SAND2014-1783P

Exceptional service in the national interest

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Capability Expansion

Dynamic Analysis Environment (DAE)

Dynamic Analysis Environment (DAE) is an environment that lets an analyst concentrate on the data being analyzed rather than the mechanics of that analysis. DAE provides an interactive environment that lets the user combine atomic data analysis algorithms in different ways, manipulate the data set being analyzed based on intermediate results, and view the results in various ways.

DAE allows an analyst to control the complexity of the information, draw intermediate conclusions, change the analysis flow based on intermediate conclusions, and thus arrive at final conclusions that may or may not have been expected.

Manage Data to Gain Knowledge

DAE Features

- Flexible
- Interactive execution
- Parallel execution via user controlled multiprocessor use
- Efficient data management
- Sophisticated graphics
- Facilitates asking the "What if?" question
- Allows the user to focus on the job at hand

The Dynamic Analysis Environment (DAE) is domain independent. Potential domains include seismic data, lightning data, and the fusion of data from multiple sources.

Contact:

David Stuart

505.844.3204

dsstuar@sandia.gov

U.S. DEPARTMENT OF ENERGY

National Nuclear Security Administration

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Data Processing, Exploitation, and Fusion

Mission Analysis, Simulation & Test (MAST)

The charter of the MAST (Mission Analysis Simulation & Test) Team is to provide a semi-independent means of verifying that ICADS/GNT Mission capability is working correctly and that it achieves system objectives. This activity requires the generation of test cases and scenarios to effectively exercise the system, the creation of test tools (simulators and analysis tools) to feed in the test cases and assess results, the execution of tests, and the analysis of test results to draw defendable conclusions about the performance characteristics of ICADS/GNT Mission Processing.

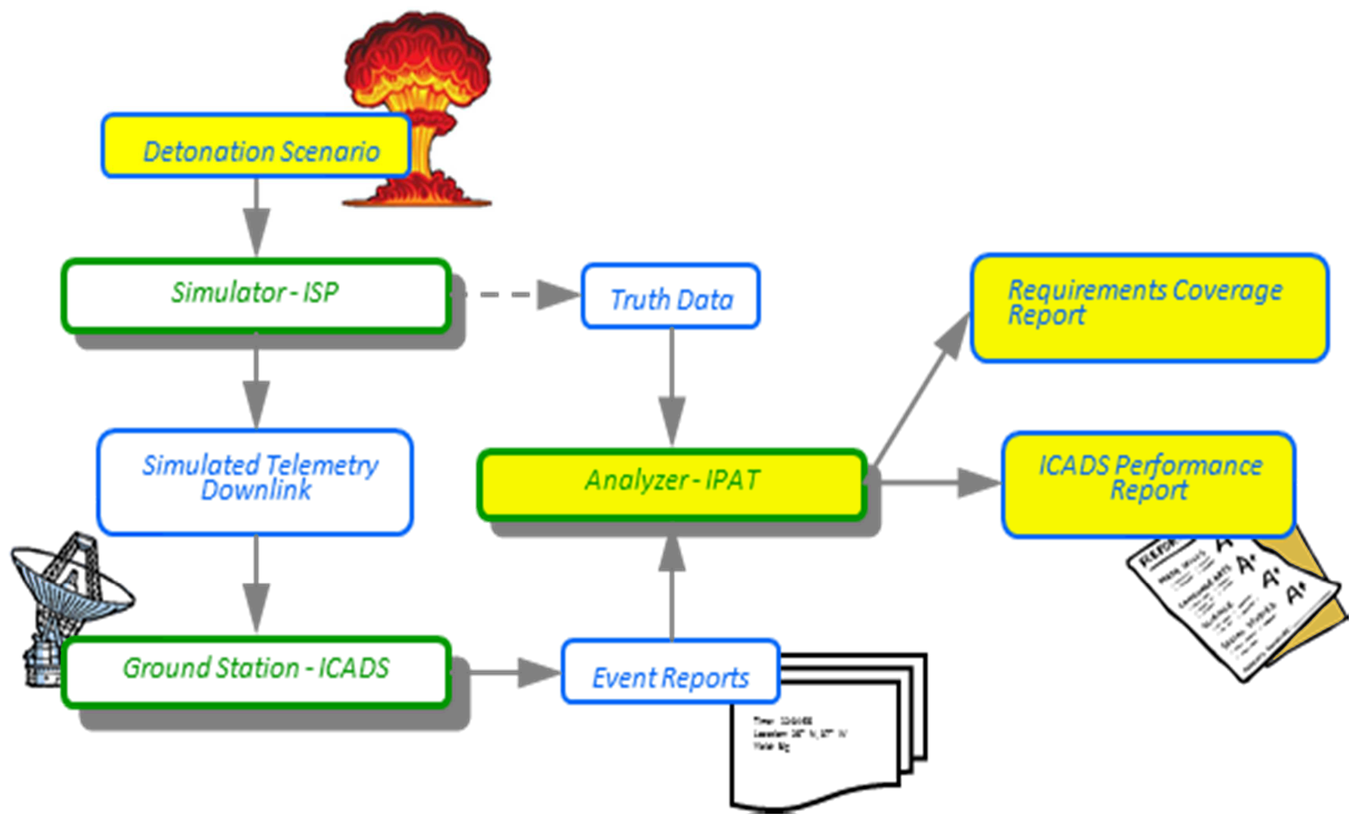
Team Responsibilities:

