A YANG Data Model for Layer 0 Types

draft-ietf-ccamp-rfc9093-bis-01

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Background of the new document and actual status

- This document obsoletes RFC9093, encompassing the content of RFC9093 with the content of draft-ietf-ccamp-layer0-types-ext-01
- Github https://github.com/ietf-ccamp-wg/ietf-ccamp-layer0-types-ext
- Addressing the comments received at IETF 112 (see minute)
- We have restructured the document draft-ietf-ccamp-layer0-types-ext to become RFC9093-bis
- Now , for IETF-114, fixing issue #48
  - The content of the ietf-layer0-types-ext.yang have been moved into ietf-layer0-types.yang
  - ietf-layer0-types-ext.yang have been deleted from the repository
- Fixing issues #41, #42, #43, #44, #45, #46, #49, #50 #54 (see next slides)
  - Issues #44,#49,#50 related to optical impairments topology model

Added new modulation format (issue #41)

```
 identity DPSK {
   base modulation;
   description
     "DPSK (Differential Phase Shift Keying) modulation";
 }
……
 identity QAM32 {
   base modulation;
   description
     "QAM32 (32 symbols Quadrature Amplitude Modulation)";
 }
 identity DP-QAM32 {
   base modulation;
   description
     "DP-QAM32 (32 symbols Dual Polarization Quadrature
Amplitude
     Modulation)";
 }
```

```
identity QAM64 {
   base modulation;
   description
     "QAM64 (64 symbols Quadrature Amplitude
Modulation)";
 }
 identity DP-QAM64 {
   base modulation;
   description
     "DP-QAM64 (64 symbols Dual Polarization Quadrature
Amplitude
     Modulation)";
 }
```

Issues #42 and #43

- We changed the reference in the operational-mode definition: no more ITU-T G.698.2 but exactly the section in draft-ietf-ccamp-optical-impairment-topology where OM is introduced.

```
typedef operational-mode {
   type string;
   description
    "Organization/vendor specific mode that guarantees
    interoperability.";
// RFC Ed.: replace YYYY with actual RFC number and remove
// this note after draft-ietf-ccamp-optical-impairment-topology-yang
// is published as an RFC
   reference
    "Section 2.5.2 of RFC YYYY: A YANG Data Model for Optical
    Impairment-aware Topology.";
 }
```

- Deleted the reference to RFC6205 in frequency definitions :

~~reference~~
~~"RFC6205: Generalized Labels for~~
~~Lambda-Switch-Capable (LSC) Label Switching Routers";~~

```
typedef frequency-thz {
   type decimal64 {
    fraction-digits 6;
   }
   units THz;
   description
    "The DWDM frequency in THz, e.g., 193.112500";
 }
 typedef frequency-ghz {
   type decimal64 {
    fraction-digits 3;
   }
   units GHz;
   description
    "The DWDM frequency in GHz, e.g., 193112.500";
 }
```

Penalty definition and associated accumulated values (issues #44, #49, #50)

- The model originally presenting a list of triplet with a combination of CD and PMD with associated penalty.
- Now we have a separate list of pair (accumulated effect, associated Penalty), effect could be CD, PMD or PDL
- Modified penalty description, aligned with OpenConfig .

```
grouping penalty-value {
   description
     "A common definition of the penalty value used for describing
multiple penalty types (.e.g, CD, PMD, PDL).";
   leaf penalty-value {
     type union {
       type decimal64 {
         fraction-digits 2;
         range "0..max";
       }
       type empty;
     }
     units "dB";
     config false;
     mandatory true;
     description
       "OSNR penalty associated with the related optical  impairment at
the receiver.";
   }
 }
```

Penalty YANG modifications

```
list chromatic-dispersion-penalty {
    config false;
    description
     "Optional penalty associated with a given accumulated
      chromatic dispersion (CD) value.
      This list of pair cd and penalty can be used to
      sample the function penalty = f(CD).";
    leaf chromatic-dispersion {
     type union {
      type decimal64 {
       fraction-digits 2;
       range "0..max";
      }
      type empty;
     }
     units "ps/nm";
     config false;
     mandatory true;
     description "Chromatic dispersion";
    }
    uses penalty-value;
}
```

```
list polarization-dispersion-penalty {
    config false;
    description
     "Optional penalty associated with a given accumulated
      polarization mode dispersion(PMD) value.
      This list of pair pmd and penalty can be used to
      sample the function penalty = f(PMD).";
    leaf polarization-mode-dispersion {
     type union {
      type decimal64 {
       fraction-digits 2;
       range "0..max";
      }
      type empty;
     }
     units "ps";
     config false;
     mandatory true;
     description "Polarization mode dispersion";
    }
    uses penalty-value;
}
```

Transmitter tunability (issue #45)

- Clarified the meaning of the attribute “central-frequency-step”: *the attribute deals with the granularity of the transmitter tunability of the carrier central frequency*.
- We have updated both the name and description

```
leaf transceiver-tunability {
    type frequency-ghz;
    config false;
    description
      "This parameter indicates the transmitter
frequency fine
       tuning steps e.g 3.125GHz or 0.001GHz.";
  }
```

Frequency range clarification (issue #46)

