

Prefix Unreachable Announcement(PUA)

[\[draft-wang-lsr-prefix-unreachable-announcement\]](#)

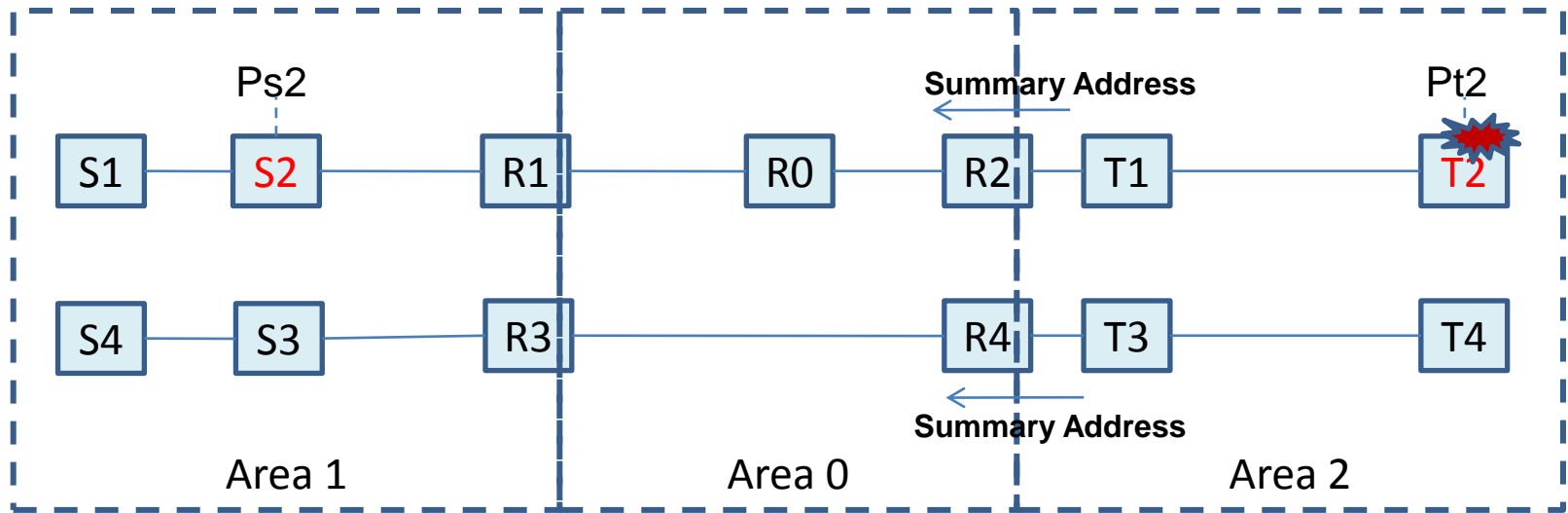
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IETF 106@Singapore, Nov. 2019

