STAC Benchmark Council ™

STAC® Summit

June 18, 2012
Doors open: 8:30am
Meeting starts: 9:00am

Grand Hyatt New York
Manhattan Ballroom
Park Avenue at Grand Central Station
New York, NY

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AGENDA

Big Picture Panel: Technology and Career Trends [video]

What are the key business trends that will affect technology needs in trading firms over the next few years? Conversely, what technology trends will have the biggest effect on trading businesses? How will these trends change the demand for human resources (management tracks, developer skills, low latency, HPC, big data, on-shore vs off-shore)? How will the capital markets continue to compete for technology talent with other industries? Our panel of senior executives will tackle these topics and your own questions.

Steven J. Sadoff, EVP, Global Head of Operations, Services & Technology, Knight Capital Group. Steven oversees the group that handles the operations, facilities, infrastructure, electronic services, and technology functions throughout Knight's global locations. Steven has been with the company since April 2002 and was named Executive Vice President in January 2009. Prior to joining the company, Steven was the CIO for BondBook, responsible for global oversight, strategy, purchasing and implementation of technology. From 1995 until 2000, he was with Merrill Lynch, where for the last two years, he was a director responsible for technology for the Global Liquidity and Credit businesses, in addition to leading e-commerce initiatives. For the first three years he was with Merrill Lynch Japan, responsible for front office technology and infrastructure. From 1990 to 1995, Steven was with Lehman Brothers, most recently as a Vice President. Steven currently serves on the Board of Managers of Direct Edge Holdings LLC, the advisory board for Corvil Ltd., the Technology/ Operations Customer Advisory Board for Thomson Reuters, the board of Pico Quantitative Trading LLC, and as a member of the SIFMA Operations & Technology Steering Committee. Steven holds a B.S. in Computer Science, an M.S. in Electrical Engineering, and a D.Sc. in Computer Science, all from Washington University in St. Louis.

Lyle Hayhurst, CTO, DRW Trading. Lyle began his professional career as a C++ developer in 1996, and has been working in the trading business since 2000. In 2007 he took the role of CTO at DRW Trading, a Chicago-based principal trading firm. He has worked closely with STAC on numerous projects.

STAC update – Big Workloads [slides/video]

Peter Lankford, Founder & Director, STAC

STAC will provide a brief update on Council activities related to Big Workloads.

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.

Advances In Number Crunching [slides/video]

In a data-driven discussion, Rick will present Intel's initial experience with the compute-intensive STAC-A2 monte carlo Greeks benchmarks on multiple Intel platforms.

Rick Carlin, Senior Performance Engineer, Financial Services Sector, Intel. Rick has been with Intel for more than 13 years, the last 7 with Intel's Financial Services Engineering team. Rick supports many of the leading FSI firms and ISVs to enhance the performance of their software and computing infrastructure. Prior to Intel, Rick worked for several investment banks and hedge funds as an infrastructure architect, system/storage/network admin and software developer. Rick holds a Masters in Computer Science from NYU-Poly and Bachelors in Computer Science and Applied Mathematics.

Innovation Roundup – Round 1

• "The Shortest Path to the Fastest Data Management" [slides/video]	**Christopher Mureen,** COO, McObject
• "Big Data meets Fast Data" [slides/video]	**Mike Stolz,** Global Architect, VMware Inc
• "Taming Big Data with SAP" [slides/video]	**Mark Mumy,** Technical Director, Enterprise Systems Group, SAP, Sybase
• "Everything You Hear About Big Data Is Wrong" [slides/video]	**Tom Deutsch**, Program Director, IBM Software Group Worldwide Sales, Big Data, IBM
• "The MemSQL Launch Announcement" [slides/video]	**Eric Frenkiel,** CEO, MemSQL

COFFEE BREAK

Panel: Breaking "Big" [video]

One of STAC's missions is to facilitate industry dialogs that have real substance. Nowhere is that need more acute than in the area of "Big Data." STAC is kicking off a series of discussions that attempt to break through the Big Data hype by focusing on specific workloads, what is challenging about them, and the tradeoffs of new approaches. In this session, people with experience tackling Big Data problems in the capital markets will share lessons learned from real use cases.

