

Topic: N121-106

Fuse Integration, Inc.

Tactical Troubleshooting Tool (T3)

Tactical Troubleshooting Tool (T3) integrates Tactical Data Link configuration settings from multiple legacy systems onboard US Navy ships into a centralized browser-based interface and distributes them via a pub-sub framework to remote, authorized users. Developed by a team of experienced engineers with warfighter input, this project streamlines the process for troubleshooting multi-TDL network connectivity issues by providing a collaborative, real-time environment to view network status and configurations, and recommend corrective actions. T3 interfaces directly with the Common Data Link Management System (CDLMS) but can be configured to interface with other TDL systems. The initial transition target is Command and Control Program Office (PMW 150). Fuse is pursuing opportunities to apply this dynamic, flexible system to DoD and civilian applications that require a remote, global view of aggregated data.

Technology Category Alignment:

Satellite Communications (SATCOM)

Robotics/Automated Material Handling Equipment

Shipyards/Shipbuilding

Supply; Storage

Satellite Communications (SATCOM)

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Supply; Storage

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Satellite Communications (SATCOM)

Shipyards/Shipbuilding

Robotics/Automated Material Handling Equipment

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Robotics/Automated Material Handling Equipment

Protection, Sustainment, and Warfighter Performance

Medical Chem-Bio Defense

Military Infectious Diseases

Propulsion and Extreme Environments

Fixed Wing Vehicles (includes UAS)

Survivability

Maintainability/Sustainability

Unmanned Ground and Sea Vehicles

Corrosion

Advanced Computing/Software Development

Networks and Communications

Modular/Open/Reconfigurable Architectures

RF Components for sensing, transmission and communication

Electronics Integration

Broadband/Multispectral Components and Systems

Sensors, Electronics and Photonics

Radio Frequency (RF) (non-EW)

Survivability

Broadband/Multispectral Components and Systems

RF Components for sensing, transmission and communication

Radio Frequency (RF) (non-EW)

Networks and Communications

Guidance, Navigation & Control (GN&C) and Data Links

RF Components for sensing, transmission and communication
Networks and Communications
Cognitive/Adaptive Capabilities
Preemptive/Proactive Effects
Broadband/Multispectral Components and Systems
Advanced Computing/Software Development
Networks and Communications
Personalized Assessment, Education, and Training
System Interfaces & Cognitive Processes
Aircraft Propulsion, Power and Thermal
Modeling, Simulation & Test Infrastructure
Rotary Wing Vehicles
Fixed Wing Vehicles (includes UAS)
Fixed Wing Vehicles (includes UAS)
Acoustic, Seismic and Magnetic
Rotary Wing Vehicles
Structures and Protection
Energy storage
Unmanned Ground and Sea Vehicles
Mobility
Power and Energy
Synthesis/Analytics/Decision Tools
Information Collection/Management
Advanced Computing/Software Development
Survivability
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Power Generation/Energy Conversion
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Advanced Computing/Software Development
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Microelectronics and Nanoelectronics
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Sensors, Electronics and Photonics
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Human/Autonomous System Interaction and Collaboration
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System Interfaces & Cognitive Processes
Aircraft Propulsion, Power and Thermal
Power Generation/Energy Conversion
High Energy Lasers (HEL)

Propulsion
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RF Components for sensing, transmission and communication
Electromechanical conversion
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Thermal Transport and Control
EO/IR Components for sensing, transmission and communication
RF Components for sensing, transmission and communication
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Fixed Wing Vehicles (includes UAS)
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Protection, Sustainment, and Warfighter Performance

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Assuring Effective Missions
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Biomedical Informatics / Health Information Systems & Technology
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High Energy Lasers (HEL)
EO/IR Components for sensing, transmission and communication

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Acoustic, Seismic and Magnetic
Fixed Wing Vehicles (includes UAS)
Aircraft Propulsion, Power and Thermal
Rotary Wing Vehicles
EO/IR Components for sensing, transmission and communication
Satellite Communications (SATCOM)
Networks and Communications
Trust Foundations
Electro-Optical/Infrared (EO/IR)
Unmanned Ground and Sea Vehicles
Maintainability/Sustainability
Modularity
Survivability
Electro-Optical/Infrared (EO/IR)
Sensors, Electronics and Photonics
EO/IR Components for sensing, transmission and communication
RF Components for sensing, transmission and communication
Networks and Communications
Broadband/Multispectral Components and Systems
Electronics Integration
Protection, Sustainment, and Warfighter Performance
Clinical & Rehabilitative Medicine
Combat Casualty Care
Medical Chem-Bio Defense
Energy storage
Protection, Sustainment, and Warfighter Performance
Human Computer Interfaces (HCI) for Decision Making
Synthesis/Analytics/Decision Tools
Undersea Weapons
Human Computer Interfaces (HCI) for Decision Making
Information Collection/Management

