# IETF 118 – ccamp Meeting

Applicability of ACTN to Packet Optical Integration (POI) extensions to support Router Optical pluggable interfaces.

## draft-poidt-ccamp-actn-poi-pluggable-02


Co-authors (frontpage):

**Gabriele Galimberti** (individual)
**Jean-Francois Bouquier** (Vodafone)
**Daniele Ceccarelli** (Cisco)
**Sergio Belotti** (Nokia)
**Oscar Gonzalez de Dios** (Telefonica)
**Fabio Peruzzini** (TIM)

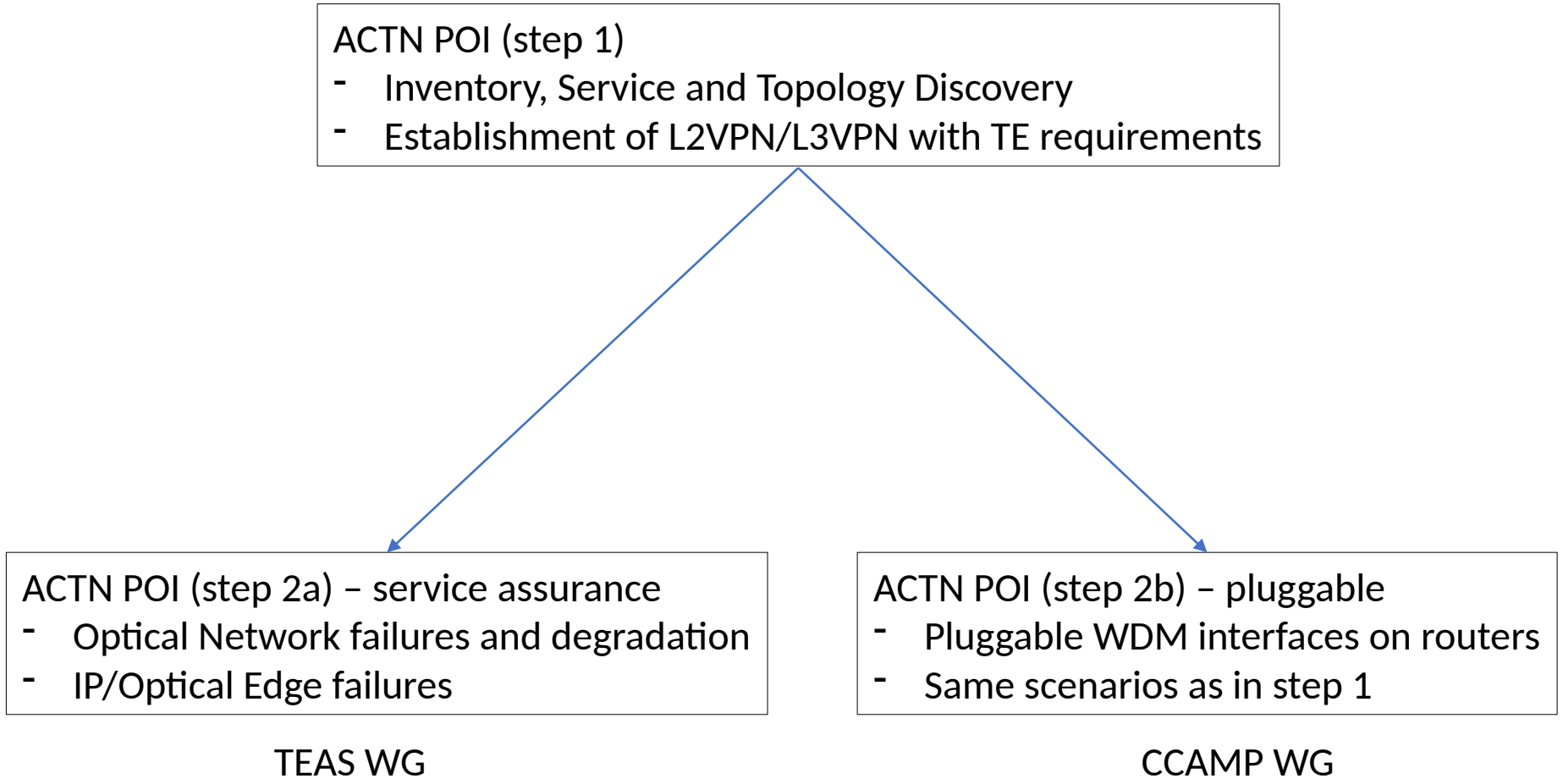
Contributors:

