# Mutually Exclusive Link Group (MELG)

## draft-beeram-ccamp-melg-00.txt

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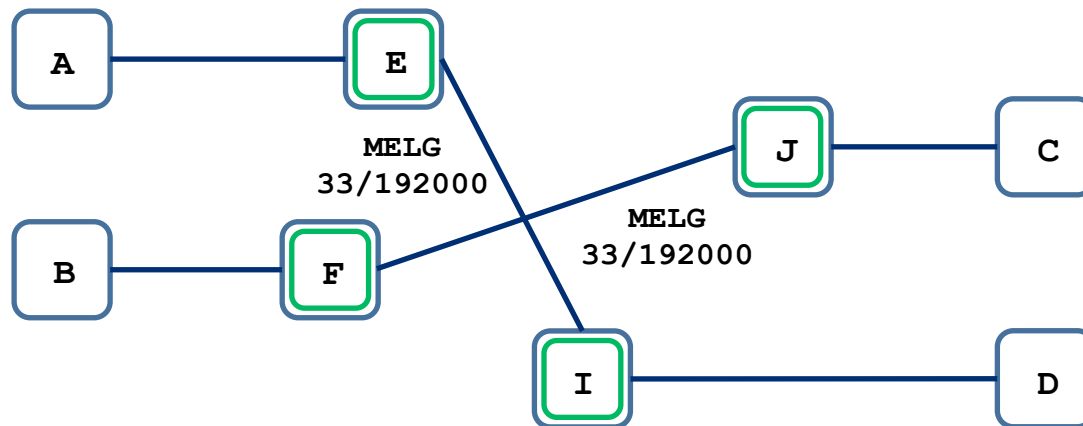Oscar González de Dios

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# MELG

- Discussed earlier in GMPLS-ENNI draft
- MELG-00 Content
  - Definition
    - Virtual TE Links and their "mutual exclusivity" attribute
  - Usage
  - Protocol Formats
    - OSPF/ISIS

# MELG: Example 1

Client
TE Info

A ——— E

**MELG
33/192000**

J ——— C

**MELG
33/192000**

B ——— F

I ——— D

- Virtual "TE Links" E-I and F-J are mutually exclusive (Underlying server-paths require usage of the same resource - lambda channel 192000)

- Same MELG is assigned to both the "TE-Links"