- Scenarios
- Proposed Solutions(Inter-Area/Intra-Area)
- Further Action

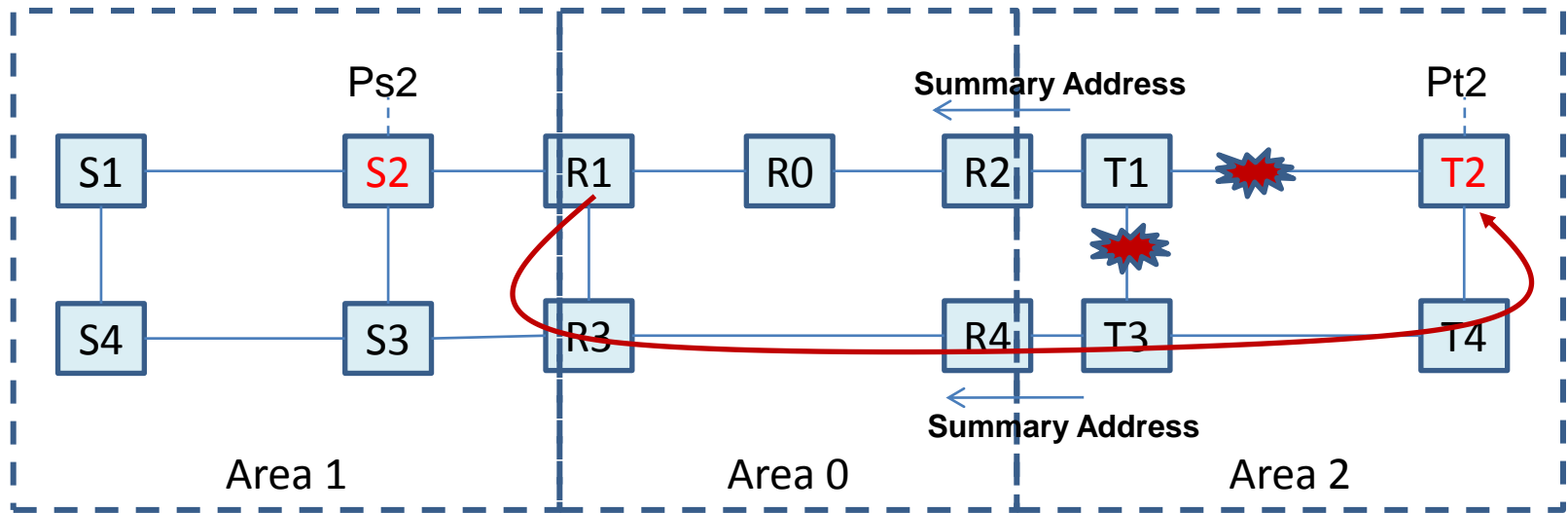
Prefix Unreachable Scenario1 (Inter-Area)



OSPF Prefix Unreachable Scenario (**Node** Failure)

- When ABR(R2/R4) do summary work:
 - Only the summary address for Area 2 will be announced to Area 0/Area 1.
 - Can decrease the SPF calculation time.
 - Reduce the link oscillation influence to other area.
- When **Node** failure, routers in other area will not be notified.
 - Traffic to these Node/Link will be in black hole.
 - Control plane(BGP) based on the logical interface of the Node(Ps2/Pt2) will keep alive until it detects.
- Such situation will be exacerbated for SRv6 based VPN solution

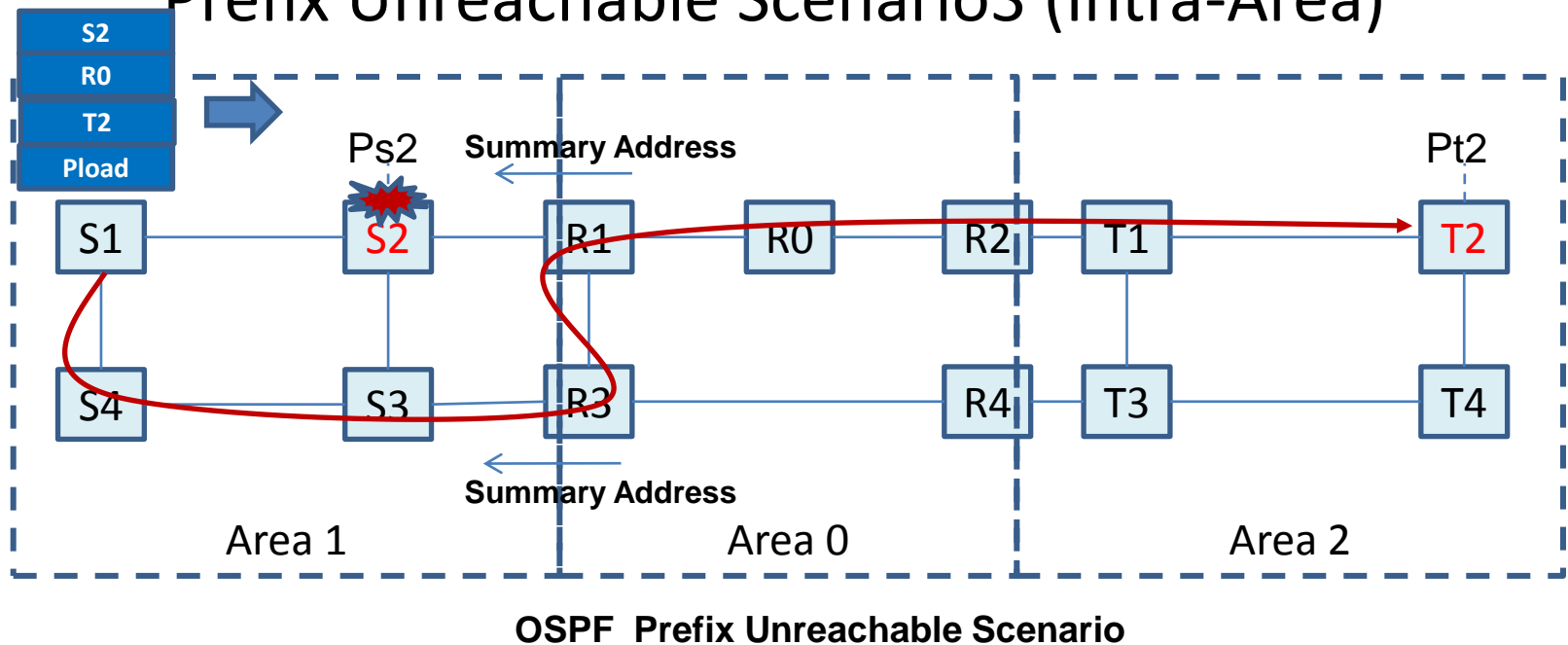
Prefix Unreachable Scenario2 (Inter-Area)



