Applicability of GMPLS for fine grain OTN

draft-lin-ccamp-gmpls-fgOTN-applicability-01

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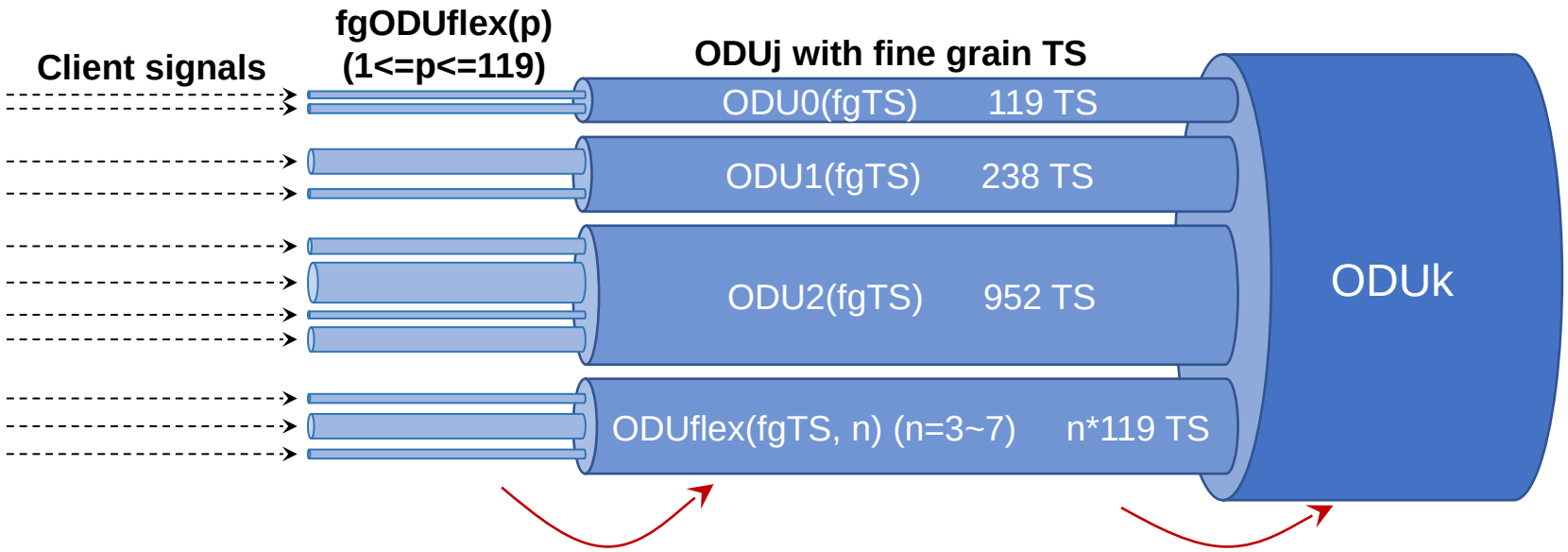
Main Ideas and Changes

- **Main ideas:**
  - Overview of **latest OTN standards** (including **fgOTN**)
  - Examines the **applicability** of using existing **GMPLS** control plane for **fgOTN**
    - **Connection control** consideration
    - **Service control** consideration
    - **Routing** Consideration

- **Main changes from -00 to -01**
  - **Service control** consideration
    - Added the analysis of **distributed** way VS. **centralized** way of service address learning
    - Proposed to extend **PCEP** for service address learning in a **centralized** way

fgOTN Introduction

- **G.709.20**: provides an overview of fgOTN functions, **Published in 2024.04**
- **G.709 (Amd.3)**: Defines OTN interfaces, including fgOTN, **published in 2024.03**



