PIM DR IMPROVEMENT
draft-ietf-pim-dr-improvement-05

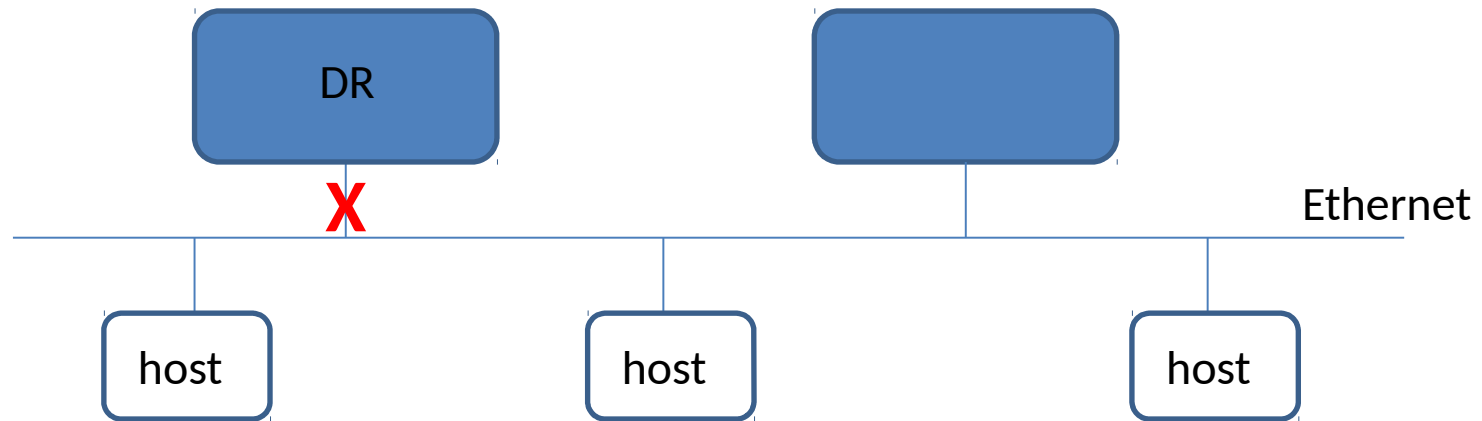## PIM WG

IETF103# Bangkok

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Update for ver-05:

- Add statements about deployment choice.
- Change some description for readability.

Problem Statement

- When DR changes

•When the DR becomes unreachable, it needs several seconds to elect a new DR.
•The multicast flow is interrupted for several seconds. It will influence the real-time applications such as IPTV, Network-Meeting.
•The maximum recover time may be 105 seconds, due to the default DR hold-time.

Problem Statement

- When a new router comes in
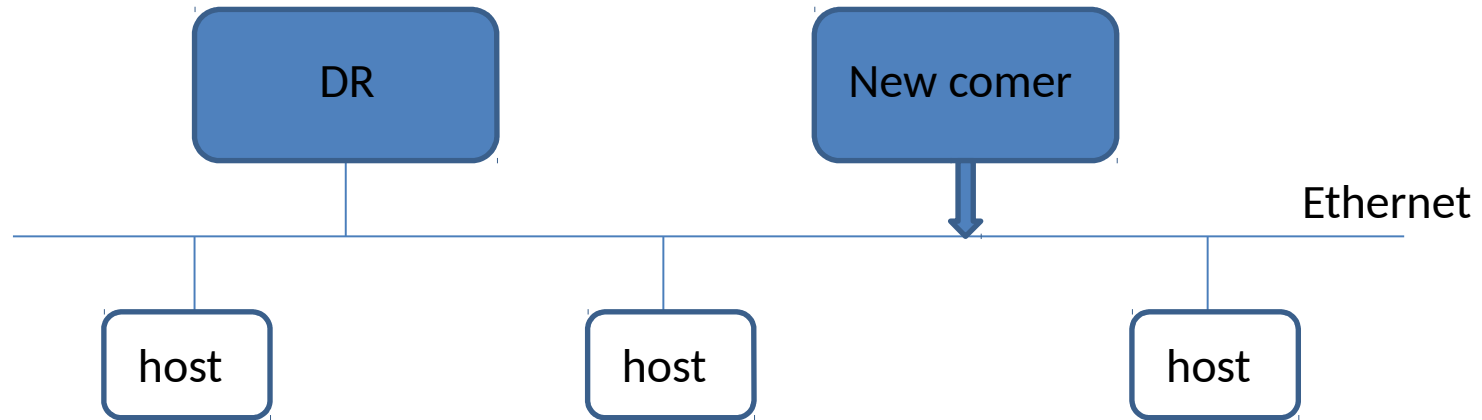
•When a new router which have a higher DR-priority comes in, the new router will become the DR and import multicast flow from upstream router.
•The multicast flow will switch to new DR from old DR.
•The real-time applications such as IPTV, Network-Meeting will be influenced.

