



GSAW 2019

Feb. 25-28, 2019

Renaissance Los Angeles Airport Hotel

“Creating Smarter Ground Systems”

Session 11A: The Making of “Smarter Ground Systems” – Brainstorming

Building Smarter Ground Systems for Smarter Spacecraft Using Smarter Teams in Smarter Organizations

Panel Intro Comments from NASA

Dan Smith

NASA Goddard Space Flight Center

Dan.Smith@nasa.gov



The Challenges

- ▶ More missions, lower cost, tighter schedule
- ▶ More data, not just mission payload data
- ▶ More interfaces, more partnerships and collaborations
- ▶ Short- and long-term missions with different views on evolvability
- ▶ Move towards increased compatibility across government agencies
- ▶ Extensive use of COTS, GOTS, and FOSS
- ▶ The software split between flight and ground systems is becoming fuzzy
- ▶ More computer science people, fewer control center domain people
- ▶ The times they are a changin! Constellations of 1,000's of spacecraft, commercial company leadership, smallsats for big science

- ▶ We must address the needs of multiple missions across different time spans and influenced by different leaderships. We have been getting smarter for decades, and now we have to get really really smarter.



Smarter Ground System Concepts at NASA

- ▶ Evolution of the “Open System Architecture” concepts
 - ▶ More adaptable infrastructure and components
 - ▶ Assume we will all be similar but different and want the same functions and components
- ▶ Increased involvement in standards development
- ▶ Move from “anything a mission can think of” to “here is what we offer a mission”
 - ▶ Moving from a resource organization to a service organization for mission ops
- ▶ Analytics
 - ▶ Enabling through new levels of mission data storage and accessibility. Cloud utilization.
 - ▶ Collecting more than just spacecraft data – need ground system performance data, log messages, security monitoring, etc.
 - ▶ Data retrieval can selectively cross mission boundaries
 - ▶ Concepts for text-based analytics using log/event message data
- ▶ Early stages of enterprise solutions
 - ▶ Start with VM’s and consolidated facilities
 - ▶ Beginning to offer common, ready-made solutions for new missions