UDP Encapsulation Revisited

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April 5-6, 1995

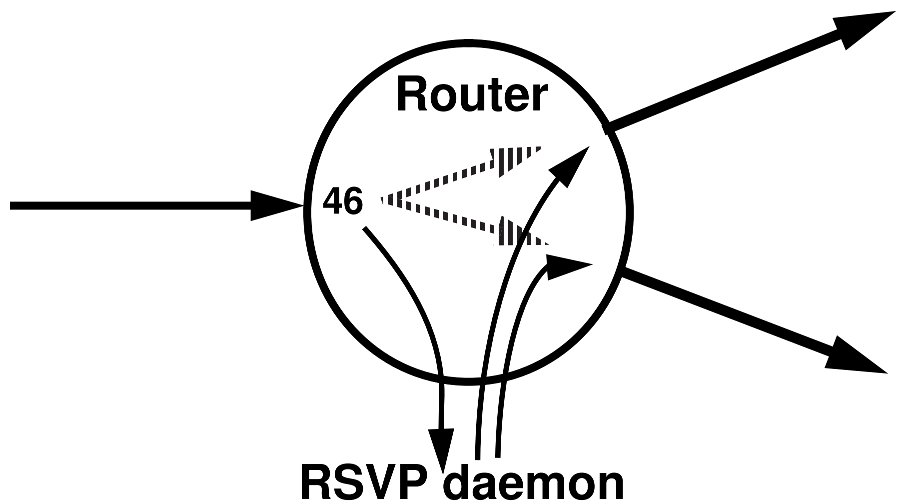
Standard RSVP: 'Raw' Messages

- **Review standard RSVP message encapsulation:**

  -- RSVP msgs are sent as IP datagrams, protocol id = 46.

