Presentation Abstract

Presentation Title	Integration Analysis via Software Architecture Verification – a Multi-Dimensional Approach
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Presentation Abstract	With the advent of increasingly complex software architectures in NASA spacecraft, NASA IV&V engineers must grapple with validating and verifying software in systems of increasing size, complexity, and importance. NASA IV&V must assess space systems software architecture strengths, weaknesses, and potential risks. This presentation describes a standards-based approach in assessing distributed software architectures in hard-real-time, mission-critical, human-rated spaceflight systems – looking at software architecture rigor in dimensions such as: interface analysis, interface verification, end-to-end performance analysis, timing requirements, usability requirements, security requirements, suitability for mission, and testing and verification requirements. The presentation examines these dimensions for intended behavior, unacceptable behavior, adverse conditions, safety, integration, and dependability – looking at artifacts, analysis processes, and tool-driven approaches for analyzing each. The goal of this approach is to facilitate early detection of space system software anomalies and enhance insight into software product risk.