

Framework and Signaling Extension for GMPLS Control of Optical Transport Networks in G.709 Edition 5

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draft-zheng-ccamp-gmpls-g709v5-fwk-00
draft-zheng-ccamp-gmpls-g709v5-signal-ext-00

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Overview

- Background:
 - ITU-T has defined G.709 v5 for Beyond 100G (B100G) data plane;
 - Control plane need to be extended to satisfy B100G control;
- Review of G.709 v5 (B100G):
 - Client signal mapping to ODUCn
 - ODUCn new features;
- Implication Analysis:
 - To support ODUCn, GMPLS need to extend signaling and routing protocol;
 - Give corresponding description of protocol Extension

G.709v5 (B100G): what's new

- New Signal Type: ODUc_n
 - Including sub-rate with ODUc_n-M
- New Tributary Slot Granularity: 5G

ODU Type	ODU nominal bit rate
ODU0	1,244,160 Kbps
ODU1	239/238 x 2,488,320 Kbps
ODU2	239/237 x 9,953,280 Kbps
ODU3	239/236 x 39,813,120 Kbps
ODU4	239/227 x 99,532,800 Kbps
ODUc _n	n x 239/226 x 99,532,800 Kbps
ODUflex for Constant Bit Rate (CBR) Client signals	239/238 x client signal bit rate
ODUflex for Generic Framing Procedure - Framed (GFP-F) Mapped client signal	Configured bit rate

Table 1: ODU Types and Bit Rates

ODU Server	Nominal TS capacity		
	1.25 Gbit/s	2.5 Gbit/s	5 Gbit/s
ODU0	1	N/A	N/A
ODU1	2	N/A	N/A
ODU2	8	4	N/A
ODU3	32	16	N/A
ODU4	80	N/A	N/A
ODUc _n	N/A	N/A	20*n

Table 2: Number of tributary slots (TS)

G.709v5: how to work with ODUk?

- Client signal mapping order:

Client (e.g., IP, Ethernet, MPLS, ...)

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OTN client signals (ODUk)

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ODUCn

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OTUCn

Signaling Implications & Extension

- Support specifying new signal types: ODUCn;
 - Add a new signal types
- Support new Tributary Slot Granularity: 5G TS;
 - Add a new tributary slot granularity
- Support for LSP setup of new ODUCn Containers;
 - Extend generalized Label;
- Support TPN Allocation and Negotiation;
 - TPN defined in generalized label tlv;
- Support OTUCn-M sub-rate;
 - Achieved by description in generalized Label with TPN;

GMPLS Implications - routing

- ISCD need to be updated to satisfy:
 - Express the link multiplexing capability;
 - New tributary slot advertisement: 5G TS;
 - Advertisement of OTUCn-M;

Open Issues

- Scope:
 - Should we keep FlexO and FlexE in/out of Scope?
 - We suggest focus on B100G control, i.e., ODUCn control;
 - OTUCn-M substrate is appendix in G.709v5, should/should not be included in this draft;
- Use Case:
 - Would like to add more informative use cases;

Next Steps

- Coordinate with the other OTN B100G Framework;
 - Refer to: draft-zih-ccamp-otn-b100g-fwk-00;
 - Call for WG after convergence;
- Drafting for a single thread of solution;