  -- Receiving node diverts all protocol 46 packets to RSVP

  -- RSVP suppresses routing in (multicast) sends



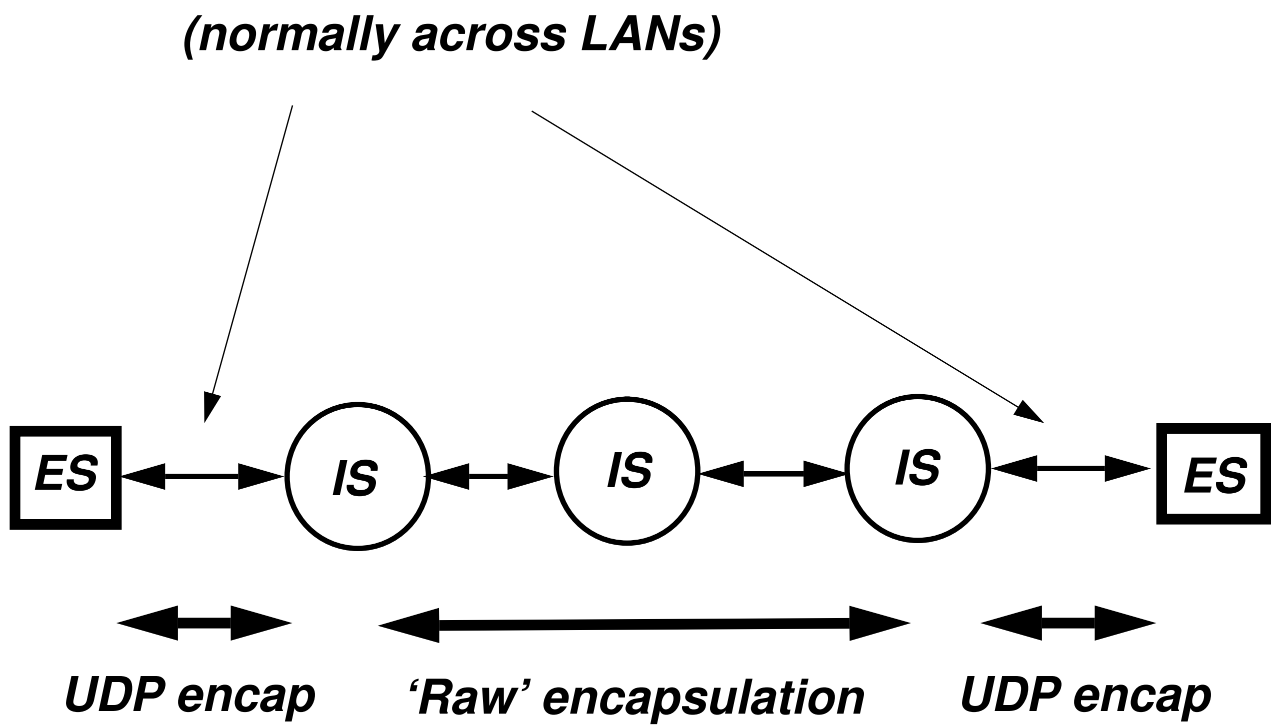
Standard RSVP

- **Rules:**
  - **-- Send Path msg => multicast to Gs *[= group addr of session]***
  - **-- Send Resv msg =>unicast to Phop *[= previous hop]***
- **Implications for host running RSVP:**
  - **-- RSVP must be privileged, to do “raw” network I/O.**
  - **-- Kernel changes are required**

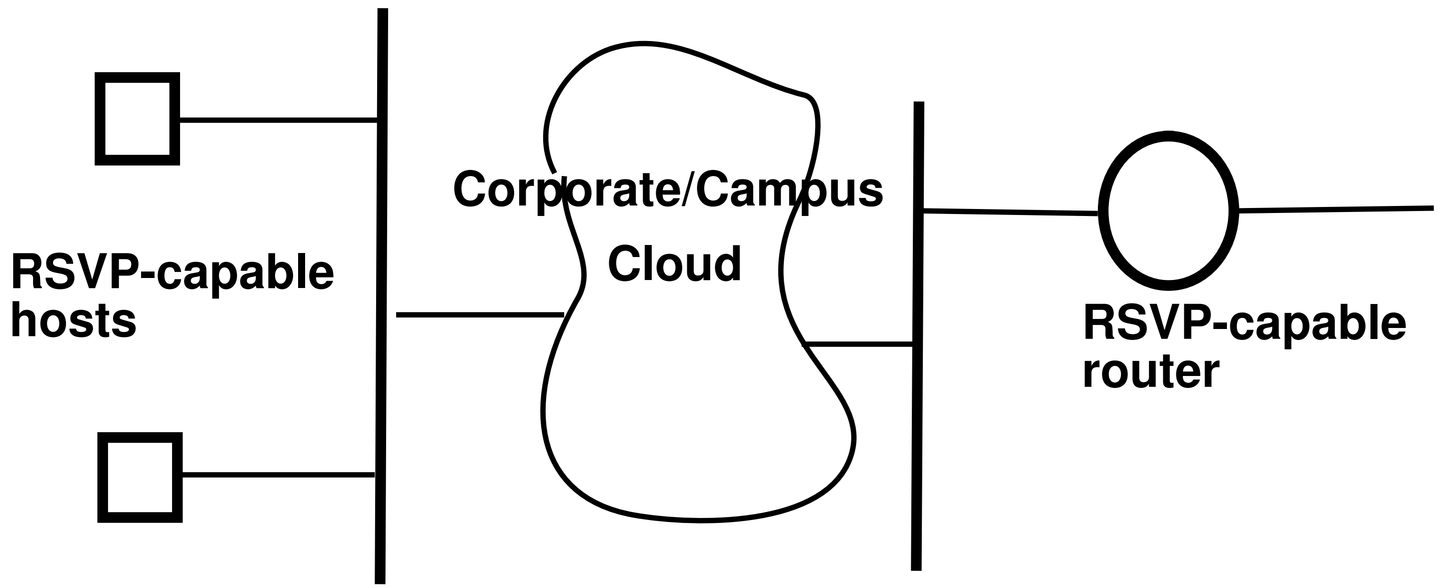
At least in short term, these requirements impede installation of RSVP on hosts.

