

Press Release

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FOR IMMEDIATE RELEASE
9 A.M. EDT, November 14, 2011

**CLUSTERED SYSTEMS UNVEILS 100KW, 50TFLOP RACK TECHNOLOGY AT
SC 2011
ANNOUNCES PROJECT CONTRIBUTORS**

SANTA CLARA, CA, NOVEMBER 14, 2011: Clustered Systems will exhibit a revolutionary blade server chassis designed to support high density, high performance computing—jointly developed by a consortium of industry leaders including Intel, Emerson Network Power, Panduit, OSS (One Stop Systems, Inc.), Smart Modular, Inc. and Inforce—in the SLAC National Accelerator Laboratory booth #303 at the International Conference for High Performance Computing, Networking, Storage and Analysis in Seattle, WA. The new chassis establishes a standard form factor for high-performance IT blade servers from numerous manufacturers. Each chassis cools the servers directly via a pumped refrigerant, up to 20 kw per 8U chassis, with up to 5 fitting into a standard IT rack. The system development was funded by ARRA and CEC (California Energy Commission) grants totaling over \$3M.

Rack Power and Cooling

Clustered Systems' new server rack can provide 100KW of power and cooling for 80 blades distributed among five 8U chassis. It is designed as an open system and each chassis can be populated in front with 16 compute, networking or storage blades and four removable switching blades at the rear. All electronic components including backplanes are field replaceable. "Blade servers have been proprietary for too long," said Phil Hughes, Clustered Systems' CEO. "The industry needs an open mechanical system standard that users can populate with best of breed and refresh at will. This is ATCA on steroids."

"The efficiency of the Clustered Systems' cooling system supports the greatest level of density and performance we've seen so far and it has the legs to support several more product generations," added Dr. Stephen Wheat, Senior Director of Intel High Performance Computing.

The cooling system is designed to interoperate with Emerson Network Power's Liebert XDP and Liebert XDC pumped refrigerant cooling products. "Emerson Network Power has been leading the industry movement toward high-density cooling since the 2003 introduction of the Liebert XD system," said Steve Madara, VP/general manager of Emerson Network Power's Liebert global precision cooling business. "We are now cooling over 400 MW of IT load globally via many different cooling modules, including the most recent Liebert XDS for cooling 1U servers using cold-plate technology and no server fans, developed jointly with

Clustered Systems." Emerson also designed and built the system rack.

Included in the IT rack is a NetSure™ DC power system, from Emerson Network Power, which converts 480 VAC to 380 VDC. "We found that our standard system was very well matched to Clustered's requirements for efficiency, footprint and reliability," said BJ Sonnenberg, business development manager of Emerson Network Power's Energy Systems business.

The 380 VDC will then pass to a Panduit unit in each enclosure which controls power delivery to each blade. "The concept of a power plane manufactured into the cabinet can be a source of improved efficiency in the data center," said Jack Tison CTO, Panduit, Inc. The 380VDC is converted to 12VDC at the chassis level.

Server Innovations

Configured for High Performance Computing, a rack houses 160 dual CPU compute modules in five enclosures and, for the first time, uses PCI express as the system interconnect. The rear blades will house a PCI express 2.0 switch matrix. Additional, external switches connect the individual enclosures. The network has about half the memory to memory latency of Infiniband and was developed by One Stop Systems, Inc. "All blades in a system communicate with each other at 40Gb/s over PCI Express (PCIe), increasing the overall performance of the system," said Steve Cooper, CEO of OSS. "By utilizing the inherent functionality of

PCIe over cable, we've designed switch blades and large 40-port switches that provide complete non-blocking communication at previously unheard of performance rates. We are the first company to exploit the potential of PCI express switching and are glad to be part of Clustered's team."

Regarding the blades used within the chassis, each front blade houses two motherboards, each with two processors from the future Intel® Xeon® processor E5 family. The motherboards were designed by Inforce. "Inforce is known for delivering unprecedented embedded computer features that require reliable operation in unique environments. This project lead by Clustered Systems has been very exciting and challenging. We are proud to have been asked to participate and very pleased with the resulting product," said Jagat Achaya, CEO of Inforce.

The DIMM memory modules were designed as a cooperative effort between SMART Modular and Clustered. "These modules are a derivative of standard DIMMs and include an optimized heatsink design that creates an efficient and cost effective method to transfer heat from the DIMMs to the cold plate." commented Mike Rubino SMART Modular's VP of Engineering.

