Telcordia Brief

Prepared for:
CBMANET Information Day
DARPA IPTO

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Background

- Telcordia:
  - Telecommunications and networking software provider
  - ~3,000 employees, most in New Jersey
- Applied Research:
  - Research and development in networking, network management, security, distributed systems, algorithms, software testing, optical networking, etc.
  - ~230 employees, 50% PhDs, 1,400 patents
- Relevant past and ongoing experience:
  - DARPA IPTO seedling (PM: C. Ramming): “Cognitive Policy-Based Network Management (CPBM)”, 2003-2004.
  - DARPA IPTO seedling (PM: C. Ramming): “Distributed Diagnostics for Tactical Networks”, 2005-2006.
  - DARPA IPTO ACERT (PM: J. Smith): “Cognitive Adaptive Radio Team”, 2005-2008.
  - DARPA ATO seedling (PM: Steve Griggs): “Policy-Based Management”, 2002-2003.
  - CERDEC DRAMA STO (PM: L. LaVergne): “Intelligent Agent-Based Network Management”, 2003-2006.
  - CERDEC MOSAIC ATD (PM: L. Muzzelo): “Multifunctional On-the-move Secure Adaptive Integrated Communications “, 2000-2004.
  - ARL CTA (PM: G. Cirincione), ongoing: “Collaborative Technology Alliance”
  - DARPA ATO (PM: Douglas Maughan): “Smart Firewalls,” 2002-2004.
- Transition program:
  - U.S. Army Future Combat Systems Network Management System: Telcordia is responsible for FCAPS, Policy Management, Network Communications Services

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CPBNM Seedling: Dynamic Adaptive Server Placement in MANETs

- Goal
  - Evaluate feasibility of and challenges to existing cognitive techniques in a realistic network management application for tactical MANETs
- Problem
  - Minimize service response time via adaptive server mobility
    - Existing solutions involved either fixed placement or reactive mobility for fault tolerance only
    - Choose a sequence of server placements among a set of candidate nodes such that the average response time to client requests over a mission is minimized
    - Account for the cost of server mobility
- Solution
  - A combination of planning, learning, and domain knowledge
    - Learning captured the a priori unknown statistical regularity (response time as a function of the number of hops)
    - Domain knowledge used to predict number of hops based on a mobility model
    - Dynamic planning used to reason about the space of migration decisions and minimize predicted cost over a sequence of steps
    - Encouraging initial simulation results; details in MILCOM 2005 paper.
- Partners: IET and Rutgers

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