

PIM DR Load Balancing

draft-ietf-pim-drlb-06

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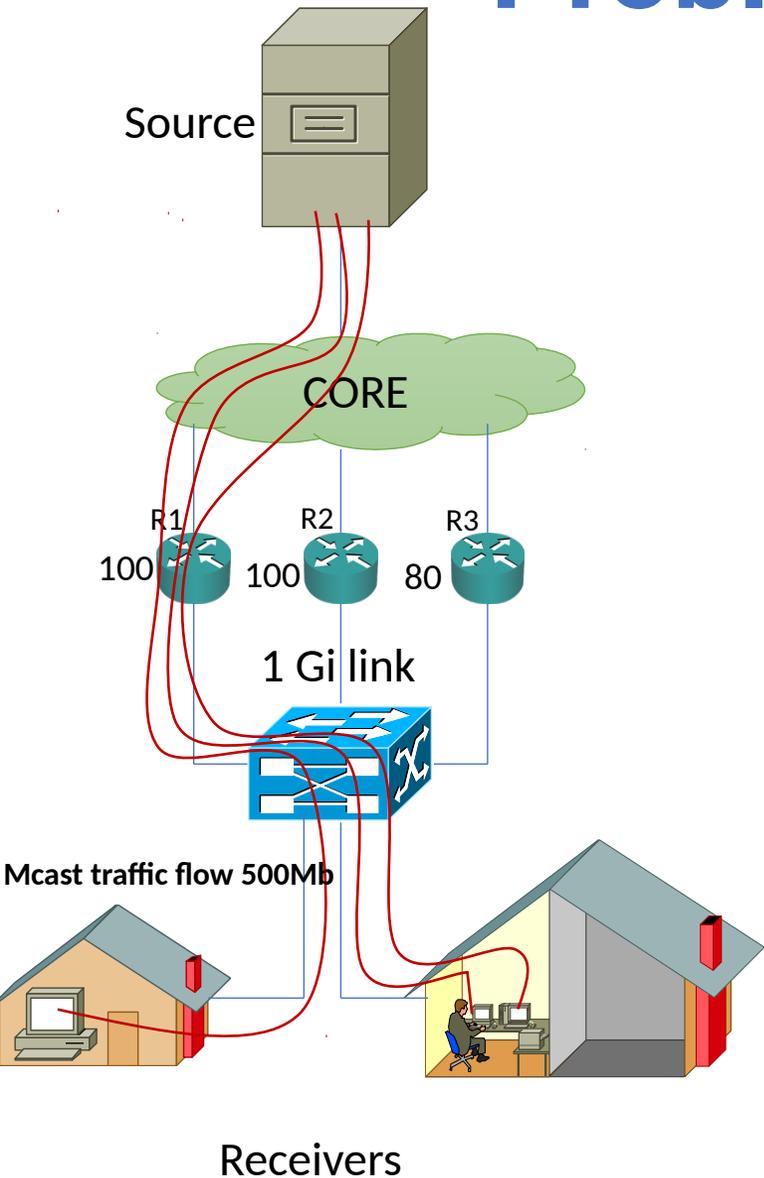
Agenda

- History of draft & Current status
- Problem Statement
- Solution Overview and Applicability
- Protocol Change
- Changes from draft-ietf-pim-drlb-05

History of draft & Current status

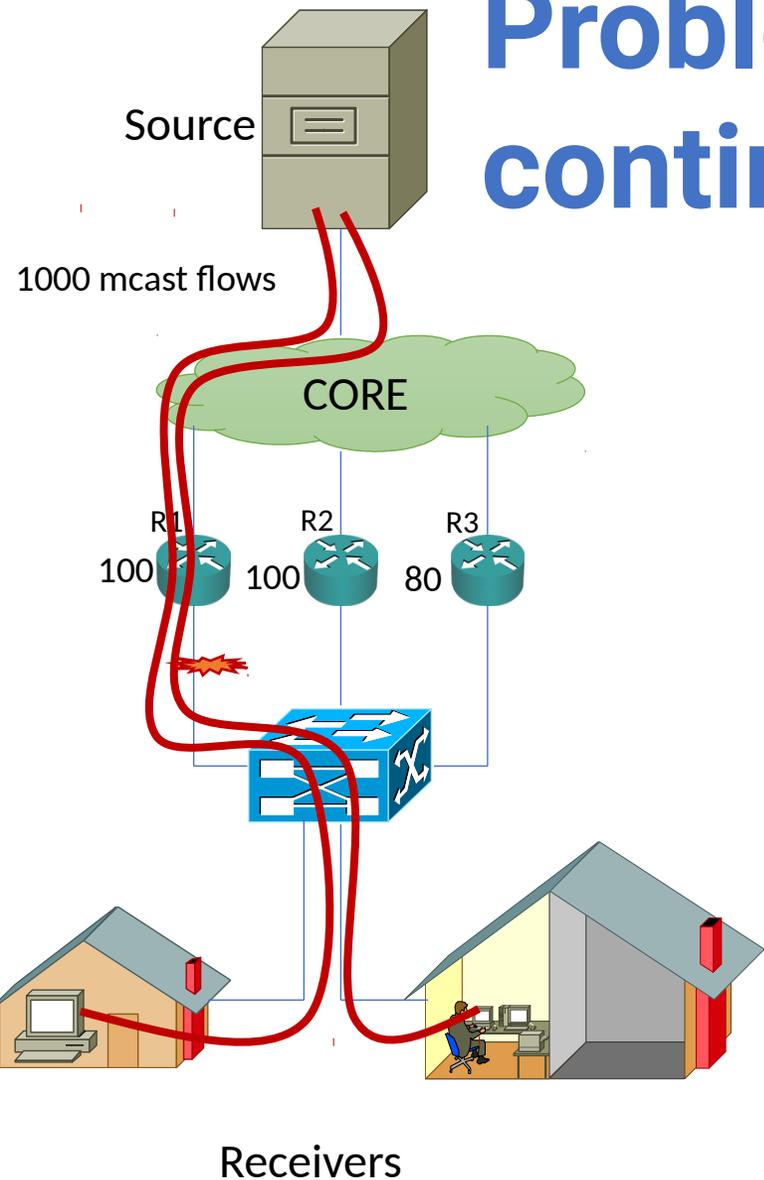
- draft-hou-pim-drlb presented at IETF 82, Taipei, accepted as WG draft-ietf-pimdr1b-00
- draft-ietf-pim-drlb-01 presented at IETF 83, Paris
- draft-ietf-pim-drlb-02 IETF 86, Orlando
- draft-ietf-pim-drlb-05 reviewed by AD and comment provided before calling for last call
- draft-ietf-pim-drlb-06 address all of the comment by AD and presented in IETF-100

