Problem Statement

• Some optical transceivers support multiple modulation formats, baud-rates, FECs, etc.
  – a set of values for these parameters is usually referred to as a “mode”.

• RWA typically happens **before** the signaling leaves the ingress ROADM:
  – RWA may rely on embedded path computation or external PCE,
  – The signaling needs to carry the mode information down to the egress transceiver.

• In case of alien transceivers (in shelves independent from the ROADM):
  – Mode selection may be performed:
    • Statically before ingress transceiver,
    • Dynamically at ingress ROADM, which implies providing info the optical line;
  – The selected mode must be exchanged between the line and transceivers at both ends.
Solution Principle

- RSVP-TE Path/Resv convey the required channel info end-to-end
  - I.e. to both the optical line and the egress transceiver
- The 1st Path message may be the path computation trigger ("alien" case)

TSVx/TSVy: transceiver shelves; Ra/Rb/Rc: ROADM}s
Short-Term Encodings

• The path computation entity (ingress ROADM or external PCE) uses a mapping table containing transceiver info
  – operator-configured or learnt by LMP

<table>
<thead>
<tr>
<th>Tsv-Type</th>
<th>Tsv-Mode</th>
<th>Parameter Set</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board-X</td>
<td>1</td>
<td>baud-rate=B, modulation=M, symbol-rate=S, FEC-ID=F…</td>
</tr>
<tr>
<td>Board-X</td>
<td>2</td>
<td>…</td>
</tr>
<tr>
<td>Board-Y</td>
<td>1</td>
<td>…</td>
</tr>
</tbody>
</table>

• Proposed TLV (using AppID from draft-ietf-ccamp-dwdm-if-lmp):

Hardware descriptive fields

<table>
<thead>
<tr>
<th>Hardware descriptive fields</th>
<th>Prescriptive fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>EUI</td>
<td>Tsv-Type</td>
</tr>
<tr>
<td>EUI (cont'd)</td>
<td>Tsv-Mode</td>
</tr>
<tr>
<td></td>
<td>Channel Output Power</td>
</tr>
</tbody>
</table>
Mid-Term Encodings

- RSVP-TE messages carry detailed parameter set
  - instead of opaque identifier to be looked up in a table,
  - enables the optical line to compute a feasible path.

- Proposed TLV will be adjusted to reflect the output from other drafts:
  - draft-ietf-ccamp-optical-impairment-topology-yang
  - draft-ietf-ccamp-dwdm-if-param-yang

- Some fields may be relevant to...
  - provide transceiver info to line (e.g., Baud-rate, Min OSNR, Carrier Spacing...),
  - send back configuration from the line to the transceivers (e.g., power, label).
Main Changes from -02

• **WDM-Transceiver-Mode** sub-TLV
  – Add a *Channel Output Power* field
    • Allows to suggest the power target from the optical line to the transceivers,
    • FFFF means unallocated, i.e. let the TLV receiver (optical line or transceiver) in charge.

• **WDM-Transceiver-Param** sub-TLV
  – Clarify that there is no intent to define yet another set of parameters
    • Will follow the consensus once the existing WG I-Ds are fully stable,
  – Add an *Operational Mode* field
    • To ensure applicability in more cases,
    • E.g., may be ignored by the optical line while meaningful between transceivers.

• Drop the proposed registries for Modulation and FEC
  – Could be considered later in the process, if consensus is there.
Next Steps

• Keep alignment on:
  – draft-ietf-ccamp-optical-impairment-topology-yang
  – draft-ietf-ccamp-dwdm-if-param-yang
  – draft-ggalimbe-ccamp-flexigrid-carrier-label

• Focus on the short-term sub-TLV
  – Keep the details about the mid-term sub-TLV for a 2nd step

• Consider WG adoption