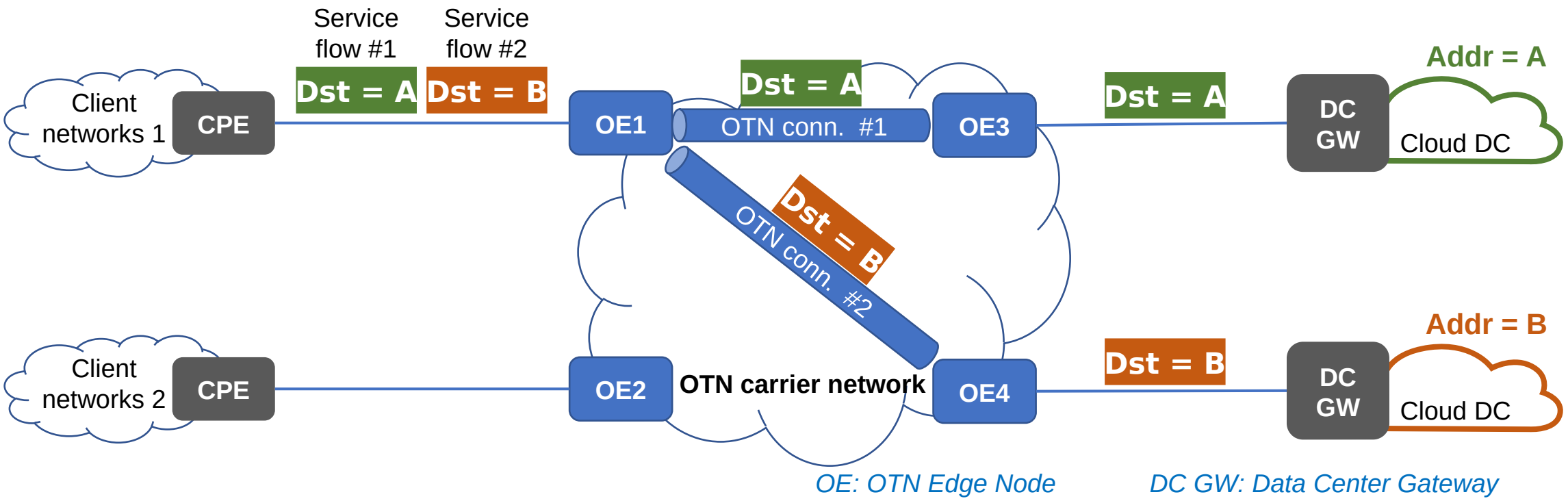
fgODUflex into ODUj(fgTS) multiplexing

- fgTS BW = ~**10Mbit/s**
- ODUj(fgTS) has **(1~8) * 119** fgTSes (**at most 952** fgTSes)
- An fgODUflex occupies **1~119** fgTSes (10Mbit/s ~ 1.2Gbit/s)

ODUj(fgTS) into OTUj/ODUk mapping/multiplexing

- Same as ODUj into ODUk multiplexing, or ODUj into OTUj mapping
- Using 1.25Gbit/s or 2.5Gbit/s TS

