...information for the Defense modeling and simulation community...

DMSO NEWS

Volume 4 Number 1 Spring 1999

INSIDE ...

New NATO Simulation Policy Group holds 1st meeting -- 16

Army moves out SMARTly with SBA -- 3

Director's Corner
(final in a series of three articles on the elements of success)
"Pragmatism" -- third element of success -- 2

M&S Education
M&S education opportunities expand -- 4
MSSOC schedule for 1999 -- 4

Defense Simulation Internet
DSI ready to support M&S into 21st Century -- 5

HLA
HLA University Outreach Program -- 6
HLA tools suite nears completion -- 7
FEPW eases federate manager's job -- 7
JTLS-NATO C2 demo uses HLA tools -- 16

Data Engineering
CMMS Toolset provides immediate support -- 8
CMMS-RT, Eurisko keys to architecture -- 9
KAT provides practical capability for JSIMS -- 10

Environment
SEDRIS success due to open interaction -- 12
Terrain MSEA, TMPO undergo changes -- 13
MEL reaches milestone with v2.0 release -- 14
IOR to offer increased fidelity in March -- 15

Winners will be announced in May

86 nominated for new DMSO M&S awards

By Sherrel Mock and Jeff Guild
DMSO Staff

The two-month nomination period for the first Defense Modeling and Simulation Office (DMSO)-sponsored Modeling and Simulation (M&S) Awards closed on Feb. 28 with 86 nominations received. Winners will be announced in May.

The awards are intended to recognize both government and non-government achievement during Fiscal Year 1998 in support of Department of Defense (DoD) M&S objectives. They will be presented during the eighth annual DMSO Industry Days, June 1-4.

The new DMSO program will recognize the achievements of eight individuals or teams — one government and one non-government award in each of four categories. The first three categories consist of the M&S functional areas — training, analysis and acquisition. The fourth category, a cross-functional area, considers those broader efforts that impact all aspects of the overall DoD M&S effort. Individuals and organizations were encouraged to nominate other individuals or groups, or themselves.

The criteria for each of the awards were derived from the charters and other defining documents of the three M&S functional area councils and the M&S Working Group (MSWG), all subordinate organizations of the DoD's Executive Council for M&S (EXCIMS).

Nominations in the functional areas will be reviewed by awards boards established by the corresponding functional area councils of the EXCIMS. A select subcommittee of the MSWG will review nominations in the cross-functional area. To ensure an equitable representation in the non-government sector, selected members of the National Defense Industrial Association's M&S Industry Steering Group will participate in the selection process. Finally, the EXCIMS, chaired by, Dr. Delores M. Etter, Deputy Under Secretary of Defense for Science and Technology, will review the various groups' recommendations for approval of the awards.

> ***The awards ... recognize both government and non-government achievement during FY98 in support of DoD M&S objectives. They will be presented during the eighth annual DMSO Industry Days, June 1-4 ...***

For additional information visit *http://www.dmso.mil/dmso/projects/award/*, or contact Jeff Guild, DMSO Operations Division, at (703) 824-3442 or *jguild@msis.dmso.mil*.

DMSO Industry days slated for June 1-4

The eighth annual Defense Modeling and Simulation Office (DMSO) Industry Days will be held June 1-4, at the Sheraton Premiere at Tysons Corner, 8661 Leesburg Pike, Vienna, Virginia.

The program will present the latest modeling and simulation (M&S) trends and developments in the DoD and industry.

Activities are intended for industry and government/military executives, strategic planners, program managers and senior technical managers.

The event is sponsored by the DMSO, the National Training Systems Association (NTSA), and the M&S Industry Steering Group of the National Defense Industrial Association.

For conference registration information, contact Barbara McDaniel, NTSA, (703) 247-2569, fax (703) 243-1659, or e-mail *bmcdaniel@ndia.org*. Refer to Event 91H.

Conference registration will be available online beginning in April at *http://www.ndia.org/Events.htm*.

Photo by Steve Wilson

Director's Corner

Col Crash Konwin, USAF

"Pragmatism – the third of the three important elements of success"

This column ends my series of articles on elements of success by encouraging that a philosophy of *pragmatism* be employed as we collectively take on the responsibility of harnessing the power of modeling and simulation in support of the needs of the diverse Department of Defense communities.

The half-life of current technical knowledge in the information age has dramatically shortened and has naturally affected even one of the most conservative of American institutions — bottom-line driven business. If you read the thoughts expressed by the "visionaries of the digital world" (*In the Company of Giants* by Jager and Ortiz), you can gain insights into the importance that these leaders place on the key attributes of successful enterprises in today's world. These giants identify the essentiality of hiring and retaining dedicated, competent and passionate people who work in high-performing, action-oriented teams.

The first two columns in this series — *People* and *Partnerships* — acknowledged these key elements of success. But, given that proper attention is paid to those critical enablers, what else can we stress to increase our probability of mission success. If you believe Andy Grove, CEO of Intel — that "we live in a world in which the only constant is change" — how does one plan and progress in a sensible manner?

From a business perspective, when the future can't be predicted with any precision, you value robust strategies. Implementation of these strategies involves the development and sustainment of a solid foundation that exhibits adaptability and agility while achieving incremental, yet measurable progress toward the overall vision. From a philosophic perspective, I would say that this approach exhibits the characteristics of pragmatism.

" ... strive to be pragmatic — productively action-oriented. Together we can move mountains through purposeful actions, even though it may only be a shovel at a time!"

What is pragmatism anyway? If you search the web, you'll find it described as "the doctrine that truth consists of the verification of a prediction and that the value of any proposition or principle is determined by its observable results. Hence, truth is not absolute but statistical. The policy or practice of valuing opportunities and political action according to near-term results that can be reasonably predicted from known costs and market conditions, in disregard of moral principles or long-term consequences."

See DIRECTOR'S CORNER, p. 3

DMSO NEWS

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Army's acquisition, M&S communities team up at SMART Conference to move out on SBA

By Major John S. Mikos, U.S. Army
Army Model and Simulation Office

The U.S. Army is moving out in its implementation of Simulation Based Acquisition (SBA)! The Service recently held its second annual SBA conference in San Antonio, Texas, Jan. 26-29.

Over 400 participants were on hand to hear host LTG Paul Kern, Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology, call for the Army to strive towards "The Big Idea" — an approach to acquisition that proposes a different process for integrating requirements, training and acquisition activities.

That approach can be summed up in the theme of this year's conference: SMART — Simulation and Modeling for Acquisition, Requirements and Training. SMART is the Army's initiative for focusing the efforts of its three modeling and simulation (M&S) domains on improving the materiel development process and implementing the goals of SBA.

The SMART gathering constituted a unique opportunity for combat developers, materiel developers, trainers, testers, analysts, industry and the M&S community to meet in a common forum for the purpose of disseminating information, exchanging views and developing an actionable set of recommendations for senior Army leadership.

See ARMY SMART CONFERENCE, p. 5

Army's top acquisition general to co-chair Service's top M&S council

LTG Paul Kern, Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics and Technology, has been named as a third co-chair of the Army's Model and Simulation Executive Council.

LTG Kern joins LTG Thomas Burnette, the Army's Deputy Chief of Staff for Operations and Plans, and Mr. Walter Hollis, the Deputy Under Secretary of the Army for Operations Research, as the senior leadership of the Army's modeling and simulation policy-making council.

Director's Corner

Continued from p. 2

From my perspective, a pragmatic approach appreciates the uncertainty inherent in predicting the future with any precision — both from technology availability and user needs basis. During a recent Miltary Operations Research Society (MORS) SIMTECH 2007 workshop, the membership struggled with this problem. Their report is now available and is worth reading for an indication of what the modeling and simulation (M&S) community feels is likely technically, and needed practically, in the next 10 years. Our community challenge is how to examine these anticipated needs and accept responsibility for constructing a program that assigns responsibility and applies resources to the greatest needs with highest probability for success. Actionable, near-term recommendations will likely be the lasting legacy of the SIMTECH 2007 Workshop participants.

