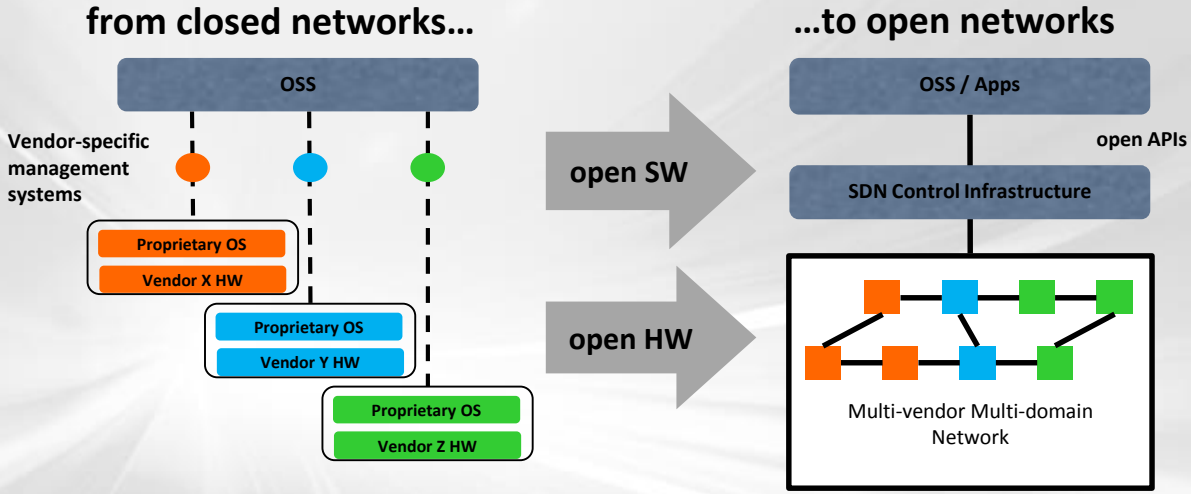
OIF Certification
Optical Control Plane UNI

Overview

October, 2016

OIF

Optical Networks Transformation



- Proprietary, vendor-specific silos
- Complex to operate across vendors and technologies

➔ Interoperable control plane
➔ Interoperable data plane
➔ End to end orchestration

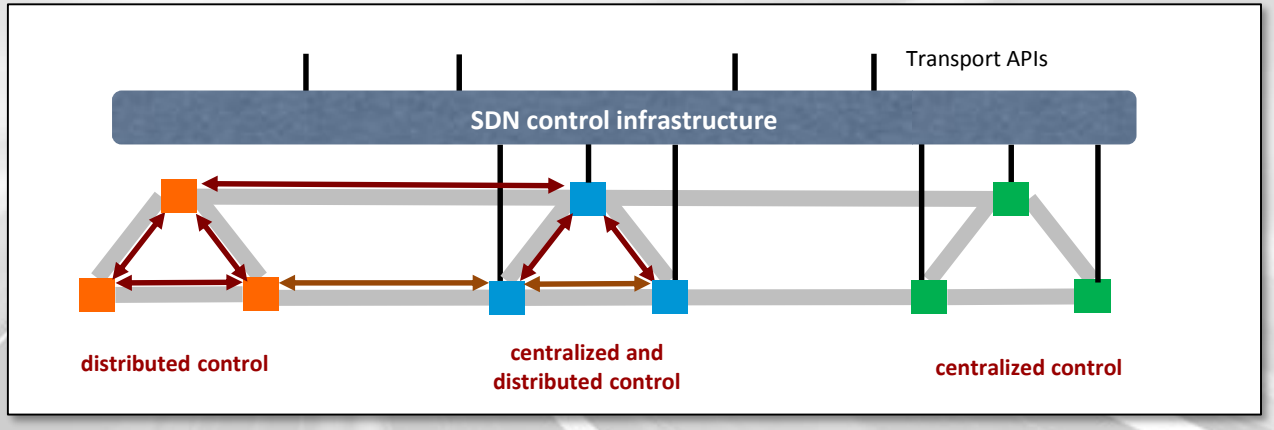
OIF certification program
Initial focus on optical control plane

- Benefits of an optical **control plane**
  - Simplified provisioning
  - Automated path selection
  - Dynamic restoration
  - Multi-layer optimization

- Combined with the benefits of **multi-vendor interoperability**
  - Reduced costs
  - Freedom to introduce new features or innovations
  - Operational agility

