Shared Resource Link Group [SRcLG]

draft-beeram-ccamp-srclg-00

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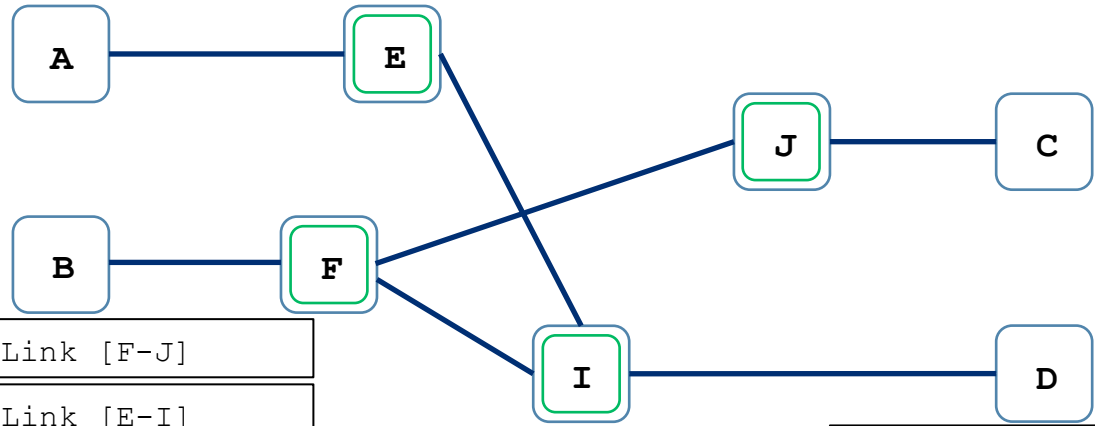
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Introduction

- [DRAFT-SRcLG] is a companion document to [DRAFT-MELG].
  - Discusses "Dynamic Mutual Exclusivity" in detail and introduces a new TE construct (SRcLG) to carry dynamic mutual exclusivity information.

Dynamic Mutual Exclusivity

Client TE Info

Create Virtual TE Link [F-J]

Create Virtual TE Link [E-I]

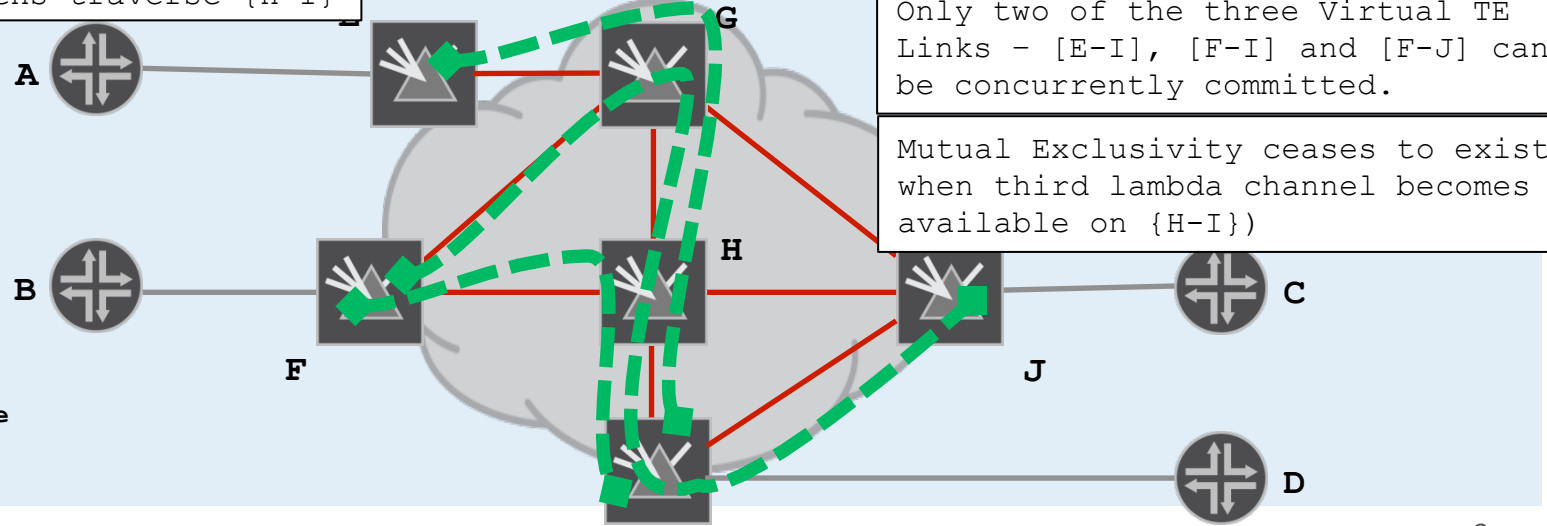Create Virtual TE Link [F-I]

All 3 Server-Paths traverse {H-I}

Assumption: WDM Link {H-I} has only 2 lambda channels available.

Only two of the three Virtual TE Links – [E-I], [F-I] and [F-J] can be concurrently committed.

