Raytheon (NPOESS) Perspective on Software Architecture

Breakout Session 10A
Architecture-Centric Evolution and Evaluation (ACE2) of Software-Intensive Systems

Jim Boegman
SO-CLG SW Technical Lead
NPOESS C3S IPT

30 Mar 04
Tri-agency Effort to Leverage and Combine Environmental Satellite Activities

Mission

- Provide a national, operational, polar-orbiting remote-sensing capability
- Achieve National Performance Review (NPR) savings by converging DoD and NOAA satellite programs
- Incorporate new technologies from NASA
- Encourage International Cooperation

Saves as Much as $1.3 Billion from the Cost of Previously Planned Separate Developments
SafetyNet – The Key to Low Data Latency and High Data Availability

SafetyNet -- 15 globally distributed SMD receptors linked to the centrals via commercial fiber – enables low data latency and high data availability
Command, Control, and Communications (C3) Segment Design

Low-cost, reliable, and timely data delivery with flexibility to accommodate system growth and technology insertion
Architecture Definitions

“The structure or structures of the system, which comprise software elements, the externally visible properties of those elements, and the relationships among them.”

“The fundamental organization of a system, embodied in its components, their relationships to each other and the environment, and the principles governing its design and evolution.”

“The set of significant decisions about the organization of a software system, the selection of the structural elements and their interfaces by which the system is composed, together with their behavior as specified in the collaborations among those elements, the composition of these structural and behavioral elements into progressively larger subsystems, and the architectural style that guides this organization—these elements and their interfaces, their collaborations, and their composition.”

“No Universal Definition of “Architecture”

“The structure of the components of a program / system, their interrelationships, and principles and guidelines governing their design and evolution over time.”
Architecture & Requirements

Architecture

Design

Implementation

Spectrum from Architecture to Implementation
Requirements Describe the Spectrum
Basis for Understandability

Different Views of the Architecture Enable Comprehension at the Appropriate Level of Detail
Architecture Alone Does Not Provide the Detail Needed to Assess Cost / Schedule Impacts
Basis for Assessing Executability

Summary

Architecture and Models Cannot Accurately Measure Performance / Reliability
Questions