Fall Simulation Interoperability Workshop (2016 Fall SIW)

Orlando, Florida, USA
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MONDAY MORNING TUTORIALS

AN INTRODUCTION TO SISO (SISO 101)   pg. 1   FORUM WEST 1
Note: The is no fee for this tutorial session

TIME: 0800-1000
INSTRUCTOR: Mark McCall
PREREQUISITE: Interest in learning more about SISO and how to become involved in SISO activities.

This tutorial is hosted by the SISO Executive Director who explains SISO's processes and organizational makeup.

INTRODUCTION TO HIGH LEVEL ARCHITECTURE (HLA 101)   pg. 20   FORUM WEST 2
Note: A one-time fee of $75.00 allows you to attend any/all tutorials that are offered at this Workshop.

TIME: 0800-1000
INSTRUCTOR: Dr. Katherine L. Morse
PREREQUISITE: A general understanding of modeling and simulation.

The High-Level Architecture (HLA) is an international standard for simulation interoperability. It originated in the defense community, but is increasingly used in other domains. This tutorial provides an introduction to HLA and these IEEE Standards that specify HLA:
- IEEE Std 1516TM - 2010, IEEE Standard for Modeling and Simulation (M&S) High Level Architecture (HLA) – Framework and Rules
- IEEE Std 1516.1TM - 2010, IEEE Standard for Modeling and Simulation (M&S) High Level Architecture (HLA) – Federate Interface Specification
- IEEE Std 1516.3TM - 2010, IEEE Standard for Modeling and Simulation (M&S) High Level Architecture (HLA) –Object Model Template (OMT) Specification

This tutorial describes the requirements for interoperability, flexibility, composability and reuse, and how HLA meets those requirements. The principles and terminology of an HLA federation is given including some real world examples.

The tutorial will cover:
- The HLA Rules that federates and federations follow.
- The HLA Interface Specification that describes the services a simulation can use for data exchange, synchronization, and overall management.
- The HLA Object Model Template that is used for describing the data exchange between simulations.

Some practical information is given about current implementations, including commercial-off-the-shelf, government-off-the-shelf, and open source implementations. The continuous development of performance, robustness of the implementations as well as available tools is also described. Finally, some advice is given on how to get started with HLA, including the use of the related process standard:

IEEE Std 1730TM - 2010, IEEE Recommended Practice for Distributed Simulation Engineering and Execution Process (DSEEP)

AN INTRODUCTION TO THE SISO STANDARDS DEVELOPMENT PROCESS (SISO STANDARDS 101)   FORUM WEST 1
Note: The is no fee for this tutorial session   pg. 41

TIME: 1030-1200
INSTRUCTOR: Jeff Abbott
PREREQUISITE: Interest in learning more about SISO and how to become involved in SISO activities.

This tutorial session is hosted by leaders of the SISO Standards Activity Committee who explain how to become involved in the SISO standards development and support process.

DISTRIBUTED INTERACTIVE SIMULATION (DIS 101) pg. 65   BOARDROOM 3

Note: A one-time fee of $75.00 allows you to attend any/all tutorials that are offered at this Workshop.

TIME: 1030-1200
INSTRUCTOR: Mark McCall
PREREQUISITE: A general understanding of modeling and simulation. Minimum technical background needed. Familiarity with distributed real-time simulation of vehicles and weapon system platforms is helpful.

This tutorial provides an overview of:
•   IEEE Std 1278.1 TM - 2012, IEEE Standard for Distributed Interactive Simulation - Application Protocols.

The tutorial includes introductory background material describing what Distributed Interactive Simulation (DIS) is; explains why DIS is a viable standard for distributed simulation; and provides information for joining an active developers group. New features added in the 2012 version, including Directed Energy Weapons, Information Operations, and the general extensibility of Protocol Data Units (PDUs) will be discussed.

DISTRIBUTED SIMULATION ENGINEERING AND EXECUTION PROCESS (DSEEP 101) pg. 94   FORUM WEST 2

Note: A one-time fee of $75.00 allows you to attend any/all tutorials that are offered at this Workshop.

TIME: 1030-1200
INSTRUCTOR(S): Dr. Katherine L. Morse, Robert Lutz
PREREQUISITE: A general understanding of modeling and simulation.

This tutorial provides an overview of:
•   IEEE Std 1730TM - 2010, IEEE Recommended Practice for Distributed Simulation Engineering and Execution Process (DSEEP)

DSEEP defines the processes and procedures that should be followed by users of distributed simulations to develop and execute their simulations.

The DSEEP generalizes the Federation Development and Execution Process (FEDEP, IEEE 1516.3) to all distributed simulation environments and architectures, no longer focusing solely on the High Level Architecture (HLA).

This tutorial provides the top level steps and supporting activities for the entire process. It also introduces and illustrates the inputs, recommended tasks, and outcomes of the activities.

There will be a brief overview of the architecture-specific annexes for HLA, Distributed Interactive Simulation (DIS), and the Test and Training Enabling Architecture (TENA).

Attendees also will be introduced to:

•   IEEE Std 1730.1TM - 2013, IEEE Recommended Practice for Distributed Simulation Engineering and Execution Process Multi-Architecture Overlay (DMAO)
•   SISO-STD-012-2013, Standard for Federation Engineering Agreements Template

DMAO is the IEEE standard that extends the DSEEP to multi-architecture environments.

MONDAY MORNING TUTORIALS

VERIFICATION, VALIDATION & ACCREDITATION (VV&A 101) `pg. 111`   FORUM WEST 3

Note: A one-time fee of $75.00 allows you to attend any/all tutorials that are offered at this Workshop.