**Manuel-Julian Lopez** (Vodafone)
**Jose-Angel Perez** (Vodafone)
**Gert Grammel** (Juniper)
**Phil Bedard** (Cisco)
**Rana El Desouky Kazamel** (Cisco)
**Prasenjit Manna** (Cisco)
**Ori Gerstel.** (Cisco)
**Brent Foster** (Cisco)

# Why draft-poidt-ccamp-actn-poi-pluggable

1. The new DWDM pluggable technology is mature and deployed in field
2. The operators are targeting to have an end-to-end SDN management architecture of the full network including those new DWDM pluggables in the Routers.
3. Extend the **draft-ietf-teas-actn-poi-applicability (the parent draft)** to networks where the DWDM (pluggable) transceivers are located in the Routers.
4. Define a set of use cases to address as well as their corresponding workflows, identifying possible gaps in terms of YANG models for each use case and provide indications to extend existing Yang drafts
5. Co-ordinate the use cases implementation with **draft-poidt-teas-poi-assurance** and continue working on new ones: performance monitoring and events/alarms correlation.

# ACTN POI work and relations



# Network scenario and use cases

- What is the type of network scenarios we're targeting? (today mainly two scenarios with high priority for operators)
  - Dedicated point to point connection Metro areas
    1. Low power ZR pluggables
    2. High capacity (nx400G)
    3. Dedicated DWDM infrastructure (fixed filter, line amplifiers, no ROADM)
    4. Distances up to 100kms

  - Point to point connection over metro/regional areas
    1. High power ZR+ pluggables
    2. Sharing the ROADM based infrastructure (classical coherent transponders)
    3. Distance up to 500 kms

