

Next Steps In Signaling (NSIS) in the IETF



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What is Signaling?

- **Signaling**
 - exchange of (control) data between nodes to install, manage, or delete states in them
 - happens in the „control plane“
- **Examples**
 - Classical: SS7 – signaling for circuit switched telephone network
 - Admission control and resource reservation for QoS (Quality-of-Service) support → RSVP
 - Dynamic configuration of firewall pinholes or NAT bindings
 - Dynamic activation of measurement points

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- IETF Working Group (created 2001)
- controls resources in IP layer (e.g., router)

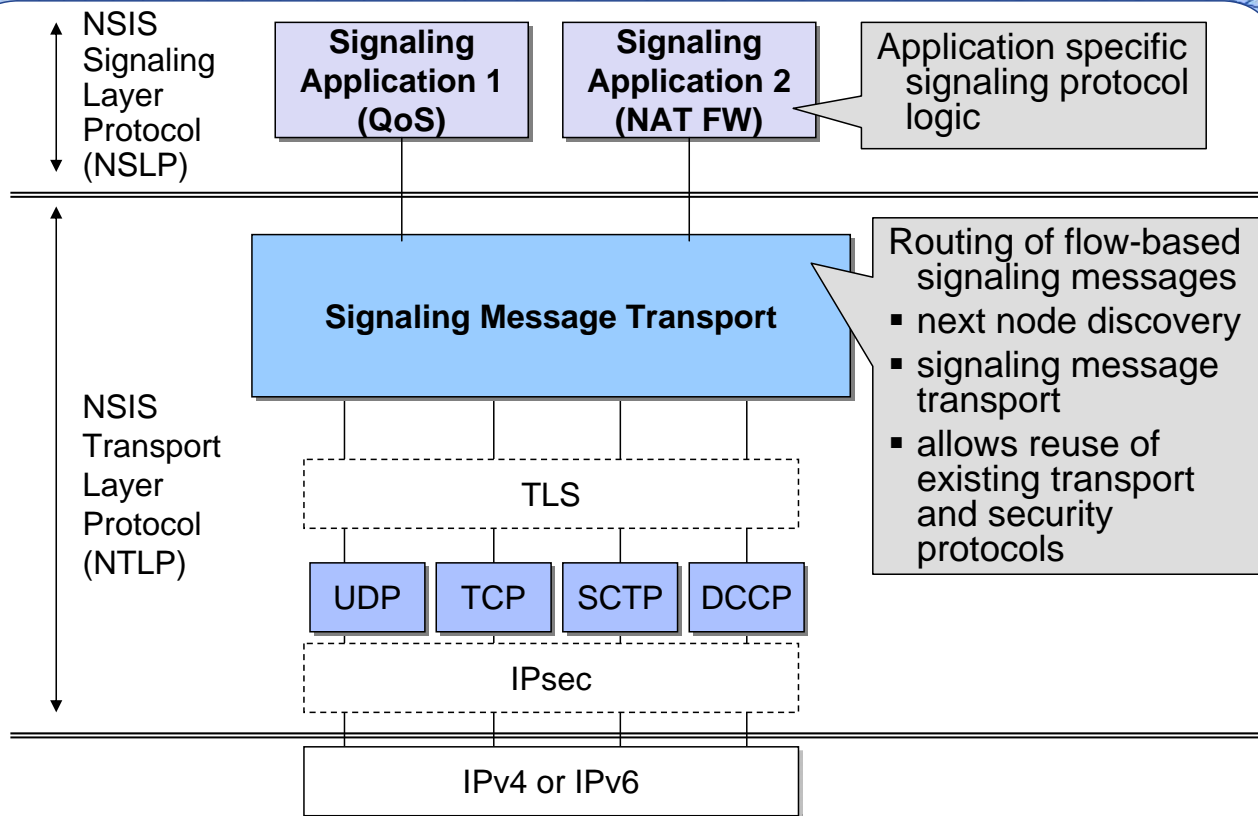
Goals: (at first mainly QoS signaling in focus)

- Interworking between different QoS solutions
- Simplified solution for QoS signaling
- Support of mobility and wireless next generation networks
- NSIS Requirements [RFC 3726] (2004)

