A Two-Level Architecture for Internet Signaling

Bob Lindell
Bob Braden
Computer Networks Division
USC/ISI
RSVP Reuse

- MPLS
- VPN Provisioning
- Optical Network Path Setup
- Link Layer QoS Setup
- TIST
- AFSP
Two Level Architecture

- ALSP – Application Layer Signaling Protocol
  - End-to-End Semantics
  - RSVP, MPLS, …
- CSTP – Common Signaling Transport Protocol
  - Hop-by-Hop Semantics
  - Transport, Security, State Management, Demultiplexing
Decompose Functionality

- Path (Tree) Oriented Signals
- Object Based Message Format
- Soft State
- Multicast Security
- Reliable Multicast Transport (Congestion Control, Ordered Delivery)
- Fragmentation and Message Bundling
- Tunneling
- Transport without Reliability Mechanisms
CSTP Downcalls

- SendNewSAPU
  - Reliably deliver a new soft state entities and initiate refreshes
- SendModSAPU
  - Reliably deliver a modification of an existing soft state entities
- SendTearSAPU
  - Reliably deliver a soft state deletion request
- SendEventSAPU
  - Reliably deliver a stateless message
- SendInfoSAPU
  - Send a stateless message without reliability or refreshes
CSTP Upcalls

- SendFail
  - Asynchronous error notification
- RecvNewSAPU
  - Receive new soft state entities
- RecvModSAPU
  - Receive modifications of new soft state entities
- RecvTearSAPU
  - Receive deletions of soft state entities
- RegenSAPU
  - Request for ALSP layer to regenerate a subsequent refresh
Waypoint

- An incremental approach to realizing CSTP (3 layers?)
- Remove complex (Transport) features
  - Soft State
  - Reliable Transport
  - Bundling
- More like a IP/IPSEC/UDP for signaling
  - Demultiplexing
  - Options
  - Checksum
  - Security
Documents

- A Two-Level Architecture for Internet Signaling
- Waypoint – A Path Oriented Delivery Mechanism for IP based Control, Measurement, and Signaling Protocols
- http://www.isi.edu/rsvp/pub.html
Beyond Signaling

- Path Oriented Network Management
- Traceroute, Pathchar
- Topology Mapping
Conclusion

- Lessons learned could be applied to an RSVPv2
- Much broader applicability with all the new path oriented signaling protocols
- IETF NSIS working group
- Should we get there incrementally?
- There are interesting Path Oriented Network Management functionality yet to be explored