- Understanding the Mission algorithms and their implementation
- Understanding the phenomenology of nuclear detonations, signal propagation, sensor capability and response, and the characteristics of satellite systems
- Understanding the ICADS System Specification and the requirements it levies on the Mission algorithms
- Developing tools and techniques to enable effective Mission testing and analysis

Air Force requested MAST team assistance during ICADS FDE.

MAST supports a major test of ICADS development deliveries every 6 months.

MAST performs special studies such as Red Team exercises and Weapon Studies within the USNDS Program.



Contact:

Linda Shepard

505.844.5186

lkshepa@sandia.gov

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Data Processing, Exploitation, and Fusion

Mission Models & Analysis

Current Applications

- Detecting sub-threshold events
- Finding interesting background sources
- All-sky camera (meteor detection)
- Sensor noise characterization
- Sensor development

"The purpose of computing is insight, not numbers" R. W. Hamming

Team Talents

- Programming (IDL, Python, C/C++, Java, PERL, Ada, Assembly language)
- Nonlinear least squares model fitting
- Network analysis
- USNDS sensor behavior
- Sensor report correlation and geolocation
- Graphics for data analysis
- Signal processing and analysis
- On-orbit code patching
- Oracle database programming
- Sensor background characterization and exploitation
- Orbital mechanics

Current Customers

- 5562 (Mission Analysis and Simulation)
  - Code development and validation
- 5737 (Proliferation Detection / On-Orbit Data Exploitation)
  - Tool Development
  - Event analysis (optical, X-ray, gamma, EMP)
- 5741 (USNDS Systems Engineering)
  - Communications system monitoring

Contact:

Christopher Hogg

505.844.8708

cjhogg@sandia.gov

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NEXT GENERATION SYSTEMS

NGS

AUDEAMUS

Capability Expansion

Sandia National Laboratories

Exceptional service in the national interest

Dynamic Analysis Environment (DAE)

The Dynamic Analysis Environment (DAE) lets analysts concentrate on the data being analyzed rather than the mechanics of that analysis. DAE provides an interactive environment that lets the user combine modular data analysis algorithms as needed, manipulate the data set being analyzed based on intermediate results, and view the results in various ways - all in real-time.

DAE controls the information complexity, freeing the analyst to focus on relationships created amongst the data. The analyst is able to draw intermediate conclusions, interactively change the analysis flow based on those conclusions, and thus arrive at final results that may or may not have been anticipated.