TIME: 0800-1000
INSTRUCTOR: Simone Youngblood
PREREQUISITE: A general understanding of modeling and simulation.

This tutorial provides an overview of the processes of Verification, Validation, and Accreditation, which are foundational elements that underlie assessments of M&S credibility. Information derived from the VV&A processes is used to shape the understanding of how and where an M&S should be used and under what the constraints.

While VV&A is founded on basic software engineering principles, implementation is often constrained by resources, whether these resources be time, money, personnel, or information. This tutorial will introduce M&S Users, M&S Developers, and VV&A Practitioners to the key concepts associated with VV&A planning and implementation, the impacts and the drivers, and basic documentation requirements

HIGH LEVEL ARCHITECTURE EVOLVED FOM MODULES (HLA 202)   `pg. 131`   FORUM WEST 3

Note: A one-time payment fee of $75.00 allows you to attend any/all tutorials that are offered at this Workshop.

TIME: 1030-1200
INSTRUCTOR: Björn Möller
PREREQUISITE: General knowledge about the purpose and principles of HLA corresponding to HLA 101. Some experience with HLA object model development is useful, but not required.

The High Level Architecture (HLA) is specified in these IEEE Standards:

- IEEE Std 1516TM - 2010, IEEE Standard for Modeling and Simulation (M&S) High Level Architecture (HLA) – Framework and Rules
- IEEE Std 1516.1TM - 2010, IEEE Standard for Modeling and Simulation (M&S) High Level Architecture (HLA) – Federate Interface Specification
- IEEE Std 1516.3TM - 2010, IEEE Standard for Modeling and Simulation (M&S) High Level Architecture (HLA) –Object Model Template (OMT) Specification

Also referred to as "HLA Evolved" by developers and users of HLA, the 2010 version introduces a new features that has attracted a lot of interest — Federation Object Model (FOM) modules. FOM modules facilitate modular specification and reuse of particular aspects of an HLA federation. One example is to put vehicles, weather, sensor, and federation management aspects in different modules. FOM modules can then be maintained and reused independently within and between federations and organizations.

This tutorial first provides a recap of FOMs and some best practices. It then describes the principles of FOM modules, how they are used in a federation, and how they are combined. Best practices of designing FOM modules are given. Special attention is given to the modular version of Real-time Platform Reference Federation Object Model (RPR FOM) 2.0, which is currently in the SISO ballot process. Other FOMs covered are the NATO Education and Training Network FOM and the Space FOM modules used in the Simulation Exploration Experience (previously known as SISO Smackdown). Finally, some practical advice on developing FOM modules is given and some tools are described and demonstrated.

1330-1500	Call to Order	**Paul Gustavson**, SISO Conference Committee Chair
	State of SISO	**Michael O'Connor**, SISO Executive Committee Chair
	Featured Speaker	**Ms. Philomena Zimmerman**, Deputy Director for Engineering Tools and Environments, Office of Deputy Assistant Secretary of Defense, Systems Engineering, US Department of Defense
	Sponsor Speaker	**Mr. Jesse Citizen**, Director, Defense Modeling and Simulation Coordination Office (DM&SCO)
	Admin Announcements	**Mark McCall**, SISO Executive Director

MONDAY PAPER PRESENTATIONS

JOINT SESSION   SALON 2

In cooperation with the Simulation Australasia organization, SISO is pleased to present the 2015 Body Of Knowledge Award paper from SimTecT 2015.

1530-1600	Improving Air Force Operator Performance Through Synthetic Mission Rehearsal	FLTLT Christopher Francis `pg. 166`

ACQUISITION LIFECYCLE AND TECHNOLOGY TRANSFER (ACQ) TRACK   SALON 2

The Acquisition Lifecycle and Technology Transfer (ACQ) Track focuses on the promotion and use of M&S standards and practices that support the acquisition lifecycle. We solicit papers that address the identification, application, and value-added benefits of M&S for analysis, research and development, test and evaluation, training, asset management, and system lifecycle strategies. Papers that demonstrate specific applications to specific systems and the benefits of M&S to those systems are preferred.

1600-1630	2016-SIW-038 – Lessons Learned from using DSEEP to Guide Exploratory Research and Prototyping	Eric Whittington `N/A`
1630-1700	2016-SIW-044 – The Fully Integrated Architectural & Visualization Suite IAC: Integrated Architecture Capability Tool	Johnny Lock `pg. 178`
1700	Wrap-up & Adjourn	Scott Johnston

M&S SPECIALTY TOPICS (SPEC) TRACK   NORTH 1

The M&S Specialty Topics Track is concerned with using simulation technologies for a specific purpose such as: system, vehicle, or weapon product development; space travel; understanding and prediction of human behavior; and design of interoperable command and control systems. Present thrust areas center on the application of M&S for Cyber Warfare, Space, and Future Training, but the forum is not limited to these topics. We solicit papers that address the use of Modeling and Simulation to these or other specific applications.

1600-1630	2016-SIW-030 – Towards a Persistent Capability For NATO MTDS	Arian Lemmers `pg. 190`
1630	Wrap-Up & Adjourn	Sara Meyer

SERVICES, PROCESSES, TOOLS AND DATA (SVCS) TRACK   SALON 3

The Services, Processes, Tools, and Data (SVCS) Track encompasses technologies, frameworks, and methodologies to provide services that support models, simulations, and associated data. The track is interested in both processes and their implementations/tools in areas of: distributed simulation process; verification, validation, and accreditation; communication infrastructure; and simulation and environment reuse. The SVCS track focuses on evolving a systems engineering solution to simulation problems across the spectrum from design, through implementation and deployment, to validation, use, and reuse.

