

# GMPLS Signaling Extensions for the Evolving G.709 OTN Control

CCAMP WG, IETF 82nd, Taipei, Taiwan

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Authors & Contributors

# Changes from Version 00

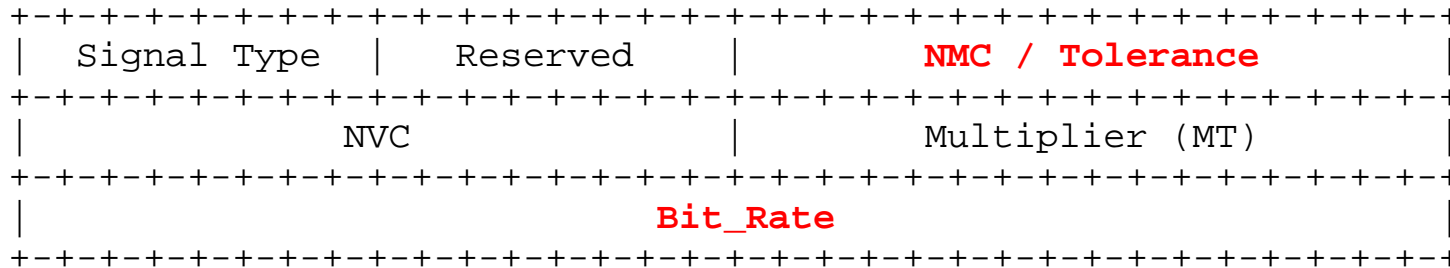
- Added some text to describe [new Switching Type](#) in Generalized\_Label\_Request to make it consistent with [OTN-FWK] and [OTN-OSPF]
- Refined the descriptions about [ODUflex formula](#) including ODUflex(CBR) and ODUflex(GFP) in Traffic Parameters
- [NMC field in Traffic Parameters](#) has been deprecated and should be only used with RFC4328

# Generalized Label Request

- **New Switching Type** for G.709v3 is introduced in [OTN-FWK] and [OTN-OSPF]
- **Generalized Label Request Object** also use this new Switching Type

Value	Type
100	Time-Division-Multiplex Capable (TDM) (RFC4328)
101 (TBA)	OTN-TDM capable (OTN-TDM)

# Traffic Parameters of ODUflex



- **NMC:**
  - RFC4328: Indicate how many TS are requested for the LO ODUj
  - Redundant information (since signal type or bit-rate is known, the number of TS can be deduced)
  - May be different on different hops
  - Deprecated and is only used with RFC4328 for backwards compatibility reasons
- **Bit\_Rate :**
  - Describe the bit rate for ODUflex (CBR) and ODUflex(GFP)
- **Tolerance:**
  - Describe the tolerance for ODUflex (CBR) (No need for ODUflex(GFP))

# Traffic Parameters of ODUflex

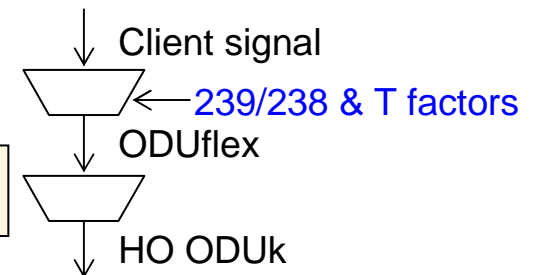
- **ODUflex (CBR) Traffic Parameters**

- The number of requested TS on HO ODUk link can be calculated by:

$$N = \text{Ceiling of } \frac{\text{ODUflex(CBR) nominal bit rate} \times (1 + \text{ODUflex(CBR) bit rate tolerance})}{\text{ODTUk.ts nominal bit rate} \times (1 - \text{HO OPUk bit rate tolerance})}$$

- ODUflex(CBR) bit rate is the client signal bit rate after applying the 239/238 factor and the transcoding factor T:

$$\text{ODUflex(CBR) nominal bit rate} = \text{CBR client bit rate} * (239/238) / T$$