We need to examine our M&S technical development and implementation strategies so that they stand up to the common sense test of senior leadership. George S. Patton said, "A good plan executed now is better than a perfect plan next week." We must carefully construct strategies that affordably exploit the power already available within today's M&S technology, while developing and deploying a solid foundation at the DoD Enterprise level for the future.

As one prone to analogies, I offer the following — during your recent air travels you may have noticed an orange or white wind sock at the end of the runway as the airplane taxied into position for takeoff. This wind sock is intended to give the pilot an indication of the relative direction and approximate speed of the wind to help anticipate flight dynamics in the takeoff or landing phase — it is not precise, but is useful and influences near-term pilot actions. It's not very expensive to deploy or maintain, but it is an elegant solution for the information it provides, and you can count on it every time.

The bottom line: the notion that waiting longer to act will provide significantly better M&S strategies, plans or solutions must be recognized as a potential illusion with inherent risk. I encourage you to continually strive to be pragmatic — productively action-oriented. Together we can move mountains through purposeful actions, even though it may only be a shovel at a time!

Cheers,
Crash

Professional Postscript — **CAPT Stanley "Steamer" O'Connor, USN**, Deputy Director of DMSO, has recently been reassigned on very short notice to meet the urgent readiness needs of the Navy. All of us will miss his contribution to the DMSO and the greater M&S community. We know that the Theodore Roosevelt Carrier Battle Group will be well served by this outstanding professional officer and aviator. We wish him God speed in his new assignment. His replacement will be named shortly.

M&S Education Web site debuts

M&S education opportunities expand

By Tom Stanford DMSO
M&S Education Project Lead

A new DoD resource for modeling and simulation (M&S) education information and materials debuted on the World Wide Web in February.

The Defense Modeling and Simulation Office (DMSO), responding to the education needs of the M&S community, further expanded its M&S education opportunities via a new M&S Education Web site at *http://www.education.dmso.mil/*. The site includes all major DMSO-sponsored M&S Education course offerings and descriptions. To facilitate and increase dissemination, cooperation and reuse throughout the M&S community, the M&S Education Web site includes a threaded discussion area for sharing ideas. An M&S course alumni listing is posted to encourage networking. Links to other DMSO education opportunities are posted as well.

Meanwhile, the newest M&S Education course has been developed with the senior level DoD executive (General/Admiral/SES) in mind. Currently being tested throughout the M&S community, the M&S **Executive Level Orientation (ELO)** will provide a high-level overview of DoD M&S policies, organizations, programs and issues. The objective is to enhance the senior executive's ability to make more informed decisions concerning issues related to M&S. The orientation, designed for one hour, can be tailored to last between 30 minutes to 90 minutes to insure the information provided is appropriate for the executive's desired time and area(s) of interest.

To better meet the M&S needs of the Acquisition Community, a one-day **Program Management Office (PMO) M&S Workshop** is being developed to assist program managers in integrating M&S into their programs' acquisition process. It uses lecture, class discussion, case analysis and practical exercises to address key concepts and how, where and when to best use M&S in the acquisition process. Integrated Product and Process Development (IPPD) methodology is used to guide case analysis and practical exercises to enhance learning and team building in a program office environment. Alpha testing is planned for March.

Another major new M&S Education Project course — the **MS 101 Tutorial** — was developed to better disseminate the DoD M&S story and information in other forums and to additional target audiences. This four-hour tutorial is designed for large audience delivery — ideally at conferences, seminars, and symposiums. MS 101 presents the major topics included in the five-day Modeling and Simulation Staff Officer Course (MSSOC) in a compressed format. Basic M&S information is presented in a fast paced, one-way information flow format. Future presentations are scheduled at the U.S. Special Operations Command at MacDill AFB, Fla., and the Korea Battle Simulation Center in Seoul, Korea.

The **MSSOC,** the very first M&S Education Project offering, continues to maintain attendance levels and gain M&S community approval. Providing M&S information to newly assigned staff officers with little or no M&S experience, it offers a broad familiarization of M&S policies, organizations, programs, activities, issues and key players. MSSOC participants include representatives from across the M&S functional areas of Training, Acquisition and Analysis; the DoD and Joint staffs; all Services, industry, academia and allies.

(See the box below for the 1999 MSSOC schedule.)

All of these DMSO-sponsored DoD M&S Education opportunities and information sources — readily-available courses and Web site — are provided free of charge and designed to encourage the sharing and reuse of operationally valid M&S information. Online requests for attendance and further course information are available via the M&S Education Web site at *http://www.education.dmso.mil/*.

The DMSO Program Manager is LTC Harry Thompson, (703) 998-0660, *thompson@msis.dmso.mil*.

For additional information, contact the project lead, Tom Stanford, (703) 998-1617, *tstanfor@msosa.dmso.mil*, or fax (703) 998-1625.

1999 M&S Staff Officer Course
... courses, dates and locations ...

Dates	Locations	Course Numbers
22-26 Feb	Orlando, FL	99-2
2-5 Mar	Seoul, Korea	MSSOC-KBSC
3-7 May	Alexandria, VA	99-3
7-11 Jun	San Diego, CA	99-4
14-18 Jun	Hawaii	99-5
19-23 Jul	Germany (WPC)	99-6
20-24 Sep	Alexandria, VA	99-7
(TBD) Oct	Detroit, MI	99-8
15-19 Nov	Alexandria, VA	99-9
13-17 Dec	Orlando, FL	99-10

For additional information, or to apply online visit the MSSOC Web site at *http://msis.dmso.mil/SOC/*.

Charlie Snead, MSSOC instructor, presents an MSSOC cup to Ellen Purdy, SARD-DO, in appreciation for her guest presentation on Simulation Based Acquisition at the July course.

DSI ready to support M&S into 21st century

By Barry Sweeney
DSI Network Engineer

The Defense Simulation Internet (DSI) is positioned to support the modeling and simulation (M&S) community into the 21st century.

The DSI is designed to provide Quality of Service (QoS) and real-time multicast Wide Area Network (WAN) services to the M&S community for both classified and unclassified distribution of simulation and video teleconferencing (VTC) data.

The DSI originated as an idea to create a WAN that fulfilled the needs and requirements of the M&S community. It was sponsored by the Defense Advanced Research Projects Agency (DARPA) and the Advanced Information Technical Services Joint Project Office (AITS/JPO) with the support of the Defense Modeling and Simulation Office (DMSO).

In Fiscal Year 1998 the DSI transitioned from a research network operated by the AITS/JPO to an operational network operated by the Defense Information Systems Agency (DISA). Prior to the transition, the DSI routers were upgraded to Cisco routers to improve the network's reliability and flexibility. To improve the network's QoS, the Streams II (ST-II) protocol was replaced by the Resource Reservation Setup Protocol (RSVP). Finally, the multiple T-1 backbone structure was replaced by an Asynchronous Transfer Mode (ATM) backbone infrastructure provided by the Defense Information Systems Network (DISN) ATM (DATM) services.

The new DSI QoS is unmatched by any other network. Through the use of RSVP, DATM and dedicated T-1 tail circuits, the network is able to provide guaranteed bandwidth to the DSI customer. The DSICell in Columbus, Ohio, monitors and manages the network to ensure that customer needs are met on a daily basis. Users submit their QoS requests to the DSICell, which works to ensure that QoS is available to the locations needed, when needed. The guaranteed QoS, in combination with ATM and T-1 circuits, results in low latency and high reliability.

Included in the cost of the DSI are all WAN requirements. Once a customer subscribes, the DSI support team will install all the necessary WAN equipment and then monitor and manage the equipment on a seven-days-a-week, 24-hours-a-day basis to ensure that the network is there when users need it. In addition, the support team takes care of the users' classified needs by installing, monitoring and managing the cryptographic devices to ensure they can communicate securely. Finally, the DSI support team provides, monitors and manages the equipment necessary for users to conduct unclassified (BLACK) and classified (RED) Desktop VTC (DVTC) at speeds up to 384Kbps.