Synthesis/Analytics/Decision Tools
Power and Energy
Propulsion and Extreme Environments
RF Components for sensing, transmission and communication
Fixed Wing Vehicles (includes UAS)
Broadband/Multispectral Components and Systems
Preemptive/Proactive Effects
Radio Frequency (RF) (non-EW)
Energy storage
Manufacturing Technology for Affordability
Power and Energy
Structures and Protection
Synthesis/Analytics/Decision Tools
Fixed Wing Vehicles (includes UAS)
Advanced Computing/Software Development
Trust Foundations
Integrating Architecture and Capability Demonstrations
Unmanned Ground and Sea Vehicles
Aircraft Propulsion, Power and Thermal
Synthesis/Analytics/Decision Tools
EO/IR Components for sensing, transmission and communication
Networks and Communications
Preemptive/Proactive Effects
Electro-Optical/Infrared (EO/IR)
Sensors, Electronics and Photonics
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Networks and Communications
Unmanned Ground and Sea Vehicles
Acoustic, Seismic and Magnetic
Test, Evaluation, Validation, and Verification
Propulsion and Extreme Environments
Fixed Wing Vehicles (includes UAS)
Networks and Communications
Mobility
Unmanned Ground and Sea Vehicles
Fixed Wing Vehicles (includes UAS)
Rotary Wing Vehicles
Manufacturing Technology for Affordability
Readiness
Aircraft Propulsion, Power and Thermal
Propulsion
Protection, Sustainment, and Warfighter Performance
Individual Warfighter
Synthesis/Analytics/Decision Tools
Collaborative Analysis and Decision-making
Survivability
Modeling, Simulation & Test Infrastructure

Fixed Wing Vehicles (includes UAS)
Human/Autonomous System Interaction and Collaboration
Scalable Teaming of Autonomous Systems
Synthesis/Analytics/Decision Tools
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Advanced Electronic Protection Techniques and Technology
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Synthesis/Analytics/Decision Tools
EO/IR Components for sensing, transmission and communication
RF Components for sensing, transmission and communication
Fixed Wing Vehicles (includes UAS)
High-Speed/Hypersonics
Synthesis/Analytics/Decision Tools
Electromechanical conversion
Energy storage
Power Control and Distribution
Power Generation/Energy Conversion
Electronics Integration
Energy storage
Power Control and Distribution
Power Generation/Energy Conversion
Survivability
Fixed Wing Vehicles (includes UAS)
Networks and Communications
Energy storage
Power Generation/Energy Conversion
Unmanned Ground and Sea Vehicles
Electromechanical conversion
Energy storage
Power Control and Distribution
Power Generation/Energy Conversion
Thermal Transport and Control
Thermal Transport and Control
Protection, Sustainment, and Warfighter Performance
Modeling, Simulation & Test Infrastructure

Microelectronics and Nanoelectronics
RF Components for sensing, transmission and communication
Modularity
Acoustic, Seismic and Magnetic
EO/IR Components for sensing, transmission and communication
Broadband/Multispectral Components and Systems
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Sensors, Electronics and Photonics
Maintainability/Sustainability
Manufacturing Technology for Affordability
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Synthesis/Analytics/Decision Tools
Distributed/Coordinated/Net-Enabled Systems
Aircraft Propulsion, Power and Thermal
Energy storage
Thermal Transport and Control
High Energy Lasers (HEL)
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Mobility
Modularity
Electronic Materials
RF Components for sensing, transmission and communication
Manufacturing Technology for Affordability
Personalized Assessment, Education, and Training
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Sensors, Electronics and Photonics
Electronics Integration
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Rotary Wing Vehicles
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Acoustic, Seismic and Magnetic
EO/IR Components for sensing, transmission and communication
Broadband/Multispectral Components and Systems
Guidance, Navigation & Control (GN&C) and Data Links
Sensors, Electronics and Photonics
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Personalized Assessment, Education, and Training
EO/IR Components for sensing, transmission and communication
Electro-Optical/Infrared (EO/IR)
Radio Frequency Weapons (RFW)
Sensors, Electronics and Photonics
RF Components for sensing, transmission and communication
EO/IR Components for sensing, transmission and communication
Scalable Teaming of Autonomous Systems
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Biomedical Informatics / Health Information Systems & Technology
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EO/IR Components for sensing, transmission and communication
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RF Components for sensing, transmission and communication
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Maintainability/Sustainability
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EO/IR Components for sensing, transmission and communication
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Sensors, Electronics and Photonics