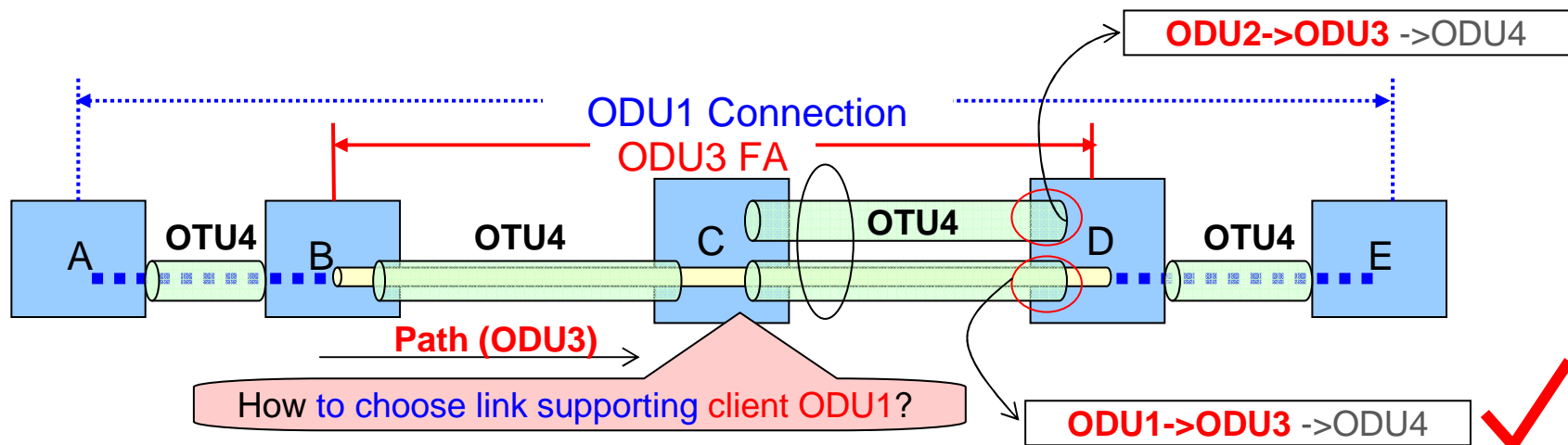
- **ODUflex (GFP) Traffic Parameters**

- G.709v3 Amd2 recommends that the ODUflex(GFP) will fill an integral number of tributary slots of the smallest HO ODUk path
- Direct mapping between ODUflex (GFP) bit rate and number of requested TS

ODU type	Nominal bit-rate	Tolerance
ODUflex(GFP) of n TS, 1<=n<=8	n * ODU2.ts	+/-100 ppm
ODUflex(GFP) of n TS, 9<=n<=32	n * ODU3.ts	+/-100 ppm
ODUflex(GFP) of n TS, 33<=n<=80	n * ODU4.ts	+/-100 ppm

# Discussion: ODU FA-LSP Creation(1)

- When creating ODU<sub>k</sub> FA-LSP (further used for ODU<sub>j</sub> client signals), how to choose appropriate link supporting the ODU<sub>j</sub> client?

