Project Overview

• Developing models, analysis methods for distributed systems, focusing on cooperative group activities in networks.
• Agent communication, group communication
• Dynamic:
  – Participants come and go, change location.
  – Network topology changes, components fail and recover.
• Implementations complex; hard to build/understand/analyze
• Use formal modeling/analysis methods:
  – I/O automata, pi calculus, knowledge-based methods
  – Extend, combine methods
• IOA language and toolset
Progress Through June 2001

- IOA language and toolset
  - New parser and semantic checker
  - Translating IOA to Larch shared language (LSL)
  - Using Larch to verify algorithms in IOA
  - Experiments with connecting IOA to Daikon

- Dynamic I/O Automata
  - Mathematical model for IOA and agents

- Building blocks
  - Performance evaluation
  - Modeling reliable multicast
Research Plan for the Next Six Months

• IOA language and toolset
  – Experiment more with connecting IOA to Daikon and Larch; get more automated help with proofs

• Dynamic I/O Automata
  – Simplify mathematical model
  – Unify DIOA and hybrid, timed, probabilistic I/O automata

• Building blocks
  – Continue performance evaluation of group communication and reliable multicast