Vinod Kutty, Senior Director, CME Group. Vinod is a key architect of the server platform technology that handles electronic trading and clearing for CME Group. His responsibilities include leading Distributed Computing/Open Systems Research and Development activities as well as internal Linux Support. Performance, scalability, reliability, openness and cost effectiveness are constant challenges in this environment. He works closely with various application development teams to cater to their needs and optimize applications for the underlying platform. He also drives performance and functionality requirements with Linux and server technology vendors and has served on various vendor customer advisory boards to align their roadmaps with user needs. Vinod is active in the Linux community via the Linux Foundation and is also an active member of Webmonsters.

Dino Vitale, Director, Cross Technology Services, Morgan Stanley. Dino currently guides Morgan Stanley businesses toward successful architectures to solve big challenges in the grid computing domain. He has over 25 years' experience with multiple application architecture models, from grid computing, HPC/low-latency design to cloud computing and data warehouses. Prior to Morgan Stanley, Dino had senior positions at JP Morgan Chase and Citibank, where he had global responsibility for implementing enterprise grid shared services including architecture, engineering, operations, and client servicing. Earlier at Citi, Dino was the Chief Architect for LATAM in leading the internet presence/deployments in Latin America. Prior to that he was a Senior Developer and Project Lead at Prudential Securities implementing cutting-edge Retail Broker workstation applications. Dino is near completion of MS in Financial Engineering and a BA in Computer Science from New York University.

Lokesh Khosla, Director Of Systems/Sales Engineer, ParAccel. Lokesh joined ParAccel as the Director Solution Architect to ensure that ParAccel solutions meet the needs of customers and partners. He brings tremendous industry experience with him to ParAccel, having worked at high-performance database companies like Netezza and DatAgllegro and with a strong background in storage. Lokesh's high performance computing career spans back to 1996 when he worked as solution architect at EMC hired to work on DBMS like Oracle and SQL Server on high end storage devices. He also served as a senior consultant in Boston where he helped major financial and retail and telecommunication providers develop breakthrough analytical databases systems and practices based on highly differentiated analytics. Lokesh has led many successful implementations of high performance DBMS systems in some of the top 10 global investment banks. Lokesh helped to introduce ParAccel technology into new geographic regions in the US and Europe. He received his Graduate degree from Delhi University, India and post graduate certificate in Computer Science.

Innovation Roundup – Round 2

• "Accelerating Performance by Transforming the way compute-intensive applications use network data" **[slides/video]**	**Bruce Tolley,** Vice President of Marketing, Solarflare
• "5 Minutes on Big Data Network Designs and Experiences" **[slides/video]**	**Ashwin Kohli**, Systems Engineer, Arista
• "Managing Distributed Big-Workloads across LAN, WAN and Web" **[slides/video]**	**Shawn McAllister,** CTO, Solace Systems

Panel: Getting Smarter Faster:
Building better platforms for research and back-testing [slides/video]

In liquid markets, tick-to-trade latency hogs the technology limelight. But another type of latency is also a key to competitiveness: the latency of developing and deploying new trading strategies. Trading firms are constantly pushing to enable more rapid experimentation and adaption of algorithms to market conditions. Depending on how quants and developers tackle this issue, big bottlenecks can arise in compute, I/O, and programmer productivity. Panelists will provide a customer perspective on the challenges of various approaches, then engage in a dialog about solutions. What's the best approach for moving from batch to near real-time analysis? For overall throughput and productivity, how best should we scale out the workloads? Where are the bottlenecks and what can we do about them? Can we believe the results we get?

Niall Dalton. Niall is an expert in algorithms and technology for low-latency, data-intensive systems in applications such as high-frequency trading. His 17 years of experience include working as Director of HFT at a Wall Street firm; CTO of Kx Systems, a leading vendor of high-performance column-oriented database software widely used on Wall Street; senior software engineer at NVIDIA; and CTO at X.R.N.D, a European vendor of high performance parallel data analysis software. He has enjoyed a variety of engineering and research positions in Europe and the US in areas such as language design and compilers for parallel computing, data-intensive distributed systems and non-traditional database internals. He currently serves on the advisory board of MemSQL, creators of a realtime in-memory MySQL compatible database, and Calxeda, designers of ultra-low power processors for hyperscale servers. Despite many publications and multiple degrees in Computer Science, Niall acquired the skills to swear fluently at multifarious hardware and software systems in a wide variety of common and obscure programming languages. He has never met an abstraction layer he didn't enjoy violating.

