Applicability of Generalized Multiprotocol Label Switching (GMPLS) User-Network Interface (UNI)

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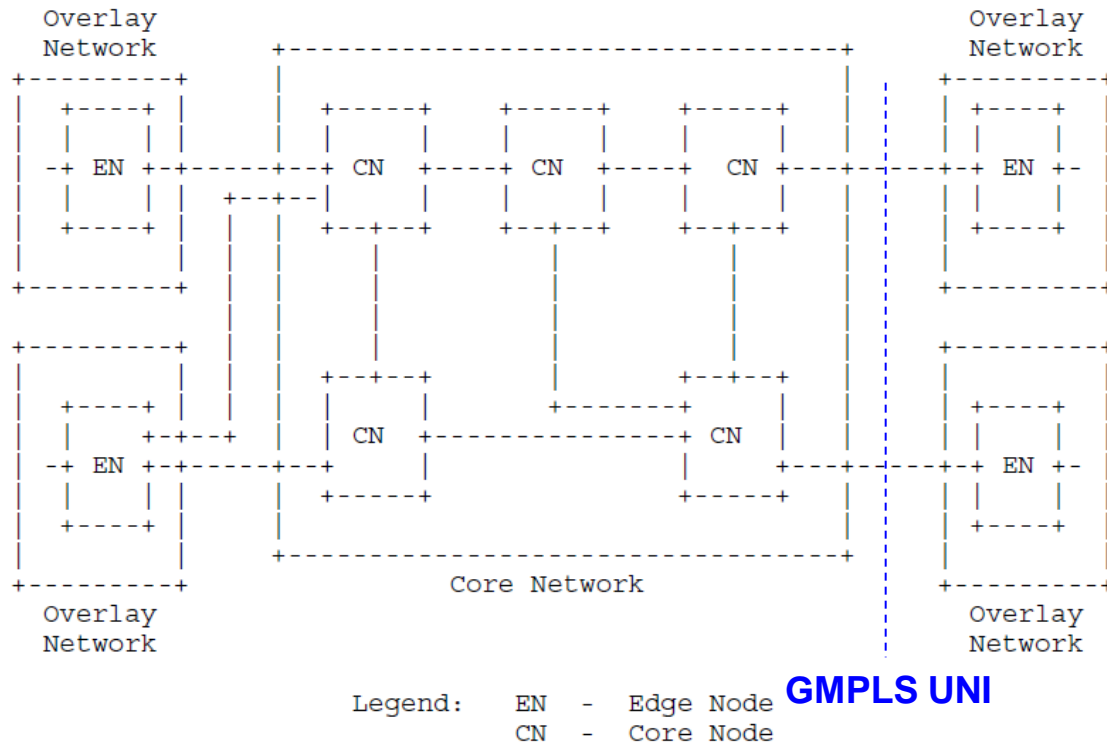
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Outline

- Background

- Draft Overview

- Next Step

Background

- **Objective**: investigates a number of application scenarios for GMPLS UNI [RFC4208];

- **Status of previous version:** presented in IETF80 and triggered lots of interest;

- **Intention**: revived in light of the heated discussion on the "overlay" topic and solicit WG opinions.

Draft Overview

Application Example 1: GMPLS UNI Addressing


```
Overlay                                                        Overlay
Network    +---------------------------------+                Network
+---------+  |     +-----+   +-----+   +-----+  |               +---------+
| +----+ |  |     |     |   |     |   |     |  |               | +----+ |
| |    | |  |     |     |   |     |   |     |  |               | |    | |
| -+ EN +-+----+--+ CN  +----+ CN  +----+ CN  +----+-----+--+ EN +- |
| |    | | +--+--+|     |   |     |   |     |  |               | |    | |
| +----+ |  |     +--+--+   +--+--+   +--+--+  |               | +----+ |
|        |  |                                 |               |        |
+---------+ |                                 |               +---------+
|           |                                 |
+---------+ |     +--+--+             +--+--+  |               +---------+
| +----+ | |     |     |             |     |  |               | +----+ |
| |    +-+-+--+  | CN  +-------------+ CN  |  |               | |    | |
| -+ EN +-+----+--+     |             |     +----+-----+--+ EN +- |
| |    | | |     +-----+             +-----+  |               | |    | |
| +----+ | |                                 |               | +----+ |
|        | |     +---------------------------+               |        |
+---------+ |     Core Network                                 +---------+
Overlay                                                        Overlay
Network                                                         Network
                                                    GMPLS UNI

Legend:   EN - Edge Node
          CN - Core Node
```
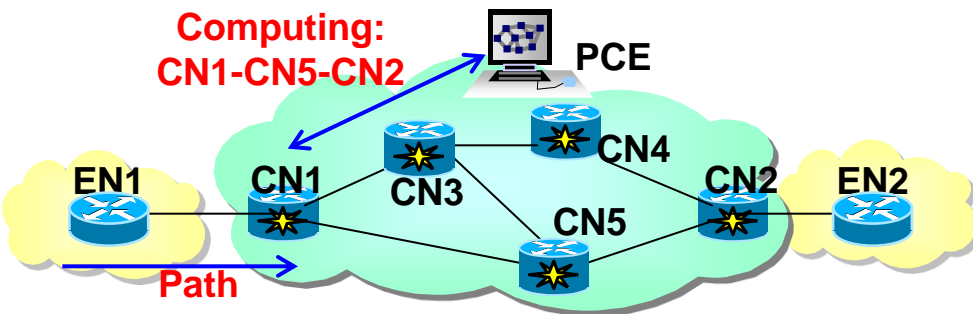
(Figure 1 from RFC4208)

