GMPLS Extensions for Shared Mesh Protection
(draft-he-ccamp-gmpls-signaling-smp-00)

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Overview

- ITU Recommendations

  - **G.808.3** defines the generic aspects of a **SMP** (Shared Mesh Protection) mechanism.

  - **G.873.3** defines the protection switching operation and associated APS protocol for **SMP at** the **ODU** (optical data unit) **layer**.

- This draft **updates RFC 4872** to provide the extensions to the GMPLS signaling to support the **control of SMP**.

SMP Introduction

SMP (Shared Mesh Protection)

W1
A B C D
P1
E F G
P2
H I J K
W2
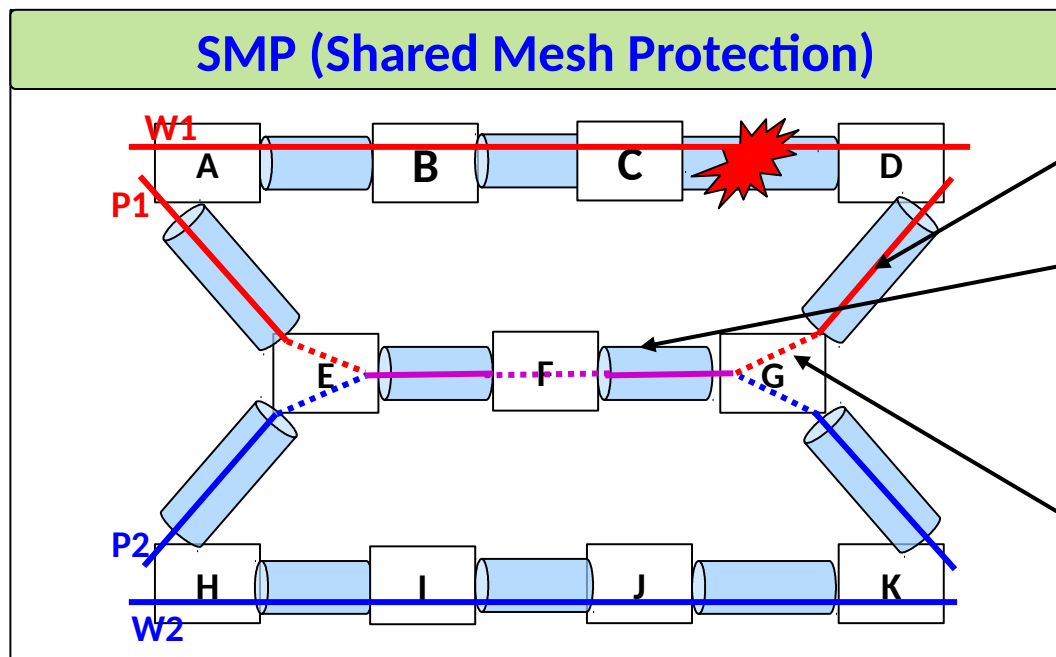
- **Resources** are **reserved** for the protection LSP at the provisioning stage, but
- **Cross-connects** of the protection LSP are **NOT pre-established** before protection switching.

- Common link and node resources in a protecting LSP can be **shared** by multiple physically disjoint working LSPs.

- When the working LSP fails, **APS messages** will be sent along the protection path to establish cross-connects, i.e. **activate the protection LSP**, and execute protection switching.

- **Differences between SMP and SMR** (Share Meshed Restoration, referring to RFC4872): after failure happens:
  - **SMP:** using **data plane APS** for protection switching ---- much faster
  - **SMR**: using **control plane** GMPLS / **RSVP-TE signaling** for protection switching

- **Therefore, it is necessary to distinguish SMP from SMR during provisioning, so that each node involved behaves appropriately in the recovery phase**