Bob Gaines, Senior Sales Director, DataDirect Networks. Bob is senior director for DataDirect Networks' solutions team for the US and Canada. He is a long-term veteran of the storage industry having spent the past 12 years at StorageTek, Sun Microsystems, and Oracle.   He created StorageTek's state, local, & education sales practice that become Sun's government education and healthcare vertical via acquisition.   Bob developed large-scale data management and storage architectures for government agencies and educational research labs..

Asaf Wachtel, Director of Business Development, FSI, Mellanox. Asaf has served as Director of Global Financial Services Industry at Mellanox Technologies since February 2011 and is responsible for the global business development for financial services. From January 2008 to February 2011, Asaf served as Senior Product Manager at Voltaire, a semiconductor company which was acquired by Mellanox Technologies. At Voltaire, Asaf was responsible for the InfiniBand switching platforms, many of which are used as infrastructure for the world's fastest and most scalable trading and market data environments today. Prior to joining Voltaire, Asaf spent 8 years at RAD Data Communications, a leading provider of access solutions for the Telecom market, and held various roles in both engineering and product management. Asaf holds a Bachelor of Science in Electrical Engineering and Computer Science from Tel-Aviv University and an MBA from the Inter-Disciplinary Center.

Gerald A. Hanweck, Jr., PhD, Chief Executive Officer, Hanweck Associates. Before founding Hanweck Associates, Gerry served as JPMorgan's Chief Equity Derivatives Strategist from 2000 to 2003 and led the bank's U.S. Fixed-Income Derivatives Strategy team. He has taught master's-level business courses at Northwestern University's Kellogg Graduate School of Management and the Graduate School of Business at the University of Chicago, in addition to dozens of seminars on financial derivatives. Before joining JPMorgan in 1993, he worked as a derivatives researcher at Discount Corporation of New York Futures, and as a software developer at Microsoft. Gerry holds the following degrees: PhD, Managerial Economics and Decision Science, Kellogg Graduate School of Management, Northwestern University; AB, Mathematics, Princeton University.

NETWORKING LUNCHEON

STAC Update: Fast Workloads [slides/video]

Peter Lankford, STAC

Peter will provide a brief update on Council activities related to Fast Workloads and cover some highlights of the just-released analysis of the 2012 STAC Latency Monitoring and Time Synchronization Survey.

Innovation Roundup – Round 3

• "Optimizing ProLiant Gen8 Systems for Ultra Low Latency" **[slides/video]**	**Lee Fisher,** Worldwide FSI-HPC Solutions,HP
• "Cisco Innovations for High-Frequency Trading Workloads" **[slides]**	**Pramod Srivatsa**, Director, Product Management, Cisco
• "Low Latency to High IOPS: Wire to Storage Solutions" **[slides/video]**	**Mike Spencer,** Senior Systems Engineer, Emulex
• "Paradigm Shift: Accelerating Financial Applications Via The Programmable Network" **[slides/video]**	**Nick Ciarleglio,** System Engineer, Arista Networks

Panel: Not Your Father's Network [slides/video]

The network landscape is changing rapidly. Innovations in latency, scalability, and even programmability are redefining how we think about both switches and host interfaces. Our panelists will discuss what this means for trading firms and what we can expect leading trading architectures to look like a year from now.

Pramod Srivatsa, Director, Product Management, Cisco. He has product management responsibility for the Nexus 3000 product line, which is purpose-built for High-Performance Trading workloads. Before Cisco, Pramod was Vice-President at Goldman Sachs, where he was responsible for the architecture and operation of the Goldman Sachs WAN Network. He has an MBA from the University of California, Berkeley, M.S in Electrical Engineering from Columbia University, New York and B.E. in Electrical Engineering from the Cooper Union for Advancement of Science and Art, New York.

Asaf Wachtel, Director of Business Development, FSI, Mellanox. Since February 2011, Asaf has been responsible for the global business development for financial services. From January 2008 to February 2011, Asaf served as Senior Product Manager at Voltaire, a semiconductor company which was acquired by Mellanox Technologies. At Voltaire, Asaf was responsible for the InfiniBand switching platforms, many of which are used as infra-structure for the world's fastest and most scalable trading and market data environments today. Prior to joining Voltaire, Asaf spent 8 years at RAD Data Communica-tions, a leading provider of access solutions for the Telecom market, and held various roles in both engineering and product management. Asaf holds a BS in Electrical Engineering and Computer Science from Tel-Aviv University and an MBA from the Inter-Disciplinary Center.