- RFC4208 requires the EN–CN link uses the same address space;

- BUT it does not provide operational explanation when CNs and their connected ENs use different address spaces:

  ✓ Address mapping functions may be needed;

  ✓ Session shuffling can be leveraged;

Draft Overview
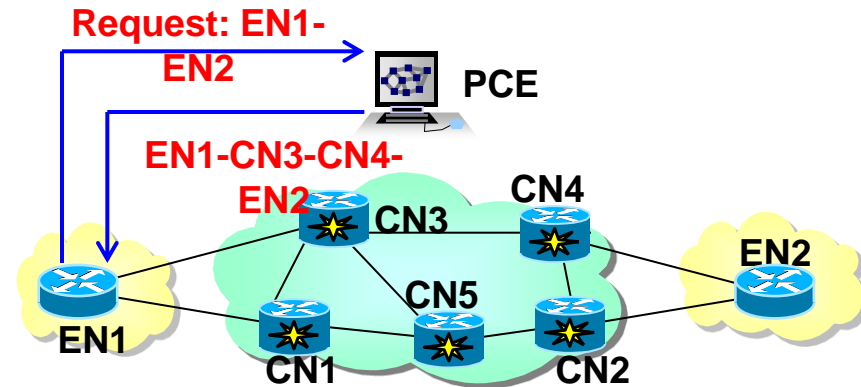
Application Example 2: GMPLS UNI Path Computation

Single-homing

Computing:
CN1-CN5-CN2

PCE

EN1 CN1 CN3 CN4 CN5 CN2 EN2

Path

Multi-homing

Request: EN1-EN2

PCE

EN1-CN3-CN4-EN2

EN1 CN3 CN4 CN1 CN5 CN2 EN2

- **CN1 or PCE computes the path segment inside the core network**
- **No need to select source UNI link because of single-homing**

- **PCE is aware of ENs and is visible to ENs**
- **PCE computes the E2E optimal path (by selecting the source UNI TE link)**

Note: Path Key mechanism can be used to hide the path segment inside the core network for confidentiality consideration
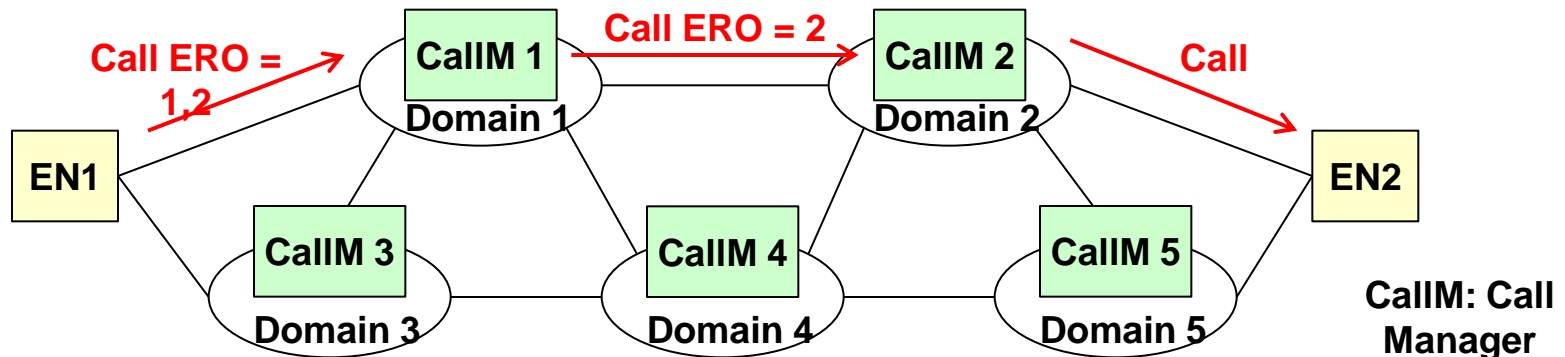
Draft Overview

Application Example 3: **GMPLS UNI Call**

Scenario 1: Information of destination UNI link is not advertised to the source EN.

Scenario 2:
(1) Commercial and policy motivations play an important role in selecting route
(2) Selection of route in a multi-homing scenario

Draft Overview

Other use cases:

- UNI CN-EN link discovery
- UNI path provisioning model: Flat, Stitching, Shuffling and Hierarchical
- Path Diversity
  - ✓ Using RRO;
  - ✓ Using SRLG/Encrypted SRG;
  - ✓ Using PCE;
- UNI Multicasting

Next Step

– WG Adoption

– Any missing scenario(s)?