draft-bardhan-spring-poi-sr-oam-00

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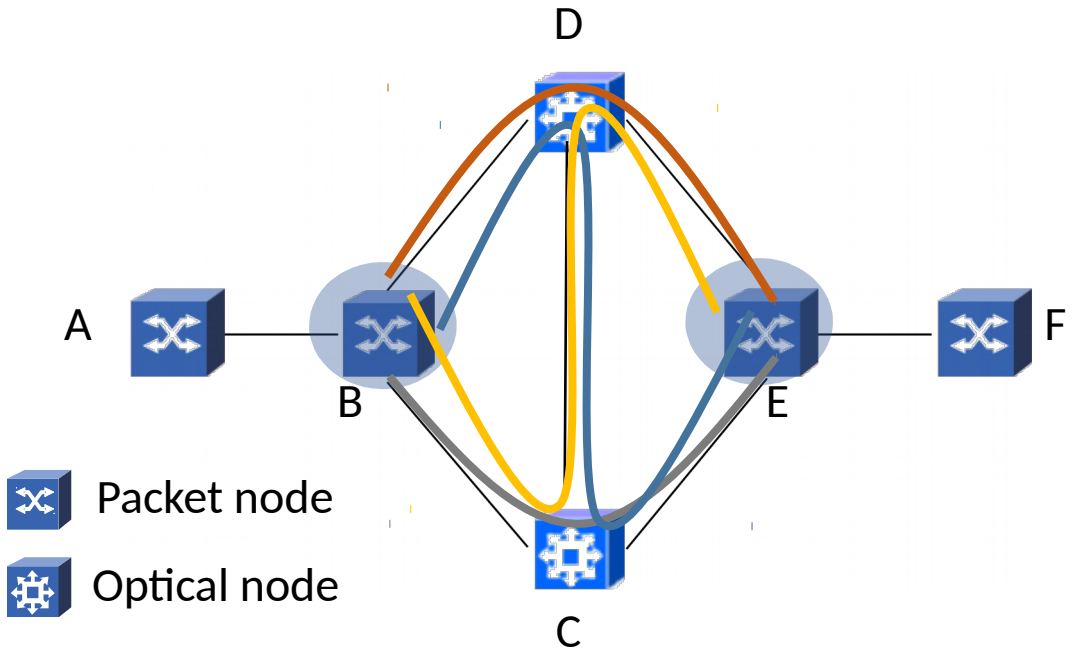
Background

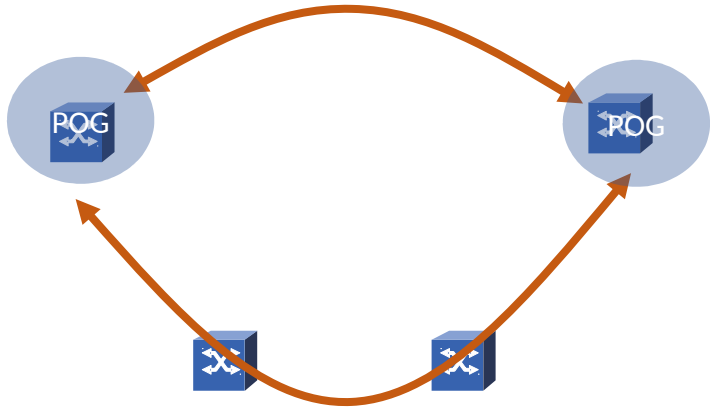


Transport Segment OAM – to provide mechanisms to determine liveliness and service validation across the optical domain as seen by the POGs

- In the packet network, node B is one hop away from node E
- Packet Optical Gateways (POGs) B and E may advertise 4 optical paths with different optical characteristics as transport segments into the packet domain
  1. O1 (B, D, E)
  2. O2 (B, C, E)
  3. O3 (B, D, C, E)
  4. O4 (B, C, D, E)
- The Packet PCE can include these transport segments O1, O2, O3, O4 in specifying paths for reaching F from A based on service needs and including them in the appropriate segment lists
- Transport segment is an opaque abstraction of the optical plane and leaves the definition of the optical path (O1/O2/O3/O4) to the optical control plane;
- This construct is introduced in **draft-anand-spring-poi-sr**