- Clarified that the grouping "frequency range" is used to define a portion of the spectrum (e.g., a band) that does not match a frequency slot width (i.e., not using the n and m attributes).
  - Frequency slot is defined by its nominal central frequency (with n value) and its slot width (with m value).

```
grouping frequency-range {
  description
   "This grouping defines the lower and upper bounds of a frequency range (e.g., a
band).

    This grouping SHOULD NOT be used to define a frequency slot,
    which SHOULD be defined using the n and m values instead.";
  leaf lower-frequency {
   type frequency-thz;
   mandatory true;
   description
    "The lower frequency boundary of the
    frequency range.";
  }
  leaf upper-frequency {
   type frequency-thz;
   must '. > ../lower-frequency' {
    error-message
     "The upper frequency must be greater than the lower
     frequency.";
   }
   mandatory true;
   description
    "The upper frequency boundary of the
    frequency range.";
  }
 }
```

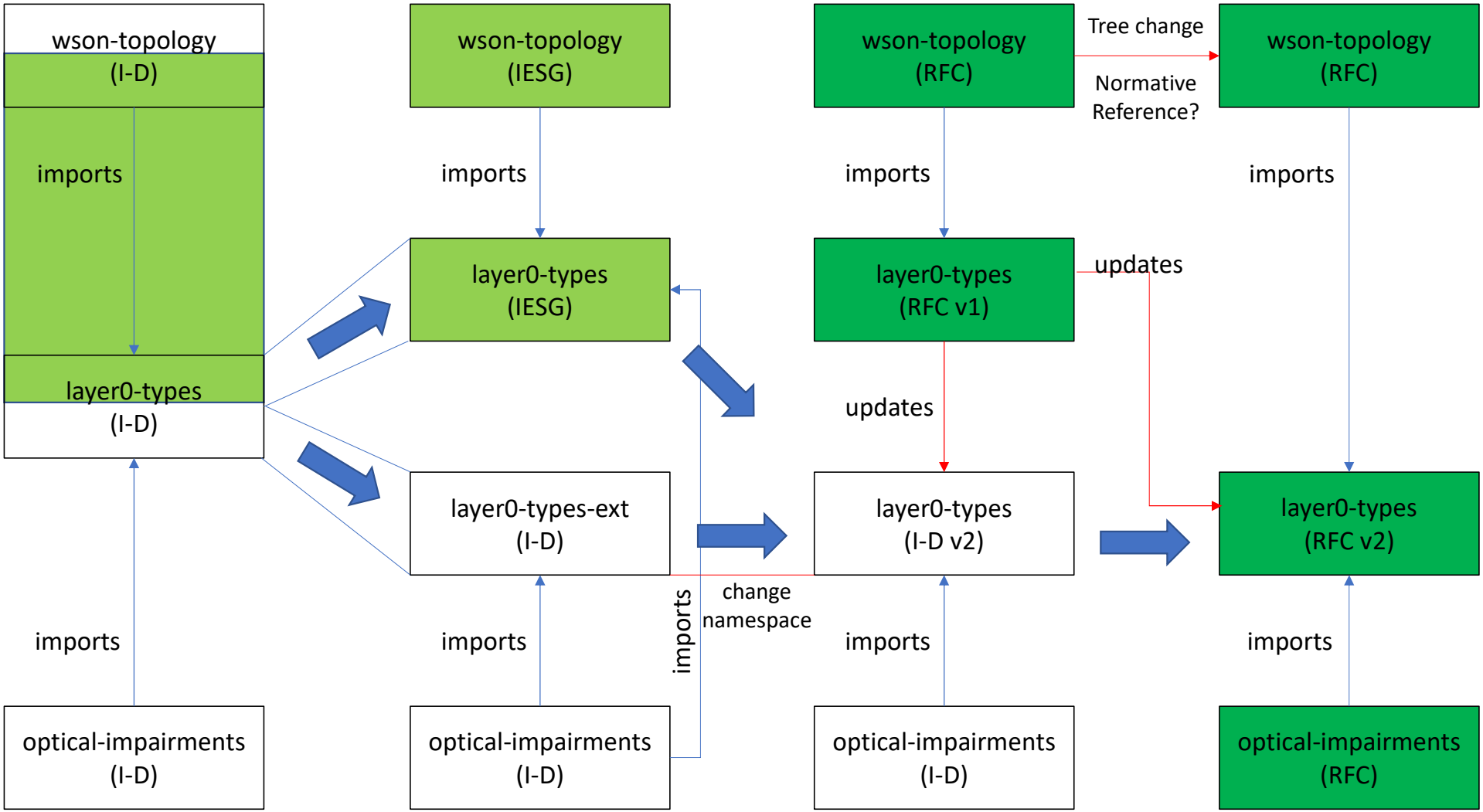
New issue related to IANA section

- As authors we received, from IANA Operation Manager, a suggested update of the section 5 “IANA Consideration” see issue #58
- The new text proposed will be added in the next draft update.

Next Steps

- We still need to reconcile text in the introduction from RFC9093 with the one from layer0-types-ext.
- Complete the Appendix A with the changes from RFC 9093
- Fixing the remaining issues https://github.com/ietf-ccamp-wg/ietf-ccamp-layer0-types-ext/issues

backup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