A Yang Data Model for Optical Impairment-aware Topology

draft-ietf-ccamp-optical-impairment-topology-yang-03

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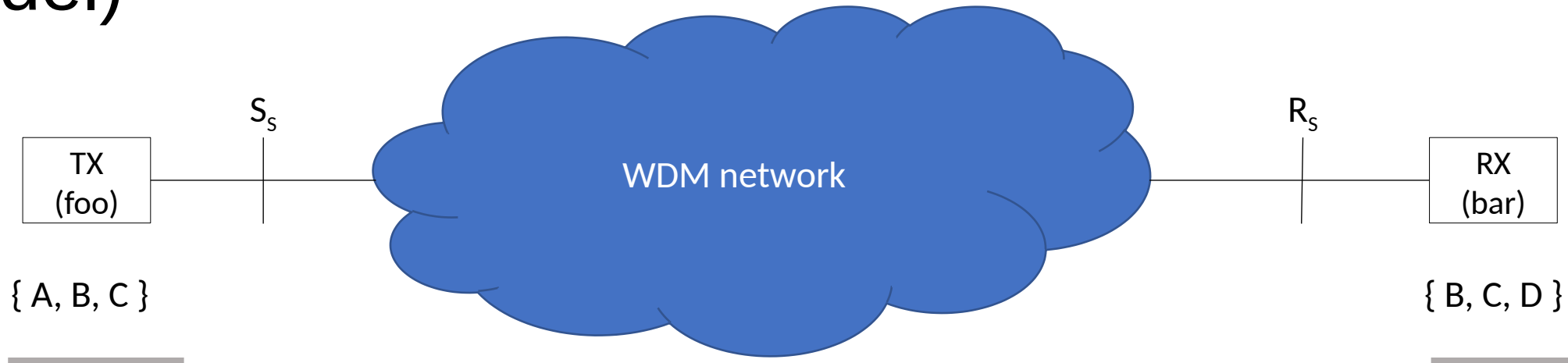
Major Activities since May Interim Meeting

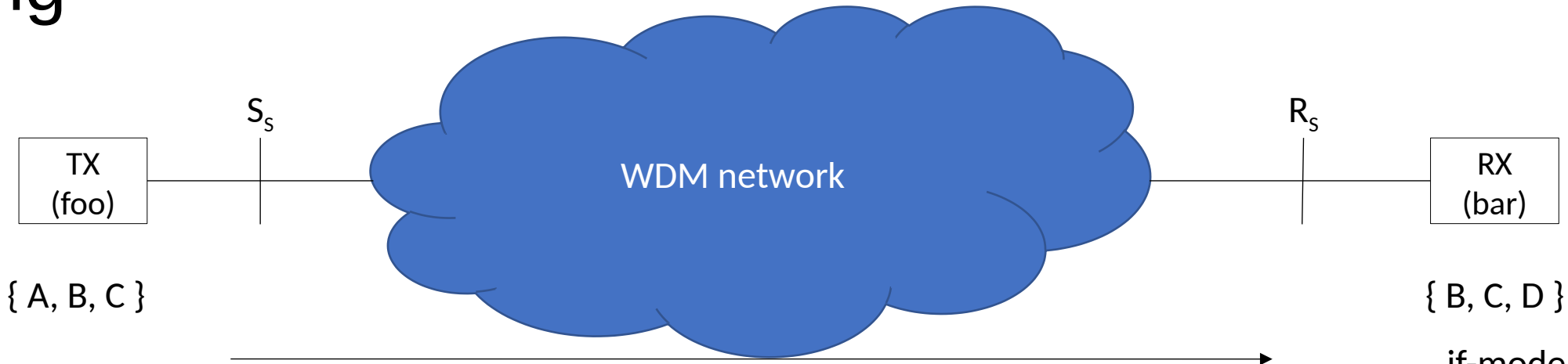
- Weekly CCAMP WebEx meetings (Thu, 4-5pm CEST)
- Topics addressed: TRANSPONDER model
  - Reconcile the different transponder models (WSON, flexgrid, optical impairments) present in CCAMP
  - Reconcile the transponder model with complementary interface model contained in draft-ietf-ccamp-dwdm-if-param-yang
  - Proceed with new layer0-types-ext draft containing common YANG structures and definitions (typedefs, identities, groupings)

Application code/organizational mode case (topology model)



1. Path computation should compute a path meeting optical requirements of B or C
2. If the optimal path is compliant with optical requirements in B:
   a) The domain controller setup the path
   b) The domain controller configures TX and RX device controllers with application code B
      a) TX device controller internally configures if-mode 1 (foo)
      b) RX device controller internally configures if-mode 2 (bar)
3. the mapping between the application code, selected by path computation, and the if-mode is done internally by the transponder device
4. Two transceivers supporting the same application code/organizational mode and a line system matching the constraints, defined in ITU-T G.698.2 or by the organization, for that application code/organizational will interoperate.

