At A Glance

GREAT is a flexible & highly portable set of mission operations analysis tools that increases the operational value of ground system event logs.

Features

• Plug-and-Play Component

• GSMEC-Compliant

• Platform Transparency

• Highly-Configurable

• Non-Intrusive to Current Missions

Benefits

• Increases operational value of System event messages

• Provides more automation and autonomy to mission operations

• Provides efficient report generation

GMSEC Reusable Event Analysis Toolkit (GREAT)

Summary

GREAT is a comprehensive system for event/log messages. GREAT provides a real-time message display, message archive & retrieval, occurrence-triggered actions, and data file format conversion. In addition, GREAT populates its automated reports with retrieved data from the archive as well as calculated data using statistics, data analysis, and data mining techniques. Utilizing GMSEC standard messages, GREAT is able to support single or multiple satellite systems, as well as, multiple missions simultaneously for flexible operations concepts.

GREAT Real Time Event Display, the bottom panel displays ʻe-mailʼ style full message.

Mission Benefits

• Increases operational value of event messages generated by Telemetry & Command, Planning & Scheduling, Flight Dynamics, Assessment & Archive, Spacecraft, and other ground system components

• Provides ʻe-mailʼ style message display provides user more detailed information

• Provides user tool to evaluate ground system quality of service

• Facilitates more efficient operations

• Reduces need for users to hunt for information, problems, and anomalies

• Supports legacy and future missions

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GREAT Architecture Overview

GREAT System Concepts
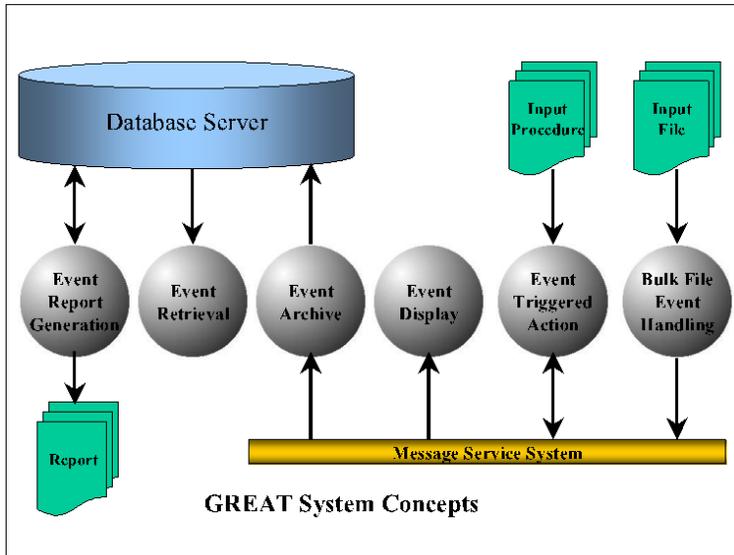
GREAT addresses technology infusion by using the latest Java and J2EE technologies. It has a simple client-server architecture that interfaces with a COTS database server through JDBC and SQL and it interfaces with the message service server middleware through the GMSEC API. Although its a plug-and-play component in the GMSEC architecture, GREAT can also work with non-standard message services through the implementation of the programming interface. GREAT provides mission flexibility by defining program and mission specific data in a configurable XML file. Standard interfaces for the Event Triggered Action, Event Report Generation, and Bulk File Event Handling subsystems allow specific action procedures, report generation, and bulk file handling to also be configurable and be used as independent plug-and-play functions.

GREAT Components

- Event Display displays the filtered system events in real-time

- Event Archive ingests the real time events into the data base or data base cluster, and manages the system event database

- Event Retrieval retrieves the historical events from the database through the SQL language

- Event Triggered Action automates the system response to certain pre-defined events

- Bulk File Event Handling merges other time-tagged data by converting file contents into event messages

- Event Report Generation performs event statistical collections, data analysis, and data mining from the database, and generates the pre-defined/custom reports
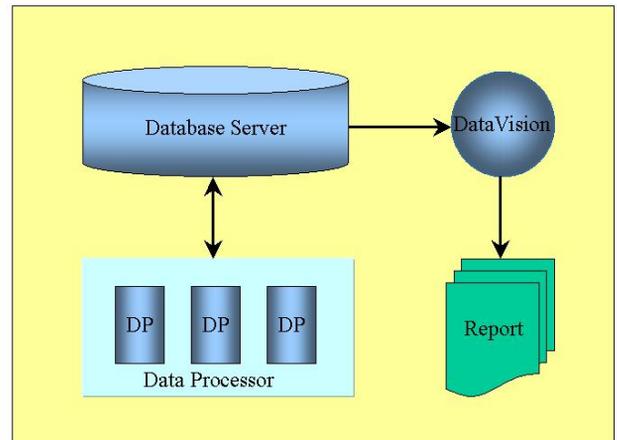
GREAT Report Generation Subsystem

Use of Open Source Software

The open source software Data Vision (http://datavision.sourceforge.net) is integrated with GREAT for the report generation. Data Vision provides the capability to extract data and collect the statistics from the database server through SQL. The output report is generated in HMTL, XML, PDF, Postscript or simple text form. GREAT allows for sophisticated algorithms to pre-process retrieved event data which can be used as input for Data Vision. This provides additional analysis capabilities above that available with SQL.