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AMD Extends Leadership in Data Center Innovation -- First to Optimize the Micro Server for Big Data

AMD's SeaMicro SM15000(TM) Server Delivers Hyper-Efficient Compute for Big Data and Cloud Supporting Five Petabytes of Storage; Available With AMD Opteron(TM) and Intel(R) Xeon(R) "Ivy Bridge"/"Sandy Bridge" Processors

SUNNYVALE, CA -- (Marketwire) -- 09/10/12 -- AMD (NYSE: AMD) today announced the SeaMicro SM15000™ server, another computing innovation from its Data Center Server Solutions (DCSS) group that cements its position as the technology leader in the micro server category. AMD's SeaMicro SM15000 server revolutionizes computing with the invention of Freedom™ Fabric Storage, which extends its Freedom™ Fabric beyond the SeaMicro chassis to connect directly to massive disk arrays, enabling a single ten rack unit system to support more than five petabytes of low-cost, easy-to-install storage. The SM15000 server combines industry-leading density, power efficiency and bandwidth with a new generation of storage technology, enabling a single rack to contain thousands of cores, and petabytes of storage -- ideal for big data applications like Apache™ Hadoop™ and Cassandra™ for public and private cloud deployments.

AMD's SeaMicro SM15000 system is available today and currently supports the Intel® Xeon® Processor E3-1260L ("Sandy Bridge"). In November, it will support the next generation of AMD Opteron™ processors featuring the "Piledriver" core, as well as the newly announced Intel Xeon Processor E3-1265Lv2 ("Ivy Bridge"). In addition to these latest offerings, the AMD SeaMicro fabric technology continues to deliver a key building block for AMD's server partners to build extremely energy efficient micro servers for their customers.

"Historically, server architecture has focused on the processor, while storage and networking were afterthoughts. But increasingly, cloud and big data customers have sought a solution in which storage, networking and compute are in balance and are shared. In a legacy server, storage is a captive resource for an individual processor, limiting the ability of disks to be shared across multiple processors, causing massive data replication and necessitating the purchase of expensive storage area networking or network attached storage equipment," said Andrew Feldman, corporate vice president and general manager of the Data Center Server Solutions group at AMD. "AMD's SeaMicro SM15000 server enables companies, for the first time, to share massive amounts of storage across hundreds of efficient computing nodes in an exceptionally dense form factor. We believe that this will transform the data center compute and storage landscape."

AMD's SeaMicro products transformed the data center with the first micro server to combine compute, storage and fabric-based networking in a single chassis. Micro servers deliver massive efficiencies in power, space and bandwidth, and AMD set the bar with its SeaMicro

product that uses one-quarter the power, takes one-sixth the space and delivers 16 times the bandwidth of the best-in-class alternatives. With the SeaMicro SM15000 server, the innovative trajectory broadens the benefits of the micro server to storage, solving the most pressing needs of the data center.

Combining the Freedom™ Supercompute Fabric technology with the pioneering Freedom™ Fabric Storage technology enables data centers to provide more than five petabytes of storage with 64 servers in a single ten rack unit (17.5 inch tall) SM15000 system. Once these disks are interconnected with the fabric, they are seen and shared by all servers in the system. This approach provides the benefits typically provided by expensive and complex solutions such as network-attached storage and storage area networking with the simplicity and low cost of direct attached storage.

"AMD's SeaMicro technology is leading innovation in micro servers and data center compute," said Zeus Kerravala, founder and principal analyst of ZK Research. "The team invented the micro server category, was the first to bring small-core servers and large-core servers to market in the same system, the first to market with a second-generation fabric, and the first to build a fabric that supports multiple processors and instruction sets. It is not surprising that they have extended the technology to storage. The bringing together of compute and petabytes of storage demonstrates the flexibility of the Freedom Fabric. They are blurring the boundaries of compute, storage and networking, and they have once again challenged the industry with bold innovation."

Leaders Across the Big Data Community Agree
Dr. Amr Awadallah, CTO and Founder at Cloudera, the category leader that is setting the standard for Hadoop in the enterprise, observes: "The big data community is hungry for innovations that simplify the infrastructure for big data analysis while reducing hardware costs. As we hear from our vast big data partner ecosystem and from customers using CDH and Cloudera Enterprise, companies that are seeking to gain insights across all their data want their hardware vendors to provide low cost, high density, standards-based compute that connects to massive arrays of low cost storage. AMD's SeaMicro delivers on this promise."

Eric Baldeschwieler, co-founder and CTO of Hortonworks and a pioneer in Hadoop technology, notes: "Petabytes of low cost storage, hyper-dense energy-efficient compute, connected with a supercompute-style fabric is an architecture particularly well suited for big data analytics and Hortonworks Data Platform. At Hortonworks, we seek to make Apache Hadoop easier to use, consume and deploy, which is in line with AMD's goal to revolutionize and commoditize the storage and processing of big data. We are pleased to see leaders in the hardware community inventing technology that extends the reach of big data analysis."