If-mode case from draft-ietf-ccamp-dwdm-if-param-yang



1. Path computation should compute a path meeting optical requirements of B or C
2. If the optimal path is compliant with optical requirements in B:
   a) The domain controller setup the path
   b) The domain controller configures TX device controller with if-mode 1 (foo)
   c) The domain controller configures RX device controller with if-mode 2 (bar)
3. the domain controller configured the if-mode which supports the application code selected based on path computation results,
4. The if-mode is an identifier for an explicit set of parameters.
5. The if-modes specify the interface configurations only and do not define interoperability requirements

Capability parameters

- Optical impairment limits for each operational mode (min OSNR, max PMD, max CD, max PDL, Q-factor limit, etc.) layer0-types-ext grouping common-transceiver-capabilities-organizational-mode
- Alternatively: explicit parameter list and supported parameter values/ranges
- Common set of parameters for both options:
  - supported transmitter tuning range [f_tx_min, f_tx_max]
  - supported transmitter tunability grid (in GHz)
  - supported transmitter power range [p_tx-min, p_tx_max]
  - supported receiver power range [p_rx-min, p_rx_max]
  - Supported max rx optical power
  - layer0-types-ext grouping common-transceiver-capabilities-organizational-explicit

Reference YANG with underlined commonalities (in red) (in blue name of YANG groupings)

```
augment /nw:networks/nw:network/nw:node/tet:te/tet:tunnel-termination-point:
   +--ro OTSiG-element* [OTSiG-identifier]
   |  +--ro OTSiG-identifier    int16
   |  +--ro OTSiG-container
   |     +--ro OTSi* [OTSi-carrier-id]
   |        +--ro OTSi-carrier-id           int16
   |        <common grouping for configured mode>  grouping common-transceiver-configured-param
   |        <reference to a transceiver>
   +--ro transponders-list* [transponder-id]
      +--ro transponder-id                        uint32
      +--ro transceivers-list* [tranceiver-id]
      +--ro transceiver* [transceiver-id]
         +--ro  transceiver-id                       uint32
         +--ro  supported-mode [mode-id]
         |  <common attributes ranges/limit for supported modes>  grouping common-transceiver-capabilities-
organizational-mode
            <common attributes for other transceiver's capabilities (if any)> grouping common-transceiver-
capabilities-organizational-explicit

   +--ro if-supported-mode
   |  +--ro  supported-mode [mode-id]
   |  |  <common attributes ranges/limit for supported modes>
   |  |  <additional attributes for supported modes (if any)>
   |     <common attributes for other transceiver's capabilities (if any)> grouping common-transceiver-
capabilities-organizational-explicit
   |  <additional attributes for other transceiver's capabilities (if any)>

   +--rw current-opt-if-och-mode-params
   |  <common grouping for configured mode>
   |  <additional attributes>
```

Topology model basic update

```
+--ro transponder-list* [transponder-id]
       +--ro transponder-id      uint32
       +--ro transceiver-list* [transceiver-id]
          +--ro transceiver-id     uint32
          +--ro supported-modes* [mode-id]
             +--ro mode-id                          string
             +--ro (mode)
                +--:(G.692.2)
                |  +--ro standard-mode?             standard-mode
                +--:(organizational-mode)
                |  +--ro operational-mode?          operational-mode
                |  +--ro organization-identifier?
                |           organization-identifier
                +--:(explicit-mode)
                   +--ro supported-std-modes
                      +--ro supported-application-codes*
                      |       -> ../../mode-id
                      +--ro supported-organizational-modes*
                              -> ../../mode-id
```

Open Issues

https://github.com/ietf-ccamp-wg/draft-ietf-ccamp-optical-impairment-topology-yang/issues

- Alignment with ITU-T terminology and definitions for the data plane
  - Sub-sections in section 2.3 will have to be updated
  - Open issue on GitHub: #25
- Open issues #5 and #12 to be closed since related to #29 Transponder model , almost completed
- Other issues: see GitHub link above
- Repositories : https://github.com/ietf-ccamp-wg

Next Steps

- Completion of review of layer0-types-ext for transponders
  - Joint effort with authors of draft-ietf-ccamp-dwdm-if-param-yang
- Completion of configuration part of optical transponder model revision.
- Modeling of 3R regenerators based on optical transponder model
- Address the other open issues on GitHub

Thank You!