For more information, contact Tim Shannon, DSI Program Manager, at (703) 735-8064 or *shannont@ncr.disa.mil*.

Army SMART Conference

Continued from p. 3

And the senior leadership was on hand to receive those recommendations. The Honorable Paul J. Hoeper, Assistant Secretary of the Army for Acquisition, Logistics and Technology, delivered the keynote address. Also, the executive panel that kicked off the conference and received reports back from the conference working groups included LTG William Campbell, Director of Information Systems for Command, Control, Communications and Computers (DISC4); LTG Randall Rigby, Deputy Commanding General of Training and Doctrine Command (TRADOC); Mr. Walter Hollis, Deputy Under Secretary of the Army (Operations Research); and Mr. Mark Schaeffer, Deputy Director for Systems Engineering in the office of the Under Secretary of Defense for Acquisition and Technology (USD(A&T)); as well as LTG Kern.

A key element of SMART is the representation of the Army's three M&S domains: Advanced Concepts and Requirements (ACR); Training, Evaluation and Military Operations (TEMO); and Research, Development and Acquisition (RDA). The SMART vision describes an acquisition process that is enabled by a robust use of simulation technology drawn from the three M&S domains and integrated across acquisition phases and programs.

Much of the conference nuts-and-bolts work was accomplished by three discussion panels, each representing one of the M&S domains. These panels set the tone for the detailed work accomplished in 10 breakout sessions that analyzed particular problem areas and devised recommended solutions. The complete set of conference presentations is available on the World Wide Web at *http://sba.iitri.org/*.

Permeating the SMART conference was an increasing recognition that, to achieve this level of integration, the Army must move away from "stovepipe" applications and begin seeking ways of achieving greater interoperability, credibility, commonality and opportunities for cost avoidance through M&S reuse. One way of meeting this challenge is the Army's efforts to develop a set of procedures, practices, processes, techniques, data and algorithms collectively known as the Army's "M&S Standards."

The Army Model and Simulation Office (AMSO) manages the "M&S Standards" process with the assistance of a diverse group of Army experts known as Standards Category Coordinators. The standards process is not intended to connote a restrictive environment. In fact it covers a range of topics, varies in type and source, and has built-in flexibility for use. Army M&S Standards are available in the Army Standards Repository System (ASTARS) through the AMSO's Web site at *http://www.amso.army.mil/*.

The first phase of the M&S standards program — establishment of the repository and the Standards Nominating and Approval Process (SNAP) — began in May. The program is now progressing into its second phase, reaching out to Program Managers and other activities supporting the RDA community to target high-cost developmental items with truly cost-effective Army M&S standards. Wide participation by military, government and industry representatives is both welcomed and encouraged. Working together, the Army's Acquisition and M&S communities are striving to realize a "Big Idea" and achieve a degree of interoperability across the mission space of M&S that will SMARTly enable the materiel development process. Our common purpose is to develop better, faster and cheaper ways of delivering the finest weapons systems in the world into the hands of our soldiers.

For more information about the Army Model and Simulation Office and Army M&S call (703) 601-0018 or visit the AMSO Web site at *http://www.amso.army.mil/*.

HLA

DMSO, McLeod Institute unveil graduate course materials for HLA University Outreach Program

By Katherine L. Morse
HLA University Outreach Program Coordinator

The Defense Modeling and Simulation Office (DMSO) launched the High Level Architecture (HLA) University Outreach Program in 1998 as part of its HLA outreach and transition activities.

Now that the HLA is a technical reality and Department of Defense (DoD) modeling and simulation (M&S) programs are moving toward compliance, there is a growing market for computer scientists and software engineers with HLA experience. There is also a long-term need for continuing research in HLA-related areas. In addition, the simulation community as a whole is growing while the number of universities offering simulation courses and study programs is not. One of the key reasons is that developing new course material is a time-consuming and expensive process for professors whose time is already divided among existing teaching and research responsibilities.

HLA University Outreach Program

To bridge this gap with respect to the HLA, the University Outreach Program is promulgating the HLA to colleges and universities at the undergraduate, graduate and researcher levels. The program's goals are to inform simulation users at universities of the applicability of the HLA to a broad range of simulation problems, to encourage application of the HLA to non-DoD models, to stimulate research into open HLA-related problems, and to educate students in the use of the HLA as a saleable job skill.

In conjunction with the Society for Computer Simulation's (SCS) McLeod Institute of Simulation Sciences (MISS), the DMSO is developing a number of products, including a graduate-course curriculum module, a researcher support package, an undergraduate-course curriculum module, a searchable bibliography of HLA-related papers and a World Wide Web site hosted at the California State University (CSU) at Chico to maintain and disseminate this information.

Unveiling of two new products

On March 15, the DMSO and MISS unveiled the first two products from the University Outreach Program — the first package of the graduate course materials and the initial version of the Web site.

The graduate course module is designed to be inserted into an existing graduate course on simulation, distributed computing or operations analysis. The first package covers the basics of the HLA and its use. It contains six lessons with integrated slides, course notes and lab exercises. The materials are available to download from the MISS Web page at CSU Chico. Those who request to download materials will be presented with a very brief questionnaire about their interest in HLA and the materials for later follow-up and feedback.

The Web site also hosts an online, searchable bibliography of citations and abstracts of HLA-related papers, both DMSO-sponsored foundation papers and papers from university-based authors on a broad range of topics. The number of papers already in the latter category is testimony to the considerable interest in the HLA from the university community. Wherever copyright restrictions allow, the papers are available for direct download from the bibliography.

The availability of the Web site will be advertised via HLA Online, the DoD Architecture Management Group (AMG) e-mail reflector, Simulation Interoperability Standards Organization (SISO) e-mail reflectors, SCS's "Simulation" journal, and an e-mail list of university points of contact who have already expressed interest in the University Outreach Program. The availability of additional materials will be announced through these same channels. Information provided on the download questionnaire will be used to add requestors to the e-mail list of university contact points who will form the initial university focus group.

DMSO providing funds

The DMSO is providing funding and support to seed this process, but ultimately the program will create a self-sustaining informal focus group of professors and universities involved in HLA work, sharing materials and research results.

Additional information on the Society of Computer Simulation, including publications and upcoming conferences and workshops can be found at online at *http://www.scs.org/*. Additional information on the McLeod Institute is available at *http://www.ecst.csuchico.edu/~mcleod/*.

For more information ...

Those interested in the University Outreach Program or who would like to be added to the focus group e-mail list, contact Katherine L. Morse at (619) 552-5442 or *katherine.l.morse@cpmx.saic.com*.

• HLA Help Desk •

Have a question about the HLA? Send your query to the HLA Help Desk at **hla@msis.dmso.mil**. We'll sort it out, send your question to the right people and get you an answer.

Two new tools released since December

HLA tools suite nears completion

By Chris Turrell
DMSO HLA Staff

The initial development of the Defense Modeling and Simulation Office (DMSO)-sponsored High Level Architecture (HLA) tools suite is nearing completion. Several important events have occurred sinc December. Among them were the release of two new tools.

The first tool, released in January, is the Federation Execution Planners Workbook (FEPW). This tool, an automation of the former spreadsheet version of the workbook, reads both Federation Execution Data (FED) and OMT (Object Model Template) Data Interchange Format (DIF) files and allows the user to populate parts of the tables automatically from data in the Object Model Development Tool. Based on the number of downloads, the FEPW tool is receiving wide acceptance from the modeling and simulation (M&S) community.

(See the FEPW article below.)

