

Large-Scale Network Experimental Data Reduction



S&T Campaign: Computational Sciences
Computing Sciences

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Research Objective

- Innovate new algorithms to improve the performance and scalability of data reduction for Army NIE (Network Integration and Experimentation).
- Enable additional analysis of NIE data through advanced algorithms and data visualization.

Challenges

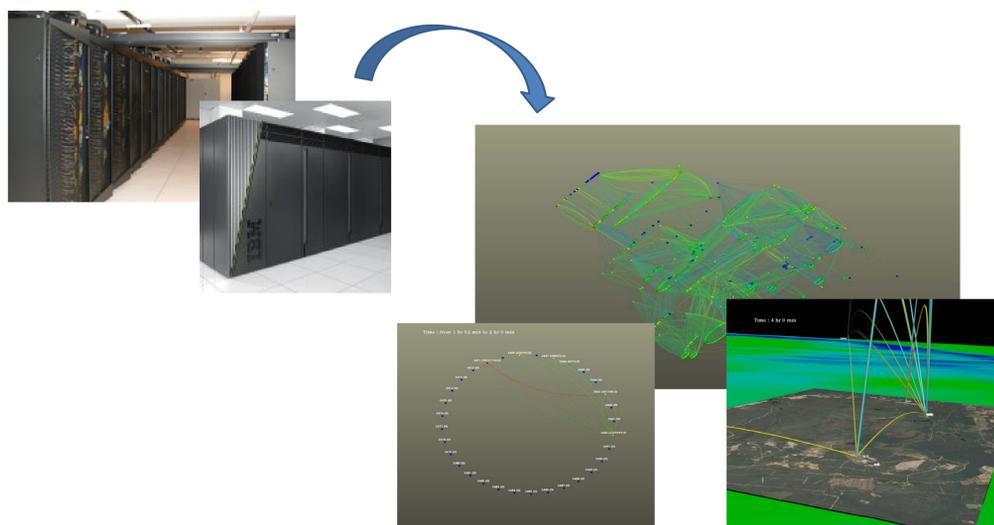
- Developing methodologies for decomposition of data for parallel execution.
- Data format requirements for dynamic analysis
- Integrating with traditional High Performance Computing platforms

Complementary Expertise/ Facilities/ Capabilities Sought in Collaboration

- Live system of systems test expertise
- Scalable visualization tools for network test data
- High speed distributed data store to support visualization and analysis

ARL Facilities and Capabilities Available to Support Collaborative Research

- HPCMP/ARL-DSRC supercomputer facility DSP (Dedicated Service Partition) provides computation and storage
- In-house development of HPC data reduction framework and modules for reduction of C4-specific data
- Unclassified and Classified computing environments depending on sensitivity of data being analyzed.
- Fast turn-around priorities on shared HPC resources
- Data and I/O intensive data processing requires dedicated partition and tailored configuration



- Data collected by NetADMAS devices on various platforms
 - Packet Data
 - GPS location
 - GPS Time - clock correction
- Harvested every 12-48 hours
- Transferred to ATC

- Pre-processing of data
 - Generation of context
 - Indexing and "view" selection
- Transfer to HPC at ARL
- **Data Reduction**
- Populate data model ATC

- Delivery of data model to evaluators
- Requests for Information (RFI)
 - Reach back to raw or intermediate data for clarifications
- Analysis and actions

Process Flow of Experimental Data