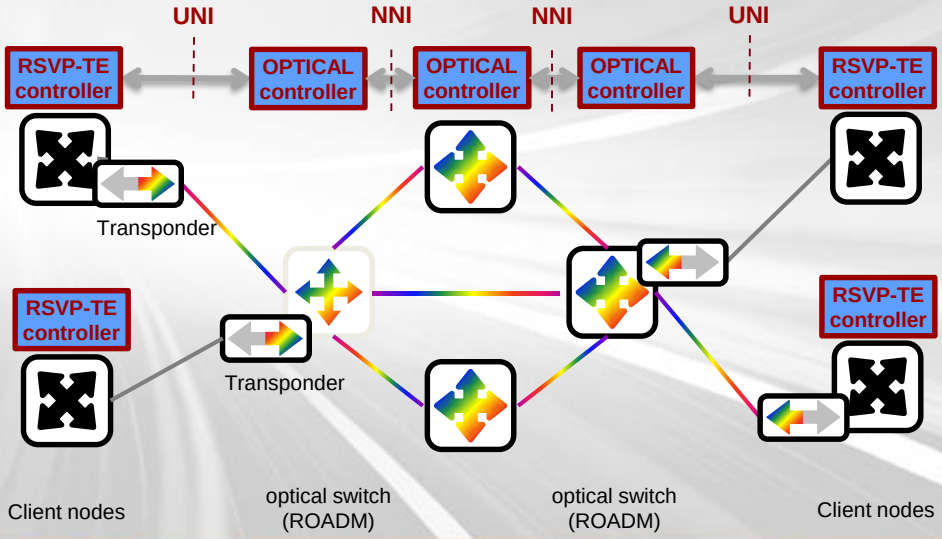
Centralized and distributed control

Centralized and distributed controls are complementary and need to interwork with each other, as to ensure end-to-end coordination across heterogeneous networks.



Optical Control Plane UNI

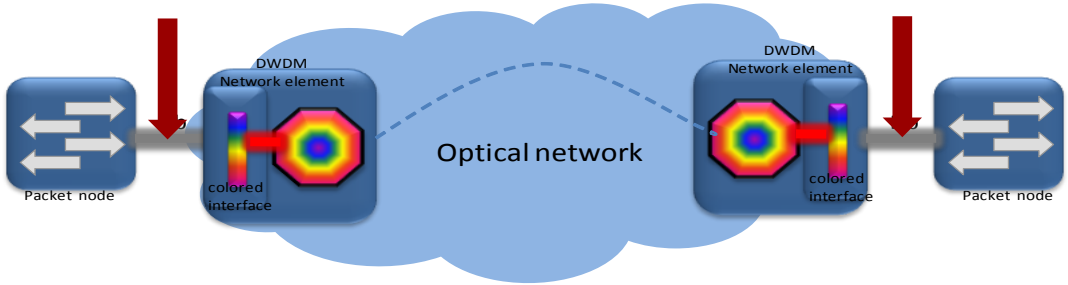
The optical control plane enables dynamic provisioning, restoration and optimization, across optical networks. User Network Interfaces (UNI) extend these capabilities to client nodes. The UNI control protocol is based on RSVP-TE.



UNI on black & white interfaces

Multi-layer interactions using black & white client interfaces

- Client nodes may include IP/MPLS routers, L2 switches, OTN cross-connects
- Transponders reside in WDM/ROADM transmission network element (not in client node)
- Control plane interactions take place at black & white Ethernet/OTN interfaces



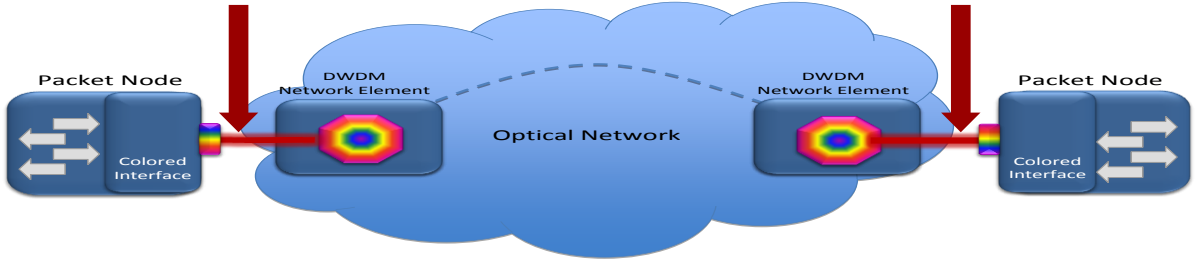
Interoperability of the optical control plane for a black & white UNI is the most basic and the **most urgent** issue to address:

- Existing set of IETF RFCs and OIF IAs
- Existing product implementations
- Interoperability is **a must-have for deploying IP-optical interconnect** with multi-layer interactions.

