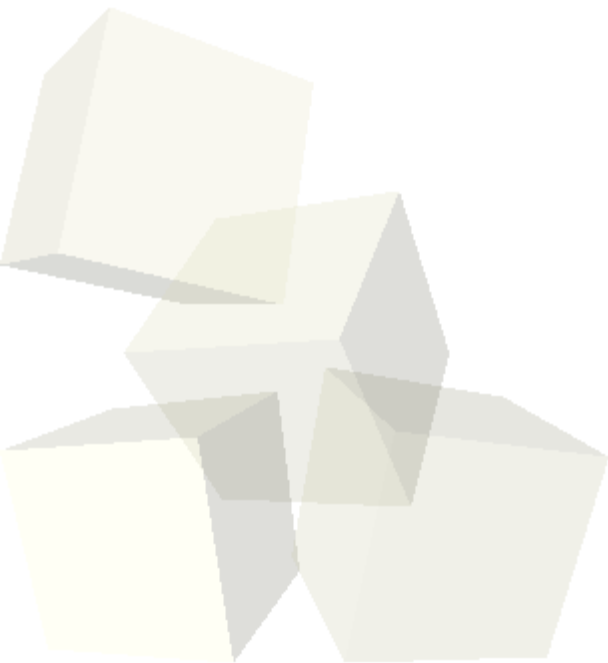




Multicast blackhole mitigation with PIM adjacency conditions on routing announcements

[draft-morin-mboned-mcast-blackhole-mitigation-00](#)

Thomas Morin
Gregory Cauchie
(Orange Labs)





■ Context

- ♦ Multicast more and more deployed
- ♦ Focus on multicast QoS / convergence

■ Multicast routing reminder

- ♦ PIM-SM/SSM is the multicast routing protocol used
- ♦ PIM relies on unicast routing
 - e.g. PIM-SSM builds a replication tree from receivers to a multicast source, by propagating “PIM Joins” hop-by-hop toward the source, following unicast routing to the source

■ Today's tagline

- ♦ “multicast needs you” !



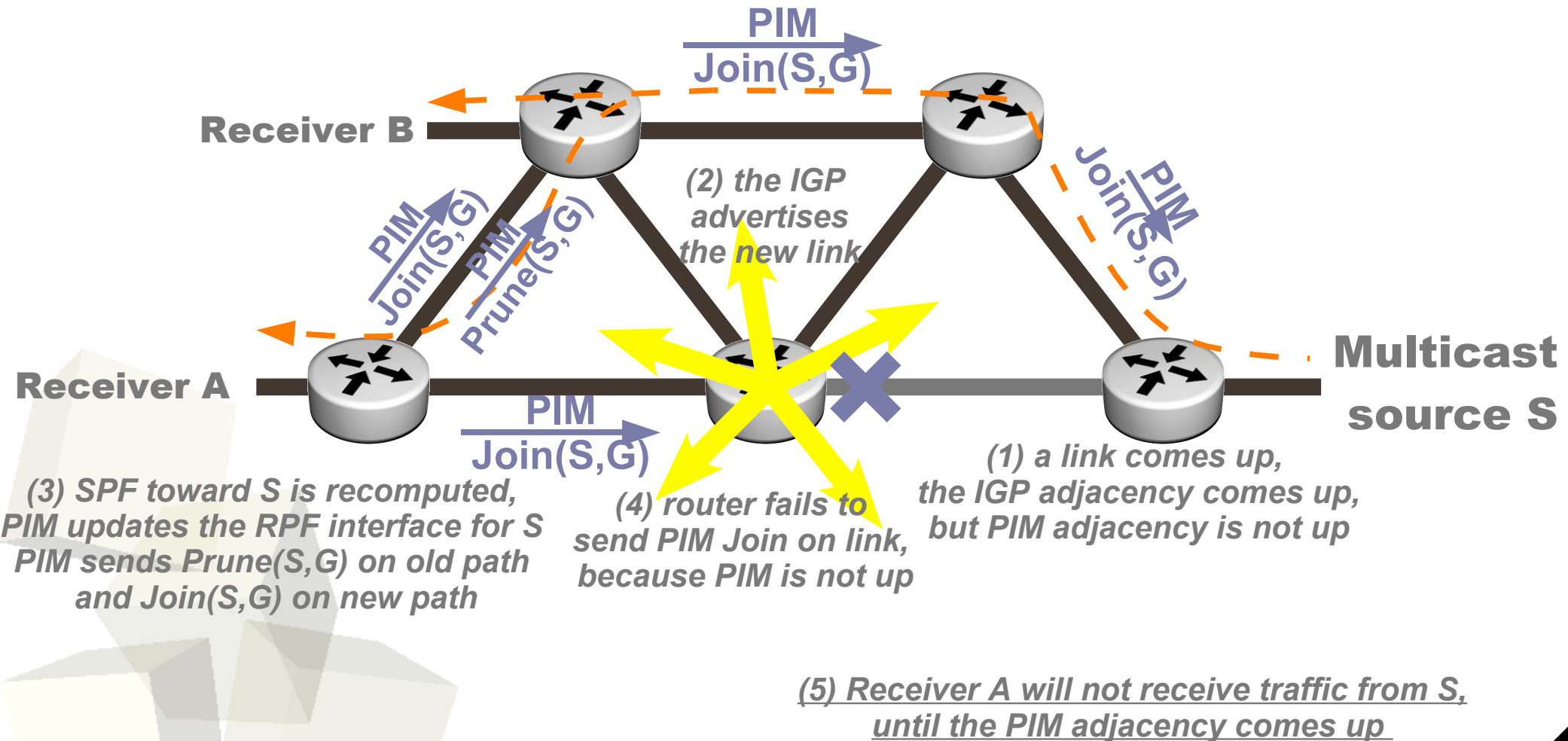
Problem statement

- It can occur that the IGP advertises a link while the PIM-SM adjacency on a link is not ready yet, e.g.:
 - ♦ if PIM Hellos not exchanged yet
 - ♦ or if PIM is not configured on both sides (not yet, or config mistake)
 - ♦ etc.
- What happens:
 - ♦ the SPF computed by the IGP uses a link on which PIM is not ready
 - ♦ PIM Joins propagate along this path...
 - ♦ ...but fail at the router before that link...
 - ♦ **resulting in a traffic blackhole**
- PIM need cooperation from the IGP to solve this
- By the way, LDP has the same issue
 - ♦ see [draft-jork-ldp-igp-sync](#)
 - ♦ (proposed solution is to advertise a link with maximum cost before LDP is ready)



Example

(0) Initially, A and B receive multicast sent by multicast source S toward group address G.





Proposed solution

- We want minimal impact unicast traffic/routing
 - ♦ raising a link cost before PIM is ready would have a significant impact
- A possible solution is to...
 - ♦ use a multi-topology/instance IGP
 - ♦ make PIM follow a dedicated IGP topology/instance
 - ♦ make the IGP use some “PIM adjacency ready” condition to advertise/not-advertise a link in the multicast topology/instance
- Advantages
 - ♦ low impact on unicast routing
 - ♦ purely local behavior
 - ♦ no need to extend the IGP
- Criteria for advertising a link in the multicast topology
 - ♦ have PIM be enabled on this link
 - ♦ having sent and received PIM Hellos on the link
 - ♦ multiple options => ...more “intelligence” depending on implementations...



- Draft to be proposed to [mboned](#) working group as an informational or BCP document
- Feedback of the unicast routing community is welcome
- Please read the draft !

Questions ? Comments ?