Signaling Primary LSPs

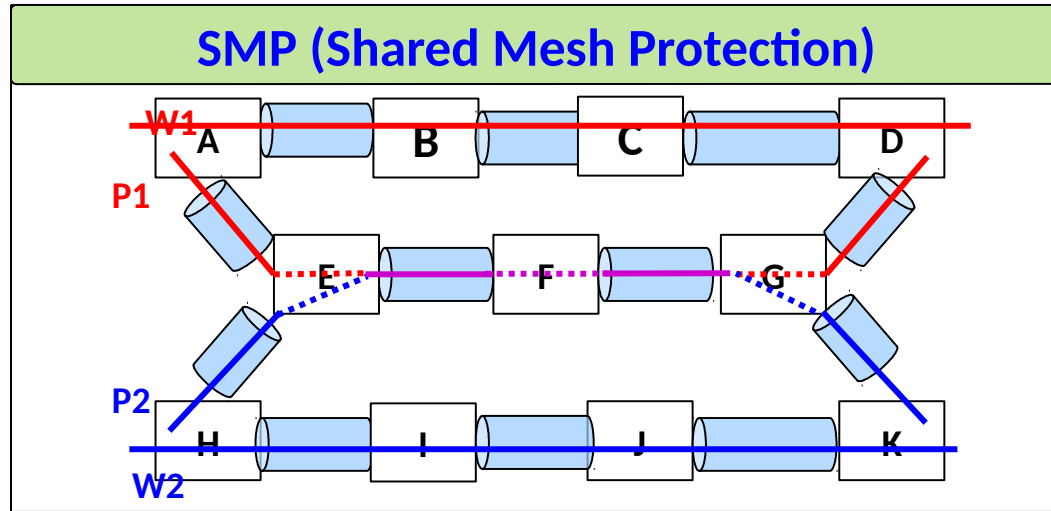**SMP (Shared Mesh Protection)**

W1
A B C D
P1
E F G
P2
H I J K
W2
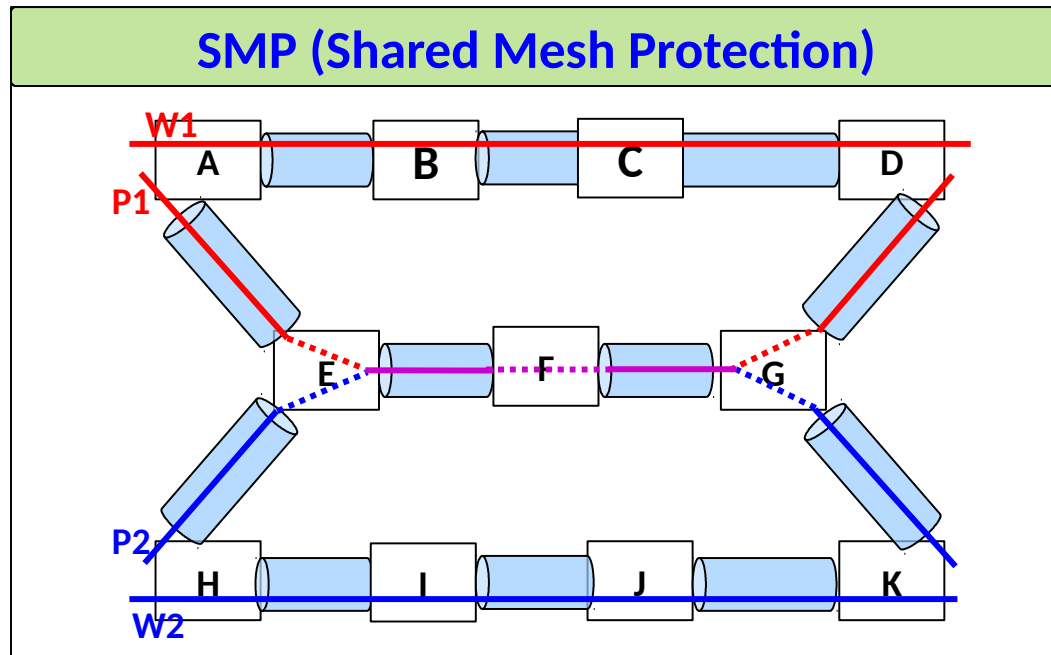
Provisioning Stage

- LSP Protection Type = "Shared Mesh Protection".

- S bit = 0, P bit = 0, N bit =1

- Association ID = associated secondary protecting LSP_ID.
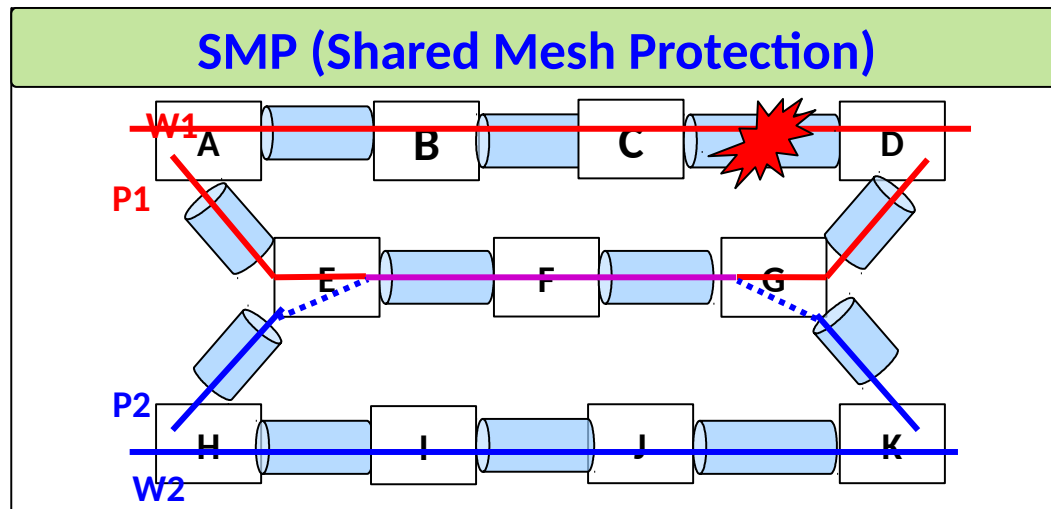
Protection Switching Stage

- A bit (in in the ADMIN_STATUS object) set

Signaling Secondary LSPs

SMP (Shared Mesh Protection)

Provisioning Stage

- LSP Protection Type = "Shared Mesh Protection".

- S bit = 1, P bit = 1, N bit =1

- Association ID = associated primary protecting LSP_ID

- Include PRIMARY_PATH_ROUTE for recovery resource sharing at intermediate nodes

SMP (Shared Mesh Protection)

Protection Switching Stage

- Activation of a secondary LSP and protection switching to the activated protecting LSP is done using APS protocol in the data plane.

- S bit = 0, O bit = 1   (becomes the primary LSP)

Updates to Protection Object

Protection Object:

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
Length																Class-Num (37)								C-Type (2)							
S	P	N	O	Reserved								LSP Flags				Reserved								Link Flags							
Reserved																															

➤ **Secondary (S): no updates**

➤ **Protecting (P): no updates**

➤ **Notification (N): Add SMP case**

➤ **Operational (O): Add SMP case**

➤ **LSP Flags (recovery type)**

  - 0x00 Unprotected
  - 0x01 (Full) Rerouting
  - 0x02 Rerouting without Extra-Traffic
  - 0x04 1:N Protection with Extra-Traffic
  - 0x08 1+1 Unidirectional Protection
  - 0x10 1+1 Bidirectional Protection
  - **0x11 Shared Mesh Protection (SMP)**

Next Steps

- Get feedbacks from the WG level and move forward.