1600-1630	2016-SIW-004 – Toward a New NATO Certification Capability for HLA Interoperability *2016 'SIWzie' Awarded paper*	Jóse Ruiz `pg. 203`
1630-1700	2016-SIW-040 – Are We Progressing? – Exploration of Next Generation Technology Applications to Modeling and Simulation Study Group Update	Christopher McGroarty `pg. 215`
1700	Wrap-Up & Adjourn	Randy Saunders

SISO SOCIAL MONDAY EVENING

1700-1900   **Salon 1**

Please join us for this informal gathering! Food and drink will be available. Renew acquaintances, plan your week, and meet members of the Executive Committee, Standards Activity Committee, Conference Committee, and Planning & Review Panels along with our authors/presenters at the conference. Also, take a look around at the products and technology on display in the exhibitor booths.

MONDAY EVENING TUTORIALS

NEW EXTENSIBILITY AND DEAD RECKONING FEATURES IN DIS VERSION 7 (DIS 201)   pg. 226   FORUM WEST 1

Note: A one-time fee of $75.00 allows you to attend any/all tutorials that are offered at this Workshop.

TIME: 1900-2100
INSTRUCTOR: Bob Murray
PREREQUISITE: Familiarity with basic DIS PDU usage. Knowledge of dead reckoning is helpful, but the tutorial will include an introduction to the concepts.

This tutorial provides an in-depth review of two Distributed Interactive Simulation (DIS) features:
• Protocol Data Unit (PDU) extensibility; and
• Dead reckoning

as specified in:
• IEEE Std 1278.1TM - 2012, IEEE Standard for Distributed Interactive Simulation - Application Protocols

Otherwise known as "DIS Version 7" by developers and users, IEEE Std 1278.1-TM-2012 contains many new features and improvements over the 1995 and 1998 versions.

PDU extensibility expands the ability of DIS users to add custom data to PDUs. Some PDUs allow user-defined records to be directly added. Other PDUs can be extended using the new Attribute PDU. Both methods retain compatibility with older versions of DIS. This allows customized PDUs to be added in new or upgraded simulations while maintaining interoperability to older simulations that cannot be modified.

Dead reckoning was enhanced in DIS Version 7 mainly in the extrapolation of entity orientation. A new geometric method of determining the orientation threshold is described using either quaternions or rotation matrices. This method avoids the problems of Euler angle singularities than can cause excessively high PDU transmit rates. Other new features speed up dead reckoning calculations in receiving simulations by adding extra information in the Entity State PDU. These new features maintain full backward and forward compatibility with DIS Versions 5 and 6.

AGILE AND M&S: MAXIMIZING THE EFFICIENCY OF YOUR M&S PROJECTS   N/A   FORUM WEST 2

Note: A one-time fee of $75.00 allows you to attend any/all tutorials that are offered at this Workshop.

TIME: 1900-2100
INSTRUCTOR: Paul Gustavson

Agile isn't just for software development, it's also well suited to support your needs as it relates to M&S. Discover how Agile can be used to support the three different bands of M&S: (1) Simulation Development, (2) Simulation Environment Development and Execution, and (3) Standards Development. The principles of Agile will help you move forward and be even more focused and relevant in supporting the needs of your users and in fostering innovation.

TUESDAY

0715-0800

The Newcomers' Orientation is designed for those who have not previously participated in a Simulation Interoperability Workshop (SIW). The session's goal is to help new participants gain maximum benefit from SIW and from their participation in the Simulation Interoperability Standards Organization (SISO). In this session, we describe the structure of the workshop, the overall organization of SISO, how SISO works, and how to participate in SISO.

PAPER PRESENTATIONS

SIWZIE PAPER FORUM   **SALON 2**

0800-0830   **2016-SIW-005 - <u>BOLD QUEST 2015: Lessons Learned from a France-U.S. Close Air Support Training Event Supported by Simulation</u>** pg. 246
Josè Ruiz, DGA/DS/CATOD, France
Lionel Khimèche, DGA/DS/CATOD, France
Lieutenant-colonel Philippe Zamoun, EMA/OIA/CPIC, France
Captain Pierre Lagrange, CFAA, France
Kevin Seavey, Joint Staff J6, USA
Emilie A. Reitz, Joint Staff J6, USA
Hervè Biran, AIRBUS D&S, France

0830-0900   **2016-SIW-017 - <u>A First Look at the Upcoming SISO Space Reference FOM</u>** pg. 258
Björn Möller, Pitch Technologies, Sweden
Dan Dexter, NASA Johnson Space Center, USA
Anton Skuratovskiy, RusBITech, Russia
Edwin J. Crues, NASA Johnson Space Center, USA
Alfredo Garro, University of Calabria, Italy
Alexander Vankov, RusBITech, Russia

0930-1000   **2016-SIW-011 - <u>Developing Service Discovery Metadata to Support Modeling and Simulation as a Service</u>** pg. 267
Katherine L. Morse, PhD, Johns Hopkins University Applied Physics Laboratory, USA
Michael Bertschik, PhD, German Armed Forces, Germany
Andy Bowers, General Dynamics Information Technology, USA
Marco Picollo, Finmecanica, Italy

HIGH LEVEL ARCHITECTURE PDG   FORUM WEST 1

0800-0945   Chair, Randy Sanders

The PDG is developing revisions of these IEEE Standards:
IEEE Std 1516™-2010, IEEE Standard for Modeling and Simulation High Level Architecture — Framework and Rules
- IEEE Std 1516.1™-2010, IEEE Standard for Modeling and Simulation High Level Architecture — Federate Interface Specification
- IEEE Std 1516.2™-2010, IEEE Standard for Modeling and Simulation High Level Architecture — Object Model Template Specification

SPACE FOM PDG   BOARDROOM 4

0800-0945   Chair, Björn Möller
1330-1500
1530-1700

The PDG is developing (1) a natural language, human readable overview, description and specification of the Space Reference FOM Federation Agreement; and (2) a set of computer-interpretable HLA 2010 FOM modules (XML) intended for consumption by HLA run-time infrastructure and other software tools.