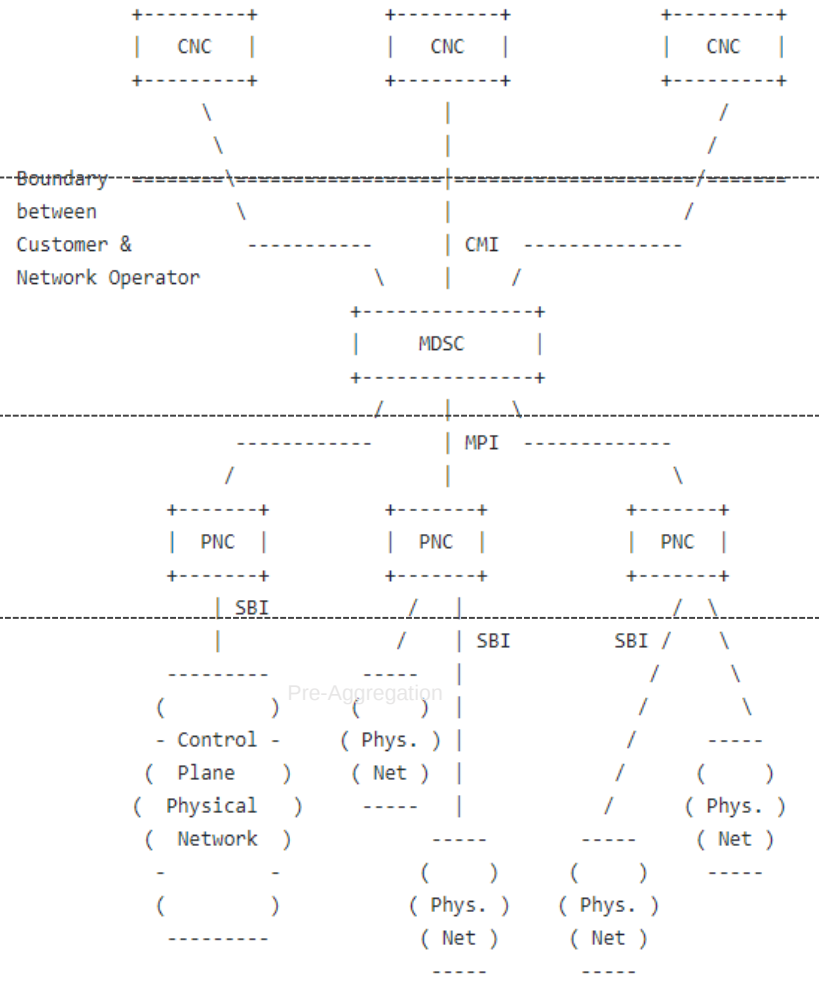
# Operator’s requirements

1. End to end visibility
    1. Inter Domain Link discovery
    2. Network topology discovery
    3. End to end performance management KPI
    4. End to end alarm correlation **at MDSC**
2. End to End service provisioning / deletion
3. IP and Optical service provisioning / deletion
4. LAG extension
5. Assurance
6. Telemetry
7. Optical Restoration
8. Network Maintenance Operations

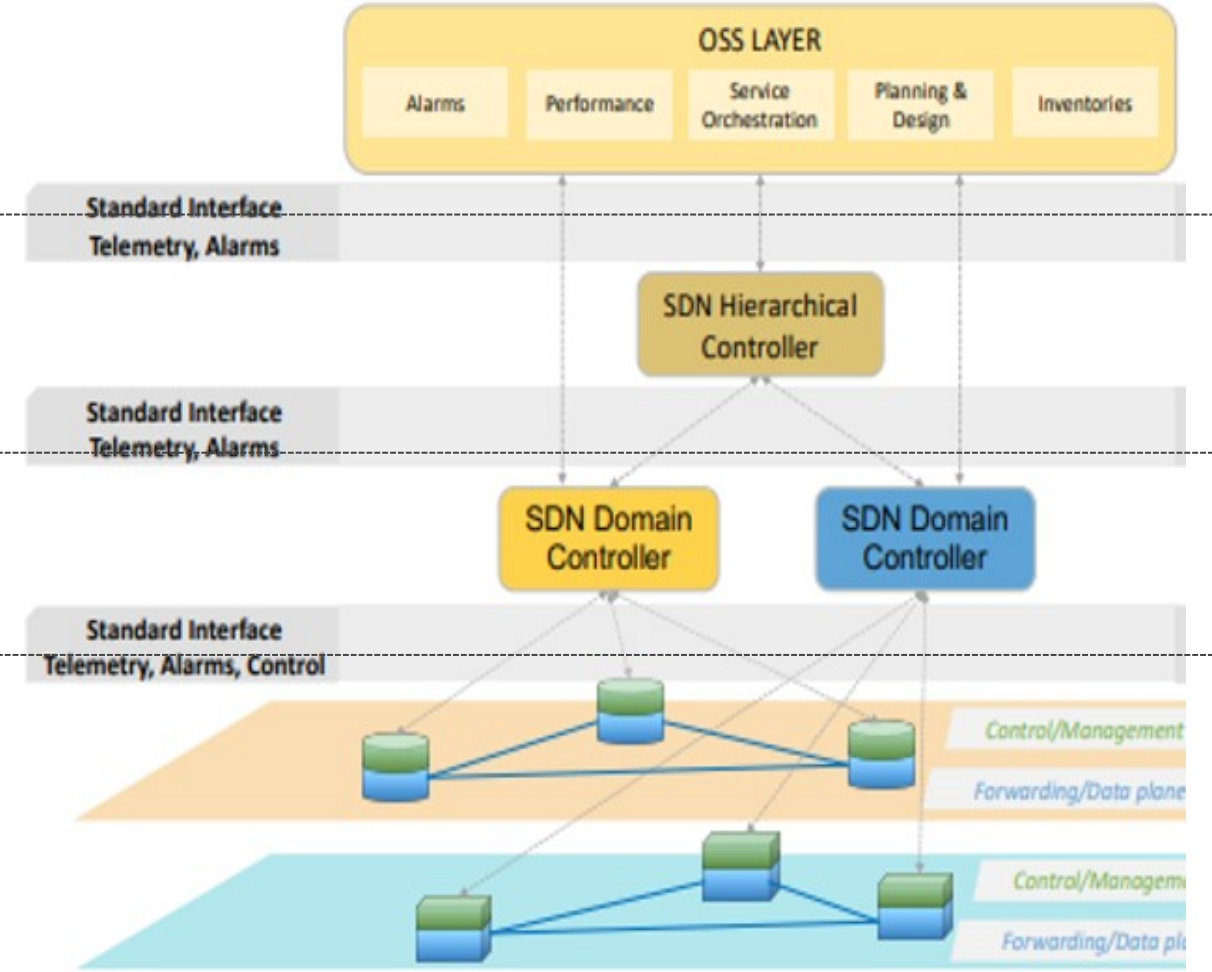
(*) no need for sub ms use cases. Primary re-routing is demanded to the IP layer

