Guard Bands requirements for GMPLS controlled optical networks

draft-cbcs-ccamp-sson-guard-bands-reqs-00

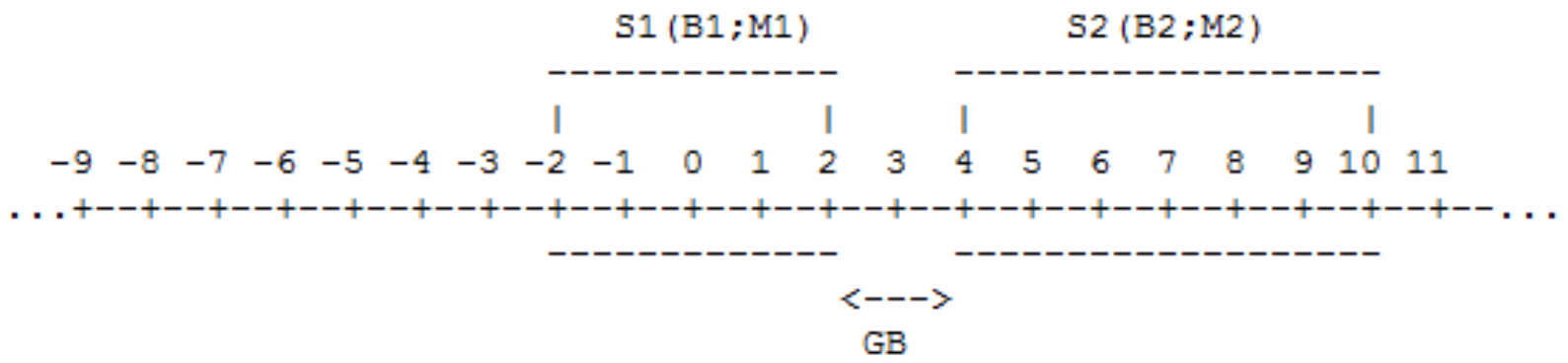
CCAMP WG, IETF 83rd Paris

Agenda

- Goal and Definitions
- Scenarios and Requirements
  - PCE – PCEP
  - Routing
  - Signaling
- Open Issues
- Next steps

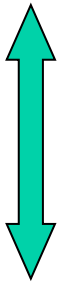
Goal and Definitions

- **Goal**: What is it addressing? "The draft gathers requirements for CP protocols to take into account Guard Bands when doing RSA
- **Guard Band**: is defined as the minimum frequency range which separates two contiguous signals, S1 at bit rate B1 and modulation format M1 and S2 at a bit rate B2 and modulation format M2, such that detrimental effects are negligible. Example of parameters impacting the GB:
  - Bit rate and modulation format of interfering signals
  - Power values of signals at each span
  - Fiber parameters (e.g. attenuation, dispersion, Kerr coefficient)



Scenarios & Requirements

- IV and RSA PCE : the PCE provides the ingress node with an impairment-validated route and a set of frequency slots.
  - Stateful PCE: LSP-DB extended with info needed for GB computation (e.g. bit rate, mod format)
  - Stateless PCE: TED extended with info needed for GB computation and hence routing protocol
  - OSPF-TE extended for stateless PCE TED feeding



- IV PCE: PCE provides ingress node with an impairment-validated route. Then, slot assignment is distributed
  - PCE needs to inform the ingress node about GBs for the route, PCEP Path Computation Reply extended accordingly
  - RSVP-TE extensions needed to identify the frequency spectrum along the path that should not be selected because of GB
- IV Candidate path PCE: PCE provides ingress node with a set of candidate routes (i.e., a set of impairment-validated routes). Then, a route is selected by the ingress node.
  - PCE needs to inform the ingress node about GBs for the set of validated routes, PCEP Path Computation Reply extended accordingly
  - RSVP-TE extensions needed to identify the frequency spectrum along the path that should not be selected because of GB

Open Issues

- ITU-T Q6/15 have not addressed guard bands in latest G.694.1 recommendation
  - Parameters for Guard Bands computation are not known yet (and may remain implementation dependent?)
  - Too early for encoding design
- Guard bands implicit or explicit?

Next steps

- Liaison needed?
  - Need to ask Q6/15 what the plans for Guard Bands are?
  - It would be helpful the design SSON encoding so to be extensible for Guard Bands support
- WG feedbacks collection

GMPLS OSPF-TE Extensions in support of Flexible-Grid in DWDM Networks

CCAMP WG, IETF 83rd, Paris, France

draft-zhang-ccamp-flexible-grid-ospf-ext-01.txt

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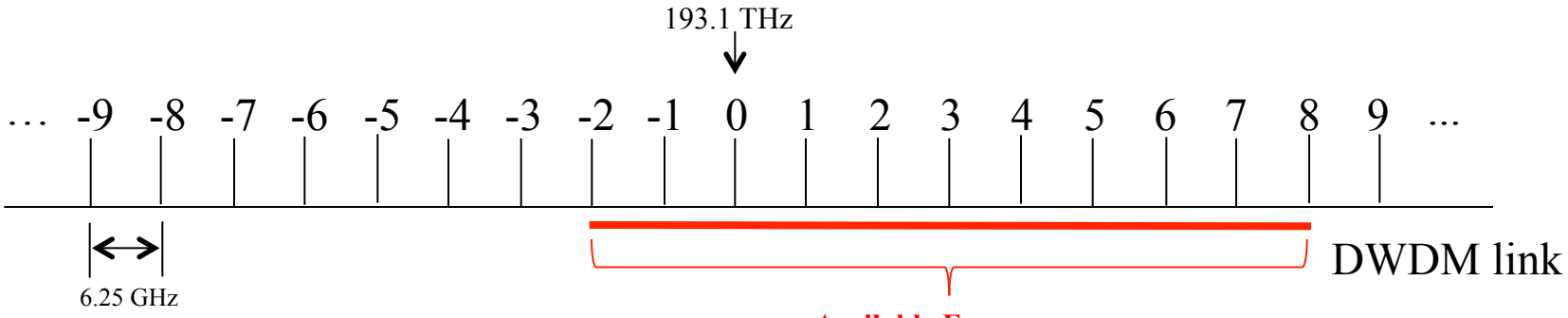
Changes from version 00

