

IGP for Network High Availability

draft-chen-lsr-ctr-availability-00

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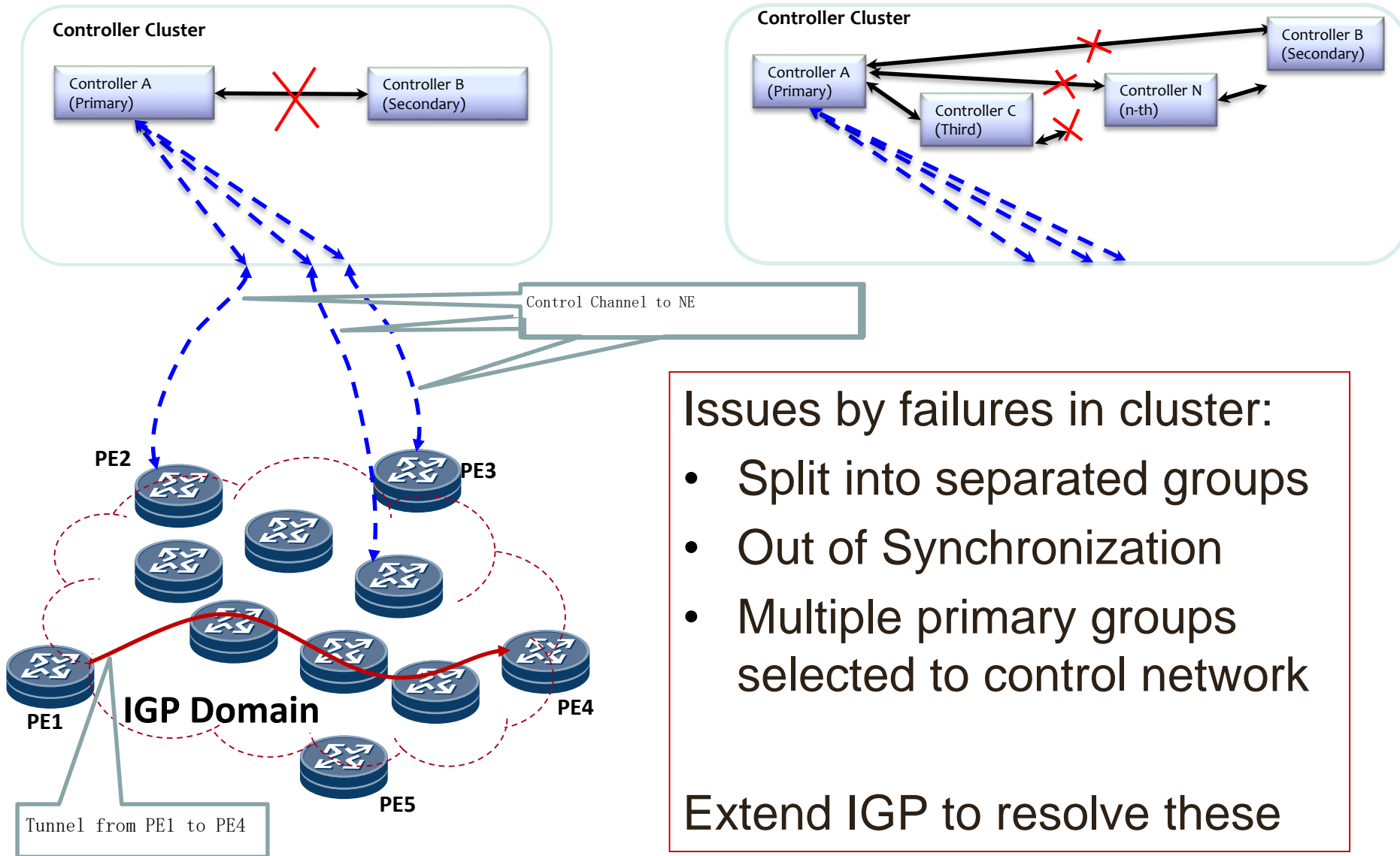
