Ground System Architectures Workshop (GSAW 97)

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Background

- DARPA Evolutionary Design of Complex Software (EDCS) Program and technologies
- Software architecture studies for various Program Offices
- Many spacecraft ground system (SGS) products and tools available or being developed

Objectives
- Define vision for applying technologies to program needs
- Identify areas of commonality
- Facilitate consensus
Current Ground System Architecture Development Process

**Program “Reference Architecture”**
- OO Analysis
- Functional Analysis

**State of Technology**
- Middleware
- LAN Designs
- WS/Server Capacities

**Alternative Architecture Options**

**Selected Ground System Architecture**
- Program Plans
- External Interface Definition
- System Evolution

**Program Requirements**
- Functional
- Performance

**COTS/Legacy Products**
- Availability/Quality
- Criteria/Requirements Met
- Cost Trade-offs
Desired Ground System Architecture Development Process

- RATIONALE
  - Consensus Reference Architecture
  - Improvement Suggestions

- Program Architecture Analysis
  - Program Requirements
  - Technology, COTS, Legacy Factors

- Tailored Program Architecture
Role of Architecture Technologies

- Architecture Description Languages support architecture evaluation and comparison
  - Performance, scalability, flexibility, evolvability, interoperability, portability
  - Ability to integrate with COTS products
- Architecture recovery, component generation, and other technologies are all needed
- GSAW 97 provides a forum for showcasing architecture technologies in an SGS context
Plan for the Workshop

- Bring together key players in the satellite ground systems (SGS) domain:
  - customers, contractors, product vendors, and technology providers
to facilitate info exchange
- Facilitate broad information exchange:
  - Presentations of reference architectures, SGS components, tools for development and/or composition of SGS systems, other architecture-related technologies
GS&AW 97 Highlights

- Lt. Gen. Roger DeKok, Commander of SMC, was Keynote Speaker
- Other featured speakers:
  - Col. Terry Graham, Dir., Satellite & Launch Ctl, SMC
  - Dr. George Paulikas, Aerospace Exec VP
  - Dr. John Salasin, DARPA EDCS Program Manager
- Panel sessions Friday morning provided forum for facilitated open discussion of:
  - Users' perspectives on future software architectures
  - Summary of challenges raised during sessions, identification of relevant opportunities and solutions
Long Term Plan

- Aerospace will organize annual workshops to provide a forum for exchanging information on:
  - Criteria, tools for defining, evaluating SGS architectures
  - Role of software architecture in SGS programs
  - Approaches for representing software architectures
  - Implementation of components/systems from archs
  - Software technologies for support of architecture
  - Mapping commercial products to reference sw archs

- Eventual goal:
  - Expedite the transition to common consensus-based open software architectures for SGSs
Goals of GSAW 97

- Promote use of state-of-the-art technologies and COTS products to solve ground system problems
- Identify barriers to achieving common consensus-based open software architectures for SGSs
- Identify ongoing activities that are addressing or could be addressing issues raised at GSAW 97
Agenda: Wednesday, 26 Feb

- Dr. George Paulikas welcome address
- Col. Terry Graham plenary talk:
  - *The Perfect Satellite Control Architecture of the Future -- and Why We Can't Get There, Yet*

- Sessions on:
  - Ground system visions for the future (DOD, AF, NASA)
  - Generic architectures for ground systems (AF, Navy, NASA)
  - Commercial architectures, from 5 COTS vendors
  - Ground system architectures case studies
Agenda: Thursday, 27 Feb

- Lt. Gen. Roger DeKok keynote address
  - Satellite Operations Vision 2000 and Beyond
- Dr. John Salasin plenary talk
  - DARPA Perspective on Technology Opportunities
- Sessions on:
  - Architecture representation and analysis technologies
  - Technologies for developing architectures
  - Applications of technologies to software architectures
  - More ground system architectures case studies
Agenda: Friday, 28 Feb

- Panel: Users' Perspectives on Future Architectures
  - Will address issues relating to consensus on SGS architectures
  - Interactive audience discussion with panelists

- Panel: Resolving Issues -- Where Do We Go From Here?
  - Recap of issues raised at each session
  - Panelists can comment, claim issues, etc.
  - Interactive audience participation required

- This begins to answer the question:
  - Now that we've raised these issues, how can they begin to be addressed during the year till the next GSAW?
GSAW 97 Basic Info

- Date: Wed - Fri, 26 - 28 Feb 1997
- Location: The Aerospace Corp.
- For details, see the GSAW 97 Home Page:
  http://sunset.usc.edu/GSAW/GSAW97.html