Matt Pfeil, co-founder and VP of customer solutions at DataStax, the leader in real-time mission-critical big data platforms, agrees: "At DataStax, we believe that extraordinary databases, such as Cassandra, running mission-critical applications, can be used by nearly every enterprise. To see AMD's DCSS group bringing together efficient compute and petabytes of storage over a unified fabric in a single low-cost, energy-efficient solution is enormously exciting. The combination of the SM15000 server and best-in-class database, Cassandra, offer a powerful threat to the incumbent makers of both databases and the expensive hardware on which they reside."

AMD's SeaMicro SM15000™ Technology
AMD's SeaMicro SM15000 server is built around the industry's first and only second-

generation fabric -- the Freedom Fabric. It is the only fabric technology designed and optimized to work with Central Processor Units (CPUs) that have both large and small cores, as well as x86 and non-x86 CPUs. Freedom Fabric contains innovative technology including:

- SeaMicro IOVT (Input/Output Virtualization Technology), which eliminates all but three components from the SeaMicro motherboard -- CPU, DRAM, and the ASIC itself -- thereby shrinking the motherboard, while reducing power, cost and space;
- SeaMicro TIO™ (Turn It Off) technology, which enables further power optimization on the mini motherboard by turning off unneeded CPU and chipset functions. Together, SeaMicro IOVT and TIO technology produce the smallest and most power efficient motherboards available;
- Freedom Supercompute Fabric creates a 1.28 terabits-per-second fabric that ties together 64 of the power-optimized mini-motherboards at low latency and low power with massive bandwidth;
- SeaMicro Freedom Fabric Storage, which allows the Freedom Supercompute Fabric to extend out of the chassis and across the data center, linking not just components inside the chassis, but those outside as well.

AMD's SeaMicro SM15000 Server Details
AMD's SeaMicro SM15000 server will be available with 64 compute cards, each holding a new custom-designed single-socket octal core 2.0/2.3/2.8 GHz AMD Opteron processor based on the "Piledriver" core, for a total of 512 heavy-weight cores per system or 2,048 cores per rack. Each AMD Opteron processor can support 64 gigabytes of DRAM, enabling a single system to handle more than four terabytes of DRAM and over 16 terabytes of DRAM per rack. AMD's SeaMicro SM15000 system will also be available with a quad core 2.5 GHz Intel Xeon Processor E3-1265Lv2 ("Ivy Bridge") for 256 2.5 GHz cores in a ten rack unit system or 1,024 cores in a standard rack. Each processor supports up to 32 gigabytes of memory so a single SeaMicro SM15000 system can deliver up to two terabytes of DRAM and up to eight terabytes of DRAM per rack.

AMD's SeaMicro SM15000 server also contains 16 fabric extender slots, each of which can connect to three different Freedom Fabric Storage arrays with different capacities:

- FS 5084-L is an ultra-dense capacity-optimized storage system. It supports up to 84 SAS/SATA 3.5 inch or 2.5 inch drives in 5 rack units for up to 336 terabytes of capacity per-array and over five petabytes per SeaMicro SM15000 system;
- FS 2012-L is a capacity-optimized storage system. It supports up to 12 3.5 inch or 2.5 inch drives in 2 rack units for up to 48 terabytes of capacity per-array or up to 768 terabytes of capacity per SeaMicro SM15000 system;
- FS 2024-S is a performance-optimized storage system. It supports up to 24 2.5 inch drives in 2 rack units for up to 24 terabytes of capacity per-array or up to 384 terabytes of capacity per SM15000 system.

In summary, AMD's SeaMicro SM15000 system:

- Stands ten rack units or 17.5 inches tall;
- Contains 64 slots for compute cards for AMD Opteron or Intel Xeon processors;
- Provides up to ten gigabits per-second of bandwidth to each CPU;
- Connects up to 1,408 solid state or hard drives with Freedom Fabric StorageDelivers up to 16 10 GbE uplinks or up to 64 1GbE uplinks;

- Runs standard off-the-shelf operating systems including Windows®, Linux, Red Hat and VMware and Citrix XenServer hypervisors.

Availability
AMD's SeaMicro SM15000 server with Intel's Xeon Processor E3-1260L "Sandy Bridge" is now generally available in the U.S. and in select international regions. Configurations based on AMD Opteron processors and Intel Xeon Processor E3-1265Lv2 with the "Ivy Bridge" microarchitecture will be available in November 2012. More information on AMD's revolutionary SeaMicro family of servers can be found at www.seamicro.com/products.

About AMD
AMD (NYSE: AMD) is a semiconductor design innovator leading the next era of vivid digital experiences with its ground-breaking AMD Accelerated Processing Units (APUs) that power a wide range of computing devices. AMD's server computing products are focused on driving industry-leading cloud computing and virtualization environments. AMD's superior graphics technologies are found in a variety of solutions ranging from game consoles, PCs to supercomputers. For more information, visit http://www.amd.com.

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