



RSVP

Jorge García Vidal

Jorge Garcia Vidal PIAM 2004

IntServ: RSVP

- RSVP:
 - Simplex reservations: RSVP makes reservation in only one direction. In two way communications, the two ends must establish a reservation in both directions
 - Receiver oriented: Receivers are responsible for deciding what resources will be reserved and initiating the reservation.
 - Routing independent: The decision to select a path for a flow is done separately by routing. RSVP simply consults the forwarding table and sends RSVP messages accordingly

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- RSVP:
 - Policy independent: RSVP provides a mechanism for exchanging control parameters, but it does not include the decisions taken using these parameters (e.g. CAC)
 - Soft State: The reservation has a timer associated with the state. When the timer expires, the state is deleted. RSVP must periodically refresh the reservation state to maintain the state along.
 - Reservation style: RSVP provides a number of different reservation styles that characterize how a reservation should be treated.

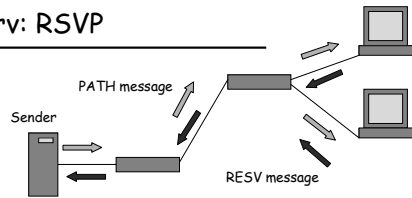
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- RSVP uses (mainly) two types of messages: PATH and RESV.
- RSVP messages are sent as raw IP datagrams with protocol ID=46. In some cases, the dst IP@ is not the IP address of next-hop router, and the IP option Route Alert is used, which causes the message to be trapped and processed at each intermediate router along the path.
- PATH and RESV message are repeated periodically in order to maintain a soft state in the routers

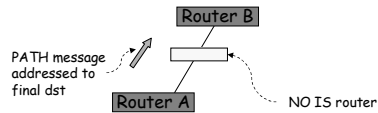
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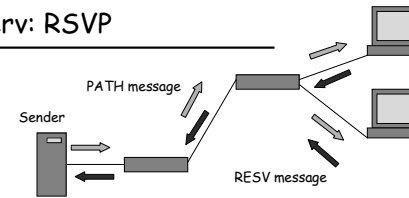
PATH messages are sent from source to receivers, and

- distribute info about traffic source
- distribute characteristics of the path
- install state in routers for RESV to find the source (Previous hop)



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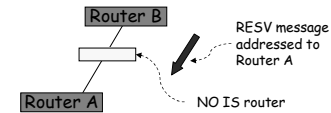
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After receiving a PATH message, receivers can request a reservation
By sending back RESV messages. These messages:

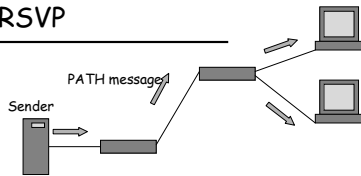
- specify the resource requirements
- set-up the state of routers along the path

After receiving the RESV, sender can start to transmit packets



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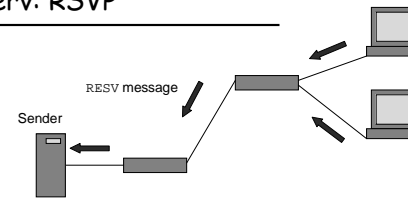
The PATH message carries info about:

- Previous hop
- Sender template, which identifies the flow
- Sender TSpec, which characterizes the traffic
- Adspec, an optional element passed to the local traffic control of each node (default: Minimum path latency, path bandwidth, IS hop count, Global break bit, Path MTU, In Guaranteed Service: Ctot, Dtot, Csum, Dsum, etc)
- in Guaranteed Services, Slack Term

(Lo que está enmarcado se da como información Adicional al tema de RSVP...)