TUESDAY GENERAL SESSION

1015-1200   Call to Order   **Paul Gustavson**,
                                              SISO Conference Committee Chair

                   Award Presentations   **Mark McCall**, SISO Executive Director

                   Keynote Speaker: **Dr Emmanuel Chiva**,
                                              Deputy CEO and Chief Strategy Officer,
                                              AGUERIS

                   International Focus Panel

ACQUISITION LIFECYCLE AND TECHNOLOGY TRANSFER (ACQ) TRACK   SALON 2

The Acquisition Lifecycle and Technology Transfer (ACQ) Track focuses on the promotion and use of M&S standards and practices that support the acquisition lifecycle. We solicit papers that address the identification, application, and value-added benefits of M&S for analysis, research and development, test and evaluation, training, asset management, and system lifecycle strategies. Papers that demonstrate specific applications to specific systems and the benefits of M&S to those systems are preferred.

1330-1400	2016-SIW-019 – Architecture for Multi-Domain Adaptive Training	Perakath Benjamin pg. 275
1400-1430	2016-SIW-047 – Development of a Synthetic Task Environment and Physiological Monitoring Suite to Evaluate Adaptive Feedback	Tim Rodabaugh pg. 289
1430-1500	2016-SIW-043 – Creating Systems to Actually Manage Learning: Creation of a Service Oriented Architecture	Winston Bennett, PhD pg. 302
1500-1530	Break	
1530-1600	2016-SIW-006 – The Need for Standards Using Human Patient Simulators: Challenges and Potential Solutions *2016 'SIWzie' Awarded paper*	Jon Diemunsch pg. 312
1600-1630	2016-SIW-022 – Driving Human Patient Simulators and Virtual Combat Casualty Characters using a High-Fidelity High-Speed Physiology Model Solver for Multi-Modal Mixed Reality Simulation	Phillip J. Curtiss, PhD pg. 319
1630-1700	2016-SIW-026 – 'Whether The Weather Be Fine or Whether The Weather Be Not' Representing High Fidelity Weather in M&S Applications	Simon Skinner pg. 327
1700	Wrap-up & Adjourn	Scott Johnston

M&S SPECIALTY TOPICS (SPEC) TRACK   NORTH 1

The M&S Specialty Topics Track is concerned with using simulation technologies for a specific purpose such as: system, vehicle, or weapon product development; space travel; understanding and prediction of human behavior; and design of interoperable command and control systems. Present thrust areas center on the application of M&S for Cyber Warfare, Space, and Future Training, but the forum is not limited to these topics. We solicit papers that address the use of Modeling and Simulation to these or other specific applications.

1330-1400	2016-SIW-013 – Application of Simulation Based-Approach in Allocation and Optimization of a Mid-Size Emergency Department Human Resources	Mohamed Elshal pg. 337
1400-1430	2016-SIW-029 – How to solve ODEs in real-time HLA distributed simulation	Martin Adelantado pg. 348
1430-1500	2016-SIW-027 – Cyber Tools and Standards to Improve Situational Awareness	Stella Croom-Johnson pg. 360
1500-1530	Break	
1530-1600	2016-SIW-028 – Modeling Cyber Threats	Carl Hein pg. 375
1600-1630	2016-SIW-035 – M&S of the Internet of Things and Cyber Physical Systems for Cybersecurity *2016 'SIWzie' Awarded paper*	Kurt Lessmann pg. 381
1630-1700	2016-SIW-050 – DOD Cyber Modeling and Simulation Technical Working Group: History and Future Work	Jerry Couretas, PhD N/A
1700	Wrap-up & Adjourn	Sara Meyer

TUESDAY PAPER PRESENTATIONS

SERVICES, PROCESSES, TOOLS AND DATA (SVCS) TRACK   SALON 3

The Services, Processes, Tools, and Data (SVCS) Track encompasses technologies, frameworks, and methodologies to provide services that support models, simulations, and associated data. The track is interested in both processes and their implementations/tools in areas of: distributed simulation process; verification, validation, and accreditation; communication infrastructure; and simulation and environment reuse. The SVCS track focuses on evolving a systems engineering solution to simulation problems across the spectrum from design, through implementation and deployment, to validation, use, and reuse.

