Hasan Abbasi

Oak Ridge National Laboratory
Oak Ridge, TN
Email: habbasi@ornl.gov
Phone: (865)-576-3153
URL: http://users.nccs.gov/~habbasi/

Professional Preparation

Ph.D.	Computer Science, Georgia Institute of Technology, Atlanta, GA, 2011
B.S	Computer Systems Engineering, Ghulam Ishaq Institute of Technology, Pakistan, 2001

Appointments

2011-present	Research Scientist, Oak Ridge National Laboratory, Oak Ridge, TN
2011-2011	Research Leader, University of Tennessee Knoxville, Knoxville, TN

Development Projects

- **ADIOS I/O Middleware:** Part of the winning team for the R&D 100 award, given to successfully research, development and deployment of high impact technologies. Developed the model and initial implementation for Data Staging, widely accepted within HPC community as an important component of future Exascale architectures. Added data staging to ADIOS middleware for usability with leadership class applications.
- **Data Movement in HPC Systems:** Developed a high performance data transport asynchronous I/O for Cray XT, Cray XK, and Infiniband based Linux systems. During development and evaluation, identified interference between background I/O and application communication. Developed a perturbation avoidance scheduler to minimize the performance impact of interference on large scale applications.
- **Data Intensive Services for HPC:** Designed and developed a middleware to enable the execution of in situ and in transit data analytics alongside petascale simulations. Combined this middleware with the high performance data transport and in situ binary code generation to co-locate portions of these data services with the simulation allowing data processing with minimal data movement.
- **Co-Design of Solutions for Exascale Problems:** Designed and developed a solution to massive data requirements by combining storage of data in a memory hierarchy, and re-generation of the original data set. The combination solved an intractable storage problem, provided bounds on the processing time and reduced energy usage. Continuing work in this area with the development of new tools to optimize on-demand data regeneration.
- **Shared Memory Transport for Inter-VM Communication**: Developing a transport for the ADIOS I/O middleware to enable low overhead shared memory data exchange across two virtual machines running on the same physical nodes.
- **Performance Understanding for Data Intensive Workflows**: Developing new methods for addressing data management challenges in collecting, analyzing and understanding performance data from exascale workflows.

Relevant Experiences

- Extensive experience in C/C++. Fluent with Fortran and C#.
- Experienced with Windows and Linux.
- Fluent in reading and writing Urdu, speaking Hindi.

Relevant Publications

1. Q Liu, J Logan, Y Tian, H Abbasi, N Podhorszki, JY Choi, S Klasky, R Tchoua, et.al, “Hello ADIOS: the challenges and lessons of developing leadership class I/O frameworks”, Concurrency and Computation, Practice and Experience, 2013
2. JC Bennett, H Abbasi, PT Bremer, R Grout, A Gyulassy, T Jin, S Klasky, et.al, “Combining in-situ and in-transit processing to enable extreme-scale scientific analysis”, SC 2012
3. Hasan Abbasi, Greg Eisenhauer, Scott Klasky, Karsten Schwan, Matthew Wolf. “Just In Time: Adding Value to IO Pipelines of High Performance Applications with JITStaging, HPDC 2011.
4. Fang Zheng, Hasan Abbasi, Ciprian Docan, Jay Lofstead, Qing Liu, Scott Klasky, Manish Parashar, Norbert Podhorszki, Karsten Schwan, Matthew Wolf, “PreDatA - Preparatory Data Analytics on Peta-Scale Machines”, IPDPS 2010
5. Hasan Abbasi., Matthew Wolf, Greg Eisenhauer, Scott Klasky, Karsten Schwan, and Fang Zheng, “DataStager: scalable data staging services for petascale applications”, HPDC 2009
6. Hasan Abbasi, J. Lofstead, F. Zheng, S. Klasky, K. Schwan and M. Wolf, “Extending I/O through High Performance Data Services”, Cluster 2009
7. Hasan Abbasi, Matthew Wolf, Karsten Schwan**,** "LIVE Data Workspace: A flexible, dynamic and extensible platform for Petascale applications", Proceedings of Cluster 2007