UDP Encapsulation

- **UDP encapsulation of RSVP messages for first, last hop**



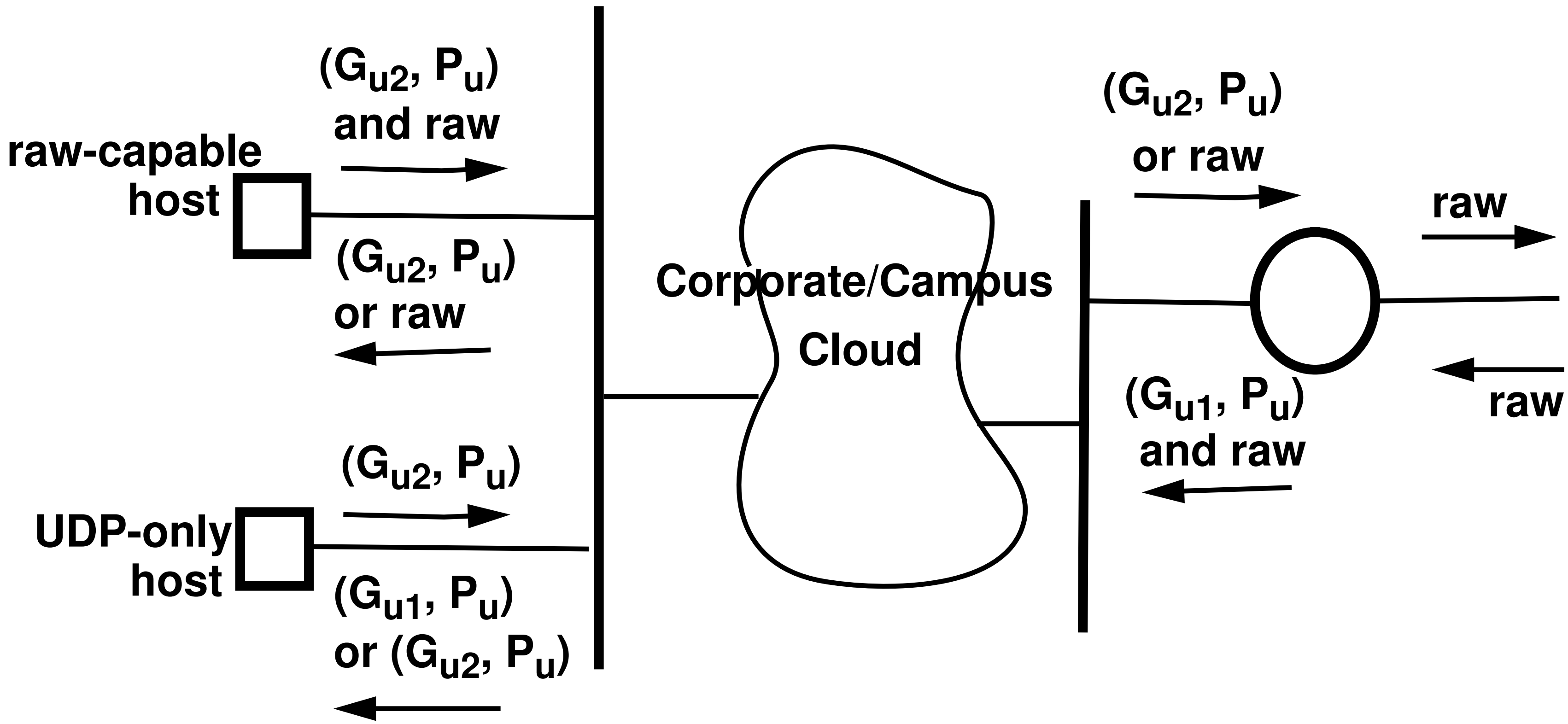
The problem is more complex than we thought...



Coping with Clouds

- Must set multicast TTL (on Path msgs) high enough to pass through cloud (but no higher!).
- Must use TWO different well-known multicast groups for UDP encapsulation.

A Solution ...



raw-capable host
(G_{u2}, P_u) and raw
(G_{u2}, P_u) or raw
UDP-only host
(G_{u2}, P_u)
(G_{u1}, P_u) or (G_{u2}, P_u)
Corporate/Campus Cloud
(G_{u2}, P_u) or raw
(G_{u1}, P_u) and raw
raw
raw

- **Distinguishes hosts from routers**

  [currently: is mrouted running?]

- **Host RSVP is self-configuring, except for setting TTL.**

- **It DOES work...**

- **The good news: a firewall surmounted**

  At least one corporate firewall keeper is much happier with UDP-encapsulated RSVP packets than with ‘raw’ protocol 46 packets!

  UDP encapsulation is a big win in this case.

- **The bad news:**

  The cloud may contain a multicast tunnel with a TTL threshold. Then cannot adjust TTL to exactly reach the outside router.