E    G

A

B    H    C

F    J

I    D

3
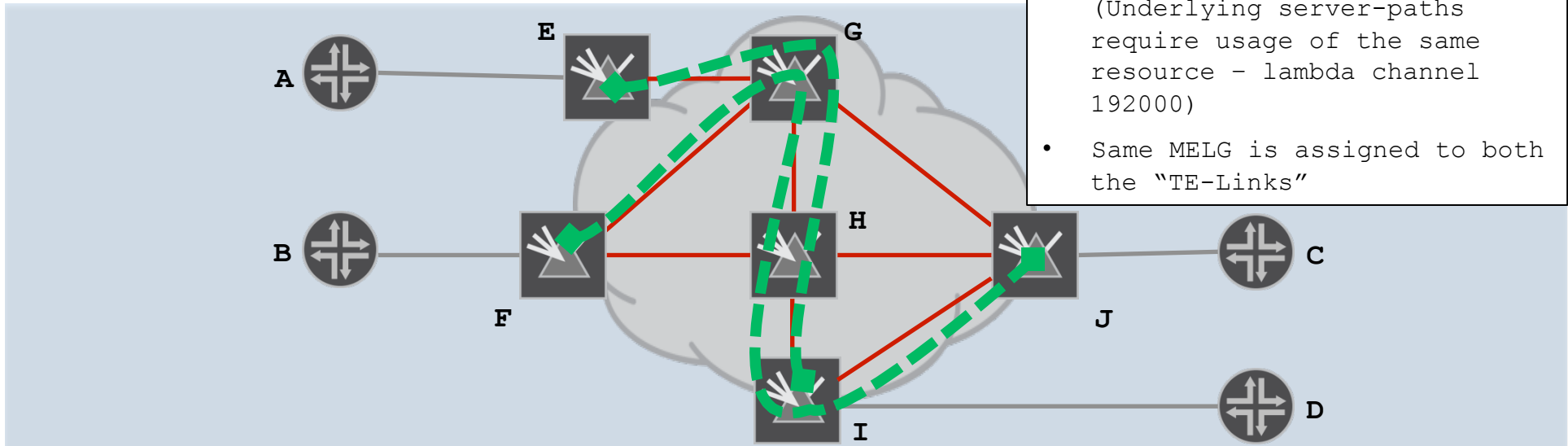
# MELG: Example 2

Client
TE Info

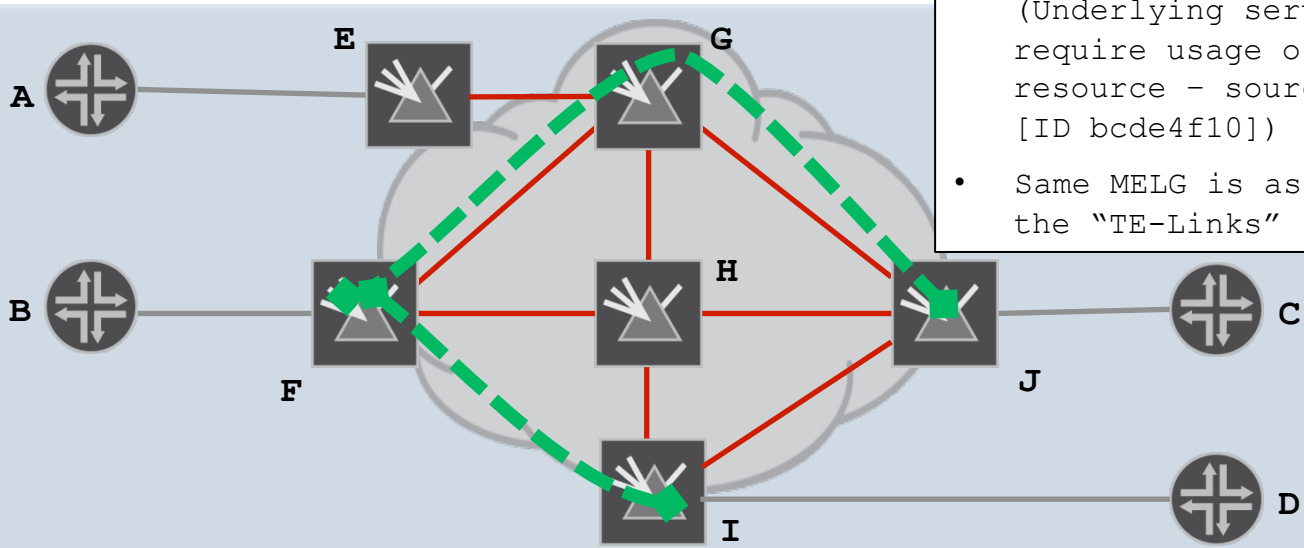A —— E

**MELG 19191901/
bcde4f10**

J —— C

B —— F

**MELG 19191901/
bcde4f10**

I —— D
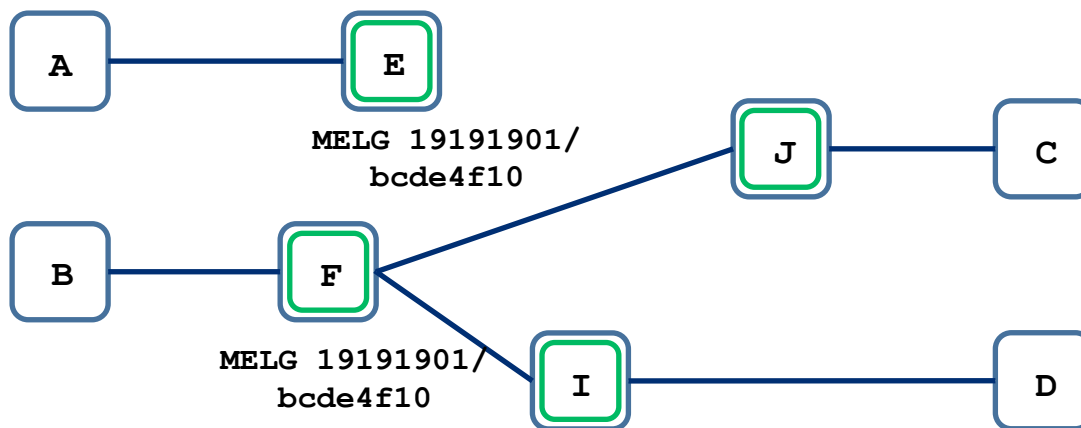
- Virtual "TE Links" F-J and F-I are mutually exclusive (Underlying server-paths require usage of the same resource – source transponder [ID bcde4f10])
- Same MELG is assigned to both the "TE-Links"

E   G

A

B   H   C

F

J

I   D

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# MELG: Construct Usage

- Indicate via separate network unique number(s) that the advertised Virtual TE Link belongs to one or more Mutually Exclusive Link Groups

- Indicate whether the advertised Virtual TE Link is committed or not at the time of advertising.

# MELG: Construct Format

```
Name: MELG
Type: TBD
Length: Variable

 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|            Sub-TLV Type           |         Sub-TLV Length    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|     VTE-Flags (16 bits)        |U |   Number of MELGs (16 bits) |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                    MELGID1 (64 bits)                          |
|                    MELGID2 (64 bits)                          |
|        ............................                          |
|                    MELGIDn (64 bits)                          |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

Number of MELGs:                   number of MELGS advertised for the
                                   Virtual TE Link;
VTE-Flags:                         Virtual TE Link specific flags;
MELGID1,MELGID2,...,MELGIDn:       64-bit network domain unique numbers
                                   associated with each of the advertised
                                   MELGs

Currently defined Virtual TE Link specific flags are:
    U bit (bit 1): Uncommitted, if set, the Virtual TE Link is
    uncommitted at the time of the advertising (i.e. the server layer
    network LSP is not set up); if cleared, the Virtual TE Link is
    committed (i.e. the server layer LSP is fully provisioned and
    functioning). All other bits of the "VTE-Flags" field are
    reserved for future use and MUST be cleared.
```

# Advertisement Rules

- VTE Link advertisement
  - Withdrawn, when there is no potential path
  - MAY include MELGs sub-TLV with zero MELGs
  - with (BW=0), (MELG U-Bit=1)
    - Resources used by some other VTE Link with common MELG
    - Candidate for MBB Computation, provided original path is known to PCE
  - with (BW=0), (MELG U-Bit=0)
    - VTE Link is fully loaded
    - Candidate for MBB computation, provided the original path is known to PCE and this link is present in the original path
  - with (BW≠0), (MELG U-Bit=0,1)
    - Candidate for normal and MBB computation
    - If U-Bit=0, VTE link is not fully loaded

# Questions

- Separate document for extensions to each protocol ?

- Working Group status ?

# Thank you