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System Interfaces & Cognitive Processes
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Synthesis/Analytics/Decision Tools
Synthesis/Analytics/Decision Tools
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Military Operational Medicine
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Propulsion and Extreme Environments
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Test, Evaluation, Validation, and Verification
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Microelectronics and Nanoelectronics
Networks and Communications
Networks and Communications
Aircraft Propulsion, Power and Thermal
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Cognitive/Adaptive Capabilities

Electro-Optical/Infrared (EO/IR)
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Synthesis/Analytics/Decision Tools
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Design and Integration
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Mobility
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Design and Integration
Modularity
Unmanned Ground and Sea Vehicles
System Interfaces & Cognitive Processes
Fixed Wing Vehicles (includes UAS)
Information Collection/Management
Electro-Optical/Infrared (EO/IR)

Broadband/Multispectral Components and Systems
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Power Generation/Energy Conversion
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Sensors, Electronics and Photonics
EO/IR Components for sensing, transmission and communication
Survivability
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Electro-Optical/Infrared (EO/IR)
Undersea Weapons
Personalized Assessment, Education, and Training
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Acoustic, Seismic and Magnetic
Undersea Weapons
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Networks and Communications
Networks and Communications
Electronic Materials
RF Components for sensing, transmission and communication
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Energy storage
RF Components for sensing, transmission and communication
Power Control and Distribution
Assuring Effective Missions
Resilient Infrastructure
EO/IR Components for sensing, transmission and communication
Preemptive/Proactive Effects
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Scalable Teaming of Autonomous Systems
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Trust Foundations
Guidance, Navigation & Control (GN&C) and Data Links
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EO/IR Components for sensing, transmission and communication
Design and Integration
Mobility
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Machine Perception, Reasoning and Intelligence
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Collaborative Analysis and Decision-making
RF Components for sensing, transmission and communication

Information Collection/Management
Networks and Communications
Broadband/Multispectral Components and Systems
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Microelectronics and Nanoelectronics
Broadband/Multispectral Components and Systems
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Rotary Wing Vehicles
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Collaborative Analysis and Decision-making
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Machine Perception, Reasoning and Intelligence
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Information Collection/Management
Maintainability/Sustainability
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Combat Casualty Care
Military Infectious Diseases
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Survivability
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Machine Perception, Reasoning and Intelligence
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Electro-Optical/Infrared (EO/IR)
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Propulsion and Extreme Environments
Machine Perception, Reasoning and Intelligence
Networks and Communications
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Acoustic, Seismic and Magnetic
Protection, Sustainment, and Warfighter Performance
Machine Perception, Reasoning and Intelligence
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Maintainability/Sustainability
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Integrated Weapon Demonstrators (IWD)
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Networks and Communications
Cognitive/Adaptive Capabilities
Distributed/Coordinated/Net-Enabled Systems
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Scalable Teaming of Autonomous Systems
Test, Evaluation, Validation, and Verification
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Unmanned Ground and Sea Vehicles
Information Collection/Management
Biomedical Informatics / Health Information Systems & Technology
Human Computer Interfaces (HCI) for Decision Making
Information Collection/Management
Personalized Assessment, Education, and Training
Protection, Sustainment, and Warfighter Performance
Modular/Open/Reconfigurable Architectures
Human Computer Interfaces (HCI) for Decision Making
Assuring Effective Missions
System Interfaces & Cognitive Processes
Modeling, Simulation & Test Infrastructure
Electronics Integration
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Readiness
Sensors, Electronics and Photonics
EO/IR Components for sensing, transmission and communication
High Energy Lasers (HEL)
Sensors, Electronics and Photonics
Information Collection/Management
Networks and Communications
Modular/Open/Reconfigurable Architectures
Modularity
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Design and Integration
Manufacturing Technology for Affordability
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Sensors, Electronics and Photonics
Personalized Assessment, Education, and Training
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RF Components for sensing, transmission and communication
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Networks and Communications
Distributed/Coordinated/Net-Enabled Systems
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Design and Integration
Modeling, Simulation & Test Infrastructure
EO/IR Components for sensing, transmission and communication
Fixed Wing Vehicles (includes UAS)
Electro-Optical/Infrared (EO/IR)
Fixed Wing Vehicles (includes UAS)
Maintainability/Sustainability
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Machine Perception, Reasoning and Intelligence
Information Collection/Management
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Protection, Sustainment, and Warfighter Performance
System Interfaces & Cognitive Processes
Advanced Computing/Software Development
Computational Research Engineering Acquisition Tools and Environment
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Rotary Wing Vehicles
Acoustic, Seismic and Magnetic
RF Components for sensing, transmission and communication
Fixed Wing Vehicles (includes UAS)
Acoustic, Seismic and Magnetic
Radio Frequency (RF) (non-EW)
Protection, Sustainment, and Warfighter Performance
Aircraft Propulsion, Power and Thermal
Fixed Wing Vehicles (includes UAS)
Power Generation/Energy Conversion
Rotary Wing Vehicles
Protection, Sustainment, and Warfighter Performance
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Power Control and Distribution
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Propulsion and Extreme Environments
Ordnance
Energy storage
Power and Energy
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Synthesis/Analytics/Decision Tools
Modular/Open/Reconfigurable Architectures
Collaborative Analysis and Decision-making
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Structures and Protection
Aircraft Propulsion, Power and Thermal
Corrosion
Propulsion and Extreme Environments