OSPF Prefix Unreachable Scenario (**Links** Failure)

- When ABR(R2/R4) do summary work:
 - R2/R4 do not announce the detailed address of T2, only announce the summary address.
 - **When the links of T1<->T3 and T1<->T2 are failure**, R1 will still think that R2 has reachability to Pt2, and forward the packet to the R2.
 - R2 will drop the packet.
- **Such situation will be exacerbated for IPv6 forwarding.**

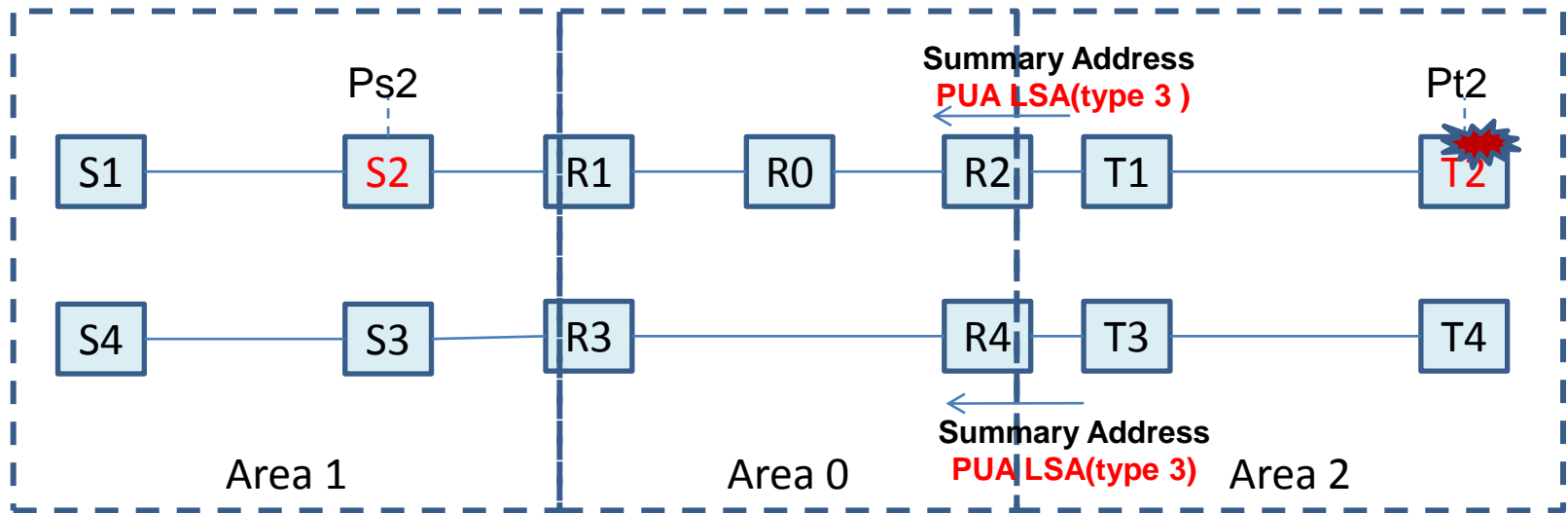
Prefix Unreachable Scenario3 (Intra-Area)