Requirements

How to reduce the recovery time of DR changing?

How to decrease the packets loss during DR changing?

- The DR should be stable, even if the new router has a higher priority.
- When the "old" DR is down, the new router becomes DR as quickly as possible. The time that the new DR finds the failure of "old" DR must be more shorter.
- The new DR imports multicast flow from upstream routers as quickly as possible.
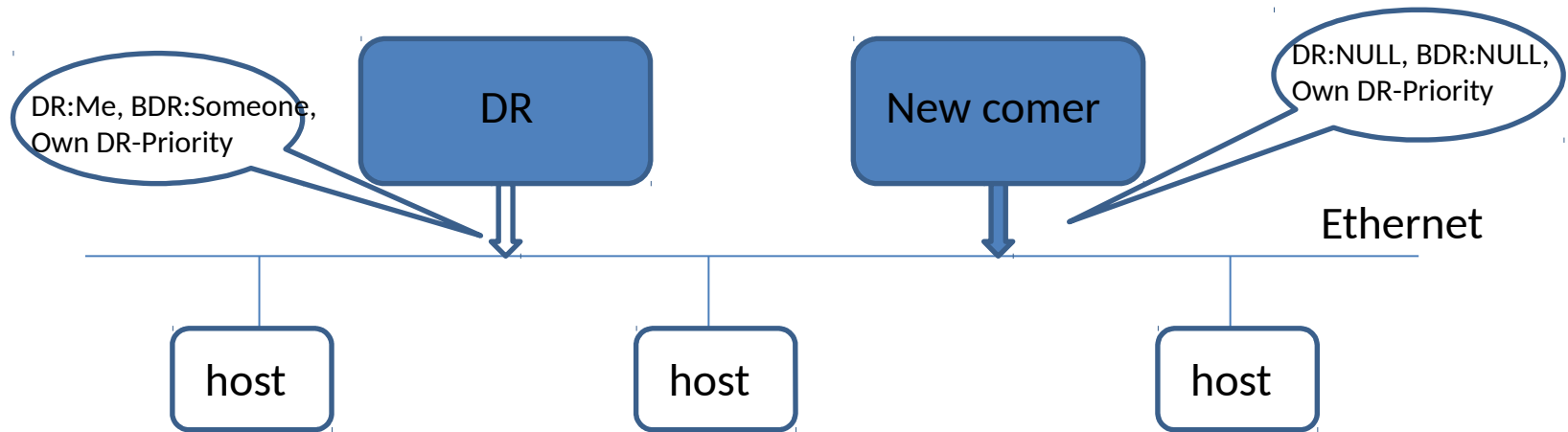
Solution

DR/BDR

- DR is the router which has the highest priority. But once DR is elected, new router which has a higher priority can not replace the existed DR immediately.

- BDR is the router which has the highest priority except the existed DR.

- BDR monitors the existed DR by BFD. When the existed DR becomes unreachable, BDR should become DR immediately.

