# Department of the Navy SBIR/STTR Transition Program

Topic # N181-007
Robust Communications Relay with Distributed Airborne Reliable Wide-Area Interoperable Network (DARWIN) for Manned-Unmanned Teaming in a Spectrum Denied Environment
Fuse Integration, Inc.

## WHO

**SYSCOM:** NAVWAR

**Sponsoring Program:** Command and Control Systems (PMW 150)

**Transition Target:** DoD platform payloads with multiple independent radios and waveforms.

**TPOC:** (619) 553-2861

**Other Transition Opportunities:** Tactical platforms/users with IP enabled network links.

**Notes:** The figure to the right shows the overall Probability of Communication (Pc) of data packets being sent and received by tactical users. The graph highlights the enhanced ability to deliver robust and resilient data over multiple links with Tactical Communication Management Processors (TCMP) versus Open Shortest Path First (OSPF), even at network degradation levels around 95%.
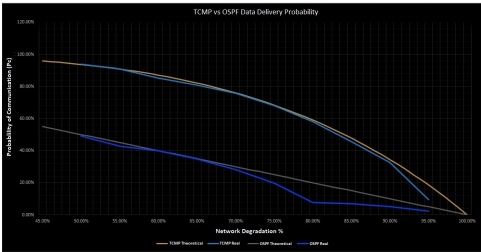


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## WHAT

**Operational Need and Improvement:** Standard IP routing, Open Shortest Path First (OSPF), moves each IP packet through a single communication path/route between IP source and destination addresses. Tactical Communication Management Processors (TCMP) improves upon this technology by using multiple IP links to transmit the same data, allowing for overall greater Probability of Communication (Pc). This becomes especially relevant for warfighters in electromagnetically contested environments where singular link loss can cause a complete lack of communications.

**Specifications Required:** TCMP works with legacy DoD network architectures.

**Technology Developed:** TCMP is a software-based solution capable of duplicating and sending information packets over multiple IP links. Once sent, the software processes the packets received and develops a composite communication picture using data packets sent over other links to 'fill the gap' for lost data.

**Warfighter Value:** Tactical Communication Management Processor's (TCMP) enhances Probability of Communication (Pc)—with a simple press of 'a big red button' TCMP sends duplicate information packets across multiple IP links critical to the warfighter, greatly increasing, sometimes two or threefold, the chances information to be delivered.

## WHEN

**Contract Number:** N68335-22-C-0544          **Ending on:** Feb 01, 2023

| Milestone | Risk Level | Measure of Success | Ending TRL | Date |
|-----------|------------|--------------------|-----------|------|
| HMI Improvements | Low | Visually Descriptive of Link Status, and Ability to Control Link Connectivity and Pc | 4 | 1st QTR FY24 |
| Backend Software Code Improvements | Medium | Successfully Implement Complex Software Optimization Features | 5 | 2nd QTR FY24 |
| Fleet Testing Solution | High | Successfully Validated in Face of Realistic Electromagnetic Interference | 6 | TBD |

## HOW

**Projected Business Model:** Fuse has developed a software based solution that can be licensed to other commercial organizations to run on any system.

**Company Objectives:** Identify other potential DoD applications for this technology. Explore opportunities with other agencies/commercial partners that have similar network monitoring and communication management needs.

**Potential Commercial Applications:** Aerospace and Aviation, Satellite Communication, Voice over IP (VoIP) Networks, Disaster Recovery and Emergency Response, Data Centers and Cloud Services, Internet Exchange Points (IXPs), Telemedicine and Remote Healthcare, Industrial Internet of Things (IIoT), Live Event Broadcasting, Connected Vehicles.

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