RSVP Working Group

Looping and Wildcard Filters

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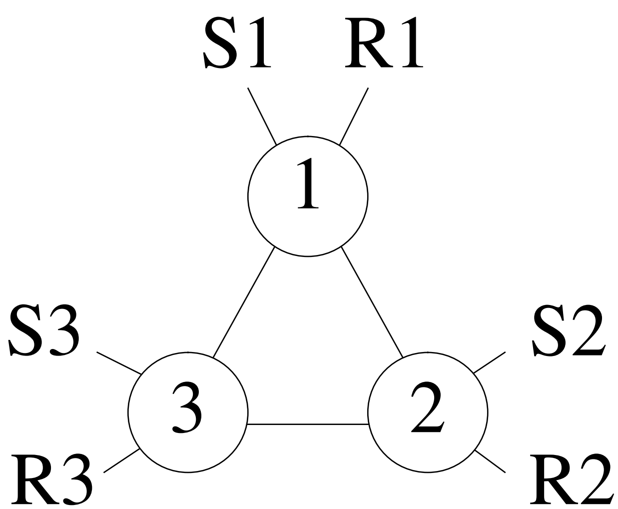
Looping Problem

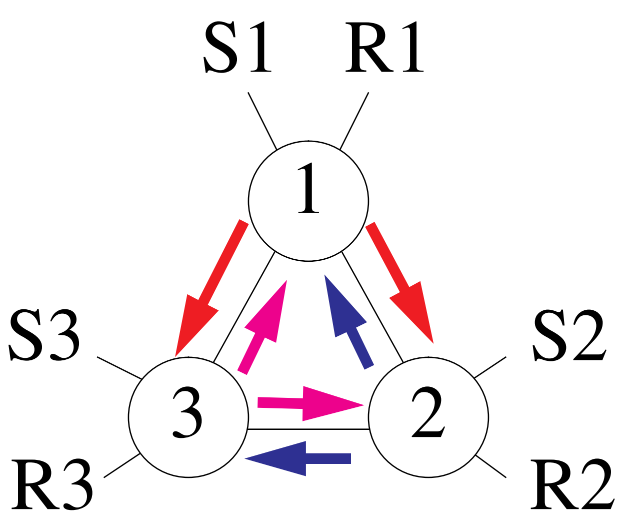
- A router sends a wildcard filter reservation upstream to "all upstream senders" based on received PATH msgs
- The notion of which senders are upstream varies at each router



Router	Upstream Senders
1	2,3
2	1,3
3	1,2

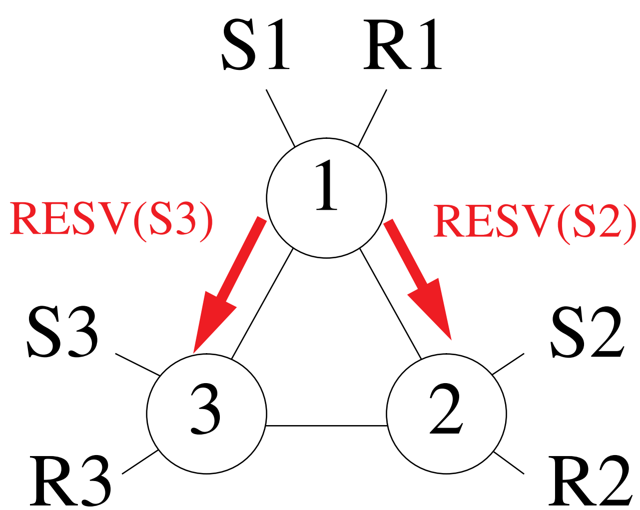
Looping Example

- Receiver R1 reserves with WF, R2 & R3 best-effort
- In steady state, router 1 forwards RESV to routers 2 & 3
- Router 2 forwards RESV to 1 & 3
- Router 3 forwards RESV to 1 & 2
- When R1 drops reservation, loop remains



