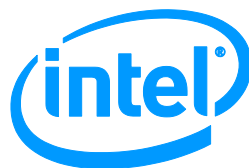# STAC® Performance Summit

October 18, 2011

Doors open at 1:00pm / Meeting starts at 1:30pm
Meeting will be followed by cocktails

Conference Center at UBS Tower
One North Wacker Drive
Chicago

Gold Sponsors:

SOLARFLARE®

intel®

CISCO™

DataDirect™ NETWORKS
INFORMATION IN MOTION™

corensic™

AGENDA

Welcome and STAC Update [slides]

Peter will briefly review activity in a number of the STAC Benchmark™ domains, with particular focus on STAC-M3™, which has provided an industry focal point for innovative storage engineering around tick data.

Peter Lankford, Founder & Director, Securities Technology Analysis Center. Peter has overseen STAC since its birth in 2006. Before that, Peter was SVP of Information Management Solutions at Reuters, where he led the $240M market data systems business. Peter's team led Reuters into the business of low-latency direct feeds and catalyzed the widespread adoption of Linux on Wall Street by making RMDS available on that platform. Prior to Reuters, Peter held management positions at Citibank, First Chicago Corp., and operating-system maker IGC. Peter has an MBA, Masters in International Relations, and Bachelors in Chemistry from the University of Chicago.

Panel: The New Frontier in Storage Performance

It is well known that while storage capacity has met or exceeded advances in CPU and memory over the past few decades, storage performance has lagged them all by a few orders of magnitude. For trading organizations, storage performance is the gating factor on many important top-line activities such as strategy backtesting and risk management. However, recent innovations such as solid-state media (including flash and DRAM), higher speed interconnects, more powerful controllers, and smarter software appear to be opening up that bottleneck. Just how good are these new solutions, and what opportunities do they present to trading organizations? Our panel will provide its views.

Christoph Lameter, System Analyst, Jump Trading. Christoph Lameter maintains the slab allocators in the Linux kernel and has been involved in enhancing the Linux operating system to be able to scale for high performance uses (HPC, NUMA, multicore processors) and low latency operations (financial application). Christoph has a long history in the Linux movement since he started contributing to the Linux kernel in 1993. Later he contributed to various open source projects as a Debian developer before he was hired by companies in Silicon Valley to enhance Linux for various uses. Christoph is currently working in the financial industry optimizing Linux for low latency trading.

Larry Jones, Sr. Director, HPC and Life Sciences, DataDirect Networks. [slides] Larry is the Sr. Director, HPC and Life Science Marketing for DataDirect Networks (DDN). He is charged with developing and evangelizing compelling storage solutions for the HPC, Finance and Life Sciences end markets. Larry has 30+ years experience in networking, storage, and technical marketing related to the cloud storage, financial services, tele-communications, collaboration software and High Performance Computing industries. Prior to his role at DataDirect Networks, he led the definition and introduction of the first parallel, object-based file system at Panasas, and held senior marketing roles at E*Trade, IBM, and Nortel Networks. Larry holds a BA in History from the University of Michigan, regularly contributes to trade journals, and has been a featured presenter at industry conferences including the IDC User Forum, STAC conferences, the XGen sequencing conference, SuperComputing, the Oil & Gas HPC conference.

John Overton, CEO, Kove. [slides] John founded Kove in 2004. Before that, John was founder and CTO of a company that built the fastest network-optimized database in the world. John has degrees from the University of Richmond, Harvard, and University of Chicago.

Jeff Margolis, Solutions Architect, Mellanox Technologies. Jeff works with financial services organizations to implement low latency networking solutions for high frequency trading. In this role, he deploys Mellanox solutions at a large array of investment banks, hedge funds and exchanges. Prior to Mellanox, Jeff spent more than three years as the central region FSI Systems Engineer at Voltaire, where he was responsible for designing and implementing large trading platforms based on InfiniBand and 10GbE. Before joining Voltaire, Jeff held a variety of network, systems and support engineering positions at The Revere Group, Interwoven and Sprint. Jeff holds a BA in Telecommunications from Michigan State University.

Technical Brief: Intel's Next-Generation of Instructions - AVX, AVX2, and FMA

Arch will highlight key points from Intel's next-gen instruction sets. Background documents are at www.STACresearch.com/node/10185.

Arch Robison, Senior Principal Engineer, Intel. [slides] Arch Robison was the original architect of Intel Threading Building Blocks. He currently works on Intel Cilk Plus and is co-writing a book on parallel programming. He was the lead developer for KAI C++, and previously worked at Shell on massively parallel codes for seismic imaging. Arch holds a Ph.D. in computer science from the University of Illinois, 12 software patents, 3 winning entries in the International Obfuscated C Code Contest, and an Erdös number of 3.