Glenn Dasmalchi, Enterprise Sector CTO, Juniper Networks. Glenn is responsible for driving Juniper's Enterprise technology vision and related go-to-market strategy and execution globally. A proven technologist with many years of experience in the network-ing industry, he leads the integration of Juniper's end-to-end Enterprise architectures in the areas of Cloud, Data Center, Security, and Campus. Before joining Juniper, Glenn was Technical Chief of Staff in the Office of the CTO at Cisco, where he was responsible for identifying and developing strategy around technology-based market disruptions. He also served in several engineering leadership roles driving architecture and engineering development on switching platforms, including the Catalyst 6000 and Nexus 7000. Prior to the networking industry, Glenn co-founded Media Engineering, a technology consulting firm. He also served in a variety of leadership and engineering roles in several Silicon Valley startups and corporations, including HP, Apple, FirePower Systems, and Chelsio. Glenn holds BS and MS degrees in Electrical Engineering from Stanford.

Nick Ciarleglio, FSI Product Manager, Systems Engineer, Arista. Nick arrived at Arista Networks in 2008 as the company's first Systems Engineer. In his current role, Nick is responsible for network architecture consulting in the financial services vertical, and has specifically focused on end to end low-latency architectures. Nick also provides field feedback and "real world" expertise to the Arista development teams. Prior to his arrival at Arista, Nick was a Senior Technical Consultant for Hewlett Packard.

Innovation Roundup – Round 4

• "WAN PTP – the good, the bad and the ugly" **[slides/video]**	**Henry Young**, CEO, TS-Associates
• "Delivering and verifying Sub microsecond time at the Linux application layer" **[slides/video]**	**Paul Skoog,** Product Marketing Manager, Symmetricom
• "The Power of Real Time Monitoring With MemSQL" **[slides/video]**	**Eric Frenkiel,** CEO, MemSQL
• "Innovations in High Performance Messaging" **[slides/video]**	**Roderick Clemente,** Product Specialist, Informatica
• "Performance Like No Other" **[slides/video]**	**Bill McLane,** Sr. Product Architect, Messaging, TIBCO

COFFEE BREAK

Infrastructure Outsourcing [slides/video]

A discussion of how the market for low-latency infrastructure hosting (aka "cloud services") is evolving. What are customers looking for, and how are providers innovating?

Jerry Nelligan, Director of Trading Technology, Integral Derivatives. Jerry has for the last year been responsible for trading systems as well as trading equity options for Integral Derivatives. From 2005 to 2011, he was Business and Technology Manager of NG Trading LLC, an Equity Options Market Making firm. From 1996-2005 he was VP & Director Global Technology of TD Securities (Stafford Trading from 1996-2002) where he managed development, systems integration, data, and infrastructure. From 1991-1996 he was a systems integrator at Bank of America (formerly NationsBanc and CRT), in addition to roles as a network administrator, system architect, and systems programmer during that time. He has an BSEE from Northern Illinois University.

Nigel Kneafsey, CEO, OptionsIT. Nigel runs Options IT, a provider of private financial cloud services to the global financial community. He founded the firm in 1993 in Europe to provide outsourced IT services to the investment banking industry. Options IT quickly expanded its client base to traditional and alternative asset management firms, and brokerages. In 2000, Nigel oversaw the development and launch of the Options PIPE platform, Options IT's global private cloud services platform. Designed to minimize what Nigel viewed as systemic inefficiencies in the financial sector's IT implementation practices, the Options PIPE platform was the first, comprehensive Infrastructure-as-a-Service platform for financial services firms. Since 2000, Options IT has expanded into North America and Asia and now provides private cloud services to about 100 firms globally.

Bill Ruvo, Head of Elektron Hosting, Thomson Reuters. Bill is responsible for overall strategy and execution of hosting solutions that provide high-performance infrastructure and applications to support trading operations and high-quality global content to drive investment decisions. Bill has over 20 years of experience in the financial services industry. Prior to his current role, Bill ran the real-time feeds business in North America. Before joining Reuters, Bill was Vice President of Business Development at Interactive Data Corporation where he was responsible for their real-time non-organic growth strategy with a specific emphasis on direct exchange initiatives. During his tenure with Interactive Data, Bill also held the position of Vice President of Strategic Account Sales. Before Interactive Data, Bill held several senior positions with the financial services sector such as Vice President of Sales for MoneyLine Telerate and sales management positions with Bang Networks, 4Cast, and Dow Jones Telerate. Bill began his career with Prudential Financial in its institutional asset management organization. He holds a BS in Finance from St. Joseph's University in Philadelphia.