The other new tool is the Runtime Infrastructure (RTI) Initialization Data (RID) Editor. It is an advanced tool that allows the user to edit the RID file within a set of recommended parameters. Additionally, it offers the capability to tune the RID file for either increased throughput or reduced latency, depending on the needs of the federation. Finally, this tool will produce a default-RID file.

During the annual Industry and Interservice Training, Simulation and Education Conference (I/ITSEC) in December, the DMSO demonstrated early releases of three tools — the Federation Verification Tool (FVT), the Federation Management Tool (FMT) and the Data Collection Tool (DCT) operating in the context of an HLA federation.

These three tools round out the HLA tools suite that DMSO is sponsoring to support its commitment to early implementers of the HLA. All three underwent beta testing by members of the community in February and will be released on March 30.

The FVT supports federation developers by verifying that each federate is meeting its data exchange responsibilities. The Federation Object Model (FOM), FED and FEPW (the object and interaction table) define federation requirements. The FVT can be used to assess consistency across federation plans (FOM, FED and FEPW), assess individual federate conformance to federation requirements and assess federation conformance to federation requirements during integration.

The FMT displays Management Object Model (MOM) data, provides MOM-based control, and acts on behalf of a federate. Like the other DMSO-sponsored tools, it is completely FOM independent. The FMT is also platform independent.

The DCT provides analysis of tactical and strategic operations, analysis of simulation model behavior (verification and validation), and analysis of measures of effectiveness, performance and success. Data can be written to file or captured in a commercial-off-the-shelf database for manipulation using a commercial spreadsheet.

Future plans for the DMSO-sponsored tool suite include an update to the Institute of Electrical and Electronic Engineers (IEEE) 1516 specification, timed to coincide with the release of the specification.

For more information visit the HLA Web site at *http://hla.dmso.mil/,* or direct HLA-related questions by e-mail to the HLA Help Desk at *hla@msis.dmso.mil*.

Federation Execution Planner's Workbook tool

FEPW, released in January, eases fed manager's job

By Chris Turrell
DMSO HLA Staff

Last fall the Defense Modeling and Simulation Office (DMSO) announced a shift in emphasis within the High Level Architecture (HLA) program from the development of the HLA Specification to the support of HLA implementations.

With this change in emphasis, came the announcement of the expansion of the HLA tools suite, to include a new group of tools designed to support federation executions. One of the first tools to be released in support of these new priorities was the Federation Execution Planner's Workbook (FEPW). The FEPW can trace its lineage to the early days of the HLA specification definition process, and the protofederations that were created to focus that effort. It began as a set of Microsoft Excel spreadsheets that were completed and managed manually by the federation manager.

See FEPW Tool, p. 15

ITEC 99

See the JTLS-NATO C2 / HLA demonstration at the Defense Modeling and Simulation Office (DMSO) exhibit — booth 204 — at the International Training and Education Conference (ITEC) in the Congress Centre, The Hague, Netherlands, April 13-15. *(See JTLS-NATO C2 story on p. 16)*

For more information about DMSO participation contact Bruce Bailey, DMSO, at (703) 824-3420 or *bbailey@msis.dmso.mil*.

DATA ENGINEERING

CMMS Toolset provides immediate M&S support, anticipates future requirements

By Tom Johnson
CMMS Project Manager

Ultimately, the utility of the Conceptual Models of the Mission Space (CMMS) Project will be determined by its ability to serve both the present and future needs of the Department of Defense (DoD) modeling and simulation (M&S) community.

A critical question facing system development efforts relates to the fundamental and pragmatic trade-offs associated with meeting the immediate needs of the system's intended user community versus future, anticipated needs of the community. This is a profound concern for the development of complex software and information processing projects such as the Defense Modeling and Simulation Office (DMSO)-sponsored CMMS Project.

The CMMS Project represents a DoD-wide effort to provide an integrated framework and toolset for developing mission space models as directed by the DoD M&S Master Plan. The objectives of the CMMS Project are to enhance interoperability and reuse of models and simulations by providing access to descriptions of real-world operational entities, their actions, interactions and operational environment. The CMMS provides the simulation developer with support for conceptual model creation, integration and maintenance within DoD simulation programs, and interoperability across DoD simulation programs. It does that through:

— Integration and operability standards,
— Common semantics and syntax (CSS),
— Data Interchange Formats (DIFs),
— CMMS Model Libraries, and
— Operational infrastructure.

It was decided early in the development process of the CMMS that if the objective to enhance the reuse and interoperability of models and simulations was to be met, the CMMS had to support the immediate needs of present DoD simulation and model efforts — but not at the expense of possible future needs of DoD M&S.

Supporting the immediate needs of the JSIMS Program

A central feature and development goal of the CMMS is its ability to capture conceptual or mission space models produced by the major DoD Partner Simulation programs including the Joint Simulation System (JSIMS) and the Joint Warfare System (JWARS) for reuse and integration. Considerable effort has been devoted to developing converters that provide automated support for translating JSIMS and JWARS data from their "native" or original format to CMMS Library data structures. A CMMS Intermediate Format File (IFF) provides a standardized intermediate form between heterogeneous native formats and the CMMS Library. During the conversion and integration process, tests for referential integrity, common semantics and syntax and the identification of redundant entities and processes are performed on the data.

JSIMS CMMS knowledge acquisition (KA) data are captured and formulated as Formalized Data Products (FDPs). These FDPs, which will serve as a foundation for the development of JSIMS mission space objects and JSIMS simulation code, are semi-structured Microsoft Word documents. These documents represent thousands of pages of mission space data gathered by JSIMS KA Agents and subject-matter experts.

To support JSIMS, the CMMS Project Team developed a series of converters, parsers, loaders and a set of application program interface (API) calls — programmed in Lex and Yacc, C, and Visual Basic — that allow JSIMS word-document FDPs to be automatically loaded into the CMMS Library in a structured and common form. This converter form of JSIMS FDP data makes it much more usable to JSIMS software engineers who can easily access the KA products in an Oracle database rather than searching huge word documents. Moreover, the CMMS Toolset contains explicit analytic tools and algorithms that can quickly scan the voluminous JSIMS data and identify systematic linkages and nominate "cross-domain" interactions between the domain models of the JSIMS Enterprise components.

The success of the CMMS Toolset in supporting the JSIMS Program is evidenced by JSIMS formal endorsement of the toolset and a JSIMS request for an accelerated CMMS Toolset Initial Operational Capability (IOC) for their exclusive use. Responding to this challenge, the CMMS Project Team developed a whole series of new analytic tools and converters to support JSIMS over the last three months. This effort has resulted in the conversion of over 25,000 pages of FDP word documents into the CMMS Library, thereby ensuring that the CMMS Library is not a "library without any books."

Army LTC George Stone, JSIMS Program Office, commenting recently on the utility of the CMMS, said "the CMMS Toolset will enable (the JSIMS CMMS) JCMMS to identify more interactions, as well as, (and more importantly) enable mission-space-object developers to search through the FDPs (for both JSIMS and JWARS products) easily."

See CMMS Toolset, p. 9

CMMS-RT, Eurisko keys to CMMS architecture

By Peggy Gravitz
COLSA Corporation

One of the objectives of the Conceptual Models of the Mission Space (CMMS) Project is to provide interoperable and reusable CMMS components and a common understanding of terms for describing and characterizing them. Once these components are developed, the challenge lies in advertising their existence to the modeling and simulation (M&S) world.

In order to locate conceptual models stored in the CMMS Library a methodic and systematic solution using a data interchange format (DIF) has been developed. Known as the CMMS Registration Template (CMMS-RT), it defines a DIF to support exchange of CMMS registration information among cooperating repositories.

The owner of each CMMS repository decides which components to advertise via the CMMS-RT DIF. This allows each repository to retain implementation and data format autonomy.

