Results in Protocol Research

- **MAC:**
  - Receiver Initiated Multiple Access (RIMA) protocols
  - Receiver-Initiated Channel Hopping (RICH) protocols
  - Collision Avoidance Transmission Scheduling (CATS) protocols and other topology-dependent transmission scheduling protocols

- **Routing:**
  - STAR
  - BEST (bandwidth efficient source tracing)
  - DST (dynamic source tracing)
  - Link-state routing over unidirectional links

- **QoS:**
  - QoS routing architecture that provides performance guarantees with very small state at routers.
  - Subset of QoS signaling being implemented
Protocol Development

• STAR has been proposed to the IETF; new Internet Draft with **embedded multicast** will be submitted “soon”.

• Embedded multicast, not CAMP, will be supported in SPARROW prototypes for July demo.

• QoS work needed for interoperation in experiments targeted for completion by mid April.

• SPARROW MAC protocols implemented only in simulation by July 2000 (CATS, RICH, other topology-dependent transmission scheduling approaches).

• DST or hybrid of DST and BEST routing protocols could be shown in prototypes (main demo effort is STAR based).

• Work on CAMP continues but can be shown only in simulations.
Modeling Summary

• PARSEC model of STAR
  • Almost completed; tests in the next two weeks
  • Collaboration with UCLA after that
  • We can try to implement scalable STAR

• OPNET model of STAR and CAMP, in collaboration with ASPEN almost there
  • Debug and integrate in SEAMLSS

• What we could do (with one grad until April):
  • Scalable STAR or QoS signaling
Medium-Term QoS Approach

**Goal:** Implement minimum signaling and minimum QoS guarantees that can be demonstrated in July demo.

**Time:** Target is April 17 deadline.

**Approach:**
- Use off-the-shelf IP routing table (single next hop per destination).
- Consider bandwidth available over links in route computation.
- Establish bandwidth reservations to provide QoS guarantees.
- Source router remembers source-destination pairs for which reservations are made.
- STAR updates specify link bandwidth available.
- ETE reservation signaling is mapped into SPARROW signaling, which is based on destination.
- Packets within a connection are sent with precedence 001 and bits 6 and 7 set to 11.
Medium Term QoS Approach

Signaling protocol handler

- Neighbor choice
- Partial topology table
- Update

REALM

- Request & obtain link to neighbor

Forward reservation request to next hop

Signal path:
- Signaling packet
- Packet snooper
- UDP signaling packet
Medium Term QoS Approach

- Bypass IP to use a separate routing table

We will try to implement the new path selection algorithm to pick min-hop paths with max available BW.