Peering into the Crystal Ball

Networks in 2015

“Things We Think We Think” 😊

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The “Evolution” to Networks in 2015

1. **Concept of creating a “Clean Slate” * from the Internet we know today**

“What if we could design the Internet from scratch?”



2. **Evolving the Internet/Network Technologies being used in today’s networks**

Transport, Routing, MPLS, Mobility, Security, IPv6



“Designing the NG Internet from Scratch” 😊

“The proposed program will focus on unconventional, bold, and long-term research that tries to break the network's ossification. To this end, the research program can be characterized by two research questions:

“With what we know today, if we were to start again with a clean slate, how would we design a global communications infrastructure?”

“How should the Internet look in 15 years?” We will measure our success in the long-term: We intend to look back in 15 years time and see significant impact from our program.”

Clean Slate Research Project
Program Goals
<http://cleanslate.stanford.edu>

Evolving the Internet/Network Technologies being used in Today's networks

■ Transport

- Common Control Plane End-to-End for IP/Optical?
- Ethernet Evolution / IEEE 802.xxx – How far will it go?
 - Terabit Ethernet? Transport? (CE, Low Latency)
- IP moving closer to Optical/DWDM Layer

■ Routed

- IPv4 to IPv6 Transition - IPv4 address exhaustion closing in (concern from all 5 Registries)
 - Transition to IPv6 is inevitable (unless there is new NAT-PT algorithms created)
- High Speed TCP? Other?

■ Routing

- Scaling to meet growth, “NG” BGP, LISP (Locator/ID Separation Protocol)
- Service Distribution/Advertisement using Routing Protocol

Evolving the Internet/Network Technologies being used in Today's networks

■ Mobility

- 802.xxx, 3G and beyond
- Security – user → Device , Device → Network, securing the Data Flow, 802.1ae (Link Sec – L2)

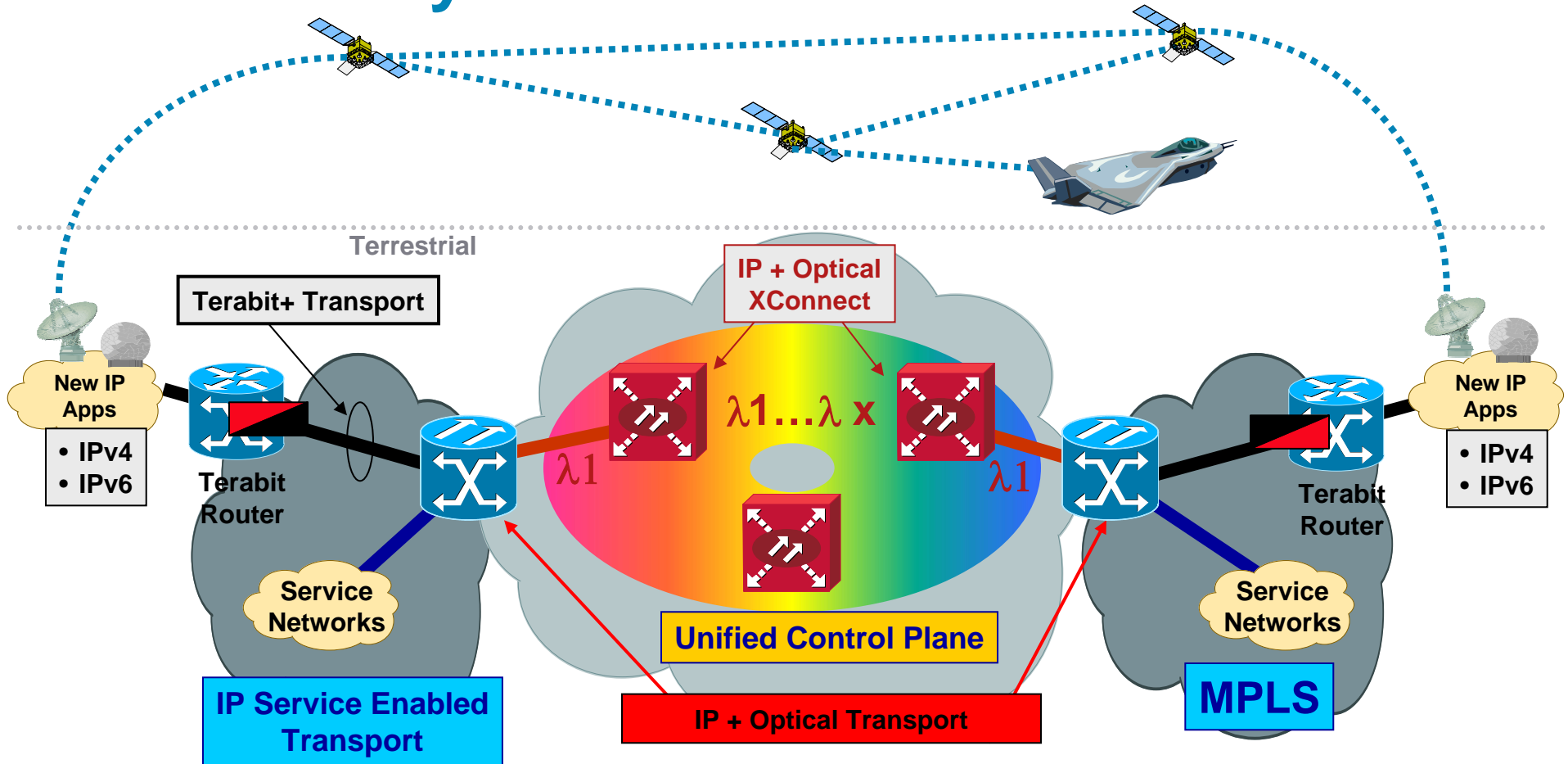
■ Quality of Service

- Granularity vs. Adding More BW
- Common QoS Service Classification
- Scalable Admission Control

■ Encryption

- Multi Level Security that are Secure and Scale
- Closer Integration of “Network” features + “Security” Features
- Speed, Speed, and more Speed! 😊

NetCentricity – “3D” Network as the Platform



Routing and QoS

- Integration of IP + Optical
- GMPLS Control plane
- Access/PoP MPLS (or extend GMPLS)
- Both IPv4 and IPv6 existing in all networks
- Call Admission Control

Router/Optical Platform Capacity

- End to End Net-Centricity
- IP + Optical Routers of 100 Tb+
- Assuring QoS requirements End-to-End
- Ease of Provisioning