Time	Title	Presenter
1330-1400	2016-SIW-032 – Towards a Reference Architecture for M&S as a Service	Tom van den Berg pg. 392
1400-1430	2016-SIW-033 - Common Web-Based Interface to a Live, Virtual, Constructive (LVC) Environment Using WebLVC	Yolanda Pettiford pg. 406
1430-1500	2016-SIW-025 – Common Image Generator Interface (CIGI) 5.0	Roland Humphries pg. 411
1500-1530	Break	
1530-1600	2016-SIW-031 – Guidelines and Best Practices for Using Docker in Support of HLA Federations	Tom van den Berg pg. 421
1600-1630	2016-SIW-023 – Modern C++ Programing for Simulation	Jordan Dauble pg. 438
1630-1700	2016-SIW-039 - A Parallel DEVS Approach for Cloud Simulation Standards	Rob Kewley pg. 450
1700	Wrap-up & Adjourn	Randy Saunders

GDACL PDG   BOARDROOM 3

1530-1700   Chair, Bob Lutz

The PDG conducted product ballots in 2015 for these products:
• SISO-STD-014-00-DRAFT, Standard for Gateway Description Language
• SISO-STD-014-01-DRAFT, Standard for Gateway Filtering Language

The product ballots were both valid and successful. The PDG is in the process of resolving comments with the balloters and documenting final comment resolutions. The next step is the preparation and processing of the Product Approval Package. Watch for new SISO Standards to be published in 2016. The family of products is used by both developers and users of Live, Virtual, and Constructive (LVC) environments during gateway selection and configuration. Each product reflects a different aspect of the overarching process of gateway selection and configuration.

PR/CR WORKING GROUP   FORUM WEST 1

1900-2000   Lance Marrou

The SAC Special Working Group Reference for Problem Report / Change Request (SAC SWG PR/CR) is developing a SISO Reference Product that describes a standardized general process that could be used / adapted for use by any SISO group or committee needing to track PR/CRs (e.g., Study Groups, Product Development Groups, Product Support Groups).

The SWG is also developing a template and instructions for a generalized PR/CR form. The SWG will maintain, support, and update the process and form as needed, and especially as feedback from users is received. The SWG will also recommend corresponding updates to SISO Administrative Products impacted by implementing a common PR/CR process and common PR/CR form.

ENUMERATIONS WORKING GROUP   FORUM WEST 2

2000-2100   Lance Marrou

The Enumerations Working Group (EWG) publishes, maintains, and updates
SISO-REF-010: Enumerations for Simulation Interoperability. SISO-REF-010 is an important resource for the entire simulation community, and we welcome all SISO members interested in enumerations usage for any standard or guidance products.

WEDNESDAY PAPER PRESENTATIONS

ACQUISITION LIFECYCLE AND TECHNOLOGY TRANSFER (ACQ) TRACK · SALON 2

The Acquisition Lifecycle and Technology Transfer (ACQ) Track focuses on the promotion and use of M&S standards and practices that support the acquisition lifecycle. We solicit papers that address the identification, application, and value-added benefits of M&S for analysis, research and development, test and evaluation, training, asset management, and system lifecycle strategies. Papers that demonstrate specific applications to specific systems and the benefits of M&S to those systems are preferred.

0800-0830	2016-SIW-021 – Realizing a Collaborative M&S Environment for System Acquisition from Five Key Components	James Coolahan, PhD pg. 460
0830-0900	2016-SIW-034 – Advanced Technologies to Enable Simulation of Life-Cycle Sustainment of Weapon Systems	CAPT Lynn Petersen pg. 473
0900-0930	2016-SIW-036 – Harness Your Inner (Modeling & Simulation) Jedi Knight {By Leveraging the Wisdom of Community Jedi Masters and Improve the Force Through the Use of Appropriate Standards Over the Acquisition Life Cycle	Kenneth 'Crash' Konwin pg. 486
0930	AdjournScott Johnston	
0945-1015	Break	

M&S SPECIALTY TOPICS (SPEC) TRACK · NORTH 1

The M&S Specialty Topics Track is concerned with using simulation technologies for a specific purpose such as: system, vehicle, or weapon product development; space travel; understanding and prediction of human behavior; and design of interoperable command and control systems. Present thrust areas center on the application of M&S for Cyber Warfare, Space, and Future Training, but the forum is not limited to these topics. We solicit papers that address the use of Modeling and Simulation to these or other specific applications.

0800-0830	2016-SIW-009 – C2SIM Logical Data Model Development: Scope, Challenges, and Future	J. Mark Pullen, Ph.D pg. 492
0830-0900	2016-SIW-007 – BML Communication Enables a Multi-Robot System Supporting an Infantry Platoon	Thomas Remmersmann pg. 501
0900-0930	2016-SIW-002 – Standards for Unmanned System Interoperability	Curtis L. Blais pg. 510
0945-1015	Break	

SERVICES, PROCESSES, TOOLS AND DATA (SVCS) TRACK · SALON 3

The Services, Processes, Tools, and Data (SVCS) Track encompasses technologies, frameworks, and methodologies to provide services that support models, simulations, and associated data. The track is interested in both processes and their implementations/tools in areas of: distributed simulation process; verification, validation, and accreditation; communication infrastructure; and simulation and environment reuse. The SVCS track focuses on evolving a systems engineering solution to simulation problems across the spectrum from design, through implementation and deployment, to validation, use, and reuse.

| 0800-0945 | No Papers Scheduled | |
| 0945-1015 | Break | |

HIGH LEVEL ARCHITECTURE (HLA) PDG   FORUM WEST 1

0800-0945   Discussion   Randy Saunders

High Level Architecture (HLA) PDG - On 5 February 2016, the IEEE Standards Association Standards Board approved three Project Authorization Requests for the revision of these IEEE 1516TM Standards:

- IEEE Std 1516™-2010, IEEE Standard for Modeling and Simulation High Level Architecture — Framework and Rules
- IEEE Std 1516.1™-2010, IEEE Standard for Modeling and Simulation High Level Architecture — Federate Interface Specification
- IEEE Std 1516.2™-2010, IEEE Standard for Modeling and Simulation High Level Architecture — Object Model Template Specification

REUSE AND INTEROPERATION OF ENVIRONMENTAL DATA & PROCESSES (REIDP) PDG   FORUM WEST 2

0800-0945   Discussion   Jean-Louis Gougeat

The PDG is developing products to harmonize environmental data representations and generation processes at a level after the source data stage, but before the run-time/proprietary stage, recognizing that there is a broad range within this band. This will be achieved by retaining the data form (or format) as close to the source data as possible in order to benefit from GIS tools; while at the same time keeping the internal data consistency (intrinsic correlation factor); and not introducing specific target application constraints at this level that should be addressed separately by each target application during run-time.

