Summary of GSAW 98 Plenary Sessions

What problems are we solving

- Reduced budgets, desire to reduce time to market, rapidly moving technology
- Stovepipes don’t work in the long term
- Cost of software changes is disproportional to changes in requirements
  - software is not “soft”
  - architectures don’t support evolution

What problems are we solving (con't)

- Reuse isn't being done effectively
- Difficulty in adopting commercial practices
- Sequentially engineering space and ground, as well as hardware and software, leads to <insert your worst fear>

Lessons learned

- One size does not fit all
  - Need systems that are tailored to requirements
  - Share core assets, but customize to fit needs
- Architectural issues are key to:
  - interoperability (standards are not enough)
  - commonality of user interfaces
  - flexibility, evolvability
  - transparency
  - lifecycle costs (product, product line)

Lessons learned (con't)

- Government needs to open-up the architecture to allow industry to provide commercial products
- Good architecting requires
  - Good engineering
  - Expertise in multiple disciplines
- Need to identify the degree of variability the architecture needs to support, to help in evolving architectures.

Lessons Learned (con't)

- Product line approaches offer the potential for large scale productivity gains
  - industry has succeeded (management commitment)
  - build on well engineered, well understood core assets
  - need a common vocabulary to help identify common assets

Lessons Learned (con't)

- Need to build skeletal architectures (not throw away, incorporating COTS)
- Autonomy requires an integrated approach to space and ground

Technology can help

- Architectural flexibility - evolution - incrementality
- Architecture evaluation - architecture tradeoffs
- Automated generation
- Assurance through model analysis
- Technology to support automation and autonomy

Organizational issues are challenging

- We build what we are organized to build
- A growing and diverse space community (DOD, civilian space, US commercial space, and international space)
- How to effectively carry out our approaches to reducing cost? How can we tell how well we are doing?
  - CCT as a product line
  - DII/COE as a product line/infrastructure
  - Common HMI

Memorable phrases & terms

- Better, faster, cheaper, RISKIER
- Tail vs. tooth
- Stovepiped hodgepodge
- Autoshave
- We build what we are organized to build
  - Conway’s law - “If you have four groups working on a compiler, you'll get a 4-pass compiler"