

"Innovation on the Ground"

Manhattan Beach Marriott, Manhattan Beach, Calif.

March 1-4, 2010

# NASA's Participation in Joint SatOPS Compatibility Efforts 2009-2010

Dan Smith

NASA Goddard Space Flight Center

3 March 2010

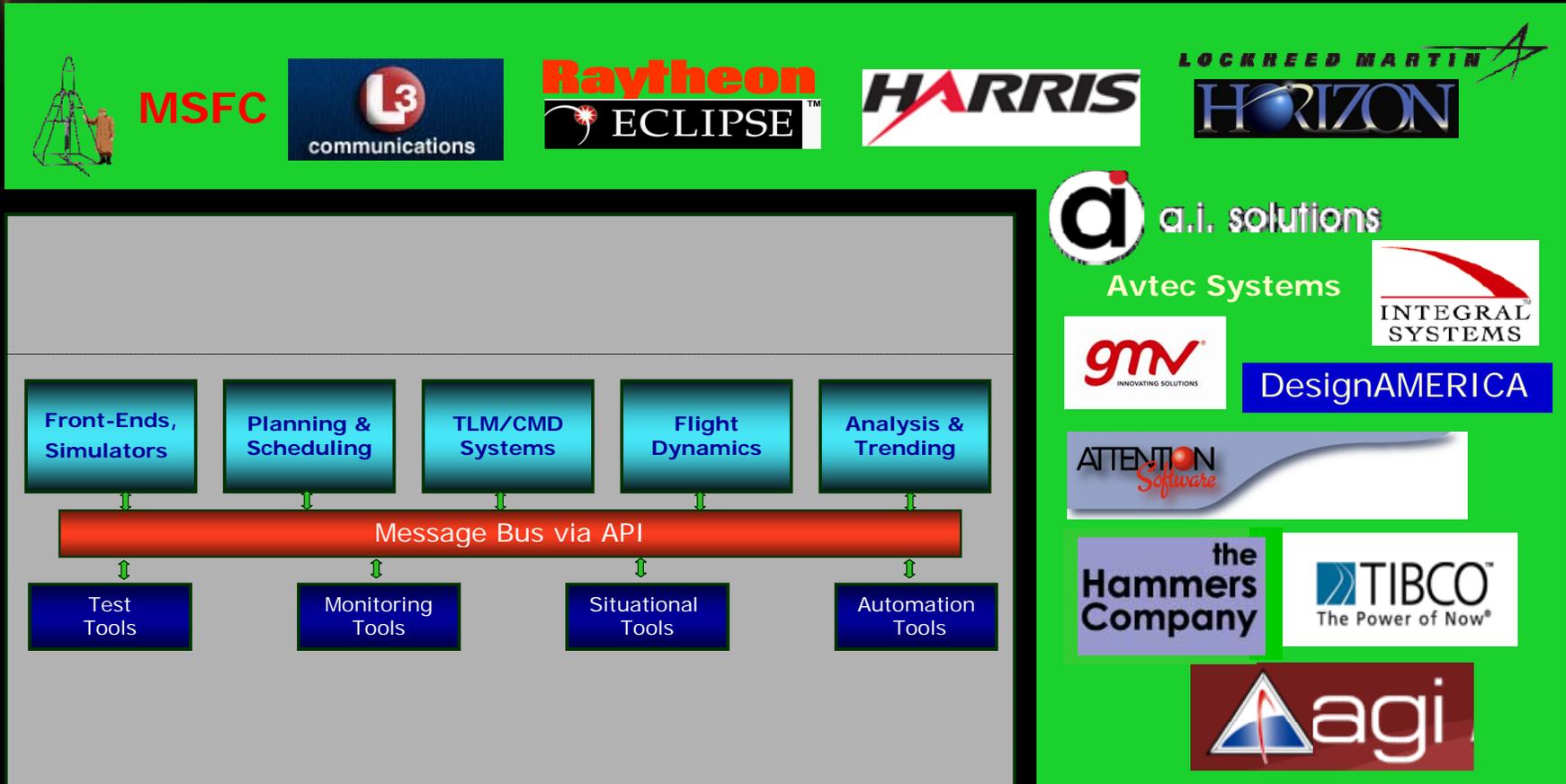




# Introduction

- ◆ Many U.S. government organizations build or fly space systems:
  - ❖ NASA, NOAA, Navy, Air Force, NRO, ORS. Others?
  - ❖ Through the Joint SatOps Compatibility Committee (JSCC) we have increased the grass-roots interaction between many of these organizations
  - ❖ We all deal with many of the same challenges
    - ✦ More rapid deployments, lower budgets
    - ✦ Advancing technologies – frameworks, clouds, virtualization
    - ✦ Evolving concepts – automation, situational awareness, enterprise mngt.
    - ✦ Standardization – formal or by common use
  
- ◆ “There is an inherently governmental role in creating the business case for contractors and commercial product vendors to move in directions beneficial to multiple government space organizations.”

# NASA/GSFC's "GMSEC" Architecture



The Goddard Mission Systems Evolution Center (GMSEC) provides a publish/subscribe framework to enable rapid integration of commercially available satellite control products.

