GSAW2003
Plenary Sessions Summary

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GSAW2003
Ground System Architectures Workshop

Outline

- **Key Themes of GSAW2003**
  - ❖ Familiar Topics
  - ❖ New Emphasis
- **Lessons Learned**
- **Quotable Quotes**
- **What's Next?**

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Key Themes of GSAW2003

Familiar Topics

- **Reference architectures**
  - NASA GMSEC, NRO, CCSDS
- **Standards for interoperability**
  - CCSDS, SLE, OMG
- **Evaluating architectures to reduce risk**
  - ATAM/QAW, UCI toolkit, complex systems-of-systems (CSOS)
- **Processes and approaches for transitioning legacy systems**
- **Architecting for ease of evolution**
  - Component specification
  - Composable/virtual ground systems
  - Information bus
  - GSML (ground station markup language)

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Key Themes of GSAW2003
New Emphasis

- **Shift of space community focus from spacecraft to ground systems**
  - More of the acquisition swing votes will be driven by software/ ground system architecture
- **Domain-specific open source components and approaches**
  - Common parameters for GS frameworks
  - ESA, NRO open source infrastructures
- **Tie it all together with standards, protocols, networks, grids**
  - Transition to standard Internet-type protocols
  - Virtual ground systems, virtual organizations

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Lessons Learned

- **Use COTS, but understand how**
  - ❖ Requirements need to be flexible - if you have to modify COTS to meet your requirements, DON'T
  - ❖ Prototype with intended COTS components, to make sure they meet your requirements and can integrate with your system
  - ❖ Minimize dependence on COTS
  - ❖ Use commercial "frameworks" rather than components
  - ❖ Define attributes for future COTS components
- **Reduce ground system risk throughout program lifecycle**
  - ❖ Ground systems are (still) major program risk drivers
  - ❖ Need to address people, organization, culture, programmatic risks
  - ❖ Need flexible architectures to minimize impacts of change
  - ❖ Innovative acquisition and sustainment approaches
- **Successful examples of acquirer/customer controlled architectures**

Quotable Quotes

- **If you don't understand the environment you are architecting in, you will fail**
- **Fly before you buy**
  - ❖ Prototype, with user/operator involvement
- **Changing the baseline while maintaining operations is like overhauling a 777 in the air**
- **What you don't know about software can hurt you**
- **Make accessing satellites as easy as accessing Google**
- **Peres's Law: If a problem has no solution, it may not be a problem, but a fact, not to be solved, but to be coped with over time**
- **If you want to keep pace, work in space, but if you want to astound, work in the ground!**

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Your ideas are encouraged

- **Please fill out the survey!**

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