



OpenSHMEM

EVENT SCHEDULE

Tuesday November 19, 2013

10:00AM - 10:30AM **OpenSHMEM Analyzer** **DOE Booth -1327**

The OpenSHMEM Analyzer is a compiler-based tool that can help users detect errors and provide useful analyses about their OpenSHMEM applications. In this demo, we will show how the tool can be used to detect incorrect use of symmetric variables in OpenSHMEM calls, out-of-bounds checks for accesses, checks for incorrect initialization of pointers to symmetric data, and alias information for symmetric data.

10:35AM - 10:55AM **Analyzing the Power & Energy Requirements For OpenSHMEM** **GCAS (UH) Booth -1101**

We will discuss the empirical analysis of the energy and power consumption behavior of two factors responsible for impacting the scalability of OpenSHMEM applications - synchronization barriers and explicit remote data transfers. We will also discuss our experiments that indicate the energy and power consumption by cores and DRAM for handling small data transfers (less 1KB), which is less than that consumed during bulk message transfers. Additionally, given a fixed data transfer size, aggregated transfers result in an overall lower energy consumption, which is less than multiple transfers.

11:00AM - 11:25AM **Static Synchronization & Multi-valued analysis for OpenSHMEM** **GCAS (UH) Booth -1101**

OpenSHMEM Analyzer (OSA) is a compiler-based tool that provides static analysis for OpenSHMEM programs. It was developed with the intention of providing feedback to the users about semantics errors due to incorrect use of the OpenSHMEM API in their programs, thus making development of OpenSHMEM applications an easier task for beginners as well as experienced programmers. In this talk we will discuss the improvements to the OSA tool to perform parallel analysis to detect collective synchronization structure of a program.

11:30AM - 12:25PM **Vampir and OpenSHMEM Demo** **TU Dresden Booth -3905**

Vampir is tool-set for performance analysis that traces events and identifies problems in HPC applications. It is the most scalable tracing analysis tool that can scale up-to several hundred thousand processes. It consists of the run-time measurement system VampirTrace and the visualization tools Vampir and VampirServer. In this tutorial, we will present how to use Vampir to trace OpenSHMEM applications at scale.

12:30PM - 1:30PM **Accelerator Programming with OpenACC and OpenSHMEM Demo** **CAPS Booth -1127**

This demo is for those who are interested in porting OpenSHMEM applications to hardware accelerators, such as GPUs using OpenACC. We will also explore the basic steps to port an application to this hybrid model.

2:00PM - 2:30PM **Parallel Performance Analysis for OpenSHMEM** **TU Dresden Booth -3905**

We will discuss the theoretical and practical aspects when extending performance analysis tools to support the OpenSHMEM standard for parallel programming. The theoretical part covers the mapping of OpenSHMEM's communication primitives to a generic event record scheme that is compatible with a range of PGAS libraries. The visualization of the recorded events is included as well. The practical parts demonstrate an experimental extension for Cray-SHMEM in Vampir-Trace and Vampir and the first results with an OpenSHMEM application.

2:45PM - 3:00PM **Introduction to UCCS** **Mellanox Booth -2722**

This talk will present the Universal Common Communication Substrate (UCCS), a low-level network Application Programming Interface (API) for parallel programming models. The API provides a simple, portable, efficient API for implementing OpenSHMEM libraries, PGAS Languages, and a Message Passing Interface (MPI), optimized particularly for Remote Direct Memory Access (RDMA).

3:15PM - 4:45PM **OpenSHMEM Poster Session** **PGAS Booth -432**

This session will present four posters. One on the OpenSHMEM library and Specification that will describe the history of OpenSHMEM, and describe the specification and the collection of tools that support the the library. We will also present a poster on the importance of using OpenSHMEM on applications to save power and energy. Next, we will show the new OpenSHMEM Analyzer tool to detect errors in OpenSHMEM applications. The last poster for session is for the Universal Common Communication Substrate (UCCS), a highly optimized low level portable API for PGAS languages/models and message passing.

5:00PM - 6:00PM **Accelerator Programming with OpenACC and OpenSHMEM Demo** **Open ACC Booth -4508**

This demo is for those who are interested in porting OpenSHMEM applications to hardware accelerators, such as GPUs using OpenACC. We will also explore the basic steps to port an application to this hybrid model.