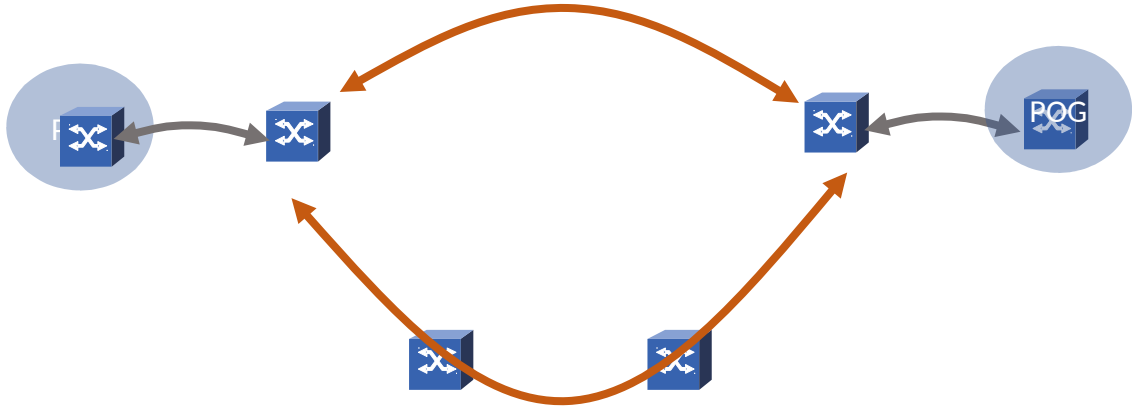
Use Cases for Transport Segment OAM

Use Case 1: Integrated POG



- Simplest case
- Bidirectional – means if one direction is impacted, the other direction must be withdrawn

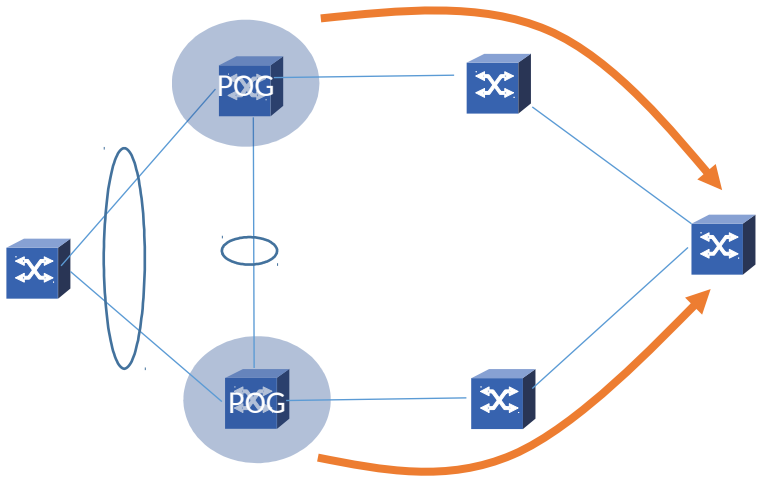
Use Case 2: Packet and Optical functions in 2 disjoint nodes



- Bidirectional
- Map/Signal Optical OAM (e.g., MPLS-TP) to Transport Segment OAM