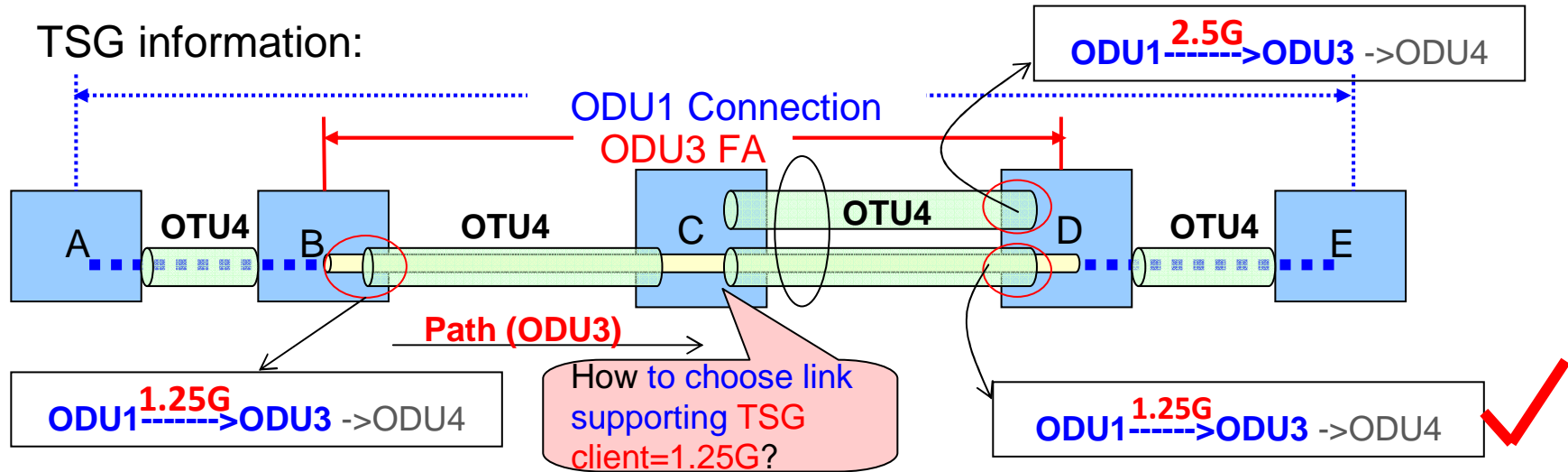


Therefore, **the client hierarchy information** (ODU1->ODU3) should be carried in the signaling to create this ODU3-FA, which will be used to carry ODU1.

Note : If the client hierarchy information is ODU0->ODU<sub>k</sub>, it also implies that TSG 1.25G must be selected.

# Discussion: ODU FA-LSP Creation(2)

- TSG information:



TSG information is needed ONLY in case that AUTOpayloadtype is disabled in node B (AUTOpayloadtype =false), otherwise ODU1 does not care which TSG will be used (either 1.25G or 2.5G can be used) when AUTOpayloadtype =true.

Therefore, if auto-payload type is off, a further information related to TS granularity supported by the interface is needed, ie., when auto-payload = false, it needs TSG information to create ODU<sub>k</sub> (k=2,3) FA-LSP to carry ODU<sub>j</sub> (j<K & j!=0) besides the client hierarchy information.

# Discussion: How to encode the info

- How to encode the client ODU signal type & TSG information?

Candidate Solution	Reasons	Issues
<b>Option 1:</b> Use <b>G-PID</b> to indicate the ODUj client & TSG	G-PID represents the <b>adaption capability</b> between the requested LSP and the client signal carried by that LSP	<ul style="list-style-type: none"> <li>• Only for end points (not the penultimate node)</li> <li>• If the LSP will carry different types of LO ODUj signals, how to <b>carry multiple G-PIDs</b>?</li> </ul>
<b>Option 2:</b> Use <b>Encoding Type</b> to indicate TSG	The "Encoding Type" represents <b>the nature of the LSP</b> which has <b>end-to-end meaning</b>	<ul style="list-style-type: none"> <li>• <b>Intermediated nodes</b> need to process this info</li> <li>• <b>How to indicate the LO ODUj client signal type</b> of the FA-LSP?</li> <li>• A <b>new Object</b> may be still needed</li> </ul>
<b>Option 3:</b> Use <b>New Object</b> to indicate the ODUj client & TSG	Since Option 1&2 are not good enough , it may be needed to introduce another new Object	<ul style="list-style-type: none"> <li>• Define new rules for the processing of the new object</li> </ul>



# Next Steps

- Figure out how to encode the needed information including client hierarchy information and TSG information when creating ODUk FA LSP for carrying LO ODUj client signals
- Refine it according to the feedback from the meeting or mailing list