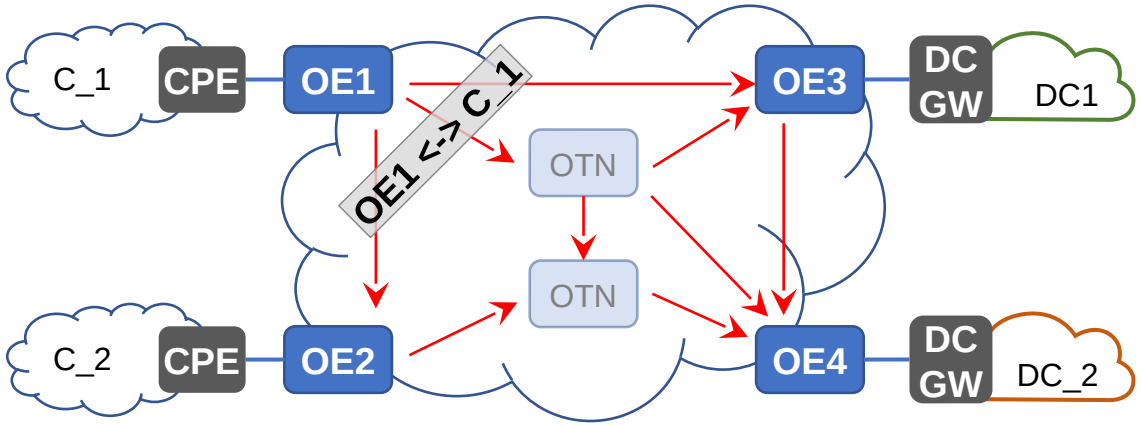
Service Control Consideration



- OE1 needs to map service flow #1 (dst = A) into OTN conn. #1, and map service flow #2 (dst = A) into OTN conn. #2
- New service layer protocol is needs, to help OE1 to know that Cloud DC (Addr=A) is attached to OE3, and Cloud DC (Addr=B) is attached to OE4
- Also see *[draft-liu-ccamp-optical2cloud-problem-statement]* and *[draft-han-pce-path-computation-fg-transport]*

Service Control Protocol Consideration

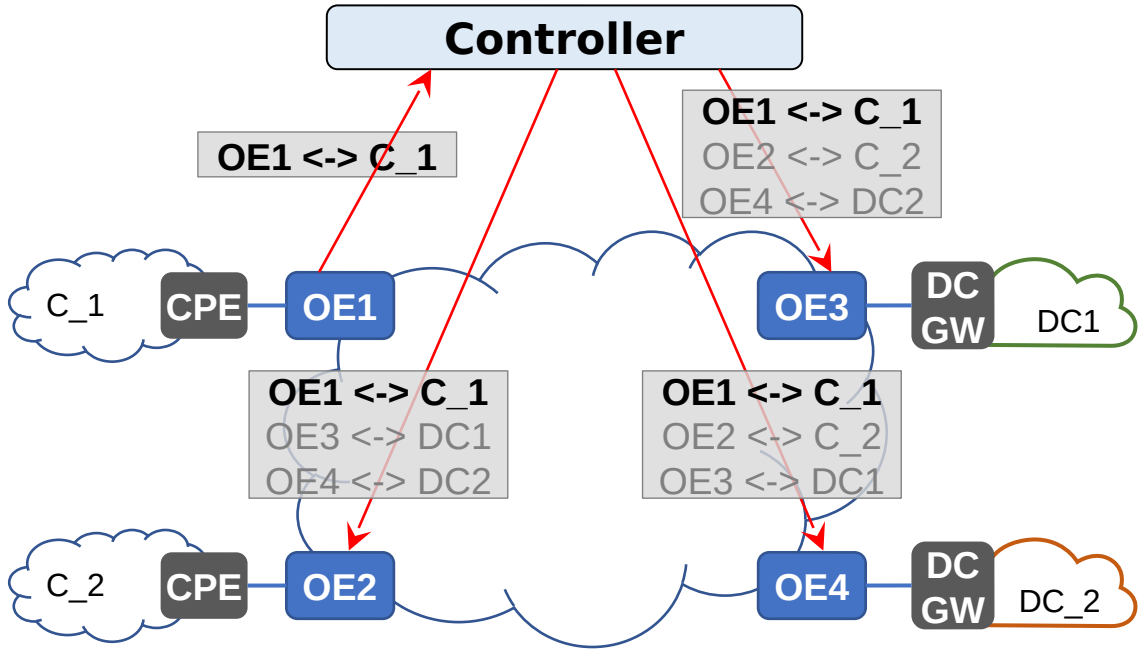
Method 1: Distributed address learning



Note: Only showing how OE1 information is shared

- Using **IGP** such as OSPF-TE
- Flooding the service address information to other OEs
- Defects: flooding large amount of address info; intermediate OTN nodes do not need to know such information

Method 2: Centralized address learning



Note: Only showing how OE1 information is shared

- Using **PCEP** in a centralized way: **Preferred**
  - PCEP has been extended to support TE info collection (PCE-LS)
  - Possible to be further extended for service address collection
  - *draft-han-pce-path-computation-fg-transport* starts working on this

Next Steps

- More detail research on the applicability analysis and technical gap analysis, especially on connection control part

- Start protocol extension for fgOTN control, especially on the service control part
  - Collaborate with [draft-han-pce-path-computation-fg-transport]

- Comments are always appreciated

Thank you