HPCMP Portal Supporting MATLAB Applications

The High Performance Computing Modernization Program (HPCMP) is increasingly interested in ways to promote the use of high performance computing (HPC). At the direction of the HPCMP, the MHPCC DSRC has taken a leadership role in establishing the HPCMP Portal initiative expanding HPC support to DoD science and engineering organizations through the use of a web-enabled portal. The success of this initiative is based on the value that users derive from enhanced access to and ease-of-use of HPC resources.

MHPCC is working with the Army Research Laboratory (ARL) DSRC, the USACE Engineer Research and Development Center (ERDC) DSRC, the Computational Research and Engineering Acquisition Tools and Environments (CREATE) Team, and DoD communities of practice to enhance the role of HPC in DoD engineering and science/technology activities.

The goal of the HPCMP Portal MATLAB development effort is to provide the user a nearly effortless way to effectively utilize HPC resources using their existing codes. Mechanisms for both naturally parallel and deep parallel MATLAB will be provided that do not require any HPC or HPC programming knowledge.

drag and drop upload
(m files and resources)

automated node distribution

Since many naturally parallel problem occur in engineering and science, e.g., Monte Carlo parameter studies etc., and because such natural problems provide optimal efficiency, a portal service providing access to MATLAB algorithms in an HPC environment will provide immediate benefit to the engineering community. As an example, MATLAB research algorithms are used to remove atmospheric effects in imagery of orbiting satellites. These algorithms require multiple passes for comparison to other techniques. The HPCMP Portal provides researchers the capability to immediately use HPC for this naturally parallel problem without knowledge of parallel programming.

As an example, DoD Time-domain Analysis Simulation for Advanced Tracking (TASAT) is a MATLAB based research code that accurately simulates reflectance and scattering properties of satellite materials. This code is used to determine the composition and surface characteristics of orbiting space vehicles and their payloads. It is a real world example of running a relatively large MATLAB code (> 500 source files). The Air Force Space Vehicles Directorate plans to field pilot activities evaluating the operational value of providing TASAT/PowerTASAT to analysts through the HPCMP Portal.

The longer-term goal of the HPCMP Portal Initiative is to work with other Government sponsors and targeted HPC user communities to identify additional applications that should be accessed through the portal environment.

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