TACTICAL DIGITAL INFORMATION LINK - TECHNICAL
ADVICE AND LEXICON FOR ENABLING SIMULATION (TADIL TALES) PSG   FORUM WEST 3

0800-0945   Discussion   Joe Sorroche

The PSG supports this SISO Standards Product:
- SISO-STD-002-2006, Standard for Link 16 Simulations

VERIFICATION, VALIDATION & ACCREDITATION/ACCEPTANCE PRODUCTS (VV&A PRODUCTS) PSG   BOARDROOM 4

0800-0945   Discussion   Simone Youngblood
1500-1700   Discussion

The PSG supports these products:
- IEEE Std 1516.4™-2007, IEEE Recommended Practice for VV&A of a Federation — An Overlay to the High Level Architecture Federation Development and Execution Process
- SISO-GUIDE-001.1-2012, Guide for Generic Methodology for Verification and Validation (GM-VV) to Support Acceptance of Models, Simulations, and Data, GM-VV Volume 1: Introduction and Overview
- SISO-GUIDE-001.2-2013, Guide for Generic Methodology for Verification and Validation (GM-VV) to Support Acceptance of Models, Simulations, and Data, GM-VV Volume 2: Implementation Guide
- SISO-REF-2013, Reference for Generic Methodology for Verification and Validation (GM-VV) to Support Acceptance of Models, Simulations, and Data, GM-VV Vol. 3: Reference Manual

WEDNESDAY WORKING SESSIONS

COMMAND AND CONTROL SYSTEMS - SIMULATION SYSTEMS INTEROPERATION PDG/PSG   **FORUM EAST 4**

0800-0945   Discussion   J. Mark Pullen

The Command and Control Systems - Simulation Systems Interoperation (C2SIM) PDG and Product Support Group (PSG) together form one lifecycle product group empowered over the product lifecycle to develop and support products. The functions of the PDG and PSG are distinct, but memberships are common, and administrative reporting will be as one group to consolidate administrative overhead. In addition to new products under development, the PSG supports these two SISO Standards Products:
- SISO-STD-007-2008, Standard for Military Scenario Definition Language
- SISO-STD-011-2014, Standard for Coalition Battle Management Language (C-BML) Phase 1

SIMULATION INNOVATION: FUTURE TECHNOLOGIES   **SALON 2**

1015-1200	Call to Order	**Paul Gustavson**
		SISO Conference Committee Chair
	Keynote Speaker	**Christopher Stapleton**
		Founder & Head Creative Venture Catalyst
		Simiosys
	Panel Discussion - Future Technologies	

WEDNESDAY PAPER PRESENTATIONS

M&S SPECIALTY TOPICS (SPEC) TRACK   NORTH 1

The M&S Specialty Topics Track is concerned with using simulation technologies for a specific purpose such as: system, vehicle, or weapon product development; space travel; understanding and prediction of human behavior; and design of interoperable command and control systems. Present thrust areas center on the application of M&S for Cyber Warfare, Space, and Future Training, but the forum is not limited to these topics. We solicit papers that address the use of Modeling and Simulation to these or other specific applications.

1330-1400	2016-SIW-041 – How Standards Support Joint Mission Planning Using United Kingdom C2SIM Testbed	Bharat Patel pg. 523
1400-1430	2016-SIW-042 – Evolving Standards for Tactical Data Link Aware Simulators	Patrik Svensson pg. 533
1430	Wrap-up & Adjourn	Sara Meyer

SERVICES, PROCESSES, TOOLS & DATA (SVCS) TRACK   SALON 3

The Services, Processes, Tools, and Data (SVCS) Track encompasses technologies, frameworks, and methodologies to provide services that support models, simulations, and associated data. The track is interested in both processes and their implementations/tools in areas of: distributed simulation process; verification, validation, and accreditation; communication infrastructure; and simulation and environment reuse. The SVCS track focuses on evolving a systems engineering solution to simulation problems across the spectrum from design, through implementation and deployment, to validation, use, and reuse.

1330-1400	2016-SIW-016 – Establishing a Standard for Sensor Materials	Ronald Moore pg. 545
1400-1430	2016-SIW-001 – A Disruptive Approach for Scenario Generation: An Agile Reuse Bridging the Gap Between Operational and Executable Scenario	Lionel Khimeche Jean-Paul Mochet pg. 561
1430-1500	2016-SIW-003 – Building Scalable Distributed Simulations: Design Patterns for HLA DDM	Björn Möller pg. 574
1500	Wrap-up & Adjourn	Randy Saunders

ADDITIONAL PAPER

HUMAN PERFORMANCE MARKUP LANGUAGE (HPML) PDG   FORUM WEST 3

1330-1500   Courtney Dean

The PDG is developing a SISO Standards Product for Human Performance Modeling Language. HPML is an XML schema-based language intended to cover all meaningful aspects of human performance measurement in various training and operational environments. The PDG is also developing the supplementary SISO Product Data Files.