- BDR imports multicast flows from upstream routers in advance. But BDR will not forward the flows until the existed DR becomes unreachable.
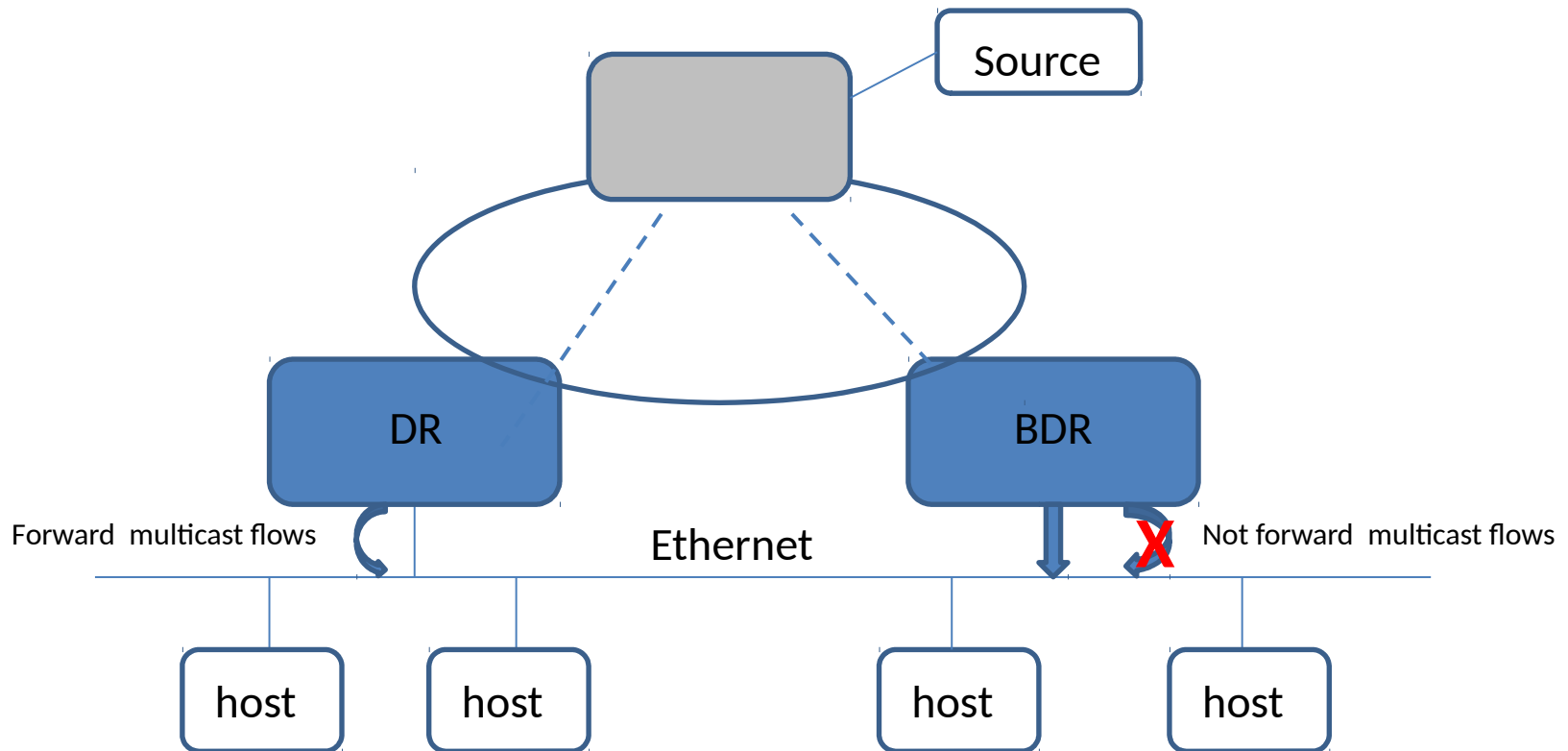
Solution Statement

- When a new router comes in

DR:Me, BDR:Someone, Own DR-Priority

DR

New comer

DR:NULL, BDR:NULL, Own DR-Priority

Ethernet

host

host

host

• When a new router which has a higher DR-priority comes in, the new router will send the hello packet that DR and BDR are all set to NULL.

• After the new router receives hello packet from DR, it will know that there is a living DR in the Ethernet, and it will follow the DR.

• If all the routers in the Ethernet find that the new router has a higher priority than the existed BDR, they will treat the new comer as a new BDR.
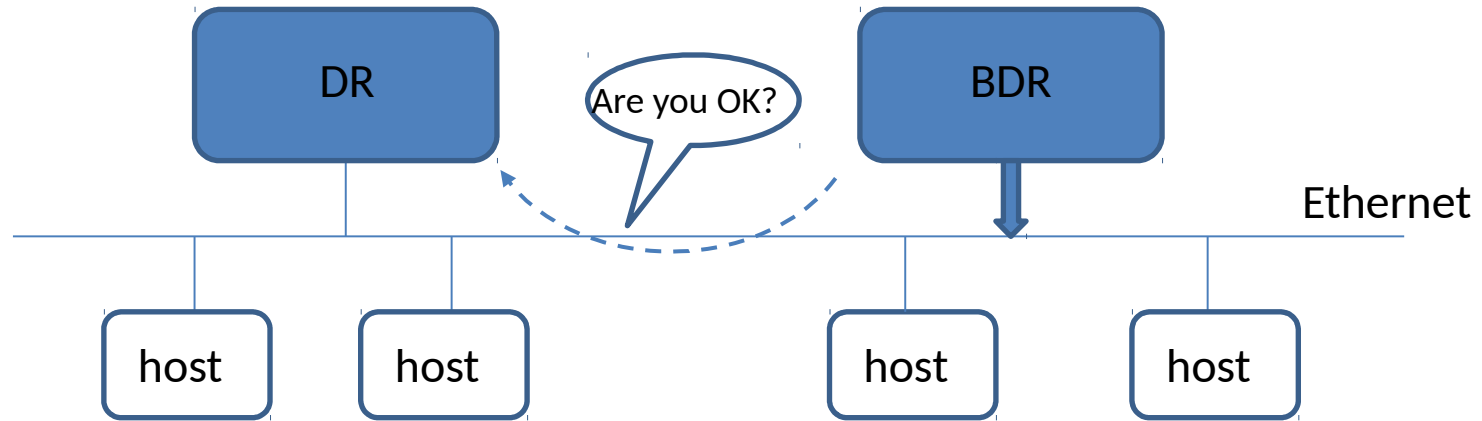
Solution Statement