Eurisko search tool employs CMMS-RT DIF

Eurisko, a World Wide Web-based search-tool application developed for the Defense Modeling and Simulation Office (DMSO) by COLSA Corporation, employs the CMMS-RT DIF to collect published search metadata. Eurisko provides users a practical method to search published CMMS components using two search features. One feature searches the text of supplied component information for user-supplied words or phrases. The other uses a taxonomy, supplied by the information provider, to locate published CMMS components. The Multi-Taxonomy Browser feature allows the Eurisko user to search multiple provider-supplied taxonomies.

Eurisko has demonstrated its Multi-Taxonomy Browser technology using a centralized search engine to access disparate catalogues and resources from current online M&S systems. The Multi-Taxonomy Browser provides a graphical view of each taxonomy as a hierarchical tree structure of the related terms used by each related system to classify its M&S components.

This search capability is useful because a search can be initiated based on a familiar taxonomy. A search with the Multi-Taxonomy Browser returns more "hits" because CMMS resources, classified by related terms in other provider-supplied taxonomies, will be included in the result set. Through partnerships among CMMS participants, the taxonomy mapping and matching can be a reality and additional tools can be added to the CMMS Toolset.

CMMS-RT and Eurisko are essential keys to CMMS architecture

The CMMS-RT and the Eurisko concept are essential keys to creating a CMMS architecture that supports the full use of CMMS resources. The extended access to CMMS resources provided by Eurisko increases the value and usage of other CMMS Toolset components such as the Knowledge Acquisition Tool (KAT), Common Semantics and Syntax (CSS) Library, and the Authoritative Data Sources (ADS) Library.

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ASK DMSO • ***ASK_DMSO@msis.dmso.mil***

Have a question about the DMSO, its programs or DoD M&S policy, but don't know who to call? Send your query to **ASK_DMSO@msis.dmso.mil**. We'll sort it out, send your question to the right people and get you an answer.

CMMS Toolset

Continued from p. 8

Anticipating and supporting future DoD M&S needs

As suggested earlier, a successful software development project requires pragmatic scrutiny that balances immediate technical and analytic concerns with anticipated future needs. Anticipating future needs by definition is extremely difficult considering the dynamic nature of military systems in specific, and computer technologies in general.

The pragmatism of the CMMS development effort is epitomized in its architectural design and development. The CMMS Toolset was developed using an architecture that supports heterogeneous software. Users, regardless of their individual computer systems, can view, interact with and retrieve CMMS Library data, and use the associated CMMS analytic tools. The CMMS Project Team adopted an "open" architecture that is compatible with nearly all the software currently supporting the World Wide Web. With minimal retooling, the system can be ported to any system. The CMMS, while currently NT-based, can be easily ported to Unix, making it very flexible. The CMMS libraries of mission space data are portable to any platform using simple recompile. The CMMS Project has also developed a set of API calls that future M&S programs can embed within their code, allowing them to automatically generate an IFF.

For more information ...

The CMMS Toolset is available on the Web at *http://38.241.48.9/*. For more information contact:

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KAT provides practical way to gather real-world knowledge from subject matter experts for JSIMS Enterprise use

By Cynthia Tuttle
KAT Project Leader

The development of accurate realistic simulations is dependent on authoritative descriptions of the "real world." The process of gathering real-world information from human experts is referred to as knowledge acquisition (KA).

The Defense Modeling and Simulation Office (DMSO) Knowledge Acquisition Tool (KAT) provides a practical means of gathering real-world information from subject-matter experts (SMEs).

Background

The KAT is a desktop database application based on the JSIMS Enterprise Formalized Data Products (FDPs). The JSIMS Enterprise, consisting of simulation programs from the various military mission space domains — land, ocean, air and space, etc., developed the FDPs prior to the KAT as textual templates for collecting information needed to represent models across the domains. FDPs are categorized into process, organization, communication, information item and equipment models.

The FDPs are in the form of Microsoft Word documents and are the standard required format for submission to the Enterprise. Prior to the development of the KAT, SMEs wrote lengthy descriptions of their domain models in the FDP format using Word. Verified and validated FDP models were then posted to a file repository for use by knowledge engineers and software developers.

While Word is an inexpensive means of providing SMEs across the enterprise with a common and familiar tool for knowledge acquisition, it has several drawbacks. Word does not enforce business rules for FDP format and content. While SMEs have style guides that assist in collecting the minimum required information, the freedom provided by Word tends to encourage lengthy descriptions containing unnecessary information. SMEs must become proficient in word-processing skills and end up spending valuable time formatting the document rather than capturing information. Due to differences in writing styles as well as word-processing skills, the FDPs produced by different SMEs result in inconsistent formats. Inconsistent formats make quality assurance more difficult and make review by knowledge engineers more difficult. Additionally, inconsistent formats mean that applications such as the Conceptual Models of the Mission Space (CMMS) Toolset, which provide analysis tools and search engines, cannot easily import the FDPs.

It was recognized early on that the SMEs needed a tool that would provide more structure, enforce consistency, and support import by other applications such as the CMMS Toolset. The problem was how to introduce a tool that was least disruptive to the Enterprise's current KA process while being affordable.

A pragmatic approach to KA

The DMSO KAT provides the solution to this problem. Leveraging the popularity of Microsoft Office 97 applications, the KAT is a Microsoft Access application based on the JSIMS Enterprise FDPs. The KAT provides forms for collecting FDP information. The forms are designed to guide the SMEs in entering the information required by the FDP style guides. The forms provide more structure than free-form text and are designed to minimize data re-entry. In order to be consistent with the existing KA processes, the KAT also automatically generates Word Documents in the FDP format. SMEs no longer need to spend time formatting the documents. The FDP data is stored in a database that can be queried and exported.

KAT benefits

The KAT is an economical means of improving the quality and output of FDP production. It increases productivity by minimizing data re-entry and eliminating SME word processing. It also produces FDP documents with consistent formats.

Current status

The KAT has been in use by the Air Force's National Air and Space (Warfare) Model (NASM) since the middle of 1998. The JSIMS Development Agents adopted it for use at the end of 1998. It has also recently been expanded to support the Army's Warfighters Simulation 2000 (WARSIM) extensions to the FDPs. WARSIM began beta testing the KAT at the beginning of the year.

Looking ahead

One of the main objectives for KAT development in 1999 is integration with the CMMS Toolset. The KAT will be enhanced to support the CMMS Data Interchange Format (DIF), which will become the primary means of interfacing with toolset components. In addition, KAT functionality will be extended to include:

— Additional import/exports
— Additional quality control checks/reports
— Additional administrative features

Platform requirements

The KAT is a Microsoft Access 97 application and can be released with a run-time version of Access, eliminating the need to purchase a separate license for Access. Microsoft Word 97 is required for the production of FDP documents.

The recommend configuration for the KAT is:

— Pentium 200+ CPU
— 64+ MB RAM
— 800x600 or finer video resolution
— Windows 9x or NT Workstation 4.0+

See KAT, p. 11

IOR

Continued from p. 15

The appropriate numerical environmental prediction model is a valuable tool for obtaining environmental realism in simulations. The IOR Project will provide an improved environmental representation through its integration of the Modular Ocean Data Assimilation System (MODAS). The MODAS uses MCSST and other observation data as input and generates a realistic, consistent environment within the ocean domain. This will serve as the basis for the further development of a realistic, consistent environment across multiple environmental domains, such as the air-sea interface, the sea-shore interface, etc.

MODAS assimilates satellite altimeter data, MCSST data, and *in situ* observations to produce 3-D ocean analyses of temperature, salinity and derived fields such as sound speed. MODAS analyses are available to the M&S community for global and selected regions at resolutions ranging from 1 degree down to 1/8 degree for any time period from 1993 to the present. Plans call for implementing MODAS to initialize 3-D ocean models to provide 3-D hindcasts, nowcasts and forecasts of ocean temperature, salinity and ocean currents.

An important point is that the IOR obtains both the observation data, such as the MCSST, and the numerical model via the MEL and integrates them. Standard data interchange mechanisms, e.g., the Synthetic Environment Data Representation and Interchange Specification (SEDRIS), make this integration not only possible, but very useful.

