Building Groundsystems Rapidly with Low Risk

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Agenda

- Ground System Developer Needs
- RTworks Generic Architecture
- Extreme Ultra-violet Explorer Architecture
- CRSS Architecture
- Common Architecture Elements
- Summary
Developers’ Needs

- Openness
- “Toolkit”
- Scalability
- Inferencing / Expert System
- Distributing Processes
- Fault Tolerance
RTworks Building Blocks
RTworks Modules Distributed

SmartSockets Goddard

SmartSockets JSC

SmartSockets Denver

Legacy Code

Third Party Software

RTie

RThci

RTdaq
EUVE Background

- EUVE payload is operated out of UCB and the spacecraft out of Goddard Space Flight Center

- To reduce cost of payload operations UCB needed to automate the process
  - from 2 people working 24x7 to 1 shift
  - from 1 shift to “zero” shift operations

- Built a system the autonomously monitors and pages operators if needed
CRSS Background

- Commercial Imaging Satellite
- Short Development Cycle
- Needed Both Operations and I&T Systems
- Cost Reduction through Standardized Ground system
Common Architecture Elements

- **Strong Use of Middleware**
  - Leverage Legacy Code
  - Shorten Integration Time
  - Add Third-Party Tools
  - Data Routing

- **Performance**

- **Fault Tolerance**

- **Low Maintainance**
Summary

● **Rapid Development**
  - Decreases risk to schedules

● **Openness**
  - Allows inclusion of 3rd party and legacy code

● **Scalability**
  - Supports architectures from a single payload system to constellation management

● **Automation**
  - Expertise can be built into ground systems