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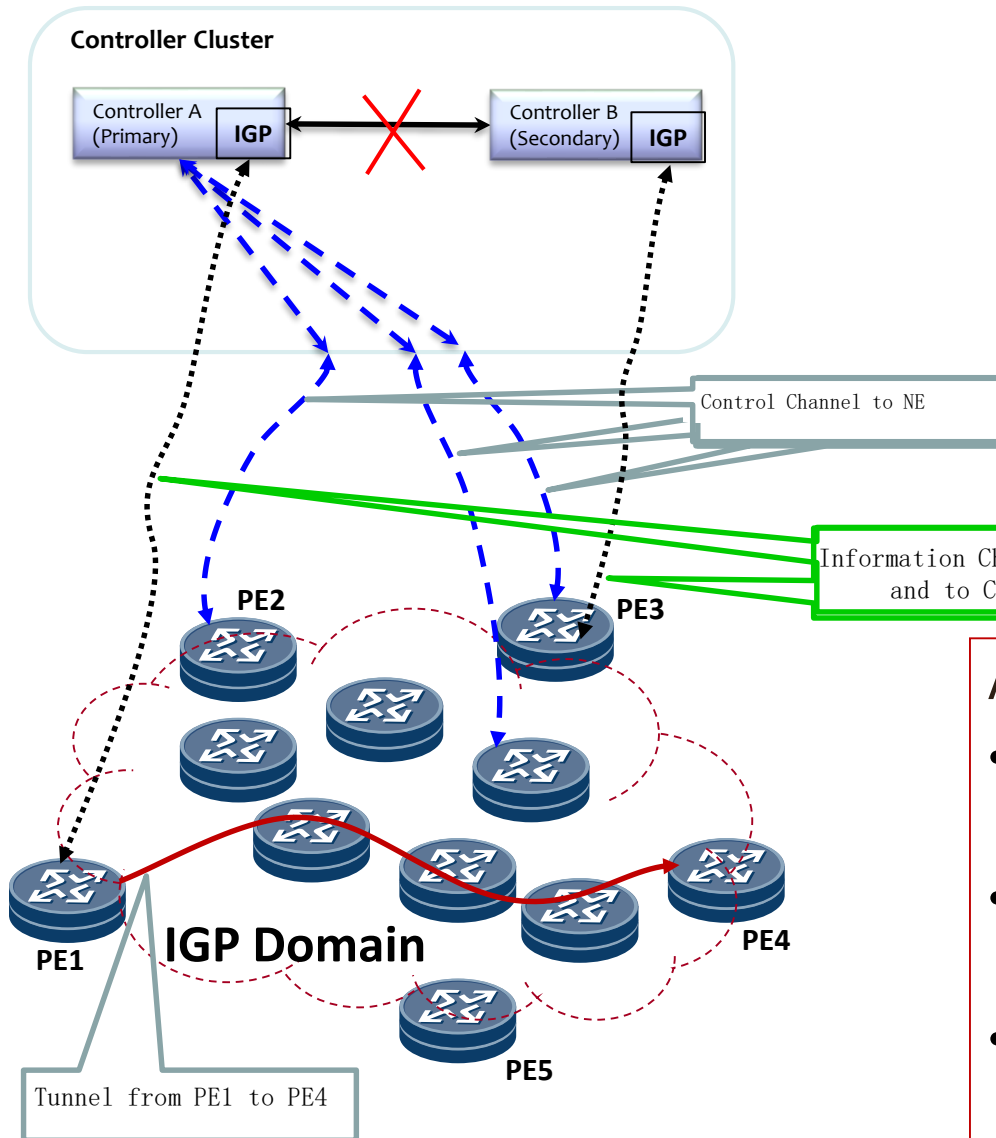
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Introduction