IOR reports, documentation

An IOR report documenting the procedures used to create physically consistent, integrated environmental representations of the surf zone has been posted at the MEL World Wide Web site at *http://mel.dmso.mil/*. These procedures use state-of-the-art, physics-based, "off-the-shelf" wave, circulation and surf models. Most of the IOR wave and surf modeling techniques were used during the 1998 North Atlantic Treaty Organization (NATO) Exercises "Rapid Response" and "Strong Resolve" in Southern Spain, and were very helpful to the Fleet. A description of that support, "Buoys Provide Real-Time Surf Data," was published in the November issue of *Naval Institute Proceedings*.

Future plans

IOR will be the initial extension to an existing weather scenario generation effort managed by the Air and Space M&S Executive Agent (MSEA). With ocean initially added, and terrain added later, this tri-MSEA Environmental Scenario Generator (ESG) will provide M&S developers and exercise managers with the capability to create scenarios targeted at simulation objectives in all environmental domains. The ESG architecture provides the mechanism to generate customized scenario databases for a particular geographic region and date for M&S applications. Enhancements this year will include the addition of an oceanographic search engine to facilitate the creation of oceanographic data sets.

For more information ...

For more information about the Ocean Executive Agent and other OEA programs visit the their Web site at *http://rsd-www.nrl.navy.mil/OceanEA/index.html*.

KAT

Continued from p. 10

The KAT does not require network administrator support for installation on NT networks. However, users are encouraged to get permission from their network administrator before installing new software.

For more information ...

The KAT Compendium is available online at *http://ORL01.DRC.COM/KAT/*. For more information contact:

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FEPW Tool

Continued from p. 15

characteristics are captured in the Interaction Table.

The FEPW also provides the means to define the computing environment required for federation execution.

In addition to helping to define the required resources, this process is used to document resources already available in an effort to allocate them efficiently. The information provides the required planning data for budget, personnel, space and configuration. This process of documenting federation configuration requirements will also contribute to the most efficient use of resources available to the federation. Done correctly, performance bottlenecks can be identified early and corrected. And, remember, it also provides the information to automatically configure the federation verification and data collection runtime tools that monitor federation execution and support the federation data collection plan.

Having said all of this, none of these requirements are unique to the HLA. They have always existed for simulation managers and were satisfied to some extent by a variety of management techniques. What the FEPW offers is an automated methodology that relies on standardized DIFs. Additionally, it offers a standardized methodology to plan for, manage and document federation executions.

For more information ...

For more information about the FEPW, visit the HLA Web site at *http://hla.dmso.mil/* and select the "Software Distribution Center." Download the tool and try it.

As with other DMSO-sponsored tools, the FEPW is FOM independent and, because it is Java based, is available on multiple platforms. Direct HLA-related questions to the HLA Help Desk at *hla@msis.dmso.mil*.

MSOSA M&S Calendar

What's going on when and where in the M&S world?
Visit the
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ENVIRONMENT

140 attend SEDRIS Technology Conference

SEDRIS success credited to open interaction among M&S community

By Paul Foley
DMSO Environmental Representation Project Manager

The initial concept of a synthetic environment data representation and interchange specification was devised in 1994.

If a common means of representing all of the different types of synthetic environmental data could be established, then a standard data interchange specification would be possible. This data interchange specification would serve to provide reuse and interoperability of data not only from original data providers, but also from providers of transformed data products uniquely developed to support individual simulation systems. Thus, the Synthetic Environment Data Representation and Interchange Specification (SEDRIS) Project was initiated.

The SEDRIS meets the need for interactive and distributed systems to share common descriptions of the natural environment as a precondition for interoperability. It does this by enabling the development and maintenance of a correlated initial environment across a network of simulation systems.

From the beginning, the SEDRIS Project set out to explicitly accommodate the superset of system-specific, data-element representation requirements by an interchange mechanism, rather than merely the minimal set of shared data elements. The SEDRIS needed to support the full extent of the synthetic environment, integrating terrain, ocean, atmosphere and space. Additionally, the SEDRIS needed to carry pre-computed topology relationships to support the environmental interactions and feedback required by Computer Generated Forces (CGF) applications.

A synthetic environment for everyone

The SEDRIS Project's primary goal is to facilitate transmission of synthetic environment data between heterogeneous simulations in order to enable a correlated environment supporting Joint training. To accomplish this, the SEDRIS Project focuses on data representations of the natural environment, man-made structures and equipment models. It provides, through its Data Representation Model, a standardized representation of the total synthetic environment that all data producers and consumers can use for open interchange between their own proprietary formats.

The development effort has been characterized by an open interaction with modeling and simulation (M&S) community system developers, simulation managers and users across a broad spectrum of training, acquisition and analysis applications.

Open involvement is key

This open involvement has been encouraged through the SEDRIS World Wide Web site at *http://www.sedris.org/*, which is characterized by its open access to both management and development teams, and by an active help line. Numerous tutorial and project status reviews have been presented to the M&S community through the semiannual Simulation Interoperability Standards Organization (SISO) Simulation Interoperability Workshops (SIWs), the annual Interservice and Industry Training, Simulation and Education Conferences (I/ITSECs) and the annual International Training and Education Conferences (ITECs) in Europe and Asia. Open exchange at both the project management and technical levels has enhanced the capability of the interchange mechanism and broadened the scope on standardization.

M&S Executive Agents (MSEAs)

The SEDRIS Project and the participating Department of Defense (DoD) M&S Executive Agents for Terrain, Ocean, and Air and Space have consistently sought out participation from new sectors of the M&S marketplace, to include entertainment applications. The core development effort has been achieved through design discussion and interchange experimentation among a team of SEDRIS Associates and participating organizations and program offices.

SEDRIS Tech Conference well attended

The warm reception for the recent public release of SEDRIS version 2.0 — Software Developer's Kit

See SEDRIS, p. 13

Terrain MSEA, TMPO undergo changes

By Major Steve Hledik
National Imagery and Mapping Agency
and Karen Williams
DoD MSEA for Terrain Liaison at DMSO

The Director of the National Imagery and Mapping Agency (NIMA) is the Department of Defense (DoD) Modeling and Simulation Executive Agent (MSEA) for Terrain. The Terrain Modeling Project Office (TMPO) performs this function on the Director's behalf, however, recent reorganizations within the NIMA host directorate have resulted in changes.

The TMPO has been absorbed into the NIMA Technology Directorate and its staff has been re-allocated into divisions aligned with the projects they manage. The point of contact for the M&S community, and Terrain MSEA representative to the Defense Modeling and Simulation Office (DMSO), is Major Steve Hledik, Australian Exchange Officer at the NIMA. Karen Williams and Paul Nagele continue in their roles as NIMA liaison officers to the DMSO and to the Joint Simulation System (JSIMS) Joint Program Office (JPO) respectively.

All former TMPO staff members have retained their affiliation with their projects in work. The following are project updates:

Synthetic Environment Data Representation and Interchange Specification (SEDRIS)

The NIMA continues to contribute to the development and publication of the SEDRIS. Interest in the specification within the Agency is high, especially as it parallels the evolution of the Foundation Data concept. For a history of foundation data, foundation feature data (FFD) and mission specific data sets (MSDS) go to the Geospatial Information section on the World Wide Web at *http://www.nima.mil/*. The points of contact for SEDRIS issues are Karen Williams at *kwilliam@msis.dmso.mil*, and Paul Nagele at *paul_nagele@jsims.mil*.

Vector Data Topology

Digital vector data for mapping applications is deficient in certain properties to meet the requirements of M&S applications. The NIMA is investigating the evolution of its vector product format (VPF) to include enhanced topological relationships and portrayal in true 3-D space. The point of contact for this project is Jon Dale at *dalej@nima.mil*.

