

JOINT EXPERIMENTATION ON SCALABLE PARALLEL PROCESSORS

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The JESPP project exemplifies the ready utility of High Performance computing for large-scale simulations. J9, the Joint Experimentation Program at the US Joint Forces Command, is tasked with ensuring that the United States' armed forces benefit from improvements in doctrine, interoperability, and integration. In order to simulate the future battlespace, J9 must expand the capabilities of its JSAF code along several critical axes: continuous experimentation, number of entities, behaviors complexity, terrain databases, dynamic infrastructure representations, environmental models, and analytical capabilities. Increasing the size and complexity of JSAF exercises in turn requires increasing the computing resources available to JFCOM. Our strategy exploits the scalable parallel processors (SPPs) deployed by DoD's High Performance Computing Modernization Program (HPCMP). Synthetic forces have long run in parallel on inter-networked computers. SPPs are a natural extension of this, providing a large number of processors, inter-connected with a high performance switch, and a collective job management framework. To effectively use an SPP, we developed software routers that replace multicast messaging with point-to-point transmission of interest-managed packets. This in turn required development of a new simulation preparation utility to define the communication topology and initialize the exercise. We also developed tools to monitor processor and network loading and loggers capable of absorbing all of the exercise data. We will report on the results of J9's December 2002 Prototype Event which simulated more than one million clutter entities along with a few thousand operational entities using 50,000 interest states on a terrain database encompassing the entire Pacific Rim. The exercise was controlled and "fought" from a J9 test bay in Suffolk, VA and the clutter entities were executed on a remote SPP in Los Angeles, CA. We will also present results from the Prototype Event in March 2003, as well as our long-term plans.

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