Overview of Mechanism



- Every controller has IGP to NE(s) as information channel

After failures in cluster

- Live controller has information channel to NE(s)
- Information on controller is advertised via the channel
- Primary group is selected correctly to control network

Information on Controller

Normally, A (Primary) advertises the information about the controllers connected to it:

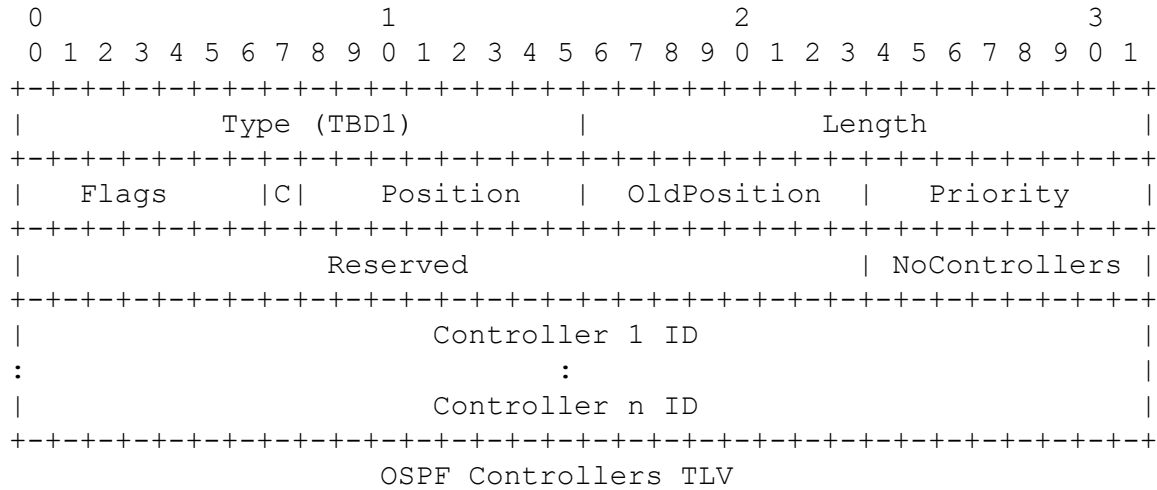
C = 1, A's current Position = 1, A's OldPosition = 1, A's Priority,
NoControllers = n, A's ID, B's ID, ...

After failures in cluster, for each separated group

- Intent primary, secondary controller, and so on are elected
- Intent primary controller advertises information about its group
- Every group has information about others. Primary group is selected.
- In case of tie, group with the highest old position controller (e.g., the old primary controller) wins in one policy

Extensions to OSPF

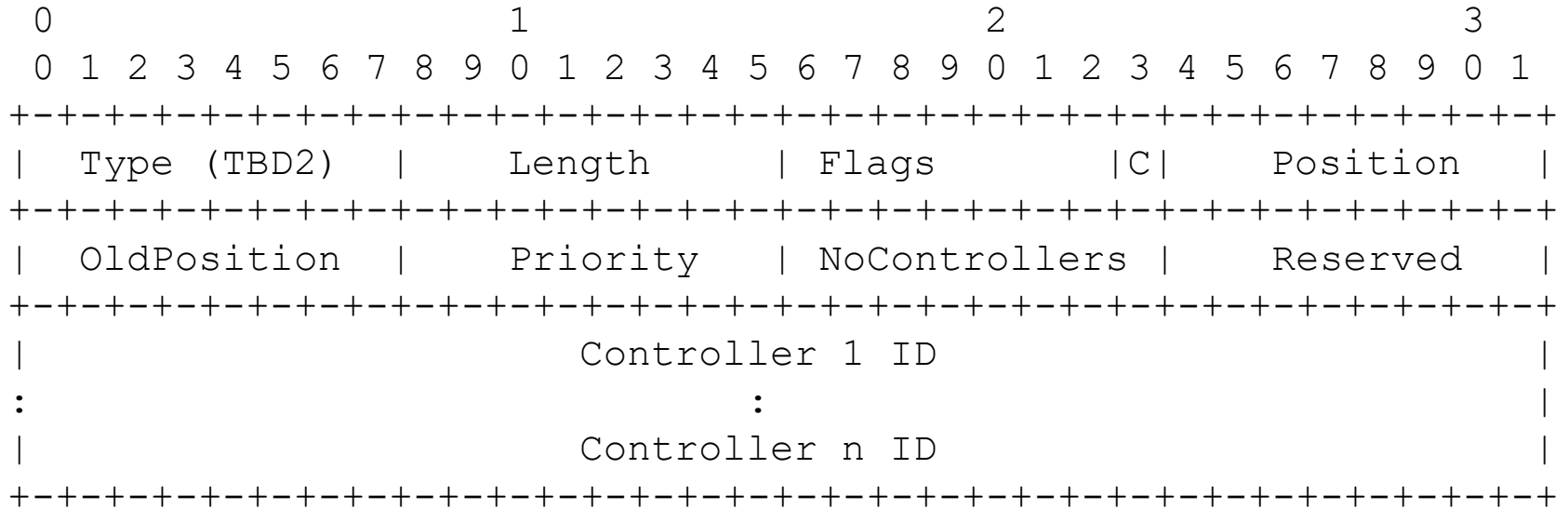
A new TLV, called OSPF Controllers TLV, is defined in RI LSA