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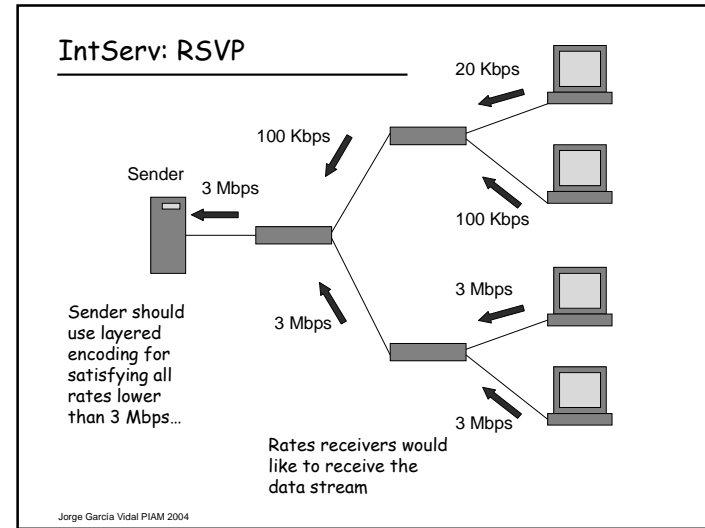
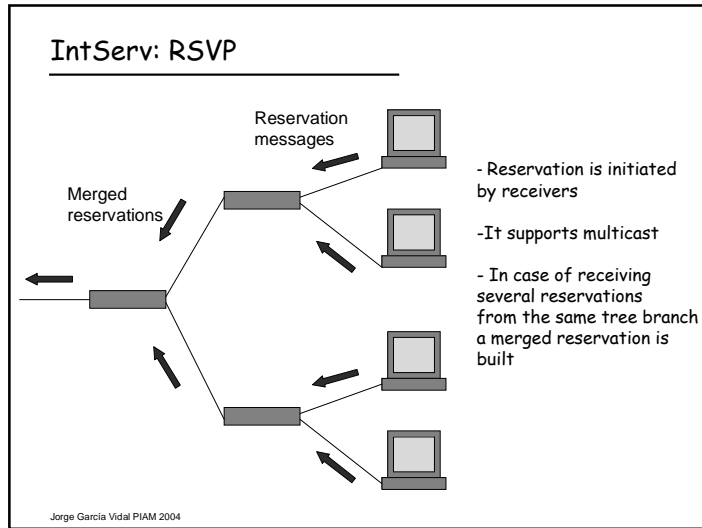
When the receiver receives the PATH message it responds by sending a RESV message. Each reservation carries:

- flow spec which contains a Rspec, reservation spec (rate wished by the receiver) and a Tspec.
- filter spec.

Routers may modify the Rspec before forwarding the message, in order to combine multiple reservation requests in multicast sessions.
Rspec can be done for an specific sender, for a set of senders or to all the senders upstream.

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(Lo que está enmarcado se da como información Adicional al tema de RSVP...)



IntServ: Service Types & Classes

- Example: A PATH message traverses three nodes in sequence. For the first node $C=10\text{ Kb}$ and $D=1\text{ ms}$, for the second node $C=20\text{ Kb}$ and $D=2\text{ ms}$, while for the third node $C=30\text{ Kb}$ and $D=1\text{ ms}$.
- As the PATH traverses the nodes, the values C_{tot} and D_{tot} are updated, and finally they are set to $D_{tot}=4\text{ ms}$ and $C_{tot}=60\text{ Kb}$.
- Assume that for T_{spec} , $p=1\text{ Mbps}$, $b=10\text{ Kb}$, $r=0.5\text{ Mbps}$, and $M=1\text{ KB}$. Propagation delay is 20 ms , then depending on the value reservation value R , we would obtain the following values for end-to-end delay

- (QD: If $R \geq p \Rightarrow (M+C_{tot})/R + D_{tot}$
- If $p > R \Rightarrow (b-M)(p-R)/[R(p-r)] + (M+C_{tot})/R + D_{tot}$

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IntServ: Service Types & Classes

R (Reserved rate)	End-to-end delay
2 Mbps	58 ms
1.5 Mbps	69 ms
1.0 Mbps	92 ms
750 Kbps	156 ms

The receiver would chose R , and send back the RESV message, including a parameter `slack`, the difference between the target delay and the delay obtained using R . The routers can use the slack parameter to adjust their resource reservations

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