- ## When a BDR is elected

- When a new router is elected as BDR, it will join the multicast groups also like the DR.
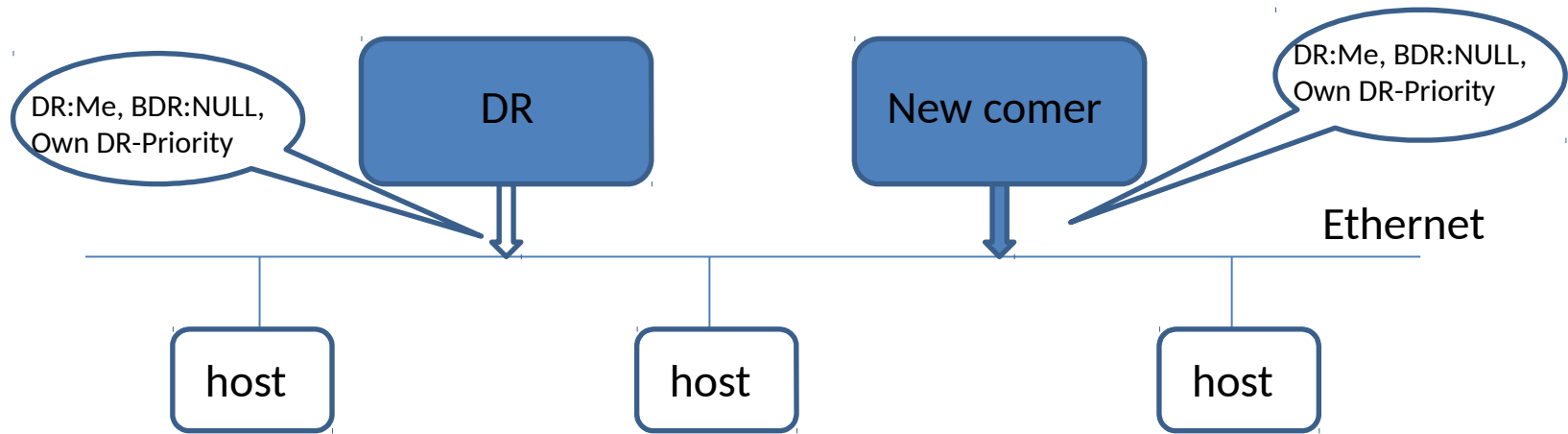- The BDR will NOT forward multicast flows.

Solution Statement

- ## When a BDR is elected

- BDR will monitor the state of DR.
- When BDR notices that DR is down, BDR will take charge of the DR's work.
- BDR forwards the multicast flow to receivers immediately.

Solution Statement compatibility

- ## When a new router comes in

- When a new router which has no DR-improvement capability comes in, the new router sends the hello packet with it's DR-priority.
- After the new router receives hello packet from existed DR, it compares the DR priority.
- If the new router elects itself to DR, it sends hello packet with DR set to itself.
- Existed DR elects the new router to be DR according DR election algorithm.

- Specification of "Election Algorithm"

- Step1. Collect the candidates of BDR. (Except the routers who declare themselves as DR.)

- Step2. Select the one who has the highest priority to be BDR. (Tie-break: Highest ip-address)

- Step3. Collect the candidates of DR. (Collect the routers who declare themselves as DR.)

- Step4. Select the one who has the highest priority to be DR. (Tie-break: Highest ip-address)

- Step5. If DR is null, the new BDR is elected to be DR. And repeat the steps, a new BDR will be elected.

- WGLC?

Thanks!