# Architectural considerations

## IETF reference architecture ACTN Framework (RFC8453)

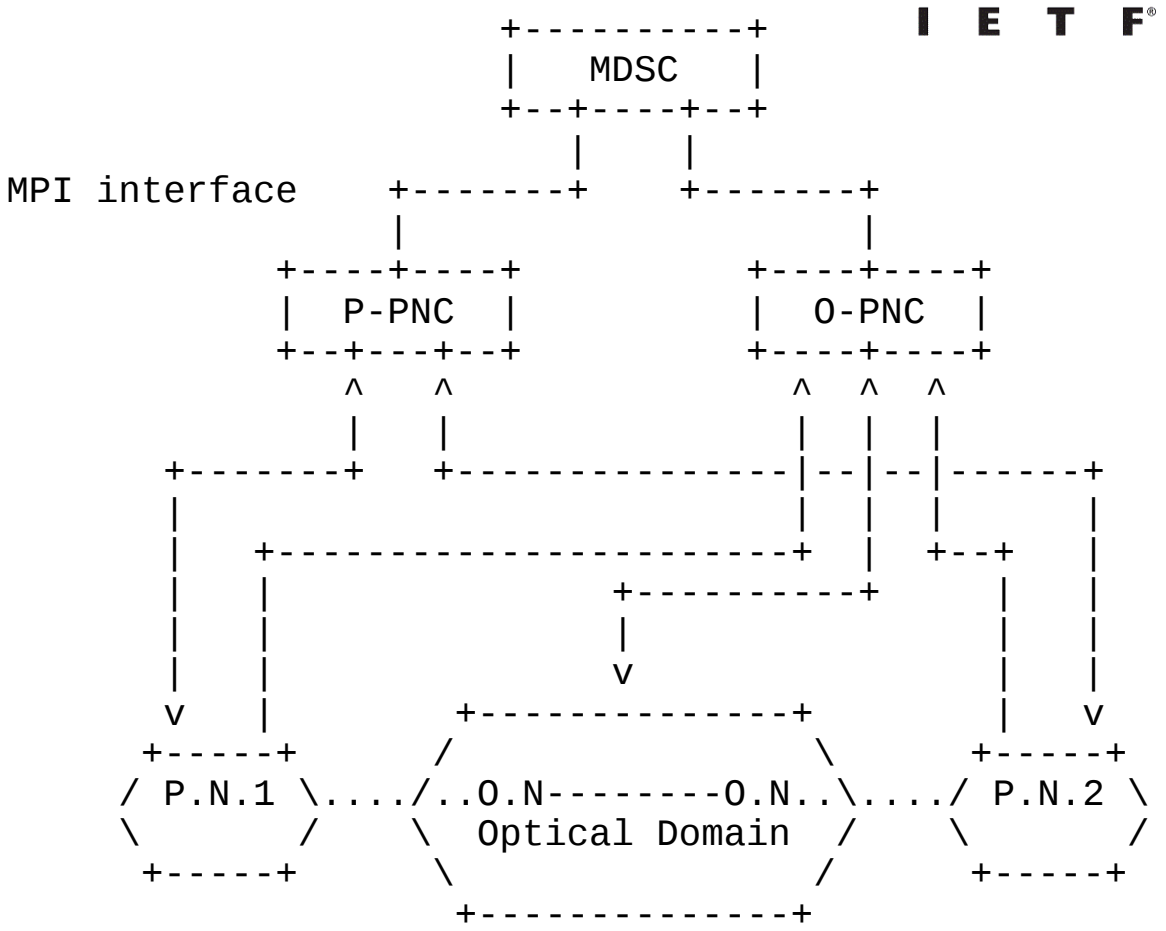



## TIP MUST reference architecture



# Option 1 - Dual SBI management of IPoWDM routers

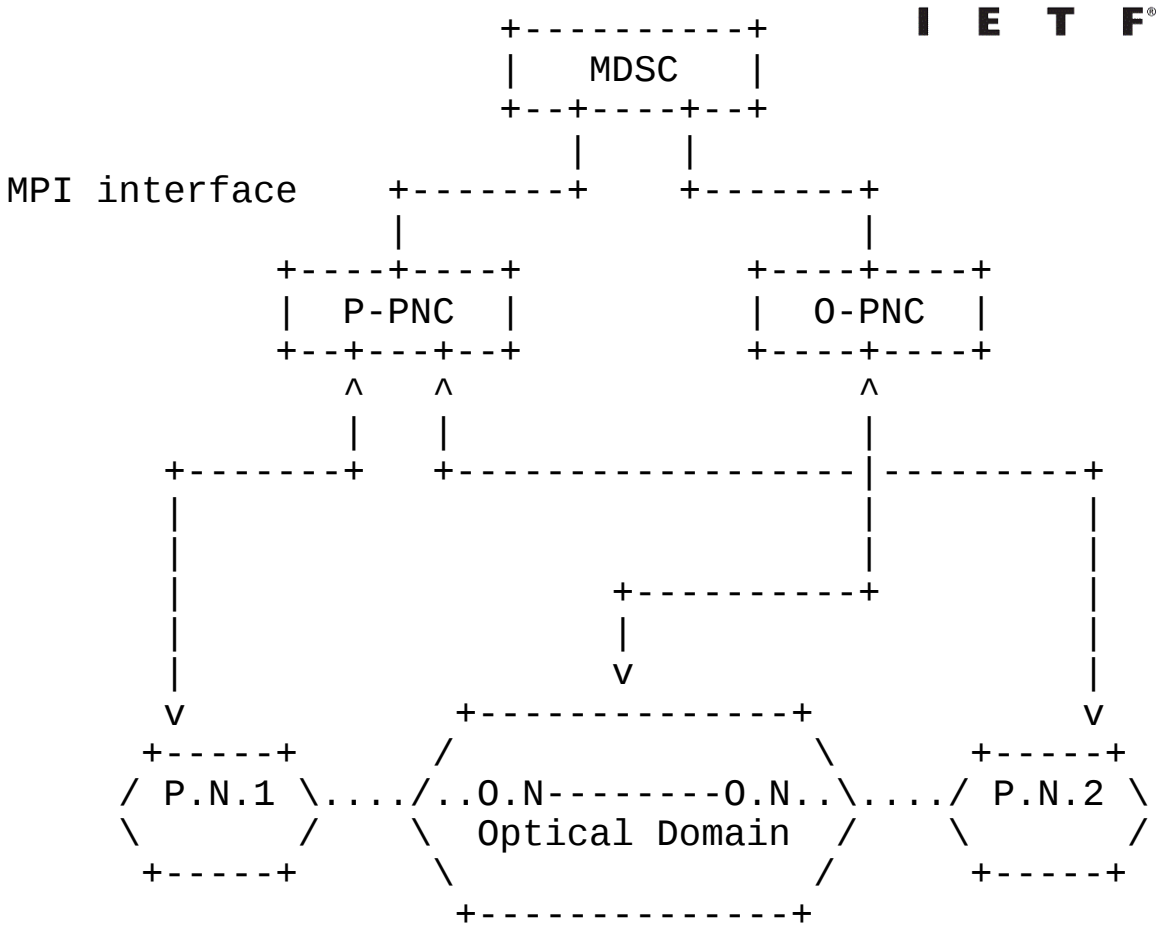
- Both the packet SDN controller (P-PNC) and the optical SDN controller (O-PNC) have access to the coherent pluggable optics on the routers.
- The P-PNC is the only entity allowed to configure them, while the O-PNC is granted with read-only permissions to avoid database inconsistency between them.
- Data write access permissions are expected to be implemented on the routers to only grant configuration rights to the P-PNC.
- O-PNC is allowed to:
  - Device discovery, poll or stream configuration, state and static capabilities.
  - Performance monitoring, periodically poll or stream performance counters.
  - Fault notification, received asynchronous alarm notifications.