High level architecture PDG Drafting Group   FORUM WEST 1

1330-1500   Randy Saunders
1530-1700
1900-2100

High Level Architecture (HLA) PDG - On 5 February 2016, the IEEE Standards Association Standards Board approved three Project Authorization Requests for the revision of these IEEE 1516TM Standards:

- IEEE Std 1516™-2010, IEEE Standard for Modeling and Simulation High Level Architecture — Framework and Rules
- IEEE Std 1516.1™-2010, IEEE Standard for Modeling and Simulation High Level Architecture — Federate Interface Specification
- IEEE Std 1516.2™-2010, IEEE Standard for Modeling and Simulation High Level Architecture — Object Model Template Specification

The Drafting Group will be developing resolutions to comments provided to the HLA Evolved PSG.

LINK 11 A/B Network Simulation Standard   FORUM WEST 3

1530-1700   Joe Sorroche

The PDG is developing a standard for existing military simulations to exchange Link-11 A / B data using a single interoperable standard.

Simulation Reference Markup Language PDG   BOARDROOM 3

1530-1700   Bob Lutz

The PDG is developing a family of products based on the Simulation Reference Markup Language. The PDG will be conducting product ballots in 2016 for these products:
- SISO-STD-009-00-DRAFT, Standard for Simulation Reference Markup Language
- SISO-STD-009-01-DRAFT, Standard for Simulation Reference Markup Language Engine Specification – Level 0
- SISO-GUIDE-009-DRAFT, Guide for Simulation Reference Markup Language – Primary Features

INTEROPERABILITY BETWEEN WEB-BASED FEDERATES AND LVC FEDERATIONS (web lvc) sg   FORUM EAST 4

1530-1700   Len Granowetter

This PDG is developing the a standard for a WebLVC protocol. The WebLVC protocol defines a standard way of passing simulation data between a web-based client application and a WebLVC server, which can participate in a federation on behalf of one or more web-based federates. WebLVC messages are encoded as JSON (JavaScript Object Notation) objects, passed via WebSockets. WebLVC is flexible enough to support representation of arbitrary types of objects and interactions (i.e. arbitrary Object Models). However, WebLVC does include a "Standard Object Model" definition based on the semantics of the DIS protocol, HLA's RPR FOM, and SISO Enumerations.

WEDNESDAY WORKING SESSIONS

XML NAMING DESIGN AND BEST PRACTICES (XML NDBP) SPECIAL WORKING GROUP   FORUM WEST 2

1530-1700   Jeffery Abbott

The SAC has been working on a reference product for several years. The meeting will review where they are on the product and plan the next steps for policy recommendations on how to document XML schemas in SISO products

OPERATION BLENDED WARRIOR PLANNING   SALON 1

0800-0945   Discussion
1330-1500   Discussion
1530-1700   Discussion

Operation Blended Warrior (OBW) is a cooperative LVC event conducted at the Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC), 28 Nov – 2 Dec 2016, in the West Concourse of the Orange County Convention Center in Orlando, Florida. SISO is working with the OBW organizers by providing a planning session during SIW.

DISTRIBUTED DEBRIEF CONTROL ARCHITECTURE (RPR FOM) PDG   SALON 3

0800-0945   Discussion   Mike France

The PDG conducted a 45-day ballot that ended on 4 Dec 2015 for this product:
•   SISO-STD-015-DRAFT, Standard for Distributed Debrief Control Architecture

The product ballot was both valid and successful. The PDG is in the process of resolving comments with the balloters and documenting final comment resolutions. The next step is the preparation and processing of the Product Approval Package. Watch for a new SISO Standard to be published in 2016 comprising an object model that defines messages, states, and behaviors.

A STANDARDS PROFILE FOR M&S ACTIVITIES IN SUPPORT OF ACQUISITION ACTIVITIES (ACQM&S) PDG NORTH 1

0800-0945   Crash Konwin
1330-1500

Starting 9 Dec 2015, the PDG initiated a 270-day trial use period for two draft products. Users were asked to use the products and to share comments and suggestions about the products. To contribute, visit the PDG webpage, scroll to the bottom, and use the Comment Tracking System to provide inputs on these two draft SISO Products:
•   SISO-GUIDE-005-DRAFT, Trial Use Guide for A Standards Profile for the Use of M&S in Support of Acquisition Activities, Volume 1
•   SISO-REF-066-DRAFT, Trial Use Reference for A Standards Profile for the Use of M&S in Support of Acquisition Activities, Volume 2

COMMON IMAGE GENERATOR INTERFACE (CIGI) PSG   FORUM WEST 1

0800-0945   Discussion   Simon Skinner

The PSG provides support for this SISO Standards Product:
•   SISO-STD-013-2014, Standard for Common Image Generator Interface (CIGI), Version 4.0.

EPLRS/SADL PDG   FORUM WEST 2

0800-0945   Discussion   Joe Sorrche

The PDG is developing a standard that defines the methods to simulate an EPLRS/SADL Network within a Distributed Interactive Simulation (DIS) or High Level Architecture (HLA) framework.