Problem Statement



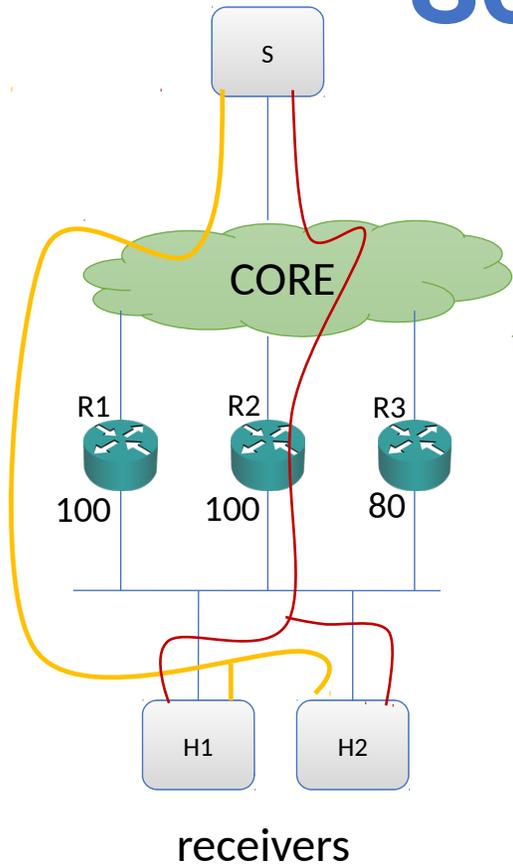
- PIM DR is elected based on DR priority or IP address (per RFC4601)
- In the last hop LAN, only one router, the DR, is responsible for forwarding
- Forwarding load is not distributed
- This leads to issue, where aggregated bandwidth will be limited what PIM DR (R1) can handle towards receiver interface.

Problem Statement – continued



- Failover takes longer time
 - All forwarding states must be rebuilt on the new DR after a failover
 - All of the groups get impacted in case of failure

Solution Overview



- Elect multiple forwarders on the last hop LAN
 - Each is called a GDR (Group DR)
 - Hashing is used to determine which candidate GDR becomes the GDR
- Forwarding load is now distributed
- During a failover only a subset of the forwarding states need to be rebuilt

Applicability

- Last hop only
 - First hop router is determined by incoming Join not DR state
 - The complexity of supporting this at FHR outweighs the benefits of distributing load for sending registers
- SM/SSM/DM only
- Bidir Not scope of this draft

Protocol Change

PIM behavior changed (From first version of draft). But changes did not get added in this version of draft.

- GDR Election

- DR election procedures remain unchanged
- A router announces hash masks in new Hello Option TLV to indicate its capability
 - Hash masks include RP, Group, Source
- All candidate GDRs must have the same DR priority as the DR
- DR announces the list of candidate GDRs and the hash masks to be used on this LAN

Protocol Change

- Creating forwarding states
 - Upon receiving IGMP reports, a candidate GDR runs a hash algorithm to determine if it is the GDR for the RP of the group, the group and/or source
 - If it is, it becomes the forwarder on the LAN
 - Forwarding states are recalculated if the list of the candidate GDR changes or the hash masks change (per announcement by DR)

Protocol Change

- GDR Assert
 - Used to reduce packet loss during GDR state change
 - A GDR becoming non-GDR MAY choose not to remove the oif immediately
 - This will lead to Assert
 - GDR state is preferred before using IP address as a tie-breaker

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AD review comment draft-ietf-pim-drlb-05

- Section 6.2 need clear specification about router supporting this capabilities. It should clearly mention different scenario and how does router behave
- Section 6.2 need text describing when GDR receives IGMP join, what are steps it need to perform.
- Detail comments can be looked at <https://mailarchive.ietf.org/arch/msg/pim/K61q4--5ZBb9RTMkeud-5MnmuOw>

Questions ??