Readiness

Sensors, Electronics and Photonics

Structures and Protection

Electronics Integration

Networks and Communications

None

None

None

None

None

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None

Department of the Navy SBIR/STTR Transition Program

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SPAWAR SR-2017-295

Topic # N121-106

Tactical Troubleshooting Tool (T3)

Fuse Integration, Inc.

WHO

SYSCOM: SPAWAR

Sponsoring Program: Navy Command and Control Program Office (PMW 150)

Transition Target: Command and Control Processor (C2P)

TPOC:
(858)537-0652

Other transition opportunities:

The Fuse T3 system can reach out anywhere and extract user-defined data from any source and display integrated data in one centralized user interface. This can be used for almost any tactical mission that requires remote access to real-time data such as law enforcement agencies, maritime industry, U.S. Coast Guard, and other DoD platforms such as the Automated Digital Network System, Maritime Patrol and Reconnaissance Aircraft, and unmanned aerial vehicle platforms.

Notes: Fuse understands the needs of tactical data link users, and develops systems that enable TDL data to be shared across Internet Protocol (IP) networks. Decoupling TDL information from rigid hardware architectures gives the DoD new ways to work with near real time tactical information coming from the tactical edge and provides visibility into real-time network status.



T3 Operational View; Copyright, 2017, Fuse Integration, Inc.

WHAT

Operational Need and Improvement: Communications systems used in the Navy are very complex and therefore, may become unreliable due to the difficulty in properly configuring network settings to remain operational. U.S. Navy Joint Interface Control Officers (JICOs) and engineering subject matter experts (SMEs) require a system that enables a global view of network connectivity along with remote insight into individual ships' tactical data link (TDL) configuration settings.

Specifications Required: Requirements include: global view of ship's network status, user-tailorable displays, identified relevant data for 'big picture' display, user-created groups to compare a specific set of ships' configurations, home page displays an overall indicator of system status for each link, within each link category have a display of the data fields most likely to be referenced in troubleshooting for each link. These 'top priority issues' will be displayed on a quick view screen under each link's indicator.

Technology Developed: System components include a Bridge Tactical Router (BTR) that interfaces directly with the Common Data Link Management system (CDLMS) through the Human Machine Interface (HMI) computer. The BTR will create a secure Internet Protocol (IP) network connection and enable a distribution framework sending data to a secure TDL web server ashore.

Warfighter Value: The Fuse Tactical Troubleshooting Tool (T3) distributes configuration data across a secure network allowing authorized Secret Internet Protocol Router Network (SIPRNet) connected users to rapidly diagnose network configuration issues using a browser based interface to view shipboard configurations and recommend corrective action, increasing multi-TDL readiness and improving communications across the fleet.

WHEN

Contract Number: N00039-15-C-0226

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Internal Acceptance Test	Low	Internal development completed	7	February 2017
System Design Document	Low	Completed design	7	June 2017
IAT	Low	Certification and accreditation complete	7	August 2018
IV&V	High	Fleet ready	8	August 2018

HOW

Projected Business Model: Fuse's balance of experience in operations and systems engineering, blended through our Fuse Process, helps to ensure that the solutions we develop are on target for the environment in which they will be employed. 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 capability/technology. Explore opportunities with other agencies/commercial applications that have similar network needs.

Potential Commercial Applications: The Fuse T3 system can reach out anywhere and extract user-defined data from any source and display integrated data in one centralized user interface. This can be used for almost any tactical mission that requires remote access to real-time data such as law enforcement agencies, maritime industry, U.S. Coast Guard, and other DoD platforms such as the Automated Digital Network System, Maritime Patrol and Reconnaissance Aircraft, and unmanned aerial vehicle (UAV) platforms.

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