Integrated Terrain Skin (iTIN)

In a cooperative agreement with TerraSim, Inc., online at *http://www.terrasim.com*, the NIMA has sponsored development of a tool that is designed to create a simulation terrain database from various sources including NIMA Digital Terrain Elevation Data (DTED) and VPF data sets. The software will automatically integrate roads with cuts and fills, logically account for hydrography and include building footprints in a triangulated irregular network representing the terrain surface. The tool is due for release by the end of Fiscal Year 1999. The point of contact for the iTIN project is Jerry Lenczowski at *lenczowj@nima.mil*.

Master Environment Library (MEL)

M&S community members may access NIMA data through the MEL interface, depending on releasabilty and access permissions. The MEL point of contact is Ron Magee at *mageer@nima.mil*.

High Resolution Terrain Information (HRTI)

In a coordinated effort with the NIMA Geospatial and Imagery Standards Management Committees (GSMC/ISMC), research continues to define gridded terrain elevation data with increasingly dense post spacing. A summit on this issue is scheduled for March 23-25. The point of contact is Mike O'Brien at *obrienm@nima.mil*.

Authoritative Data Sources (ADS)

The NIMA is collaborating in the definition of standards for ADS. Recent progress has been reached on agreement of metadata standards. The point of contact is Dave Danko at *dankod@nima.mil*.

Automatic Placement of Names and Labels

A new tool has been developed to assist in the labeling of features on maps and charts. Significant time savings have been achieved while still maintaining product integrity. The project lead is currently Michele Motsko at *motskom@nima.mil*.

For more information ...

Future announcements of project progress and other items of interest will be provided on the MSEA for Terrain Web site at *http://www.tmpo.mil/*.

Major Hledik may be contacted by e-mail at *hlediks@nima.mil*.

SEDRIS

Continued from p. 12

— and enthusiastic response to a supporting SEDRIS Technology Conference (STC) are directly attributable to the importance of the enabling technology and the success of the design team. The STC, held in the Orlando area, Feb. 11-12, drew over 140 participants from U.S. and international government, industry and academia. More events are planned. They will be advertised over numerous organizational reflectors, and the process for review and adoption as an international standard will begin. The SEDRIS is an evolving standard in the DoD Joint Technical Architecture (JTA), and a critical technology in both the DoD and North Atlantic Treaty Organization (NATO) M&S Master Plans and the Simulation Based Acquisition (SBA) Roadmap.

For more information ...

The DMSO and the SEDRIS Project Team actively solicit questions, comments and willingness to participate and share from the M&S community. Come join us at *http://www.sedris.org/*.

ITEC 99

Visit the SEDRIS demonstration at the Defense Modeling and Simulation Office (DMSO) exhibit — booth 204 — at the International Training and Education Conference (ITEC) in the Congress Centre, The Hague, Netherlands, April 13-15.

For more information about DMSO participation contact Bruce Bailey, DMSO, at (703) 824-3420 or *bbailey@msis.dmso.mil*.

MEL reaches milestone with v2.0 release on Jan. 29; access, resource site upgrades key to full integration

By Richard Siquig and Louis Hembree
MEL Project Team

The Master Environmental Library (MEL) reached a significant milestone on Jan. 29, when installation and testing of software version 2.0 (v2.0) was completed at an access site at the Modeling and Simulation Operational Support Activity (MSOSA) and two resource sites, the Naval Research Laboratory (NRL) in Monterey, Calif., and the Center for Air Sea Technology (CAST) at Stennis Space Center, Miss.

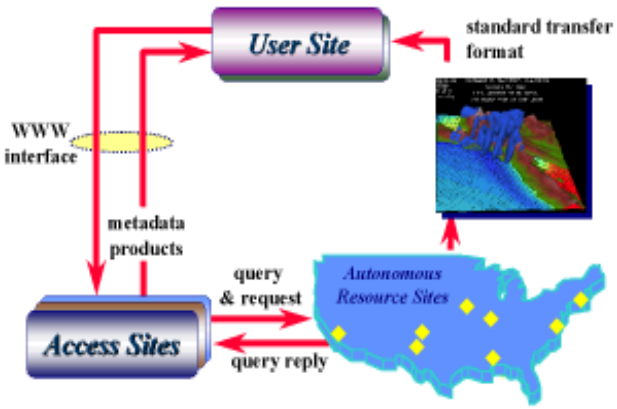

Figure 1 — MEL access and resource sites

The MEL is part of the Defense Modeling and Simulation Office's (DMSO) solution to the access-to-resources problem for modeling and simulation (M&S) users. It is an advanced, three-tiered, Internet-based, environmental data discovery, access and distribution system consisting of a user World Wide Web browser, a central access site for queries and orders, and distributed resource sites that hold and control the data.

Some of the new or enhanced features of MEL v2.0 are improved Web interfaces, a new search engine, improved keyword lists and the use of a Common Object Request Broker Architecture (CORBA) for communication between the access site and the resource sites.

Another innovative and very important part of v2.0 is the MEL Services Architecture, which is based on CORBA. This includes a MEL Software Development Kit (SDK), which is a library of functions that provide access to the MEL services outside of the Hyper-Text Transfer Protocol (HTTP) Web server. An application programmer's interface (API) is provided and implemented in Java.

Now outside developers can get access directly to MEL services without using the Web interfaces. The Environmental Scenario Generator (ESG), another DMSO-funded project, is already using this capability to access MEL resources.

With the release of v2.0, MEL also has its Computer Software Configuration Items (CSCIs) under configuration management and is moving to transition routine operation and maintenance of the system to a Life Cycle Support Activity (LCSA). Draft Memorandums of Agreement (MOAs) have been distributed to key resource sites to finalize formal relationships between these sites and DMSO.

Integration Plan

A complete upgrade of the entire MEL system to v2.0 requires careful coordination and timing involving the access sites — Internet and Secret Internet Protocol Router Network (SIPRNET) — and the resource sites.

The upgrade involves updating the metadata records for the data, which are held at the access sites, to comply with the new metadata standard; installing the new MEL Access Site Software (MASS) at the MSOSA; installing the new MEL Resource Site Software (MRSS) at the resource sites; testing; and cutting over to the new system.

The integration requires that all resource sites be upgraded to v2.0 due to backward compatibility issues. The sites listed in Table 1 below are the ones that must be successfully upgraded to MEL v2.0 to reach Initial Operational Capability (IOC). The upgrade to v2.0 was targeted to be completed during the week of March 10.

Future Plans

During this fiscal year MEL will continue to develop new features for testing and integration into the fielded system. Early enhancements will include an online tutorial, a metadata creation tool and a prototype classified capability.

Later improvements and additions will include data delivery in SEDRIS Transmittal Format (STF), integration of the Modeling and Simulation Resource Repository (MSRR) Authentication and Authorization (A&A) capability, capability for MEL metadata to be searched by outside Z39.50 search systems, improved scalability for larger numbers of metadata records, improved capability for the SDK to handle more clients simultaneously, and conversion of the resource site software to Java for improved portability to NT machines.

For more information and to try out the system visit the MEL Web site at *http://mel.dmso.mil/*.

— National Imagery and Mapping Agency (NIMA)(Internet)
— Air Force Weather Agency (AFWA)
— Air Force Combat Climatology Center (AFCCC)
— Mississippi State University Center for Air Sea Technology (MSU-CAST)
— National Geophysical Data Center (NGDC)
— Naval Research Laboratory, Marine Meteorology Division (NRL/MMD)
— Simulator Data Base Facility (SDBF)
— Terrain Simulator Center, Seventh Army Training Command (7ATC)
— Army Research Laboratory, Battlefield Environment Division (ARL/BED)
— Modeling and Simulation Operation Support Activity (MSOSA)

Table 1 — MEL sites required to upgrade for IOC

IOR to offer increased environmental fidelity in March

By Rick Allard
Naval Research Laboratory
Ocean Executive Agent Project Manager

Beginning in March, the Integrated Ocean Representation (IOR) Project will enable the user to obtain increased environmental fidelity through its ability to ingest global Multi-Channel Sea Surface Temperatures (MCSST) from the Master Environmental Library (MEL) into user simulations.

