

- Support for big data analysis in sparse and sporadic network environments
- Visual and multi-sensory interaction with data
- Multi-domain and cross-storage big data architectures
- Architectures capable of supporting massive data stores (Exabyte-scale)
- Multi-velocity big data architectures (combing zero-latency dynamic and persistent information)
- Techniques and technologies for rapidly improving the veracity of data
- Cognitive load reduction for sense-and decision-making
- Specific Areas of Interest
  - Semantic conceptual contextual interoperability
  - Multi-sensor information fusion in native arrays
  - Ability to store massive property graphs in memory
  - Data representation persistency for flexible exploitation
  - Correlation of legacy data stores and re-factoring of legacy sources code to enable smooth migration to scalable big data platforms
  - Mission models and model ensembles
  - Human-Computer shared cognition
  - Efficient extraction of high-value information
  - Increased data velocity through timely, distributed, and in-memory data transformation across a variety of data representations
  - Advancing Universal Query from "associative matrices for graphs" to hybrid "On-Line Analytic Processing (OLAP) over Arrays" data model
  - Automated execution of computations over data (e.g. correlation and fusion algorithms) at target storage engines
  - Stream-based integration of multiple data stores with in-memory property graph

**30. *Combat Survival Radios.*** Seeking upgrade or replacement for the PRQ-7/7A survival radio systems. Candidate technologies shall be software defined with a user friendly interface. Recovery/extraction forces require timely information flow among the combat survivor/evader (S/E), operations command centers, recovery/support aircraft, and support agencies, for worldwide use with ability to be polled by base stations. This is accomplished by the S/E transmitting/receiving secure data through military UHF OTH or LOS relay platforms to rescue forces, including rescue response cells and airborne rescue forces. In addition, "on demand" near real-time secure data communication is required between the S/E and rescue forces. S/E handheld radio's shall be small, lightweight, easy use for carry in survival vest. The radio shall be capable of standard VHF/UHF LOS emergency voice/beacon communication and secure

UHF OTH and LOS data transmission. The radio shall provide precise position and status and reception of evasion/pickup navigation guidance, along with LPE data transmission for Blue force tracking and backup use of international SRSAT systems. Radio systems shall include the ability to interface with SAR aircraft communications systems for secure data communications with the S/E radio.

**c. Situational Awareness During Disaster Response**

- 1. *Mobile Data Collection during Disaster Response Operations.*** Solutions are sought to enable domestic disaster response teams to quickly and securely collect information on individuals from the affected population. Potential solutions that are sought would be implemented through a tablet interface. Potential solutions would also provide an ability to operate in areas that have lost network connectivity.
- 2. *Cellular Strength Mapping in Disaster Environments.*** Solutions of interest would be capable of mapping, in real-time, cellular strength (at a local, regional, and potentially national level) to include strength indexing and location of breaks in coverage.

**d. Electronic Warfare (EW)**

- 1. *Exploitation of Data Links.*** Solutions are sought that may spoof, disrupt, or disable data links that support command & control functions, Air to Ground functions, and Air to Air functions of C4I networks. The type of data links being used in this category are HF links, UHF links, and links that utilize TDMA, CDMA and support spread spectrum encoding and cyclic code shift keying. All data links will assume to be encrypted to some degree.
- 2. *Electromagnetic Battle Management (EMBM).*** A joint capability that includes the functionality resident within Improved Many-on-Many (IMOM) family of Electronic Warfare (EW) analysis software tools, the Electromagnetic Propagation Integrated Resource Environment (EMPIRE) software toolkit (IMOM-Planner, IMOM-Engineer, IMOM-On-the-Web, Communications and Radar Electronic Attack Planning Effectiveness Reference (CREAPER), and Joint Broadcast and Analysis Tool (J-BAT)), GPS Interference and Navigation Tool (GIANT), and SPECTRUM XXI. The capability must also be compatible with service specific tools, such as the U.S. Army EW Planning and Management Tool (EWPMT) and the USMC MAGTF EW. This EMBM capability must be able to conduct EMS management, EMS modeling and simulation (M&S), decision support aid generation, analysis and planning services, and measurement of EW effects analysis.
- 3. *Lightweight, Active, Selective Jamming Payloads for Unmanned Systems.*** Payloads that allow users to remotely program jamming frequencies and notch filters to de-conflict with other onboard sensors.

**e. Deployable Infrastructure, Power & Water**

- 1. *Deployed Infrastructure Building and Maintenance.*** Support building partnership and Stability operating through building infrastructure capabilities. Ability to reduced time and money spent increasing safety and operational capacity. Areas of interest include solutions that can assist in Dust