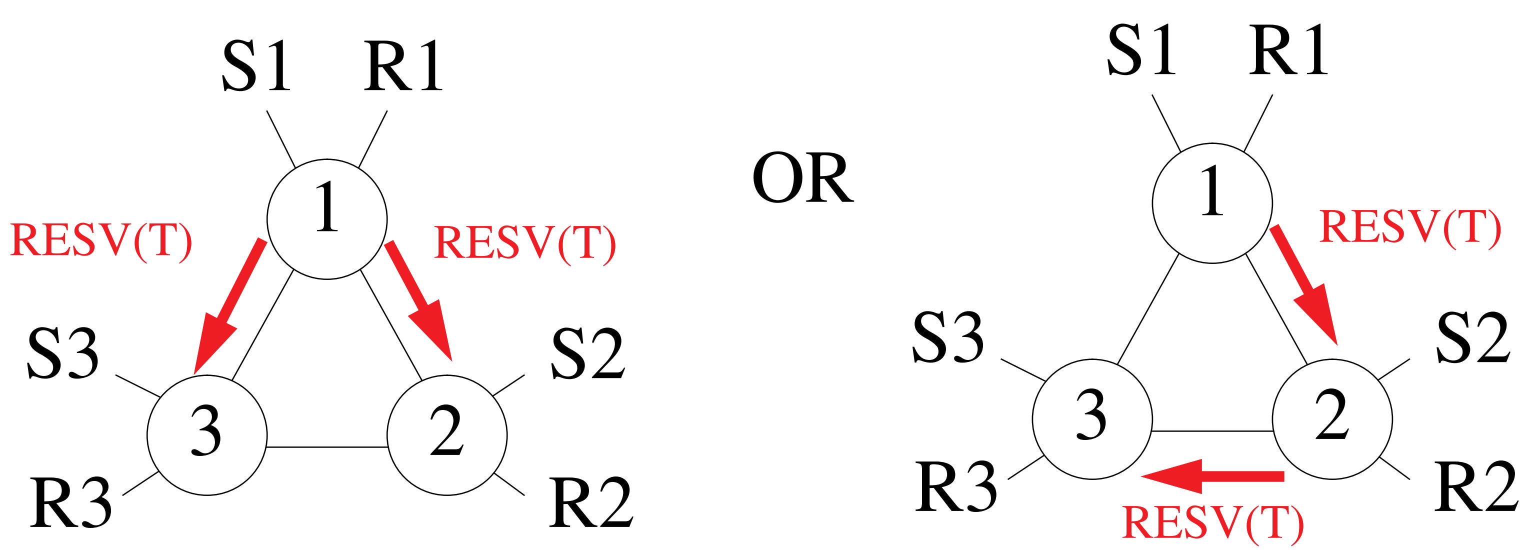
Proposed Solution

- Host requests WF reservation
- First-hop router maps WF into list of senders
- Router stores upstream senders in each outgoing RESV msg



Shared Trees

- Host requests WF reservation
- First-hop router maps WF into tree identifier (i.e. group address)
- Router stores tree identifier in each outgoing RESV msg
- A single, loop-free tree is guaranteed by routing

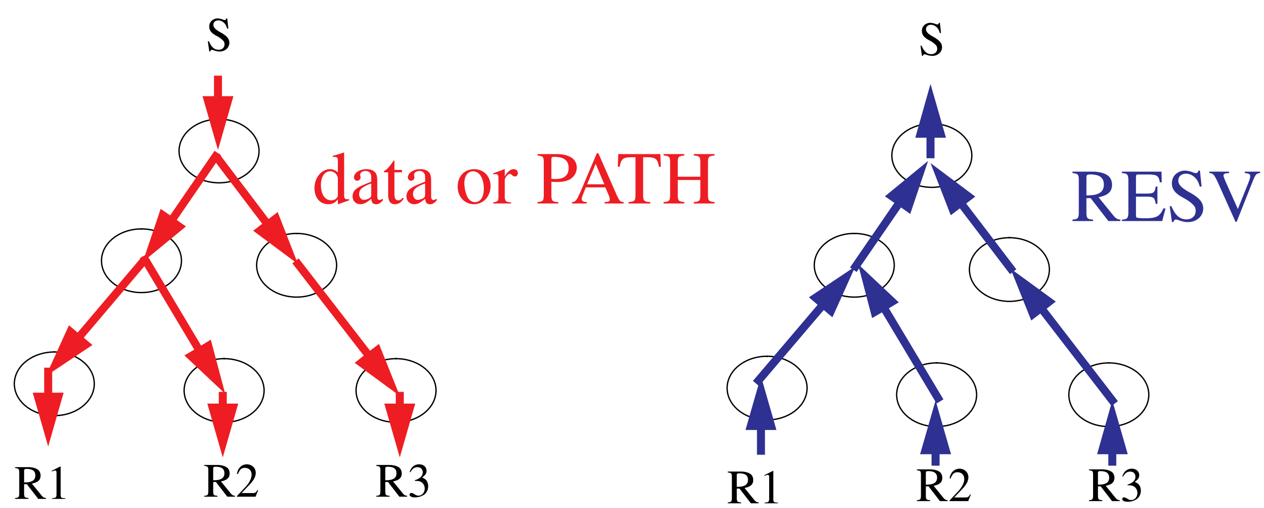


Scalability: Packet Size

- WF RESV message may grow with the number of upstream senders
- However, each message can easily be split by RSVP into a group of messages, each containing some senders
- The tradeoff is one message with N senders or N messages with one sender, or some point in between.

Scalability: Network Load

- For one sender the RESV messages merge into the equivalent of one data packet or one PATH message



- For N senders, the RESV messages merge into the equivalent of N data packets.
- Refreshing RESV messages once every 30 seconds is equivalent to each sender sending a data packet once every 30 seconds.