First Deployment

The first two racks are scheduled to be installed at Stanford Linear Accelerator (SLAC) within the next few months. Cooling water exiting from existing IT equipment or directly from a cooling tower will be used for rack cooling. We are very excited to be chosen as the first deployment site for the 100KW, 50

Teraflop system. The bleeding edge high density, high efficiency system design is exciting on its own, and the 50 Teraflops compute capacity (to be used by Scientific Computing here at SLAC) would be icing on the cake", said Norm Ringgold, Head of IT Operations and Infrastructure, SLAC National Accelerator Laboratory. Energy savings accrue from systems' ability to use exhaust cooling water from other IT equipment for cooling and DC power distribution.

"This is HPC, Cloud or even a Data Center in a box", concluded Hughes. "A user can put a system anywhere there is power. No special facilities are required. All investment can go into compute and not have to be shared with bricks and mortar."

About Clustered Systems Company, Inc.

Clustered Systems is a privately- owned company specializing in innovations for system cooling and switching. They are the developer of a revolutionary cold plate cooling system for 1U servers. It was recognized as being the most energy efficient cooling system available in a series of tests performed by Lawrence Berkeley Labs under the aegis of the Silicon Valley Leadership Group California Energy Commission. The system has been licensed to Emerson Network Power and is available through Emerson's Liebert representatives worldwide. Clustered is now focusing on the next generation of cooling systems.

www.clusteredsystems.com

About Intel

Intel (NASDAQ: INTC) is a world leader in computing innovation. The company designs and builds the essential technologies that serve as the foundation for the world's computing devices. Additional information about Intel is available at newsroom.intel.com and blogs.intel.com.

About Emerson Network Power

Emerson Network Power, a business of Emerson delivers software, hardware and services that maximize availability, capacity and efficiency for data centers, healthcare and industrial facilities. A trusted industry leader in smart infrastructure technologies, Emerson Network Power provides innovative data center infrastructure management solutions that bridge the gap between IT and facility management and deliver efficiency and uncompromised availability regardless of capacity demands. Our solutions are supported globally by local Emerson Network Power service technicians. Learn more about Emerson Network Power products and services at www.EmersonNetworkPower.com

About Panduit:

Panduit is a world-class developer and provider of leading-edge solutions that help customers optimize the physical infrastructure through simplification, agility and operational efficiency. Panduit's Unified Physical Infrastructure SM (UPI) based solutions give enterprises the capabilities to connect, manage and automate communications, computing, power, control and security systems for a smarter, unified business foundation. Strong relationships with technology leaders complemented with

its global staff and unmatched service and support, make Panduit a valuable and trusted partner. (www.panduit.com)

About SMART Modular Technologies, Inc.

SMART is a leading independent designer, manufacturer and supplier of electronic subsystems to original equipment manufacturers, or OEMs. SMART offers more than 500 standard and custom products to OEMs engaged in the computer, enterprise, industrial, networking, gaming, telecommunications, defense, aerospace and embedded application markets. Taking innovations from the design stage through manufacturing and delivery, SMART has developed a comprehensive memory product line that includes DRAM, SRAM, and Flash memory in various form factors. SMART also offers high performance, high capacity solid state drives, or SSDs, for enterprise, defense, aerospace, industrial automation, medical, and transportation markets. SMART's presence in the U.S., Europe, Asia, and Latin America enables it to provide its customers with proven expertise in international logistics, asset management, and supply-chain management worldwide. See www.smartm.com for more information.

About Inforce

Inforce Computing supplies high performance processing, networking and embedded hardware platforms based on widely-used open standards for real life applications. Inforce products offer the highest density computing solutions in small, eco-aware footprints that are being deployed today to enable next

generation cloud-based services. OEMs and system developers can choose from a rich selection of standard off-the-shelf products and customer-ready reference platforms. Founded in 2007 by embedded industry professionals, Inforce is backed by experienced management and leadership that promote innovative thinking. More information can be found at www.inforcecomputing.com.

One Stop Systems

One Stop Systems (OSS) pioneered PCIe over cable products and has been first to market with many of the PCIe cable adapters, expansion kits, and expansions systems available today. With an extensive engineering resource experienced and trained in PCIe design, manufacture, and test, OSS also customizes products to fit its customer's precise requirements. Custom and semi-custom products have long been OSS' core capability, with over 500 custom and semi-custom products designed for OEM customers who continue to purchase these products over time. OSS has a proven record of producing the highest quality products through superior engineering, ISO9001-2008 quality-driven production, and responsive pre- and post-sales. For more information, contact our sales department toll free at 877-438-2724 and visit our Website at www.onestopsystems.com.

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