UNI on colored interfaces

Multi-layer interactions using colored client interfaces (a.k.a. Alien wavelength)

- Client nodes may include IP/MPLS routers, L2 switches, OTN cross-connects
- Transponders are moved into the client nodes (out of WDM/ROADM transmission network elements)
- Control plane interactions take place at a colored client interface



Interoperability of GMPLS control plane for a colored UNI is slightly more complex, but an **increasingly urgent** issue to address:

- Existing set of IETF RFCs
- Existing product implementations
- Interoperability is **a must-have for the support of "alien wavelength" deployments**, where transponders are made independent from ROADMs.

Why Certification?

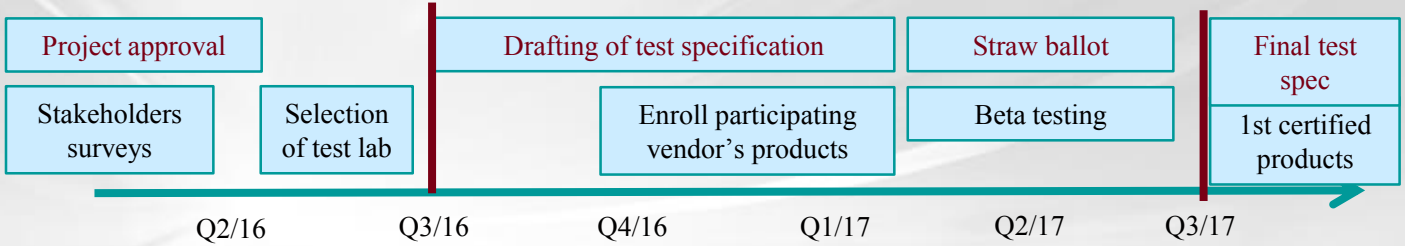
- Issue to be solved : Multi-vendor interoperability of the optical control plane is still missing from commercial products, although various demonstrations have proven it is feasible.
- Certification is a powerful tool to bridge the gap between technical standards and commercial implementations: it will provide a unique reference and a market advantage to compliant, interoperable products.
- In line with its mission is to enable global interoperability in optical transmission networks, OIF surveyed the market and decided to create a certification program for interoperable products – starting with the Optical Control Plane UNI.

Initial Focus on Optical Control Plane UNI

- Focus on Control Plane UNI (black & white + colored interfaces)
  - Mature: existing standards, existing products
  - Timely: IP-optical interconnect and alien wavelength support are increasing business requirements
  - Very strong market drivers: interop has to happen sooner or later, for IP-optical interactions and alien wavelength use cases.
  - Standalone issue: not dependent on other work in progress
  - OIF has the required skills and legitimacy
  - Lowest hanging fruit (yet a serious piece of work)

- There is a real need from the market to open up optical networks
  - Once this first OIF certification is launched on control plane UNI, it may be followed by others, e.g., NNI, SDN API, data plane or management plane.

UNI Certification Deliverables and Timeline



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Value to the industry

- Means for operators to obtain and differentiate interoperable commercial products
- Market advantage to manufacturers' products which pass certification
- Reduced repetitive testing for vendors and operators. Time to market.
- Enhanced implementations, better competition, more innovation.

Operators: make sure to mandate the OIF certification in all your upcoming RFPs!

Vendors: get involved in the OIF program and be first to ship certified products!

Supportive quotes

Vendor #1: “**A universal set of requirements** and certifications gives us the ability for interop of components where certifications in the past used best guesses as to what parameters or metrics were important and which ones were actually tested.”

Vendor #2: “OIF certification can help broaden and accelerate the market for optical products by assuring **multi-vendor/-product interoperability** and thereby reducing the time to get products qualified and accepted. This reduces the sales cycle for system vendors and lessens the testing and qualification burden on service providers.”

Carrier #1: “The OIF certification will greatly facilitate **integrating our IP and optical networks together**. We need a control plane open to multiple vendors and multiple layers. The OIF certification will avoid the fear of vendors lock-in. On the longer term, the advent of interoperability in optical networks will increase agility and innovation, at lower costs, for the benefits of the entire industry.”

Carrier #2: “An OIF certification will enable us to guarantee the devices we buy are compatible with the latest Multi-layer interoperability features. We believe that a correct management of GMPLS-UNI interaction is **the key to transport SDN at its maximum level**.”

Conclusion

- Interoperability is technically feasible, as demonstrated in labs, but still needs to get into commercial products
- The OIF helps the industry unlock the benefits of SDN for optical networks, through three interrelated programs:
  - Implementation Agreements, that document the use of industry standards;
  - Interop demonstrations, hosted by participating operators leveraging key interfaces such as the Transport API to bind together multi-layer and multi-domain carrier networks;
  - Certification, to address the gap between paper specification or early implementation and products that carriers can deploy.

To participate in the specification of the certification tests, please contact: Andi Kosich, OIF (akosich2@oiforum.com)

To participate in beta testing and to get your products certified, please contact: Timothy Winters, UNH-IOL (twinters@iol.unh.edu)

Thank You!

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