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# **GSAW2005:**

## **Collaboration and Common Solutions**

### **Plenary Sessions Summary**

**Judy Kerner**

**Mary Rich**

**The Aerospace Corporation**

**Mark Walker**

**PanAmSat Corporation**

# Outline

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- **Collaboration is Happening**
- **Enablers/Inhibitors of Collaboration**
- **Collaboration Hurdles**
- **Common Solutions**
- **Updated and Repeated GSAW Themes**
- **Heard at GSAW2005**
- **And finally, ...**



# Collaboration is Happening

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- **Organizations, consortia, communities, nations, etc.**
- **Collaboration between spacecraft engineers and ground system engineers**
- **Continuous customer/developer/user participation**
- **Government and industry support of architecture-level integration**
  - ❖ Using an architecture to tie together different architectures so you don't have to throw anything away



# Enablers/Inhibitors of Collaboration

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- **Common lexicons**
  - ❖ Standardization/"harmonisation" of common terms is a very slow process
- **Use of standards - CCSDS, SLE, ECSS, XML, ...**
  - ❖ Creating standards and trying to embrace standards
- **Establishing trusted relationships**
- **Defining the business case**

# Collaboration Hurdles

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- **Scale (also a motivator)**
- **Increased initial cost of collaboration**
  - ❖ And also of architecture, design, test, ...
- **Competition, intellectual property issues, security concerns**
- **Necessary legal paperwork**
  - ❖ MOUs, NDAs, ITAR compliance, ...
- **When there are bugs in the interfaces: "It's not us, it's you"**
- **NTWWADI**

# Common Solutions

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- **Common solutions are not identical solutions**
- **Common ground architectures within and across mission families**
- **Catalogs of components**
  - ❖ Even middleware can be switched!
- **Consensus reference models/reference architectures**



# Updated and Repeated GSAW Themes

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- **Middleware**
  - ❖ In use, with more understanding of its realities
- **Open standards and protocols**
- **Open source software**
- **Approaches that are working**
  - ❖ Accommodating change - anticipating creeping requirements
  - ❖ Harmonizing architectures
  - ❖ Adapting protocols
- **Plan for updates and COTS refresh during the development phase**



# Heard at GSAW2005

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- **It's a lot easier to communicate with Mars if you have orbiting infrastructure**
- Server in space
- **The "Delta" approach**
- **"Sensor to shooter"**
- "Bring the sensors to the scientists and the planets to the public"
- **"Plug and play"**
- "Configure and go"
- **Better, cheaper, faster - you CAN get all three**
- Better, cheaper, but not necessarily faster
- **In Europe, you never see a mix of military and industry people like at GSAW**
- **"Transforming" - if you want to get money, make sure that word's in all your budget documents**

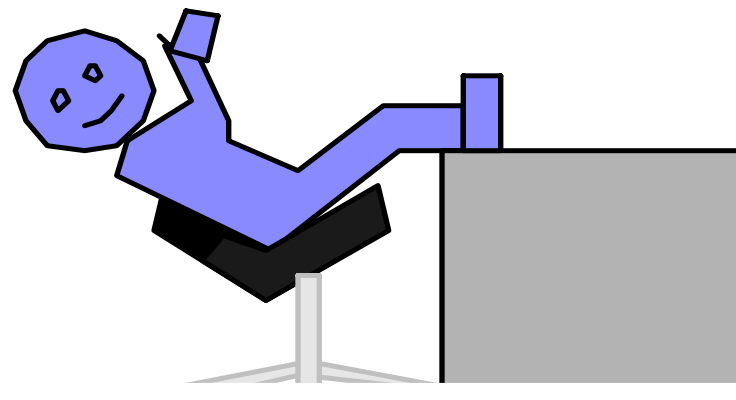




# Seen at GSAW2005

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- Automation



Ops Support

[Thanks to John Hughes for this figure.]

# GSAW: A Key to Collaboration

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- **GSAW is the international forum for exploring software and system architecture issues for spacecraft ground systems**
- **Since its inception in 1997, GSAW has transitioned from *identifying* the hard issues to *addressing* the hard issues**
- **Come back and join us for GSAW2006!  
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