- Described various kinds of Labels Set
  - –Inclusive/Exclusive Label Range
  - –Inclusive/Exclusive Label Lists
  - –Bitmap
- Added port label restriction information

Labels Set sub-TLV



Inclusive Range :

Start Label = 193.1 + (-2)*0.00625,
End Label = 193.1 + (8)*0.00625

Inclusive Label Lists:

Label 1 = 193.1 + (-2)*0.00625
Label 2 = 193.1 + (-1)*0.00625
Label 3 = 193.1
Label 4 = 193.1 + (1)*0.00625
…
Label 10 = 193.1 + (7)*0.00625
Label 11 = 193.1 + (8)*0.00625

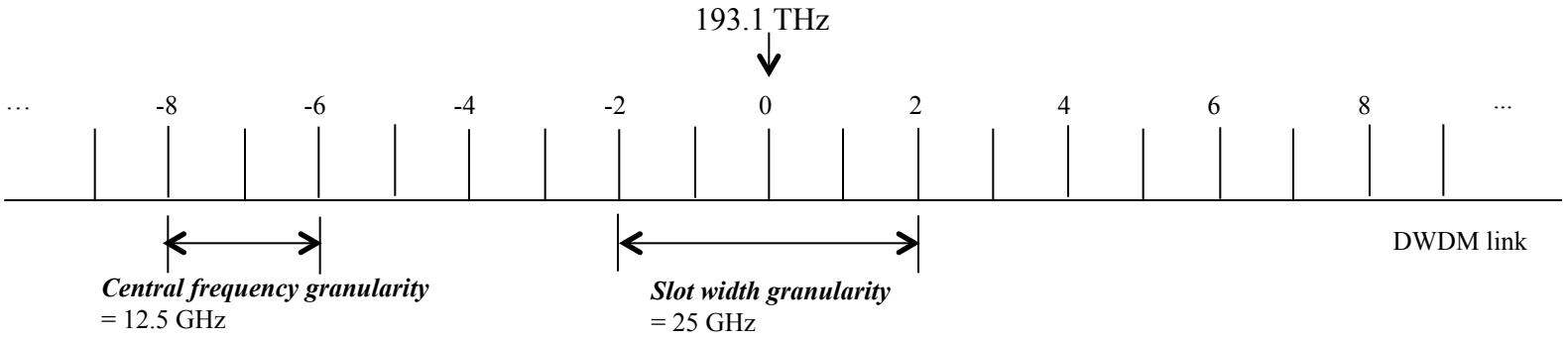
Bitmap:

Base Label = 193.1 + (-1)*0.00625
Bitmap =
(padded out to a full multiple of 32 bits)

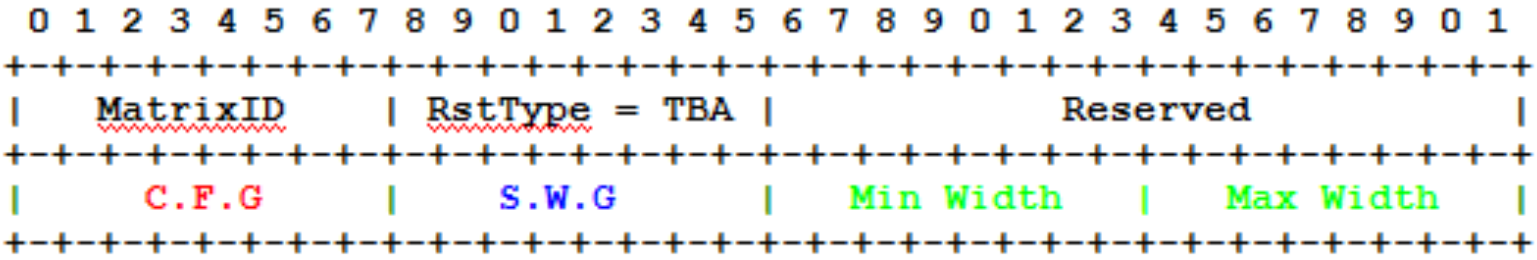
1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Port Label Constraints

- G.694.1 says:
  - Applications may be defined where only a subset of the possible slot widths and positions are required to be supported. An example as follows:



- The following parameters should be advertised (Port Label Restriction sub-TLV)
  - Central frequency granularity
  - Slot width granularity
  - Slot width range



Discussion

- Should slot width (or ‘m’) be advertised for the link resource (available spectrum)?
  - Slot width is only significant for a frequency slot (ie., a specific connection), There is no pre-defined fixed “wavelength” (i.e. slot width is not given before a frequency slot is allocated) therefore, no need to advertise slot width (or ‘m’)
- What to do with unreserved bandwidth per prio, MAX LSP bw per prio in the ISCD?

Next Steps

the meeting or mailing list

the meeting or mailing list

- Keeping alignment with ITU-T progress

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