Innovation Roundup – Round 1

• "Spinning Rust is Dead" **[slides]**	**Keith Josephson,** CTO/VP Engineering, Ion Computer
• "Squashing bugs: Innovative techniques for parallel code" **[slides]**	**Scott Lasica**, VP, Global Alliances, Rogue Wave Software
• "Need for Speed: Taming Latency" **[slides]**	**Sujay Lele,** CTO, SR Labs
• "TIBCO FTL® Goes Global" **[slides]**	**William McLane**, Senior Product Architect Messaging, TIBCO Software
• "FSI-HPC: 5 HP updates in 5 minutes" **[slides]**	**Scott Olsen**, HP Solution Architect, HP

COFFEE BREAK

STAC Network API Study A [slides]

Peter Lankford, Founder & Director, STAC

Developers writing applications directly to a network interface have several choices. What are the pros and cons of APIs like Sockets, RDMA, and RDS and the implementations available for each? Key questions are their performance, complexity, and resource usage, including the tradeoffs of different usage patterns. STAC has recently researched these questions in "STAC Network API Study A," with support from key networking vendors and the RDMA experts at the University of New Hampshire. This study is expected to be the first round of an interactive research program involving Council members. While the reports are reserved for premium STAC subscribers, Peter will offer highlights and discuss this ongoing research program.

Technical Brief: Identifying Kernel Mode Data Races [slides]

High-performance systems in the financial services industry often require customizations to operating system kernels, device drivers, and third-party applications in order to gain the maximum possible efficiency and throughput. Whether these customizations are done in-house or through specialized vendors, quality tools for detecting concurrency errors, such as race conditions, atomicity violations, and data races, are necessary in order to gain the reliability required of financial services solutions. In some cases, even when the software is well-tested throughout the development lifecycle, these concurrency errors manifest themselves only when the full system is finally put together. And, when discovered, it can be inordinately difficult to communicate information about how to reproduce the error. In this session, you'll learn how to identify kernel mode data races in your software at every phase of the app dev lifecycle (development, test, and acceptance testing) and how to communicate errors you've identified to the developers and vendors who may have caused them.

Peter Godman, Founder & CEO, Corensic. Peter joined Corensic from Isilon Sytems where, as Director of Software Engineering, he led development of several major releases of Isilon's award-winning OneFS distributed filesystem and developed around twenty patent-pending technologies. Prior to his six year tenure at Isilon, Peter led development of several generations of Linux-based client software at RealNetworks.

Innovation Roundup – Round 2	
• "Cisco Innovations for High Frequency Trading" **[slides]**	**Pramod Srivatsa,** Product Manager, Cisco
• "Implementation experience and performance results with the Solarflare 10GbE precision time network adapter" **[slides]**	**Bruce Tolley,** VP, Solutions Marketing, SolarFlare
• "Timekeeping Accuracy on Servers Under Load" **[slides]**	**Paul Skoog**, Product Marketing Manager, Symmetricom
• "Real time network monitoring with EOS LANZ Streaming" **[slides]**	**Dean Nebrig,** Director of Central Region, Arista
• "Mellanox: Delivering the World's Fastest Trading Solutions" **[slides]**	**Jeffrey Margolis,** America SE Group Manager & Senior Systems Architect, Mellanox Technologies

Closing View: What's On the Minds of Chicago Trading Technologists

Doug Puenner, CTO of Blue Capital Group, and Craig Mohan, Managing Director of Co-Location Services at the CME will close out the meeting with thoughts on some of the key topics on the Chicago trading technology scene and ways to approach them.

 Craig J. Mohan, Managing Director, Co-Location and Data Center Services, CME Group. Craig J. Mohan has served as Managing Director, Co-Location and Data Center Services of CME Group since May 2010. He is responsible for the strategic development, management and overall execution of the company's co-location and data center hosting business, including sales, product development and client services. Prior to joining CME Group, Mohan most recently served as Director, Global Infrastructure at Citadel Investment Group, where he was responsible for managing the firm's networking, technical architecture and global operations. His background also includes technology and operations management positions with ShopperTrak RCT, Accenture and Blue Meteor Inc. He holds a bachelor's degree in electrical engineering, with honors, from the University of Illinois at Urbana-Champaign.

 Doug Puenner, CTO, Blue Capital Group. Doug's focus is on low latency direct market access infrastructure and high frequency trading solutions. This includes top of rack solutions, co-location, fiber, and communication providers in the managed and unmanaged capital markets space. Prior to Blue Capital, Doug served with several capital markets and financial investment firms, working his way up to senior level management positions from roles such as application developer, developer liaison & developer engineering support, and developer team manager. Doug's professional IT career started with Quotron Systems in 1979, where as the lead support engineer for two major Chicago exchanges, Doug supported the three-fold expansion of the CBOE trading systems that directly supported the trading floor after the lifting of the options trading moratorium of 1977. Doug is a Member of Microsoft's High Performance Computing & Technical Advisory Committee and was one of the first Chicago representatives on the STAC Benchmark Council.

COCKTAIL RECEPTION