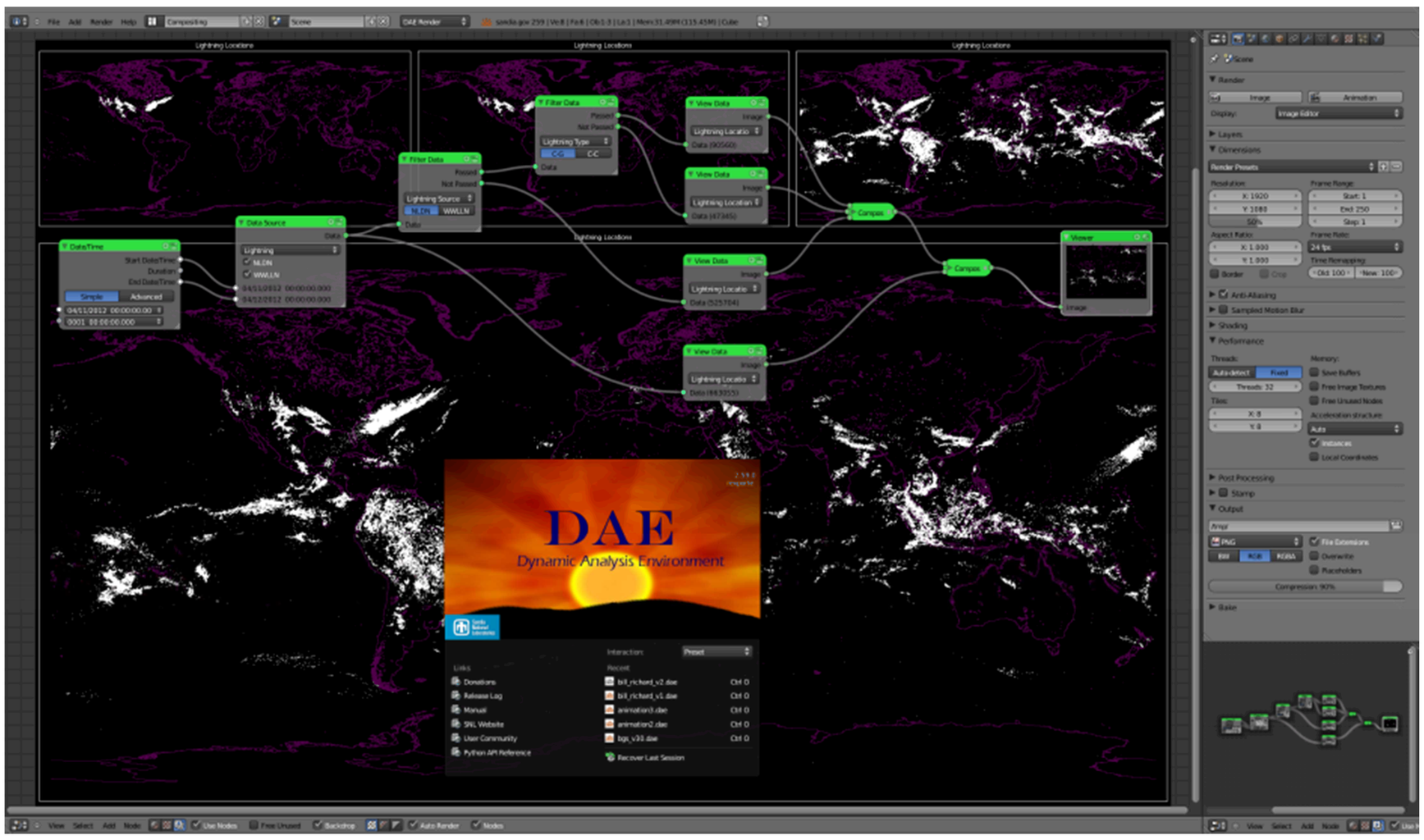
Manage Data
Gain Knowledge

Contact:

David Stuart
505.844.3204
dsstuar@sandia.gov

DAE Features

- Flexible
- Interactive execution
- Powerful parallel execution
- Efficient data management
- Sophisticated graphics
- Facilitates "What if ?"



