Protocol Independent Multicast - Sparse Mode (PIM-SM) Designated Router (DR) Improvement

draft-ietf-pim-dr-improvement

PIM WG

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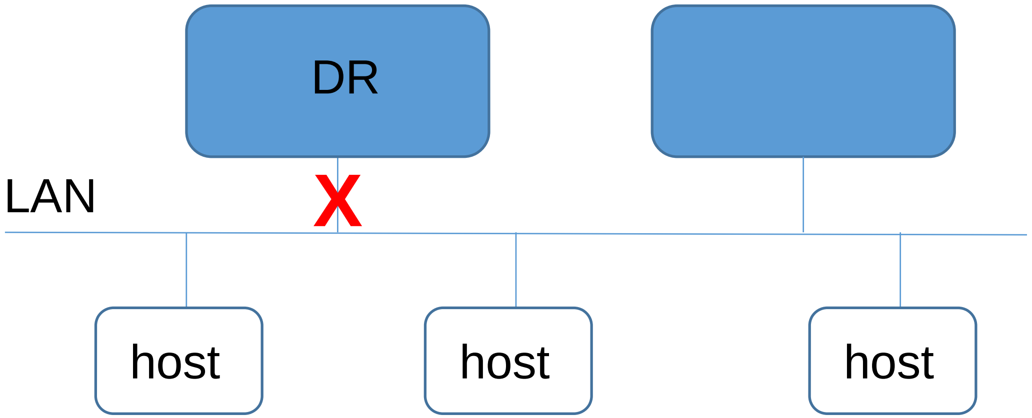
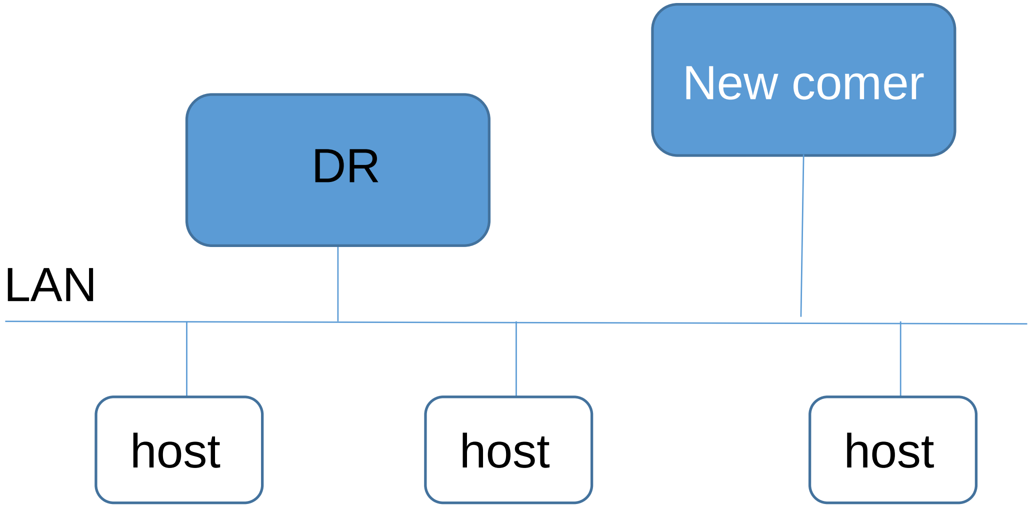
The problem statement

- Fast changing of DR takes times to converge and causes packets lost, it takes affect on modern services, such as IPTV, Net-meeting, etc.





•The reasons for the DR changing include:
- DR becomes unreachable
- New router joins with higher priority

DR & BDR

- Sticky DR Role
  - Once elected, the DR's role will not change (unless it fails), even if a new device has a higher priority.

- A new BDR Role
  - Following the DR election, the same election algorithm is used.
  - When the DR has the highest priority in the LAN, the BDR has the second highest priority. Otherwise, the BDR has the highest priority in the LAN.
  - It joins the multicast tree like the DR, but does not forward traffic unless the DR fails.
  - It monitors the DR and will take over the DR's responsibilities when the DR fail in the LAN.

Solution introduction

- Defines two new options in Hello message: DR option, BDR option.
- New router sends Hello message with DR/BDR option set to 0;
- When one Hello_Holdtime expires, the new router receives Hello message from other routers;
    - If there is a router works as DR already, the new router receives the DR option with DR's IP address, the new router will not replace the existed DR.
    - The new router will be the new BDR if there is no other routers with higher priority.

- The BDR will be in standby mode but not forwarding flow until it finds that the DR fails.

- **This idea is borrowed from OSPF DR election as defined in RFC2328 (Section 9.4), except that for BDR election, the BDR will be the highest or second highest priority on the LAN.**

Solution advantages

- Explicit signaling:
  - To avoid error handling, especially when devices that do not support this solution are present.

- Sticky solution:
  - To avoid DR oscillations that could cause flow interruptions or flow rate fluctuations.

- Compatibility
  - All routers in the LAN need to support the signaling. If any do not support it, fall back to RFC7761.

- comments welcomed :-)

Thanks!