System of Systems Engineering Collaborators Information Exchange (SoSECIE)

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Analysis of the Results from Many Mission Thread Workshops

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Abstract
In this presentation, we discuss lessons learned from using mission thread workshops (MTW) as an early architecture development step for a number of DoD systems of systems (SoS). The approach is based on defining a number of critical warfare vignettes, then developing some associated end-to-end mission threads that stress the envisioned capabilities of the SoS, and finally, augmenting these threads with quality attribute and capability considerations elicited from the SoS and system stakeholders in a facilitated workshop. Each mission thread is comprised of a number of steps (typically 15 to 25), where each step describes an activity, and a number of engineering considerations and use cases are associated with each step. The MTW explores these threads with the stakeholders in a number of half-day or full-day sessions to determine gaps in the functional and non-functional capabilities (e.g., performance, availability, usability, security) at each step. Architectural challenges are then derived from the resulting augmented threads, and these can be used to drive follow-on efforts, such as building the DoDAF views and products.

The MTW is organized into three activities: preparation for the workshop, conducting the workshop and follow-on after the workshop. We will firstly present a quick outline the workshop to set the context. Next we will summarize the lessons learned in conducting each of these three activities mentioned above. Each MTW results in a set of challenges being developed during the follow-on activity. We have reviewed, analyzed, and organized the challenges from 46 of these mission threads and there was a surprisingly consistent overlap of the challenges developed, which are: usability/automation, capability gaps, resource management, training, migration of legacy systems, and collaboration. The presentation will describe each of these general challenges in detail.

Biography
Mr. Michael Gagliardi has over 25 years experience in real-time, mission critical software architecture and engineering activities on a variety of DoD systems. Mike is currently working in the SEI Research, Technology, and System Solutions Program on a Software Architecture Technology initiative involved in the development of architecture evaluation methods for System of Systems Architectures and System Architectures, based on the key principles from the SEI Architecture Trade-off Analysis Method (ATAM). While at the SEI, Mr. Gagliardi served as the Chief Engineer for Navy Programs in the Acquisition Support Program and was also a member of the Rate Monotonic Analysis (RMA) project. Prior to joining the SEI, Mike had been involved in the software design, development, and integration of real-time radar, sonar and command and control systems at General Electric Company.