Michael Dunne, Chief Technology Officer & Co-Founder, ACTIV Financial Systems. Michael is co-founder and CTO of ACTIV. He has 5 years of senior management experience and over 15 years' software development experience at ICV Ltd / Primark / Thomson Financial, making major contributions to the design and development of the TOPIC3 and GlobalTOPIC products. At ACTIV, Mike has architected and led the develop-ment of the state-of-the-art ACTIV suite of products. He holds a BSc (Hons) in Mathematics and Computer Science from The University of Manchester.

Technical Briefing: The Sandy Bridge Difference for Tick-to-Trade Latency
[slides/video]

Intel will review the latest research on how Sandy Bridge improvements tick-to-trade latency.

Daryan Dehghanpisheh, Director, Financial Services & Institutions Team, Intel. Daryan is responsible for the company's sales and marketing efforts and architecture development with customers and partners throughout the world. Intel's focus in financial services is in banking, capital markets, and exchanges/liquidity venues. Daryan resides in New York City and directs all of Intel's technical sales, design win efforts, and marketing strategies in financial services. He holds a BS in computer engineering from the University of Arizona, with a specialty in hardware/software co-design and discrete mathematics.

Panel: Java In Low-Latency Trading [slides/video]

A fact that gets little media attention is that there is a lot of Java code deployed in latency-sensitive trading. This means there is an important conversation to be had about how to optimize Java. What are some of the highly effective patterns of low-latency Java programming? Are innovations available in underlying technology that promise to help? What could vendors do that they aren't? More broadly, what role should Java play in low-latency trading today? What are the non-performance benefits (or drawbacks) to using Java in this kind of environment vs C/C++? Does making Java perform well mean giving up those benefits?

Ryan Eavy, Executive Director, Enterprise Architecture, CME Group. Ryan leads the Emerging Technology function as part of the Enterprise Architecture team at the CME Group. He is responsible for ensuring the company's technology is aligned with business strategy through application research and development, technical solution assessment and systems roadmap definition. Among Ryan's many other accomplishments, he has recently led the design and implementation of the Exchange's ultra-low-latency middleware strategy and common abstract middleware layer. Prior to this, he most recently served as a Senior Application and Security Architect for the Chicago Board of Trade. Before joining the CBOT in 2003, Ryan worked as a Senior Applications Developer at Quotes Plus where he designed and developed trading analysis software and as a Senior Applications Engineer at Dewpoint. Ryan earned a bachelor's in computer science from the University of Michi-gan and is currently pursuing a master's in Computational Finance from DePaul University.

Gil Tene, CTO & Co-founder, Azul Systems. Gil has been involved with virtual machine technologies for the past 20 years and has been building Java technology based products since 1995. He co-founded Azul Systems in 2002 with the goal of eliminating common Java responsiveness, performance, scale, and overall deployment barriers. Gil guides Azul Systems architectural vision and product design to align with business and market opportunity strategies. At Azul, Gil pioneered Pauseless Garbage Collection, Java Virtualization, and various managed runtime and systems stack technologies that combine to deliver the industry's most scalable and robust Java platform. Prior to co-founding Azul, Gil was Director of Technology at Nortel, Shasta Networks and Check Point, where he delivered several industry-leading traffic management solutions including the industry's first Firewall-1 based security appliance and the industry's first subscriber edge Broadband Service Node. Gil architected operating systems for Stratus, clustering solutions at Qualix/Legato, and served as an officer in the Israeli Navy Computer R&D unit. He holds a BSEE from The Technion Israel Institute of Technology, and has been awarded 28 patents in computer related technologies.