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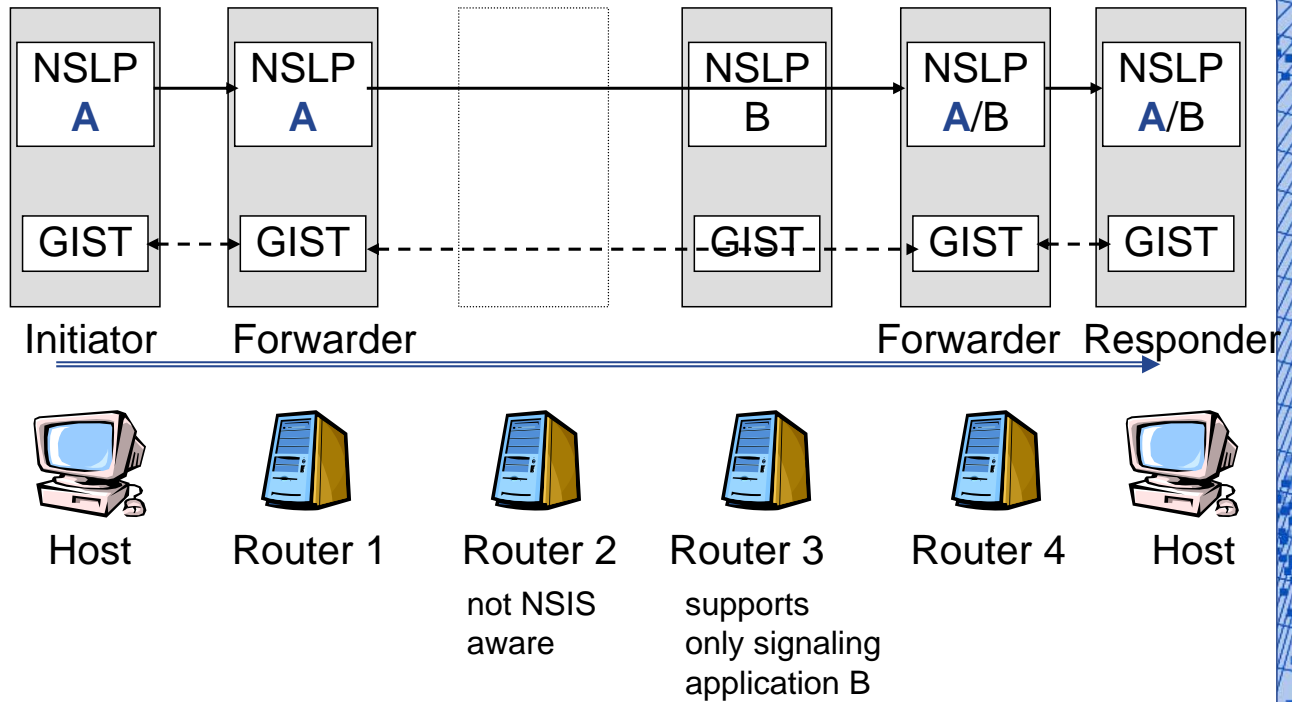
- Lessons learned from RSVP
 - offered no efficient support of unicast reservations
 - used for various unforeseen purposes / signaling applications
 - mobility support required
- Assumptions
 - **path-coupled signaling:**
signaling messages follow data path
 - normal routing (no QoS routing or load balancing etc.)
 - no multicast support considered (at first)

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General Internet Signaling Transport (GIST) Protocol

- Common signaling transport service for different signaling applications
- Simple message-by-message transport service
 - conveyed contents are transparent for GIST
 - does not handle signaling application state
- Discovery and management of signaling message routes
- Provides Session-ID – supports mobility
- Datagram or Connection Mode for message transfer
 - Establishment of signaling message associations (soft state)
- Simple protection against DoS



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- **QoS NSLP**
 - RSVP-like functionality (but unicast support only)
 - Sender and receiver initiated reservations
 - Independent of specific QoS models such as IntServ or DiffServ
 - Messages
 - ▶ RESERVE: creates modifies or deletes reservation state
 - ▶ QUERY: Probing
 - ▶ RESPONSE: Reply to RESERVE or QUERY
- **NAT/FW NSLP**
 - Dynamic configuration of NATs and/or Firewalls along a data path
 - ▶ Establishing bindings
 - ▶ Controlled opening of firewall pinholes

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- Main specs now “finished”
 - GIST
 - QoS NSLP
 - NATFW/NSLP
 - QSPEC
- Several freely available interoperable implementations, e.g.,
 - NSIS-ka: <https://projekte.tm.uka.de/trac/NSIS>
 - Uni Göttingen: FreeNSIS
- Must strive for deployment now: assure that protocols get implemented by vendors and used by applications

- NSIS: New and flexible framework for signaling protocols in the IP layer
 - General signaling message transport by GIST
 - Different signaling applications: NAT/FW, QoS
- Extensible:
 - Explicit Signaling Target MRM allows path-decoupled signaling
- Used in ScaleNet QoS Architecture
- Probably used in EU project 4WARD: Virtual Network Configuration NSLP