OSPF Prefix Unreachable Scenario

- S1 send a packet with Srv6 segment list <S2, R0, T2>.When S2 is failure, S1 needs to forward packets through a backup path of bypass S2.
 - When S2 is failure and S1 deletes the host route of S2, S1 depend on Fib miss to trigger fast-rerouting forwarding.
 - S1 cannot be triggered fast-rerouting forwarding if there is a default or summary route.
- Such situation will be exacerbated for SRv6 midpoint-protection.([draft-chen-rtgwg-srv6-midpoint-protection-01](#))

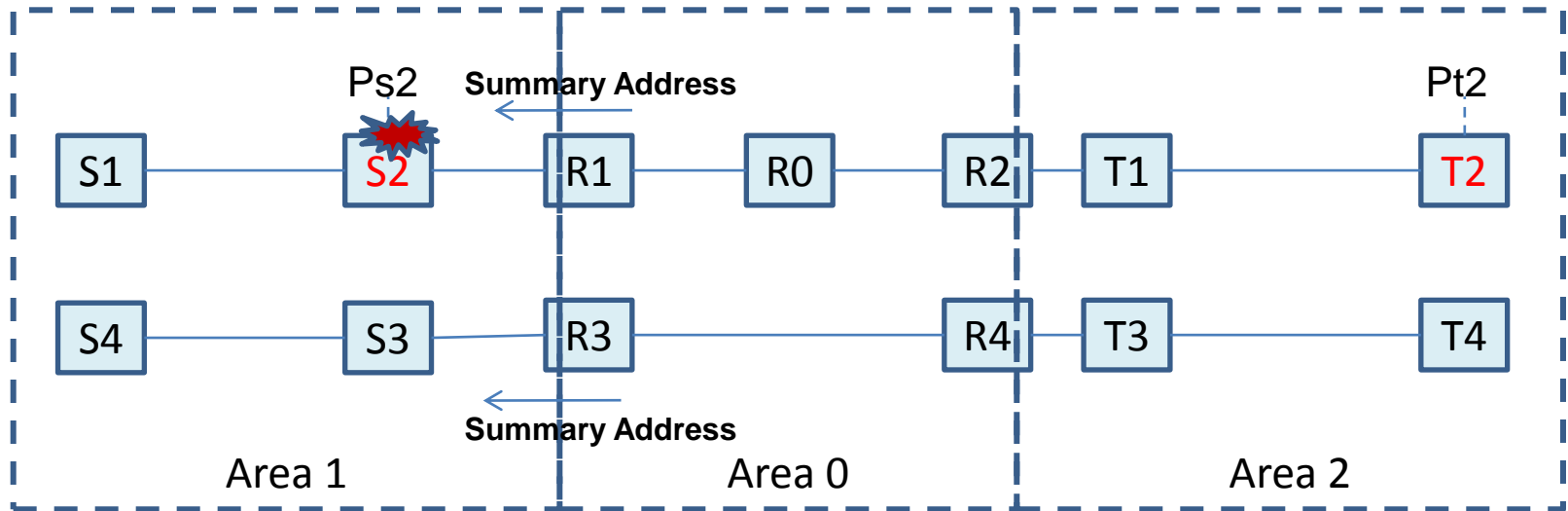
Solution-Prefix Unreachable Announcement



OSPF Prefix Unreachable Announcement Solution (Inter-Area)

- For OSPF, [draft-ietf-lsr-ospf-prefix-originator](#) propose
 - Prefix Originator TLV to transfer the originator information of the prefix.
- For ISIS, [RFC 7794](#) also introduce the similar parameter.
- Here we propose that when ABR(R2/R4) know the failure of Node/Link, it should:
 - Judge whether the prefix of Node/Link is within the range of summary address.
 - If so, set the value of “Prefix Originator” to Null, and advertise it (**PUA LSA**).
- When Node(T2) receives such LSA information, it will:
 - Generate one black hole route to the prefix **if all the route source** whose originator information is Null.

