Space Object Technology Group (SOTG)
Software Integration Standards

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Outline

- GSAW 99 “Standards Presentation” Highlights
- SOTG Initiative
  - Background
  - Government & Industry Participation
  - Reference Architecture
  - Subdomain Interface Definitions
  - CY99 SOTG End Products
  - CY00 Demonstration System
- Object Management Group - Space, Satellite, and Ground Systems Working Group (SSGSWG)
Adopt a set of Standard Interfaces for the Ground Station Domain which would Provide:

- Standard Interface Definitions for each Subdomain
- Open, Non-Proprietary Interfaces based on Industry Accepted Standard (e.g. IDL)
- Reduce Risks and Costs associated with COTS Integration
- Develop Vendor Product Interface Adapters
  - Provides the Adapter From the Existing COTS Product, or Custom Software, to the Standard Interfaces.
- Plug and Play of COTS Products that Support the Standard Interfaces
SOTG Background

- Initial Sponsorship
  - Formed in 1998 by the National Reconnaissance Office and NASA's Goddard Space Flight Center

- Goal/Vision
  - Reduce the risk and cost of implementation of ground/space systems by using standard plug and play architectures

- Purpose
  - Establish industry standards for object-oriented software to be used in the space industry to enable plug-and-play interoperability
SOTG Industry Participation

- SOTG Industry Participants
  - AI Solutions
  - Altair
  - Century
  - Computer Sciences Corporation (CSC)
  - Integral Systems Inc.
  - Logicon
  - Raytheon
  - Scitor
  - Software Technology Inc. (STI)
  - TASC
SOTG Object Management
Architecture View

- Data Acquisition
- Commanding
- Logging and Playback
- Automation

- Orbit
- Attitude
- Maneuver
- Planning and Scheduling

- CORBAfacilities
  - TBD
- SOTGfacilities*

- CORBAservices
  - Naming
  - Event
  - Property
- SOTGservices
  - Authorization
  - Coordinate Conversion
  - Fault Tolerance
  - Fetch
  - Group
  - Message Handling
  - Persistent
  - Profile
  - Publish-subscribe
  - State
  - Stream
  - Time Conversion
  - Time Synchronization
  - Transform

Object Request Broker
SOTG Subdomains

- SOTG Ground System Subdomains
  - Attitude
  - Automation
  - Command
  - Data Acquisition
  - Logging
  - Maneuver
  - Orbit
  - Planning and Scheduling
  - Remote Systems
  - Vehicle Modeling
  - [SOTG Services]
SOTG CY99 End Products

- SOTG Reference Architecture Document
- Requirements Document for each Subdomain
- UML-Based Reference Architecture Model
  - Developed using Rational Rose
- Interface Definition Language (IDL)
  - Generated and Compiled for each Interface
- SEI Architecture Evaluation
SOTG Phase I (CY00) Demonstration System

Legend:
- SOTG Component
- Non-SOTG Component
- SOTG Adapter
- SOTG Interface
- Non-SOTG Interface

SOTG Commanding
- SOTG Adapter
- OS/COMET Command (STI)
- Altairis MCS (Altair)

SOTG Automation
- OA/Tool (STI)
- SOTG Adapter
- Altairis FSM (Altair)

SOTG Data Acquisition
- SOTG Adapter
- OS/COMET Telemetry (STI)
- Altairis MCS (Altair)

GREAS (PSR)
- STK Orbit

FLEETSAT Simulator (Pluto)
Object Management Group (OMG)
- Space, Satellite and Ground System Working Group (SSGSWG) formed under the OMG C4I Special Interest Group.
- SSGS Request For Information (RFI) Released 19 Nov 1999 and Responses Received through 17 Feb 2000
- Responses to RFI Currently being Evaluated and Responses to be Folded into the Request for Proposal (RFP).
SOTG/OMG Forward Plan

- Forward Plan
  - Expand the Semantics Description of the Interface Definitions
  - Refine Interfaces based on Implementation in the SOTG Target Architecture Demonstration System
  - Transition Work from SOTG to OMG/SSGS
  - Enhance COTS Products to Support the Standard Interfaces
  - Evaluate SSGS RFI Responses and Issue RFP
SOTG/OMG
Contact Information

- **SOTG Web Page**
  - http://sotg.gsfc.nasa.gov/sotg/

- **OMG SSGS RFI Web Page**

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