# NASA/GSFC's Efforts Since GSAW 2009 (1 of 2)



- ◆ Supported establishment of Joint SatOPS Compatibility Committee following GSAW 2009
  - ❖ Primary NASA participation from NASA Headquarters and NASA GSFC
  - ❖ GSFC GMSEC Team and Standards Group participation
  
- ◆ Continued development of the GMSEC system
  - ❖ Proof of concept labs running at other JSCC locations
  - ❖ NASA continues to fund basic system development and maintenance
    - ✦ Introduced IBM's Websphere as a pub/sub communications bus
    - ✦ Adding local environmental monitoring (temp/humidity, etc.)
  - ❖ Collaborations started for GMSEC core enhancements
    - ✦ Enterprise communications
    - ✦ Security
    - ✦ NDDS as a pub/sub communications bus

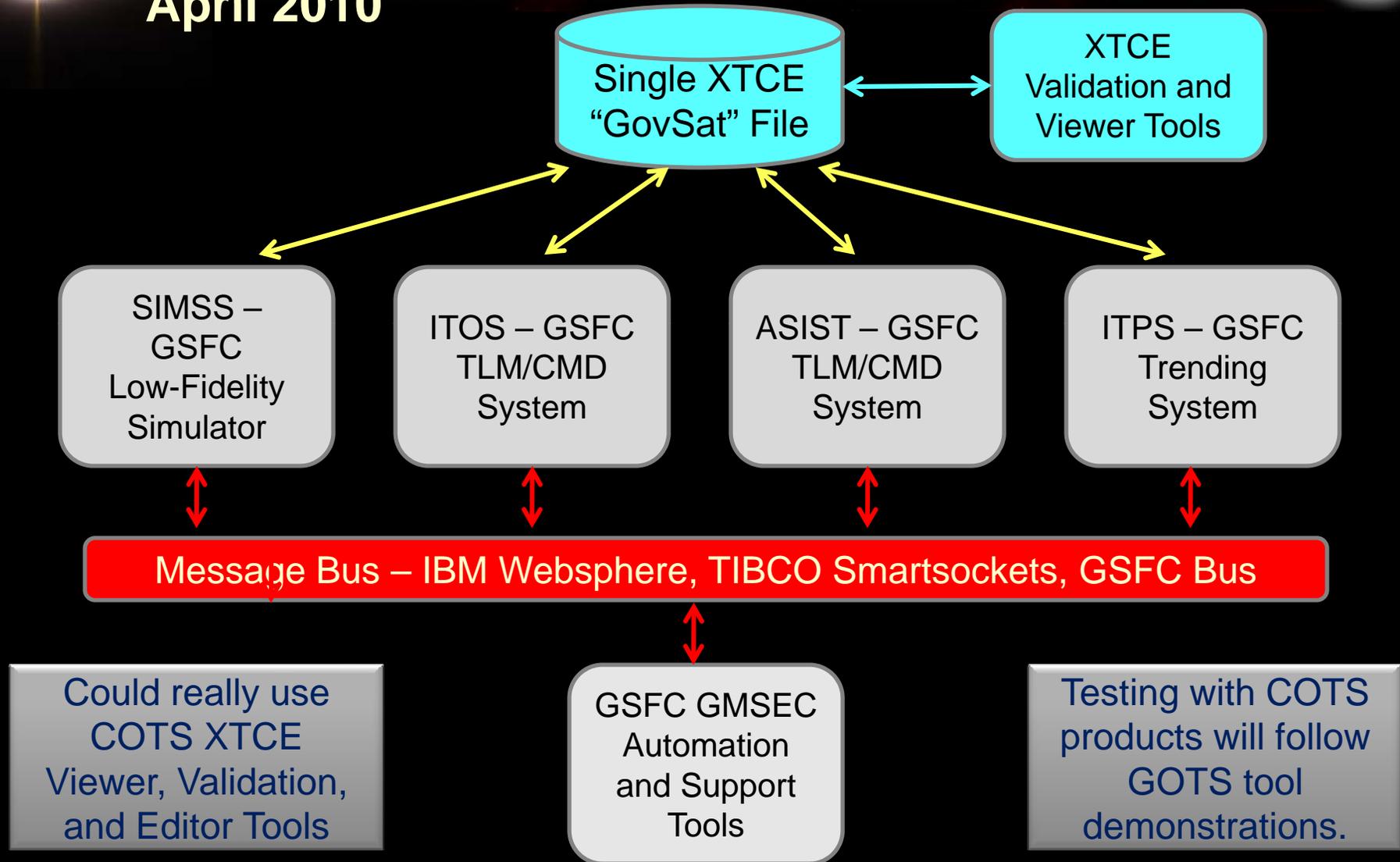
## NASA/GSFC's Efforts Since GSAW 2009 (2 of 2)



- ◆ Pushed for the adoption of XTCE for TLM/CMD list definitions
  - ❖ Proceeded with plan presented at GSAW 2009
  - ❖ Developed “GovSat” – a tailored XTCE subset for CCSDS missions
    - ✦ Documented limited set of XTCE-compliant capabilities and approaches
    - ✦ Added field constraints
    - ✦ Created populated database for consistent testing
    - ✦ Preparing for general industry release of GovSat materials
  - ❖ Modified GSFC-internal products to utilize XTCE definitions
    - ✦ Full test planned for April 2010
  - ❖ Encouraged use of XTCE for upcoming missions
    - ✦ Missions at several NASA Centers now considering XTCE
    - ✦ ORS and Naval Research Labs will soon be testing with XTCE
  - ❖ Will encourage industry participation in 2010
    - ✦ Adapters need to COTS tools can accept XTCE files
    - ✦ New XTCE support tools suites needed

# NASA/GSFC XTCE "GovSat" Validation Test

April 2010



# Now What?



- ◆ NASA believes in the value of the JSCC
  - ❖ Let's keep it going as a broad forum
  
- ◆ Time for increased industry participation
  - ❖ JSCC should consider position papers for future direction
  - ❖ Forums like GSAW used to describe new directions
  
- ◆ Work on common challenges
  - ❖ Enterprise level situational awareness
  - ❖ Security
  - ❖ Increased use of inter-agency sharing and COTS
  
- ◆ Broad acceptance of standards
  - ❖ CCSDS packetized data
  - ❖ XTCE
  - ❖ Delay/Disruption Tolerant Networking (DTN)