OpenSHMEM

EVENT SCHEDULE

Wednesday November 20, 2013

10:00AM - 10:50AM **OpenSHMEM and UCSS Demo** **GCAS (UH) Booth -1101**

The University of Houston and ORNL will be presenting a demo on the OpenSHMEM reference implementation library API aimed at helping the standardization of several vendor implementations of SHMEM. The demo will talk about a new OpenSHMEM implementation using the UCSS API, which is designed to sit underneath of user-oriented PGAS libraries and languages such as UPC, CAF and Chapel.

11:00AM - Noon **OpenSHMEM Tools** **DOE Booth -1327**

Four demos will be presented on state-of-the-art tools available for OpenSHMEM. The demos will include: the OpenSHMEM Analyzer, presented by Oak Ridge; the TAU performance tool, presented by University of Oregon; the Vampir Tool presented, by TU-Dresden; and Allinea will also demo DDT, a debugging tool, which is currently available for OpenSHMEM. We will also discuss the future roadmap to provide an integrated tools environment for OpenSHMEM.

12:15PM - 1:15PM **PGAS BoF: Partitioned Global Address Space Programming Model** **Room 401/402/403**

The partitioned global address space (PGAS) programming model strikes a balance between the ease of programming due to its global address memory model and performance due to locality awareness. While developed for scalable systems, PGAS is gaining popularity due to the NUMA memory architectures on many-core chips. Some PGAS implementations include Co-Array Fortran, Chapel, UPC, X10, Phalanx, OpenShmem, Titanium and Habanero. PGAS concepts are influencing new architectural designs and are being incorporated into traditional HPC environments. This BOF will bring together developers, researchers and users for the exchange of ideas and information and to address common issues of concern.

1:30PM - 1:50PM **Hybrid Programming using OpenSHMEM and OpenACC** **CAPS Booth -1127**

In this talk, we will discuss the OpenSHMEM and OpenACC hybrid programming model. Plus, we will discuss our experiences using this model in the NAS-BT MZ benchmark. We also plan to discuss OpenSHMEM and OpenACC optimizations that are needed to achieve good performance.

2:00PM - 2:30PM **Introduction to UCSS** **PGAS Booth -432**

This talk will present the Universal Common Communication Substrate (UCSS), a low-level network Application Programming Interface (API) for parallel programming models. The API provides a simple, portable, efficient API for implementing OpenSHMEM libraries, PGAS Languages, and a Message Passing Interface (MPI), optimized particularly for RDMA.

2:35PM - 3:55PM **OpenSHMEM Poster Session** **PGAS Booth -432**

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3:35PM - 3:55PM **Programming Abstraction for MPI to PGAS Transitioning** **PGAS Booth -432**

In this talk, we discuss a set of directives that serve as intermediate expressions for transitioning scientific applications written with MPI to PGAS languages, like Chapel, that are being developed with user productivity in mind.

4:00PM - 4:55PM **OpenSHMEM Tools** **TU Dresden Booth -3905**

Four demos will be presented on state-of-the-art tools available for OpenSHMEM. The demos will include: the OpenSHMEM Analyzer, presented by Oak Ridge; the TAU performance tool, presented by University of Oregon; the Vampir Tool, presented by TU-Dresden; and Allinea will also demo DDT, a debugging tool, which is currently available for OpenSHMEM. We will also discuss the future roadmap to provide an integrated tools environment for OpenSHMEM.

5:00PM - 5:25PM **Introduction to UCSS** **Unv. of TN Booth -836**

This talk will present the Universal Common Communication Substrate (UCSS), a low-level network Application Programming Interface (API) for parallel programming models. The API provides a simple, portable, efficient API for implementing OpenSHMEM libraries, PGAS Languages, and a Message Passing Interface (MPI), optimized particularly for Remote Direct Memory Access (RDMA).

5:30PM - 7:00PM **OpenSHMEM BoF: Further Developing a Standard for the PGAS & SHMEM Community** **Room 201/203**

The purpose of this BOF is to engage collaboration and input from users and developers of systems, libraries, and applications to further expand the open organization for OpenSHMEM. The current API of OpenSHMEM is expected to develop with a richer feature set over time to accommodate advances in system design and scale. This BOF is an excellent face-to-face opportunity to provide your input into this ongoing process. We invite attendees to present and discuss contributions to the ecosystem of OpenSHMEM tools and applications, and hardware solutions.

