

Annual Report

Functional Area: IMT

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Summary of strategy and activities: The Integrated Modeling and Test Environments (IMT) Functional Area (FA) covers application of HPC software and tools and techniques in live tests and hardware-in-the-loop simulations for test and evaluation of DoD weapons, components, subsystems, and systems in virtual and composite virtual-real environments. This community has not traditionally been heavy users of HPC capabilities for many different reasons, and our overall goal is to lower the barriers to HPC usage so that the T&E community can gain additional benefit from on-going advances in computing technologies.

Program Personnel: The IMT core team consists of the Functional Area Point of Contact (FAPOC), one on-site lead awaiting security clearance approval for assignment to Arnold Engineering and Development Center, a part-time on-site at Wright Technology Network (shared with FMS), and an open on-site position at ARL. In addition the government Component Technical Assistant (TA), the Government CTA lead, and the User Advisory Panel (UAP) provides strategic direction and ongoing review of the IMT program.

Technical Strategy Development Process: The background for the IMT technical strategy was developed by reviewing and characterizing the HPCMO User Survey for IMT in which 29 project in real-time processing, 21 projects in interoperability and systems of systems testing, 8 projects in test data repositories, 4 projects in model-based diagnostics, and 3 projects in test planning were identified. These categories were discussed in on-on-one conversations with IMT technical leaders, and technical presentations and reviews with groups such as the Range Commanders Council (RCC) technical subgroups for validation and to achieve a consensus on key topics and project proposals. The consensus priority areas were determined to be: high-fidelity component and process models, real-time model execution, integration of information from disparate sources, test data repositories, optimal test strategy planning, and

training in new software tools and methodologies. The process also identified groups committed to work along with the PET team in these areas.

Problematic issues:

Startup Activities: (1) Developing a process for the University of Illinois to accept a classified contract for PET was very time consuming and significantly delayed invoicing to MSU. With the on-going commitment of core funds implied by the multi-year core tasks, regular invoicing should now occur. (2) On-site personnel require security clearances to obtain DoD computer accounts and hiring these personnel within an academic framework when their prime work responsibility is at a DoD facility has generated some unique challenges especially with the increased security awareness. To mitigate downtime between hiring and clearance approval, it is recommended that DoD facility security officers become part of the applicant review process and that a 6 month unclassified work plan be established prior to hiring since typically universities have no alternate source of funds for these hires during the clearance review period.

Staffing: Adequate on-site staffing has been a major issue during the first contract year. Performance issues required the termination of the ARL on-site in May, but a new hire for this slot is on hold due to budget reductions. Security clearance issues have inhibited the full utilization of the on-site staff hired for the AEDC slot. No timely resolution of the AEDC staff security clearance issue is apparent, and it is anticipated that this staff member will have to be assigned to a different DoD facility or terminated. Given the widely varying needs and levels of HPC expertise in the T&E community, it is also recommended that, along with FMS, IMT should move away from the traditional Onsite model and provide a “composite offsite person” made up from a mixture of specialists drawn from academic and contractor personnel.

UAP: HPC current and potential usage within the T&E community is divided between those using traditional discipline areas such as CFD or CSM in support of test activities and those seeking utilization within the testing process or analysis and archiving of test data. The current UAP is weighted toward the latter set and will be balanced with more representation from traditional disciplines.

Cross-FA activities: T&E activities lend themselves well to cross-FA partnerships. A joint FMS/IMT project proposal in simulation data analysis was submitted and discussions are continuing for coordinated data mining/data repository approaches with ET. In the coming year, collaborations with the SIP-FA for real-time processing and MATLAB training and with the CFD-FA for stores separation will be explored.

Training: Funding for IMT training was allocated to project IMT006 and no formal core-based training was conducted during the first year of this contract. Opportunities for introductory training in parallel programming and MATLAB were identified in user discussions and coordinated with other FA's.

Outreach: The IMT outreach effort in year one focused on identifying end-users in the T&E community who would potentially become the core IMT users as the programs matures, making these users aware of the availability and relevance PET program, soliciting technical requirements for their activities, and developing work package proposals that could address those needs. The most successful of these efforts was with the Range Commanders Council subgroups in Modeling and Simulation and in Data Analysis and Computer Applications. These tri-service groups have representation from essentially all test ranges including AEDC, AFFTC, ACC, WSMR, DTC, RTTC, NUWC, NSWC, NAWC, NAVAIR, and Reagan Test Site as well key range architecture development teams of the Foundation 2010 Initiative. Both subgroups invited the IMT FAPOC to become a permanent, contributing group member which will provide the PET program with continuing access to these users and requirements as well as a pathway to transition training and technology innovations into DoD programs in quick and efficient manner.