Cameron Purdy, VP Development, Oracle. Cameron is responsible for the Java EE plat-form, web server, and application server products. Prior to joining Oracle, Cameron was CEO of Tangosol, whose revolutionary Coherence Data Grid product provides reliable and scalable data management across the enterprise. Cameron has been working with Java and Java-related technology since 1996, regularly participates in industry standards development, and is a specification lead for the Java Community Process. As a software visionary and industry leader, Cameron is a frequent presenter at industry conferences and has received a number of awards in recognition of his contribution to the Java community, including three times being named as a JavaOne RockStar and being recognized in TheServerSide's "Who's Who in Enterprise Java".

Panel: Accelerator Boards: Making Hardware Softer or Software Harder?

FPGAs and more recently, network processors (NPUs), have secured a place in many low-latency trading shops. While most early adopters bought complete, integrated solutions from vendors, today many trading firms are going directly to component vendors and doing the integration themselves. These accelerators are effectively "bumps in the wire" that perform critical tasks directly within a network card or switch without needing to up-call a host system. What is the state of the art in these components? What differentiates them from each other? How broad a part can they play in the trader's arsenal? Just how tough are they to program, and how risky is it to slow down code change in a world of rapidly evolving requirements? How do the underlying technology roadmaps compare to those for CPU-based platforms?.

Bruce Tolley, Vice President of Marketing, Solarflare. [slides/video] Bruce is responsible for solutions and technical marketing at Solarflare. Prior to joining Solarflare, Tolley was a Senior Product Line Manager at Cisco Systems where he launched Layer 2/3/4, Metro Ethernet and 10 Gigabit switching. Formerly Study Group Chair of the IEEE 802.3aq 10GBASE-LRM standards project, Tolley has been a frequent contributor to the IEEE 802.3 Ethernet standards projects and a frequent speaker at industry events such as IEEE 802.3 Working Group and Interop. He holds an MBA from Haas School of Business, UC Berkeley and a PhD from Stanford University.

Nikolaj Hermann, CTO, Fiberblaze. [slides/video] Nikolaj has been in charge of the development of the complete product portfolio at Fiberblaze, including all 10 GigE FPGA based Network Interface Cards. The network interface cards are now being used as the state-of-the-art choice at many High Frequency Trading sites worldwide. Before Nikolaj founded Fiberblaze in 2008, he worked in the electronics and telecommunication industry for more than 10 years and holds a degree in physics.

John Lockwood, CEO, Algo-Logic. [slides/video] John is the founder and CEO at Algo-Logic Systems. Algo-Logic's hardware-accelerated logic circuits enable networks to achieve ultra-low latency processing while carrying large volumes of data. From 2006 to 2009, John managed the NetFPGA program as a Consulting Associate Professor at Stanford University. At Stanford, John grew the worldwide deployment of NetFPGA hardware from 10 to 1,021 units. Prior to joining Stanford in January of 2007, John led the Reconfigurable Network Group, which was a part of the Applied Research Laboratory at Washington University in Saint Louis. There he was a tenured Associate Professor in the Department of Computer Science and Engineering. John and his research group developed the Field programmable Port Extender (FPX) to enable rapid prototype of extensible network modules in Field Programmable Gate Array (FPGA) technology. Over the past 20 years, John has published over 100 papers and has 7 patents related to FPGA systems and networking systems. John earned his MS, BS, and PhD degrees from the Department of Electrical and Computer Engineering at the University of Illinois.

Matthew Knight, President, Accensus. [slides/video] Matthew has been with Accensus for just over a year in the role of President. In that time, he has shaped their recently released new hybrid FPGA/CPU platform and overseen its introduction to market. Prior to Accensus, Matthew was with DRW Trading in Chicago, running technology research and development for the high-frequency and algorithmic trading desks. Before that he spent two blissful years at STAC focusing on measuring latency and designing and implementing benchmarks. Nine years at Reuters working mainly in the Market Data System realm and two years at BNP Paribas preceded that. Matthew's key expertise is in low-latency computing and networking across the whole stack.

Bob Doud, Director of Processor Strategy, Tilera. [slides/video] Bob brings more than 25 years of experience in the networking, silicon, and security industries to Tilera. He has previous-ly worked at a number of networking silicon companies including Hifn, NetOctave and SafeNet in roles ranging from Sr. System Architect to Product Line Director. Bob also spent a number of years in the security appliance industry in both engineering and lead technologist roles, giving him a strong background in the design requirements and challenges in bringing hardware & software systems to market. Bob received a Bachelor's degree, cum laude, in Physics and Math from Ohio Wesleyan University.

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