IOR procedures will enable this data to be received by the appropriate environmental models at the proper scales and resolutions. As a result, the simulation will more realistically represent environmental conditions, particularly in complex areas such as the littoral zone.

The IOR Project was established to develop and document the procedures and resources needed to create physically consistent representations of the ocean environment at varying levels of aggregation in support of Joint and Service M&S program requirements. Portions of the project have been in development since 1996, and in Fiscal Year 1998, they were integrated into the present project. During FY98, the project provided support to a number of Fleet exercises as well as technology support to other modeling and simulation (M&S) programs.

MCSST data consists of more than 150,000 daily global observations from the satellite-based Advanced Very High Resolution Radiometer (AVHRR). This product is used as input into global/regional thermal analyses, civilian and military maritime activities, and numerical weather prediction nowcasts and forecasts.

See IOR, p. 11

FEPW Tool

Continued from p. 7

January FEPW release reduced fed manager's work

While the system offered a means to capture and organize much of the information required to execute the federation, the federation manager was faced with the task of essentially doing the work by hand. With the release of this tool in January, all that has changed.

Before looking at the functionality and capabilities offered by the new FEPW tool, lets review its background and purpose, starting with a review of the HLA Tools Architecture.

The HLA Tools Architecture established an open framework for the development of an interoperable set of HLA tools that could grow as requirements evolved. The HLA is a technical architecture, not software, but some software implementations are required to support early implementers, giving commercial developers time to identify and respond to the market for additional tools. The HLA Tools Architecture provided a template for the identification of the types of tools that are required, and the automated data-exchange opportunities necessary to support them.

The FEPW tool clearly takes advantage of the data assembled in the Object Model tools suite and similarly provides data required through the use of the FEPW Data Interchange Format (DIF) to initialize several of the runtime tools, notable among these are the Federation Verification Tool (FVT) and the Data Collection Tool (DCT).

FEPW purpose

As for its purpose, the Federation Execution Planner's Workbook assists the federation manager in planning the HLA federation execution. Its templates provide the means for capturing the runtime federate and federation characteristics and provide the mechanisms for describing the federation's physical structure, performance and resource requirements. In short, it provides a framework for assisting in the planning of federation executions and a means for documenting the results of Federation Assessment activities.

With regard to federation planning the FEPW identifies federates and their capabilities, identifies the computing environment necessary to execute the federation, and defines how federation objects, attributes and interactions are distributed across the federation.

In support of testing and execution, it provides the means to validate expected federate performance in a federation execution and facilitates the gathering and logging of simulation data. Once completed, it also provides a means to document the characteristics of the federation for the future supporting the DoD goal of reuse.

With the completion of the Object Model Tool suite, much of the data required by the federation manager at runtime is already available. Using either the Federation Execution Data (FED) DIF or the Object Model Template (OMT) DIF as mentioned above, data from the Object Model Development Tool (OMDT) automatically populates portions of the tables in the FEPW tool. This means that the information needed at runtime, previously captured in the FOM, is now available to the federation manager with little or no additional work. Remember, the Federation Execution and Development Process (FEDEP) is an iterative process and changes are inevitable, making this data-transfer feature all the more attractive and useful.

In short, the FEPW provides the number and types of each of the federates, the object attributes and interactions each federate will publish and subscribe to, expectations for how each federate will manipulate object attributes and interaction parameters, as well as hardware and software requirements for each federate. Additionally, a Federate Summary Table, and separate Object and Interaction Tables, are provided to document the characteristics of each federate in the federation.

Ready source of information on federate operating characteristics

The FEPW is also a ready source of information on the federate operating characteristics, such as the Runtime Infrastructure (RTI) language Application Program Interface (API), the amount of memory used by a federate, minimum and maximum values for Tick Rates and the Time Management and Lookahead values provided to the RTI.

The Federate Object Table and Federate Interaction Table both identify and characterize manipulations that the federate performs on object attributes and interactions. This data permits planners to come to a common understanding of the activities and expectations of each federate. Additionally, the data can be used to verify the activities of federates in the federation execution. The size of attributes, maximum latency tolerated and ownership characteristics are captured on each object attribute while parameter size, initiate characteristics and sense/react

See FEPW Tool, p. 11

New NATO Simulation Policy Group holds first meeting

By Leon Armour
DMSO International Activities

The new NATO Simulation Policy Group (NSPG) of the North Atlantic Treaty Organization held its inaugural meeting at NATO headquarters in Brussels, February 16-17.

Air Force Colonel Ken "Crash" Konwin, Director of the Defense Modeling and Simulation Office (DMSO) and Principal U.S. Delegate, was elected NSPG chairman. Mr. Eric Schwann of the *Bundesamt fur Wehrtechnik und Beschaffung* in the German Ministry of Defense was elected vice chairman.

The NSPG, established by a North Atlantic Council decision in December, is charged with ensuring the coherent management and coordination of modeling and simulation (M&S) activities across the Alliance. The NSPG oversees the NATO Simulation Coordination Office (SCO) and implements the NATO M&S Master Plan. It reports to the NATO Research and Technology Board (RTB).

The group approved the draft NSPG terms of reference (TOR), and the TOR and 1999 plan of work for the SCO during the meeting.

The meeting was attended by the NATO nations, as well as the Major NATO Commands (SHAPE, SACLANT); the NATO Consultation, Command and Control Agency; the Research and Technology Agency; and the International Military Staff. Ms. Lana McGlynn, Special Assistant for M&S and Light Force Studies in the office of the Deputy Under Secretary of the Army (Operations Research), was also a member of the U.S. delegation.

The next meeting is scheduled in Brussels, July 7-9.

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DMSO, NC3A to demonstrate JTLS-NATO C2 using HLA tools at ITEC Europe, April 13-15

By Marnie Salisbury
C2 Federation Experiment Manager

The Defense Modeling and Simulation Office (DMSO) and the NATO Consultation, Command and Control Agency (NC3A) will demonstrate the Joint Theater Level Simulation (JTLS) and NATO Command and Control (C2) Federation operating with a set of federation run-time support tools at the DMSO booth at the International Training and Education Conference (ITEC), April 13-15, at The Hague in the Netherlands.

This federation, the result of a partnership in 1998 between the DMSO and the NC3A, uses the JTLS to stimulate NATO's Initial Combined Air Operations Centre (CAOC) Capability (ICC) Air Track display and a suite of Report Generator tools that create situational awareness messages in NATO standard formats. The federation also includes two exercise support tools, the Land Order Translation Module (LOTM) and the Aggregator, that reduce the workload on response cell players at NATO computer-assisted exercises (CAX).

The set of run-time support tools rounding out the federation consists of the Federation Management Tool (FMT), the Federation Verification Tool (FVT), and the Data Collector Tool (DCT). These freeware applications are intended to work with any Department of Defense (DoD) High Level Architecture (HLA) federation. They are available from DMSO through the HLA Software Distribution Center on the World Wide Web at *http://hla.dmso.mil/*.

The JTLS-NATO C2 federation was first demonstrated in the United States in September and included the Global Command and Control System (GCCS) at that time. The federation was the product of a successful experiment to demonstrate alternate ways to use the HLA as the foundation for linking C2 systems to combat simulations. In December, the full federation executed HLA compliance testing and passed. All federates have been certified compliant with HLA Specification 1.3.

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ITEC 99

Visit the Defense Modeling and Simulation Office (DMSO) exhibit — booth 204 — at the International Training and Education Conference (ITEC) in the Congress Centre, The Hague, Netherlands, April 13-15.

For more information about DMSO participation contact Bruce Bailey, DMSO, at (703) 824-3420 or *bbailey@msis.dmso.mil*.