Solution-Prefix Unreachable Announcement



OSPF Prefix Unreachable Announcement Solution (Intra-Area)

- When Node(S1) in the same area know the Node/Link failure information, it should:
 - Judge whether the prefixed associated with failed Node/Link is within one summary address, if so:
 - Generate one black hole route to the prefix that associated with the failed Node/Link.
- Such black hole route can keep until the service based on it is converged.

Overall Consideration

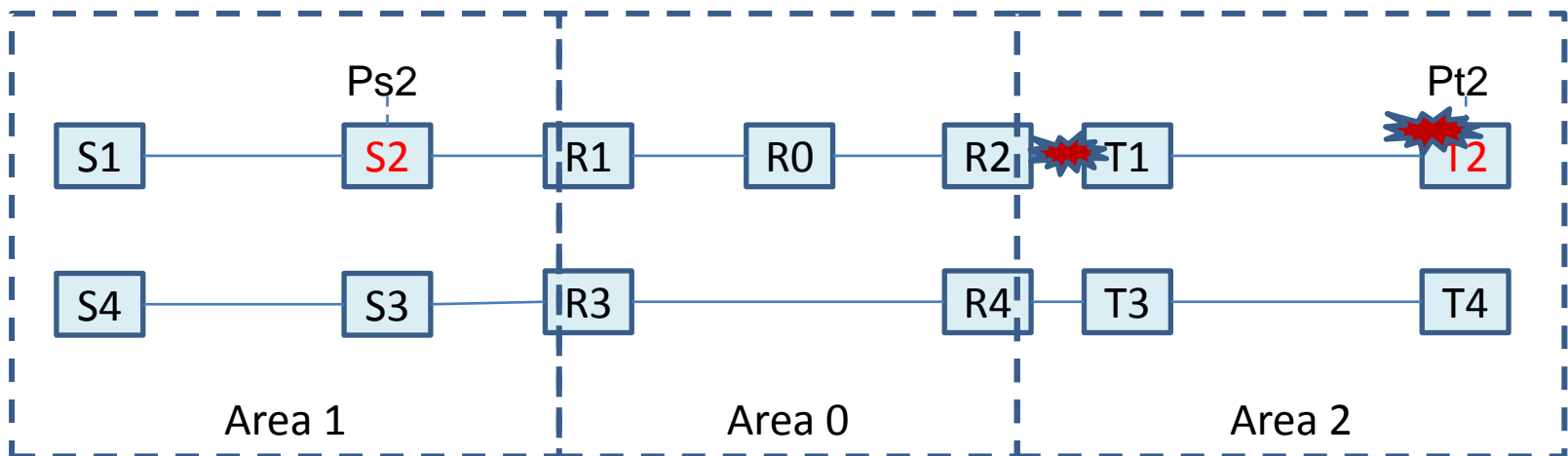
ABR should have the threshold to control the advertisement of Summary Address or PUA

Configurable Value: MAX_Addresses_Summary (MAS)

The maximum number of detail reachable/unreachable addresses for each summary route。

- 1: If unreachable prefix is less than MAS, Advertise the summary address and PUA.
- 2: If reachable address is less than MAS, Advertise the detail reachable address only.
- 3: If the unreachable address and the reachable address are more than MAS, Advertise summary address with **MAX metric**.

The receiver router will keep the black hole route for PUA as MAX_T_PUA(configurable) time.



Further Action

- Comments?
- More complex scenarios are welcome.
- Co-Authors are welcome.
- Adopt as WG document?

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