Lecture 13

CS625: Advanced Computer Networks
Fall 2004

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http://www.cse.iitk.ac.in/users/braman/courses/cs625-fall2004/outline.html

Topic for Today

- RSVP: Resource ReSerVation Protocol
- Announcement:
  - Reading assigned for Tue 02 Sep 2003.
- *Scribe for today?*

RSVP: Resource ReSerVation Protocol

- Signaling to allocate resources in the network
- Strawman proposal:
  - Sender sends reservation message along path to receiver
  - Routers admit/reject flow
  - But, we want multipoint-to-multipoint communication (e.g. Video conferencing)
  - So, extend proposal: source sends reservation request to all receivers
  - But several problems...

RSVP: Design Goals

- Accommodate heterogeneity
- Deal with dynamic group membership
- Allow application to specify aggregate resource needs
- Allow receivers to switch channels
- Adapt to changes in network routes
- Low control overhead
- Modularity

RSVP: Design Principles

- Receiver-initiated reservation
  - Receiver decides quality desired, based on its capacity, and cost
  - Scales better than sender-initiated mechanism
- More design principles...

RSVP: Packet Filters

- Separate from the reservation mechanism
- Different filtering styles:
  - No-filter: all sources of the multicast group use the reservation
  - Fixed-filter: fixed set of sources for whose packets the reservation will be used
  - Dynamic-filter: dynamic set of sources
- Why are fixed-filters required when dynamic filters are available?

RSVP: Soft-State

- Reservation messages are sent periodically
- How does receiver know the path along which to reserve?
  - Path message from source(s) to receiver(s)
  - Reserve message along reverse path
- Path message contents:
  - Flowspec, F-flag to indicate if filters are allowed
- Reserve message contents:
  - Flowspec, Filter specification

RSVP: Soft State (continued)

- Path/Reserve messages install path/reservation state at routers
  - Aggregate state for no-filter/fixed-filter
  - Per-receiver state for dynamic-filters
- Path-state, and soft-state time-out if not refreshed
  - No explicit tear-down required
  - Only way to delete no-filter/fixed-filter reservations
  - Deals with dynamic membership elegantly
  - Also with dynamic route changes

RSVP: Modularity

- Independent of flow-spec
- Admission control mechanism has to return admit/reject
- Packet scheduling should be able to change filters dynamically
- Independent of routing

Further topics…

- Tomorrow: differentiated services (diff-serv)
- Next week:
  - Wireless TCP (assigned reading)
  - Mobile-IP