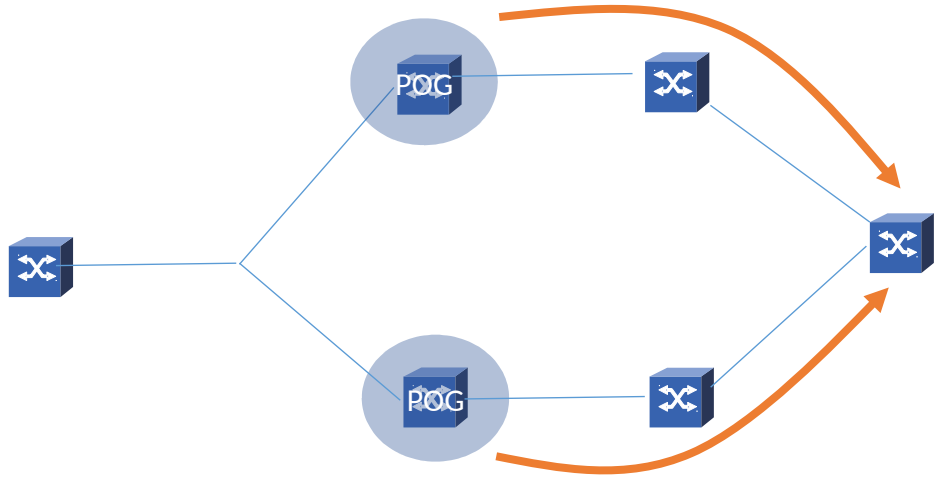
Use Cases for Transport Segment OAM

Use Case 3: Dual homed POG



- Bidirectional
- Transport Label sharing between POGs
- OAM states for the shared Transport segment OAM may differ between the POGs and will impact the data flows

Use Case 4: Y-cable connected POGs



- Bidirectional
- Transport Labels are different between POGs
- Per Transport Segment view of active/backup paths

These use cases need to be discussed further to incorporate into the draft

Requirements for Transport Segment OAM (1 of 4)

- REQ#1: Transport Segment OAM SHOULD support Continuity Check Fault Verification - exercised on demand to validate the reported fault (Ping).
- REQ#2: Transport Segment OAM MUST support both On-demand and Continuous OAM functionality.
- REQ#3: Transport Segment OAM packet MUST follow exactly the same path as the dataplane traffic.
- REQ#4: The Transport Segment OAM packet MUST have the ability to exercise any available paths as defined by the transport segment label.
- REQ#5: Transport Segment OAM SHOULD have the ability to allow the Initiator to add the Remote Transport Label and control the return path from egress responder. draft-ietf-mpls-bfd-directed has provided the semantics of a return path which would suit this need.
- REQ#6: Transport Segment OAM MUST have the ability to be initialized from an ingress POG node to perform connectivity verification and continuity check to any remote POG within the same optical domain ID based on the declared Transport Segment Label.

Requirements for Transport Segment OAM (2 of 4)

- REQ#7: In case of any failure with continuity check, Transport Segment OAM Layer SHOULD support rapid Connectivity Fault notification to the Packet Control plane of the POG to withdraw the Transport Segment Label associated with the affected path and/or take a local protection action.

- REQ#8: Transport Segment OAM SHOULD also have the ability to be initialized from a centralized controller.

- REQ#9: When Transport Segment OAM is initialized from centralized controller, the node on receiving the alert MAY take a local protection action and/or pop an informational message.

- REQ#10: When Transport Segment OAM is initialized, it SHOULD support node redundancy based on network configuration. If primary Initiator fails, secondary one MUST take over the responsibility without having any impact on customer traffic.

- REQ#11: Transport Segment OAM MUST have the ability to measure bidirectional packet loss, throughput measurement, delay variation, as well as unidirectional and dyadic measurements.

Requirements for Transport Segment OAM (3 of 4)

- REQ#12: When a new path is instantiated, Transport Segment OAM SHOULD allow path verification without noticeable delay. It may be desired to check for liveliness of the optical path using Transport Segment OAM before announcing the Transport Segment.

- REQ#13: The above listed requirements SHOULD be supported without any scalability limitation imposed and SHOULD be extensible to accommodate any new SR functionality.

- REQ#14: Transport Segment OAM SHOULD maintain per Transport label state entry at the originating POG.

- REQ#15: When traffic engineering is initiated by centralized controller device, and when Transport Segment OAM is performed by POGs, there MUST be a mechanism to communicate the failure to a centralized controller device.

- REQ#16: When a local repair in the optical network takes place, the characteristics of the path between the POGS may have changed. If there is significant change in the path characteristics based on thresholds, the ingress POG SHALL trigger a re-advertisement of the transport segment label at the global level.

Requirements for Transport Segment OAM (4 of 4)

- REQ#17: The format of the Transport Segment OAM Ping packet SHALL follow RFC 4379.

- REQ#18: The format of the Transport Segment OAM BFD packet SHALL follow RFC 5884

Next Steps

- Get consensus on the approach
- Issue V1 of the draft
- WG Adoption