P.N. = Packet/Optical Node (IPoWDM router)
O.N. = Optical Switching DWDM Node (ROADM)
ROADM = Lambda/Spectrum switch

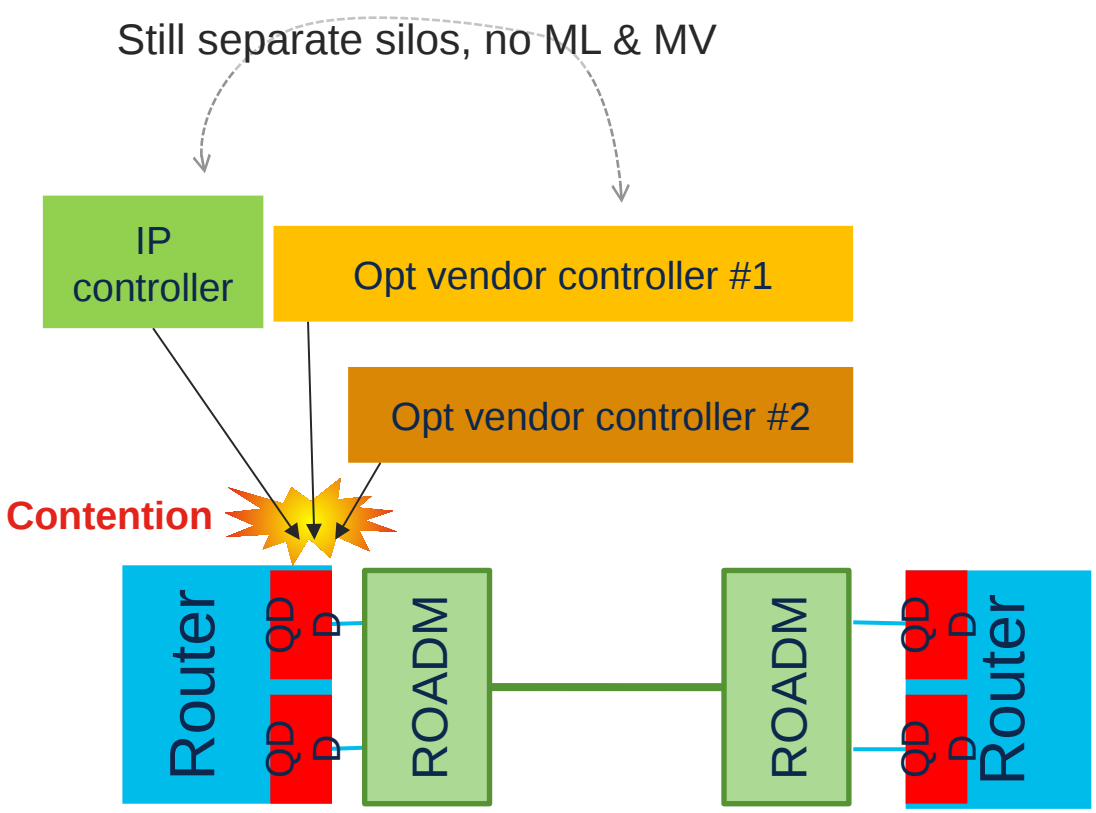
# Option 2 - Single SBI management of IPoWDM routers

- The P-PNC is the only component which has access to the routers and implements all the management capabilities.
- In this case the P-PNC not only needs to expose to the MDSC all the needed info for the management of the multi-layer network, but also physical impairment data needed for the computation and validation of the optical channel.
- In addition, also performance data need to be exported, as well as the API needed for the configuration of the pluggables.
- The MDSC is then the real co-ordinator between the IP and the Optical domains.