Mutual Exclusivity ceases to exist when third lambda channel becomes available on {H-I})

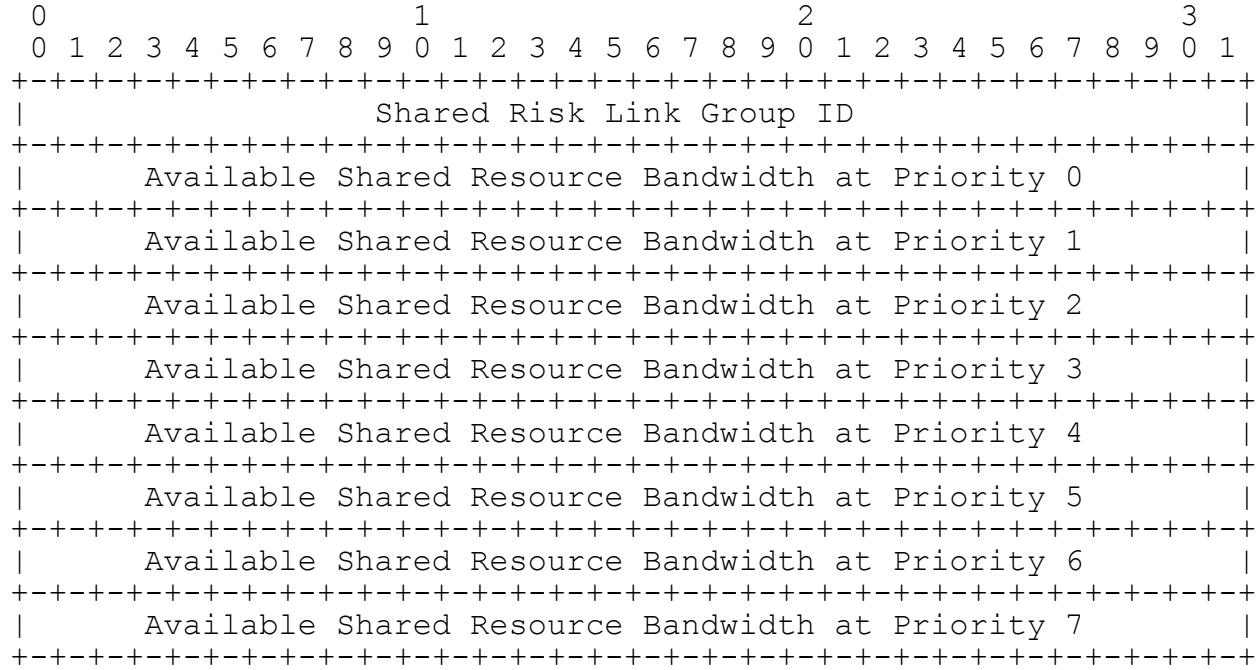**Physical Topology**

Router Node

WDM Node

3

Shared Resource Link Group [SRcLG]

- Shared Resource Link Group (SRcLG) is meaningful only in the context of Virtual TE-Links.

- SRcLG represents a set of Virtual TE-Links that depend on the usage of a shared server-layer resource that has a variable bandwidth capacity and as a result may sometimes not be able to simultaneously accommodate all corresponding Virtual TE-Links in the set.
  - Since dynamic mutual exclusivity comes into play only when the underlying server resource is shareable, all Virtual TE-Links in an SRcLG would also belong to the same SRLG.
  - As is the case with SRLGs, a given Virtual TE-Link may belong to multiple SRcLGs.

SRcLG - Construct

- In terms of the TE construct, an SRcLG is nothing but an SRLG with some additional information to help determine which and how many of the corresponding Virtual TE Links can get committed simultaneously.
  - This additional information is the per-priority available shared resource bandwidth associated with a given SRcLG.
  - Since an SRcLG cannot exist without the presence of a corresponding SRLG, the SRcLG is identified by the corresponding 32-bit SRLG-ID.
  - Unlike the SRLG construct or the MELG construct, the SRcLG construct does not get advertised per TE-Link (to avoid scaling concerns).

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 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
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                    Shared Risk Link Group ID                  |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|        Available Shared Resource Bandwidth at Priority 0      |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|        Available Shared Resource Bandwidth at Priority 1      |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|        Available Shared Resource Bandwidth at Priority 2      |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|        Available Shared Resource Bandwidth at Priority 3      |
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|        Available Shared Resource Bandwidth at Priority 4      |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|        Available Shared Resource Bandwidth at Priority 5      |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|        Available Shared Resource Bandwidth at Priority 6      |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|        Available Shared Resource Bandwidth at Priority 7      |
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Advertising Rules

- As far as the advertisement of a Virtual TE-Link is concerned, there is no perceived difference between SRLG and SRcLG.
  - The 32-bit IDs of all SRcLGs that a Virtual TE-Link belongs to are advertised via the SRLG construct.
- Additionally, all SRcLG information associated with a given Virtual Topology is advertised into the Client TE Domain by the provider of the Virtual Topology.
  - It is the responsibility of this provider to keep the bandwidth availability information for each SRcLG current with timely updates.
  - The draft envisions that one or more server domain OSPF/ISIS TE speakers will be tasked to provide these timely updates. This TE speaker may advertise all SRcLG information (that it is responsible for) in the same OSPF-LSA/ISIS-LSP or advertise each SRcLG TLV separately – one in each OSPF-LSA/ISIS-LSP.

Processing Rules

- Intended consumer of the SRcLG information is the PCE in the Client TE Domain.
  - Client PCE should take this advertised information into account when performing path selection for services over the Virtual Topology provided by the network domain.
    - In particular, this information should be used when deciding how many Virtual TE-Links could be accommodated simultaneously on a given SRcLG at a given priority level.

Next Steps

- Initiate discussion.