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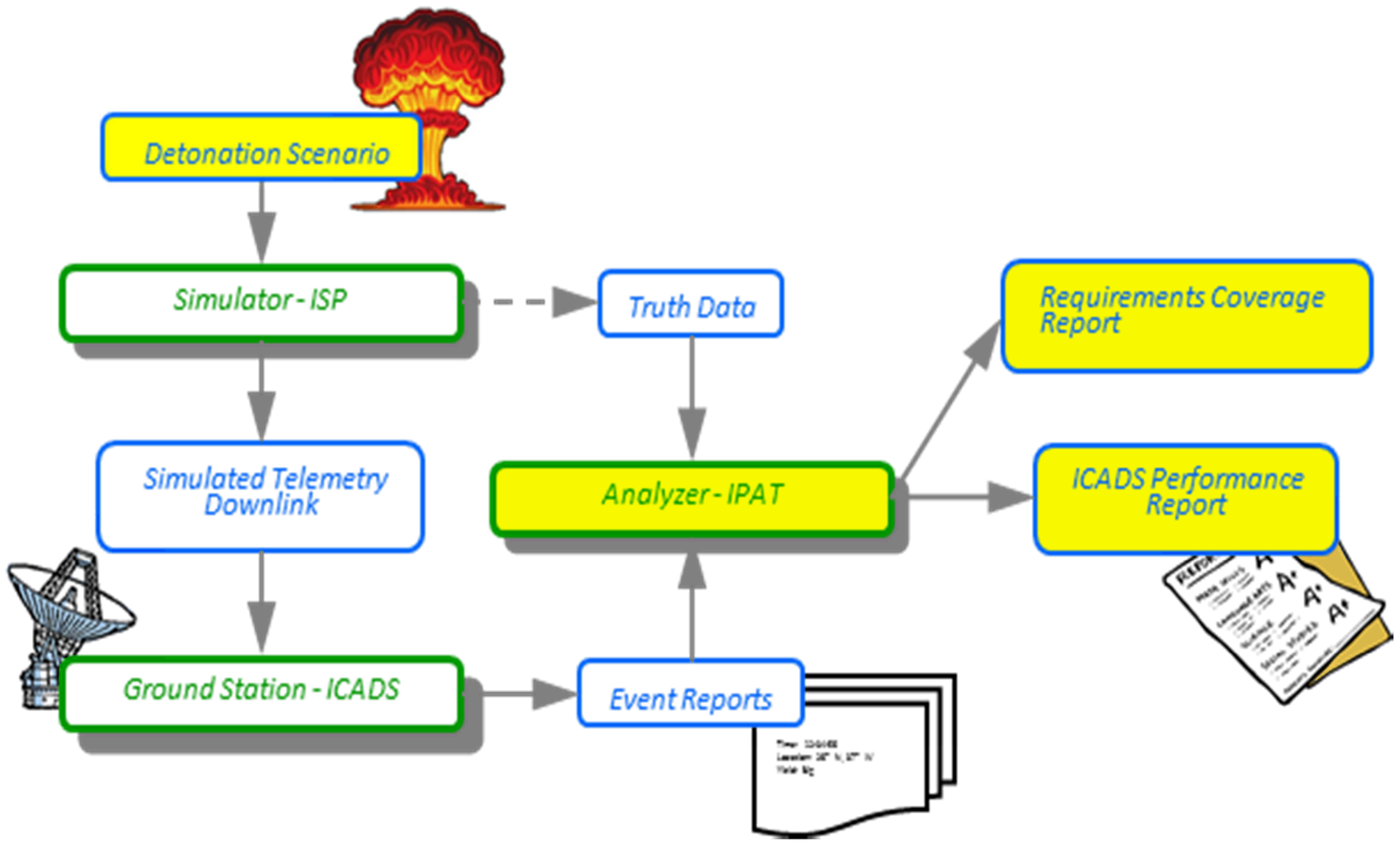

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