

Live Virtual Constructive (LVC) Architecture Interoperability Assessment

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ABSTRACT

The Joint Mission Environment Testing Capability (JMETC), Joint National Training Capability (JNTC), and Joint Experimentation (JE) are major Modelling & Simulation (M&S) Community programs exploiting live, virtual and constructive environments. To mature this environment it is imperative that Live Virtual Constructive (LVC) technical interoperability be achieved. However, while capable in meeting the unique requirements for which they were designed, paradigms and architectures such as High Level Architecture (HLA), Test & Training Enabling Architecture (TENA), Distributed Interactive Simulation (DIS), and Aggregate Level Simulation Protocol (ALSP) are not inherently technically interoperable. At the present technical interoperability is achieved by using gateways and bridges (which themselves may not be interoperable), specifically engineered Federation Object Models, or embedded middleware solutions. These solutions to technical interoperability, however, can be prone to violating latency thresholds, significantly increased complexity, mis-translation of data, and can require large workarounds resulting in differences in protocols.

The resources required to develop these interoperable solutions coupled with the frequency these efforts are required has prompted the M&S User Communities to identify an implied or explicit gap in the area referred to as Simulation Interoperability. These applications span all forms of LVC M&S supported events which, may be composed of all or any subset of LVC capabilities (i.e., L, V, C, LV, LC, VC, LVC)

This paper will provide information for consideration for moving toward improved LVC interoperability based on initial findings and recommendations from the USA DoD sponsored and funded project that is exploring and assessing a number of alternatives supporting simulation interoperability (at the technical level), business models, and the evolution process of standards management across the Department

ABOUT THE AUTHORS

Warren Bizub is the Technical Management Division Chief of the Joint Training & Education Capability Group based out of Joint Warfighting Center, USJFCOM. After serving in the USAF he has been in the DoD training community for twenty years as a PE, PM, In-Service Engineering Supervisor, and Software Support Facility Manager. Before reporting to USJFCOM Mr. Bizub was the Science Advisor to the Commander, U. S. Naval Air Forces. He has a B.S. degree in Ocean Engineering, is a graduate of the Navy's Senior Executive Management Development Program, and a MIT fellow of Seminar XXI: Foreign Politics, International Affairs, and the National Interest.

Dannie Cutts is a Senior Computer Scientist supporting the USJFCOM Training Technology Group in Suffolk, VA. He has over 20 years experience in Modeling and Simulation (M&S) for NASA and the DoD and has been involved with the High Level Architecture (HLA) since 1995, serving on the Interface Specification and Time Management Working Groups. He has provided HLA Training, Cadre support for DMSO, and currently serves on the IEEE Drafting Group for the HLA IEEE 1516.1 standard. Mr. Cutts has supported numerous federation development efforts as well as projects bringing legacy and new simulations to HLA compliance. At USJFCOM he is involved in efforts to improve interoperability between Live Virtual and Constructive assets in support of Joint Training.