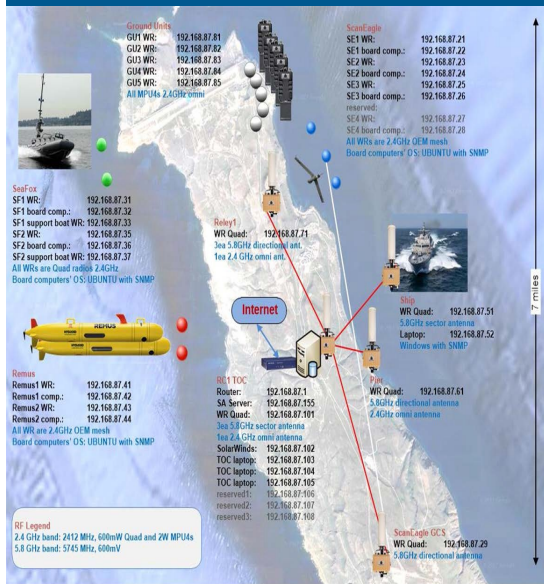


Short-Living Nodes and Links for Littoral Mesh Networking



Naval Postgraduate School



How

- Miniature directional antenna units will be added on to the littoral mesh networking testbed
- A plug-in will be developed for the Android Tactical Assault Kit (ATAK) to enable communication with the Raspberry Pi. The connection will be made up of a control line, for informing the Pi of the GPS location of the recipient of the message, and a transmission line, for transmitting data.
- The Raspberry Pi will be programed with an algorithm that controls the alignment of the antenna using inputs from the ATAK and the SkyLink's GPS and Internal Motion Control Unit.
- We'll conduct simulated tests within the CENETIX lab followed by field experiments focused on feasibility and constraints analysis for the proposed network integration combined with experimental studies of the self-aligning network control channels and network operation techniques

What

- Enable a littoral mesh network of short-living nodes and links while integrating UxS, and miniature orbital nodes
- Enable integration of miniature directional-antennas with littoral mesh nodes, and the elusive networking capability they bring
- Enable two types of autonomies, the autonomy of fast access, collection, and sending out (short living nodes), and the autonomy of long sensing, data collection, and very fast meshed transmission (short living links)
- Minimize tactical operator interactions with directional antennas
- Design the Knowledge Base foundations for managing short-living nodes and short-living links autonomies.

Why

- Survivability in the littorals. The Navy must communicate, but needs to exploit the potential of self-organizing networks of elusive unmanned systems to conduct cyber-physical maneuver in the maritime combat clutter to survive in the future operating environment.

We address significant key warfighting needs to:

- Gain an asymmetric warfighting advantage through hard-to-detect networks
- Increase survivability during C2 communications
- Reduce detectable footprint of USN/USMC/USSOF tactical communications to counter near-peer communications direction-finding capabilities
- Enable real-time collaborative mission planning and execution with seamless and continuous situational awareness in contested or denied environments



Dr. Alex Bordetsky
abordets@nps.edu

Lead Students: MAJ

Tom Kline LT