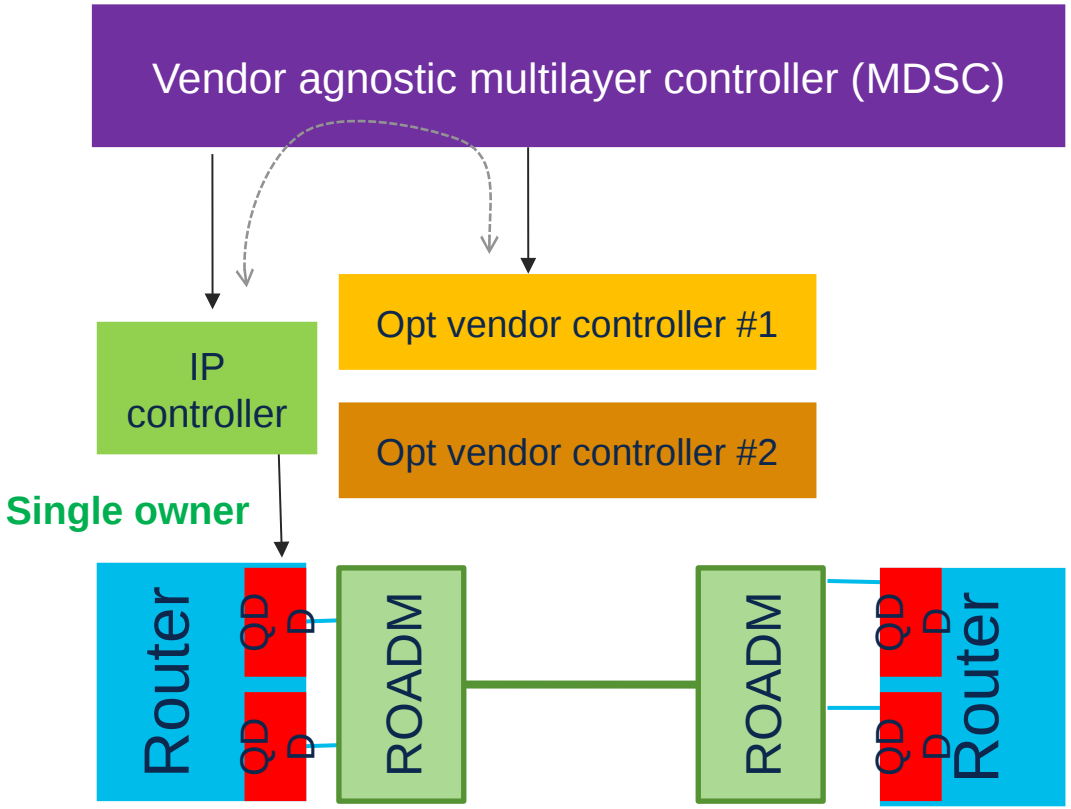



P.N. = Packet/Optical Node (IPoWDM router)
O.N. = Optical Switching DWDM Node (ROADM)
ROADM = Lambda/Spectrum switch

# The benefits of the hierarchical approach




**Multiple optical controllers managing the pluggables**




**IP controller managing the pluggables**

# Next steps

- Keep the the draft updated with the proper IETF terminology
- Maintain the GitHub repo to support the DT:
  - https://github.com/ggalimba56/draft-poidt-ccamp-actn-poi-pluggable
- stream line (prioritize) the use cases set
- Address new use cases like:
  - End to End Performance management KPI
  - End to End Alarm Correlation at MDSC
- Get feedbacks and harmonize the terminology to the “parent draft” and L0 specific drafts (e.g. draft-ietf-ccamp-optical-impairment-topology-yang).
- Open to new authors and contributors
- Keep alignment on draft-ietf-teas-actn-poi-applicability and draft-poidt-teas-poi-assurance
- Give directions to define the (Yang) models to support the Pluggables in Routers (in Yang drafts)
- WG adoption