THURSDAY WORKING SESSIONS

COMMAND AND CONTROL SYSTEMS – SIMULATION SYSTEMS INTEROPERATION PDG/PSG   FORUM EAST 4

0700-0945   Discussion   J. Mark Pullen
1330-1500

The Command and Control Systems - Simulation Systems Interoperation (C2SIM) PDG and Product Support Group (PSG) together form one lifecycle product group empowered over the product lifecycle to develop and support products. The functions of the PDG and PSG are distinct, but memberships are common, and administrative reporting will be as one group to consolidate administrative overhead. In addition to new products under development, the PSG supports these two SISO Standards Products:
- SISO-STD-007-2008, Standard for Military Scenario Definition Language
- SISO-STD-011-2014, Standard for Coalition Battle Management Language (C-BML) Phase 1

SPACE REFERENCE FEDERATION OBJECT MODEL PDG   BOARDROOM 3

0800-0945   Discussion   Björn Möller
1330-1500   Discussion
1530-1700   Discussion

The PDG is developing (1) a natural language, human readable overview, description and specification of the Space Reference FOM Federation Agreement; and (2) a set of computer-interpretable HLA 2010 FOM modules (XML) intended for consumption by HLA run-time infrastructure and other software tools.

VERIFICATION, VALIDATION & ACCREDITATION/ ACCEPTANCE PRODUCTS (VV&A PRODUCTS) PSG   BOARDROOM 4

0800-0945   Discussion   Simone Youngblood

The PSG supports these products:
- IEEE Std 1516.4™-2007, IEEE Recommended Practice for VV&A of a Federation — An Overlay to the High Level Architecture Federation Development and Execution Process
- SISO-GUIDE-001.1-2012, Guide for Generic Methodology for Verification and Validation (GM-VV) to Support Acceptance of Models, Simulations, and Data, GM-VV Volume 1: Introduction and Overview
- SISO-GUIDE-001.2-2013, Guide for Generic Methodology for Verification and Validation (GM-VV) to Support Acceptance of Models, Simulations, and Data, GM-VV Volume 2: Implementation Guide
- SISO-REF-2013, Reference for Generic Methodology for Verification and Validation (GM-VV) to Support Acceptance of Models, Simulations, and Data, GM-VV Vol. 3: Reference Manual

DSEEP/DMAO PSG   FORUM EAST 4

0800-0945   Bob Lutz

The PSG supports these SISO-sponsored IEEE Standards:
- IEEE Std 1730™-2010, IEEE Recommended Practice for Distributed Simulation Engineering and Execution Process (DSEEP) (Revision of IEEE Std 1516.3™-2003)
- IEEE Std 1730.1™-2013, IEEE Recommended Practice for Distributed Simulation Engineering and Execution Process Multi-Architecture Overlay (DMAO)

OPERATION BLENDED WARRIOR   **SALON 2**

1015-1200   Call to Order   **Paul Gustavson**
                                              SISO Conference Committee Chair

                   Keynote Speakers   **Kent Gritton**
                                              Director, Joint Training Integration
                                              and Evaluation Center

                                              Mike Genetti
                                              Principal Business Development Manager,
                                              Rockwell Collins

                   OBW Panel Discussion

THURSDAY WORKING SESSIONS

EXPLORATION OF NEXT GENERATION TECHNOLOGY APPLICATIONS TO MODELING AND SIMULATION   SALON 3

1330-1700   Chris McGroarty

This group is executing these group-specific tasks.
- Capture and decompose common M&S program goals including account for non-functional requirements such as security, performance, risk, cost, and long term sustainability.
- Explore the latest industry technology trends and available solutions, specifically focused on their applicability to the M&S domain. Examples include wearable technology, streaming, advanced hardware, cloud services, and data sharing applications.
- Account for security requirements and what the application each technology will need to consider.
- Consider other architecture quality requirements and management requirements such as risk, cost, and long term sustainability, among others.
- Assist the M&S domain in staying informed of recent technology advancements and to understand their impacts to our current and future implementations.

DISTRIBUTED INTERACTIVE SIMULATION/REAL TIME PLATFORM REFERENCE FOM (DIS/RPR FOM) PSG   FORUM WEST 1

1330 - 1700   Discussion   Mark McCall

Distributed Interactive Simulation (DIS) PSG - In 2012, the DIS PDG published:
- IEEE Std 1278.1™-2012, IEEE Standard for Distributed Interactive Simulation - Application Protocols (a revision of IEEE Std 1278.1™-1995 and IEEE Std 1278.1a™-1998)

In 2015, the RPR FOM 2 PDG published:
- SISO-STD-001-2015, Standard for Guidance, Rationale, and Interoperability Models (GRIM) for the Real-time Platform Reference Federation Object Model (RPR FOM) Version 2.0
- SISO-STD-001.1-2015, Standard for Real-time Platform Reference Federation Object Model (RPR FOM) Version 2.0

On 14 Dec 2015, the EXCOM approved the formation of a new PSG from the DIS PSG that would incorporate responsibilities both DIS and RPR FOM products.

GUIDELINE ON SCENARIO DEVELOPMENT (GSD) PDG   FORUM WEST 2

1330-1700   Stefan Vrieler

The PDG is developing a SISO Guidance Product for "Guideline on Scenario Development for Distributed Simulation Environments."

FEDERATION ENGINEERING AGREEMENTS TEMPLATE (FEAT) PSG   BOARDROOM 4

1330-1500   Katherine L. Morse

The Federation Engineering Agreements Template (FEAT) benefits all developers, managers, and users of distributed simulations by providing an unambiguous format for recording agreements about the design and use of the distributed simulation. The FEAT also benefits this community by enabling the development of federation engineering tools that can read the XML schema and perform federation engineering tasks automatically.

The FEAT Product Support Group (PSG) supports the FEAT schema and associated reference products such as examples of application of the schema. The FEAT PSG supports the distributed simulation community by acting as a forum and library for FEAT-related information; providing technical support to users and developers by answering questions; and providing contact information for experts in different areas.

The FEAT PSG will be reviewing the status of an exemplar under development based on the Pitch HLA Tutorial and discussing comments submitted against the first version of the standard.