- Flag (8 bits): One flag bit, C-bit, is defined. When set, it indicates that the position is the position of the current active primary controller.
- Position (8 bits): It indicates the current/intent position of the controller in the controller cluster or group. 1: primary (first) controller, 2: secondary controller, ...
- OldPosition (8 bits):): It indicates the old position of the controller in the controller cluster before it is split.
- Priority (8 bits): It indicates the priority of the controller to be elected as a primary controller.
- NoControllers (8 bits): It indicates the number of controllers
- Controller i ID (32 bits): It represents the identifier (ID) of controller i at position i (i = 1, ..., n) in the cluster or group.

Extensions to IS-IS

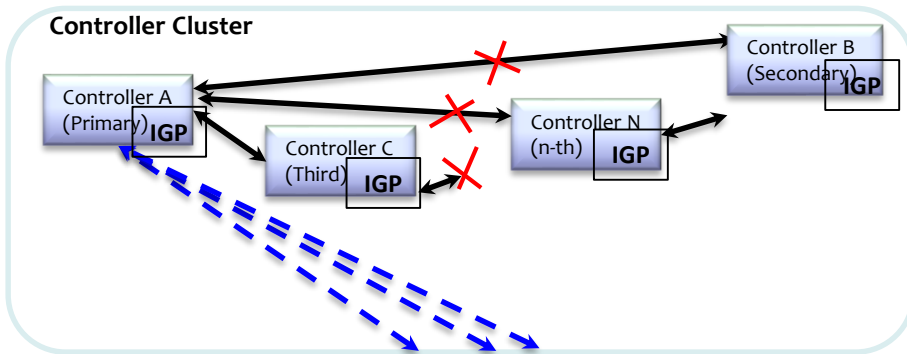
Similar to OSPF, a new IS-IS Controllers TLV, is defined in LSP



IS-IS Controllers TLV

The meaning of each of the fields such as Falgs, Position is the same as the one of the corresponding field in the OSPF Controllers TLV.

Recovery Procedure



- Cluster of n controllers: A, B, ..., N with position 1, 2, ..., n respectively
- Failures split cluster into:
Group 1: A, C;
Group 2: B, N

- Normally, A originates LS containing a Controllers TLV:

C=1, Position=1, OldPosition = 1, A's Priority, NoControllers= n , A's ID, B's ID, ..., and N's ID.

- After failures, intent primary in each separated group originates LS containing a Controllers TLV

A in group 1 originates LS containing:

C=0, Position=1, OldPosition = 1, A's Priority, NoControllers=2, A's ID, C's ID.

B in group 2 originates LS containing:

C=0, Position=1, OldPosition = 2, B's Priority, NoControllers=2, B's ID, N's ID.

Group 1 and 2 have the same number of controllers, which is 2. But OldPosition in group 1 is higher than that in group 2. Group 1 is elected as the primary group

Primary controller A in the primary group (i.e., group 1) originates the LS containing

C=1, Position=1, OldPosition = 1, A's Priority, NoControllers=2, A's ID, C's ID.

Next Step

Comments