

Small Unit Operations

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DARPA/ATO



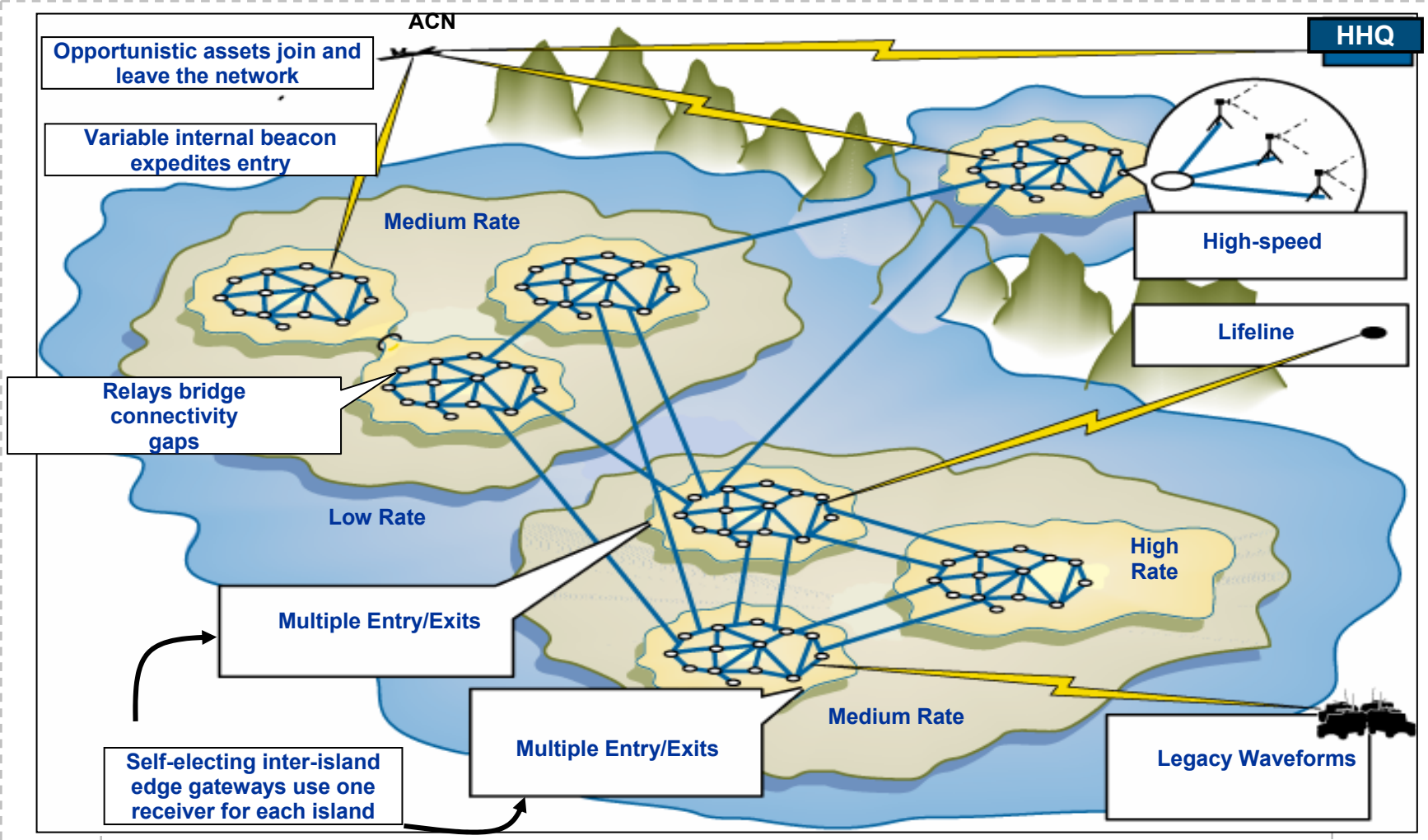


Problem: Develop a robust, wireless, ad hoc network

- **Ensure timely arrival of critical voice and data to and from anywhere in the network**
- **Provide radio connectivity to all network members in hostile and rugged environments**
- **Provide Quality of Service guarantees when requested**
- **Allow network to scale to thousands of nodes**
- **Use power and other radio resources efficiently to reduce SWAP**



Background





Objective

- **Automatically Maintain a 10,000 Node Network All of the Time**
- **High Capacity Radio Links Anywhere, Anytime**
- **Estimation Position Anywhere, Anytime**
- **Interface with Warriors and Sensors**



Activities

- **Provide technical expertise on issues relating to RF, networking, and systems integration**
- **Develop and analyze networking field tests of real hardware/software using up to 50 fielded radios**
- **Conduct protocol evaluations to determine network performance under severe co-location conditions**
- **Conduct evaluations of SUO Opnet models and determine radio performance under various conditions**

Highlight: Tuning Flexibility, Modulation, Architecture, and Protocols



- **The SUO radio defines several different frequency bands for operation for high, medium, and low data rate applications**
- **Signals are DS spread spectrum modulated on each center frequency to reduce interference and detectability**
- **Network forms into a 2 tiered architecture consisting of “islands” to provide scalability**
- **Sophisticated networking protocols are used to determine most efficient transmission paths to and from anywhere in the network**



Impacts

- **MITRE supported transition efforts of SUO radios to other platforms and produced plan to interface SUO radios with the current Tactical Internet architecture**
- **MITRE developed and implemented new processes for modeling and simulation of ad hoc networks to expedite the collection of performance statistics and ensure accuracy**
- **MITRE developed field demonstrations and analyzed output data in an effort to optimize radio and network performance**

Future Plans

- **Continue with modeling and computer simulation of SUO networking protocols utilizing data from antenna analyses**
- **Provide insight into the development of the new SUO SAS SWAP-compliant radio**
- **Continue participation in all technical and formal design reviews regarding SUO SAS radio and networking components**