# Progeny Systems

# Network Health Monitoring for Condition Based Maintenance

# Topic N171-071 NAVSEA

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# **Corporate Profile**



#### • Progeny - Founded in 1995

- Privately held with no debt
- ~650+ team members working in 13 states
- Over 360,000 sq ft of Production, Test, Office and Storage space

#### Numerous SBIR contract awards that have transitioned to In-Service Program of Records

- Proven record of development, production and life cycle support of Mission Critical/Ship Safety Self-Protect equipment and functions
- Successfully compete with large defense corporations
- Phase I (186) Phase II (119) Phase III (81) ongoing success through Innovation

#### • Technology Leader in numerous areas

 Technology insertion; Acoustic sensors; Signal processing; Combat Systems; Fire Control; Torpedoes; Information Assurance; Biometrics; Knowledge Management; Undersea Vehicles; Open Architecture; Electronics Surveillance Measures; Electronics Packaging; Image and Video Processing/Analysis; Computer Learning; Fleet Readiness, Qualifications and Experience

#### • Extensive operational and military experience across DoD

 Built upon a proven successful product deployment track record for over 26 years in support of tactical application and system development and integration of systems across DoD SYSCOMs

**Focused on Long Term Business Stability And Customer Satisfaction** 



### Opportunity



- Problem Statement: IT Networks continue to expand in complexity and are difficult to maintain while ensuring cybersecurity hardening
  - Introduction of virtual components to legacy systems create a diverse ecosystem which is difficult to monitor and maintain
  - Failures can degrade operational capabilities or even prevent a ship from deploying
  - Failures can occur because preventive maintenance cycles do not support degraded system elements
  - Resolving system anomalies or understanding degraded systems is challenging and determining root-cause of a problem in a distributed system is difficult

#### • Solution: Requirements and Capabilities

- Provide a plug-and-play framework for data collection to support Condition Based Maintenance Plus (CBM+)
- Provide ability to collect system log and health data from disparate systems
- Provide ability to parse and store unstructured data into a structured format
- Provide big data storage capability to support fleet-wide analytics

#### SBIR N171-071 is in Phase II

# **Enabling Network Monitoring**

#### **Data Aggregation**

- Metrics from all Operating Systems on the network
- Uptime monitors for all services and equipment
- Central log management
- Tailored monitors for high priority targets
- Single pane of glass for network health and status

#### **Error Prediction**

- Error detection for individual data streams
- Error prediction based on trend analysis
- Open API to define new trend line analyzers
- Query language for integration with machines learning tools

#### **Preventive Maintenance Tracking**

- Red/Green for maintenance cards
- Tracking for individual items on MRCs
- Configuration drift reporting

#### Network Monitor in a Box

- Self contained solution in a virtual machine
- Can run on existing ship's hypervisor
- Monitor updates do not require downtime
- Capability to off-hull data for ashore analysis



#### **Target Environments**

- Afloat networks
- Ashore network
- Navy datacenters
- Tactical and nontactical systems





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# **The Software Solution**



#### • The Enhanced Monitoring Tool (EMT) monitors network health status

- Agents are installed on network components. The agents schedule to send target data back to the EMT central repository
- EMT conducts analysis on the agent data to find network problems
- Agent data includes OS level metrics, log files, maintenance data, configuration data and more
- EMT data is available via an RESTful API and query language
  - The API can be used for displaying errors, conducting 3<sup>rd</sup> party analysis & machine learning, or off hulled for ashore analysis
- Ship's Force can use the aggregated logs and metrics to diagnose issues in the network
  - Predictive algorithms generate alerts based on trend analysis
  - Algorithms and agents can be updated on the fly as monitoring requirements evolve



### **Current Status**





### **Key Features**



#### Central Data/Log Repository



Metrics and logs from all network components normalized in single repo

#### Single "Pane of Glass" for Network Health



All network resources are rolled up into a single UI, reducing time to error diagnosis

#### **Streamlined Updates**



Quick turnaround for configuration updates to data agents and analytics software

#### **Stakeholder Governance**



Open communication with software development team to ensure product meets stakeholder requirements

#### **Agile Development**



New functionality presented to stakeholders for immediate feedback

#### **Systems Integration**



Seamless integration of EMT with host IT systems and external applications

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## **Transition to Aegis**



- Prove technology capabilities in Aegis lab
- Leverage lab integration to provide system health monitoring for the Aegis lab
- Leverage lab integration to provide system health monitoring in Aegis afloat test environments
- Support development of PEO IWS 1.0 transition plan for fielding across Aegis Baselines and ACBs

### **Alternate Transition Paths**





SBIR Phase I & II

**Transition to Program of Record** 

Base technology development and verification will be complete at the end of Phase II Leveraging the base solution, new partners can tailor EMT to their systems with minimal effort

### **Progeny Contacts**



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#### Contact us for

- Follow-on Questions
- General Discussion
- Technology Demonstration