

SeaMicro SM15000 Server and Hortonworks Hadoop 2.0 (YARN) Solution

The transformative waves of big data are changing everything about storage and Hadoop has emerged as the key application to help companies gain insights that were previously unattainable. As Hadoop becomes more mainstream, factors such as ease of deployment, scalability and operational considerations are becoming just as important as pure performance. To meet these and other requirements of web-scale storage, AMD has designed the SeaMicro SM15000 server for:

SeaMicro SM15000 Server

- 64 compute cards with AMD Opteron® 4365EE or Intel® Xeon® E3-1265Lv3 processor
- 512 cores and up to 4 TB of DRAM (8 GB per core)
- 1.28 Tbps Freedom™ Supercompute Fabric bandwidth
- 64 internal SSD or HDD drives
- Up to 5.4 PB of direct attached storage (16 x mini SAS connectors 4 x 6 Gbps, 16 fabric storage devices, 84 SAS/SATA drives per fabric storage device, 4 TB per drive)
- 160 Gbps of network uplink bandwidth (16 x 10 Gbps full duplex)

- Data that is always available and stored forever
- 100 percent continuous data protection with carrier-class availability
- Seamless growth and scalability to support petabytes of data

Hadoop 2.0 (YARN) incorporates enterprise-class features such as high availability for the Hadoop File System (HDFS) and a more modular architecture (see Figure 1). A stand-by copy of the name node can now be configured, and MapReduce has become its own component and is now just a computation layer on top of the cluster scheduler. This enables the possibility of plug in analytical algorithms. The end result is that Hadoop 2.0 is starting to evolve into a platform and less a fixed software library framework.

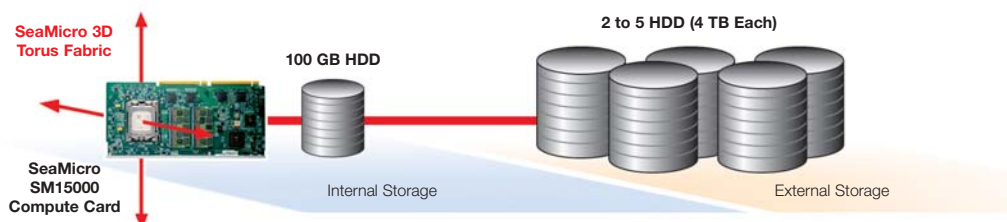


Figure 1: For HDFS/YARN, each SM15000 compute card has eight internal drives for the OS and 2-5 HDD (4 TB each) for external storage.

The SeaMicro SM15000 Server

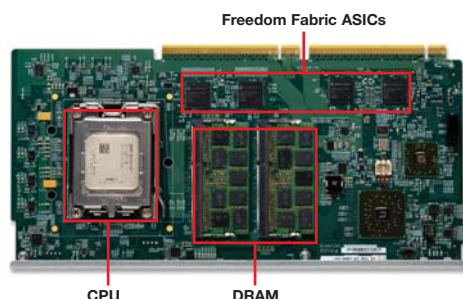
The SeaMicro SM15000 uses the patented SeaMicro Freedom™ Supercompute Fabric to interconnect computing, networking and storage together in a single 10-Rack Unit (RU) system. It can be configured and managed through a single management interface with industry-leading hardware features and components.

Five Petabytes in Two Racks for Hadoop and Object Storage

The SeaMicro SM15000 server extends fabric-based computing across the racks and aisles of the data center with its supercompute fabric supporting more than five petabytes of capacity in two racks.

The SeaMicro SM15000 Server and Hadoop 2.0 Solution

Figure 2 illustrates the complexity of a Hadoop deployment. Assuming the basic question of compute and storage sizing are addressed, the next layer of complexity of ensuring all the different computational clusters have the right storage and network resources can be extremely complex given that a Hadoop deployment can scale to thousands of servers. The SeaMicro SM15000 removes this complexity by providing a converged platform that integrates compute, storage and networking in a 10 RU system.



Each compute card has eight fabric nodes providing an aggregated Ethernet bandwidth of 8 x 1 Gbps full duplex.

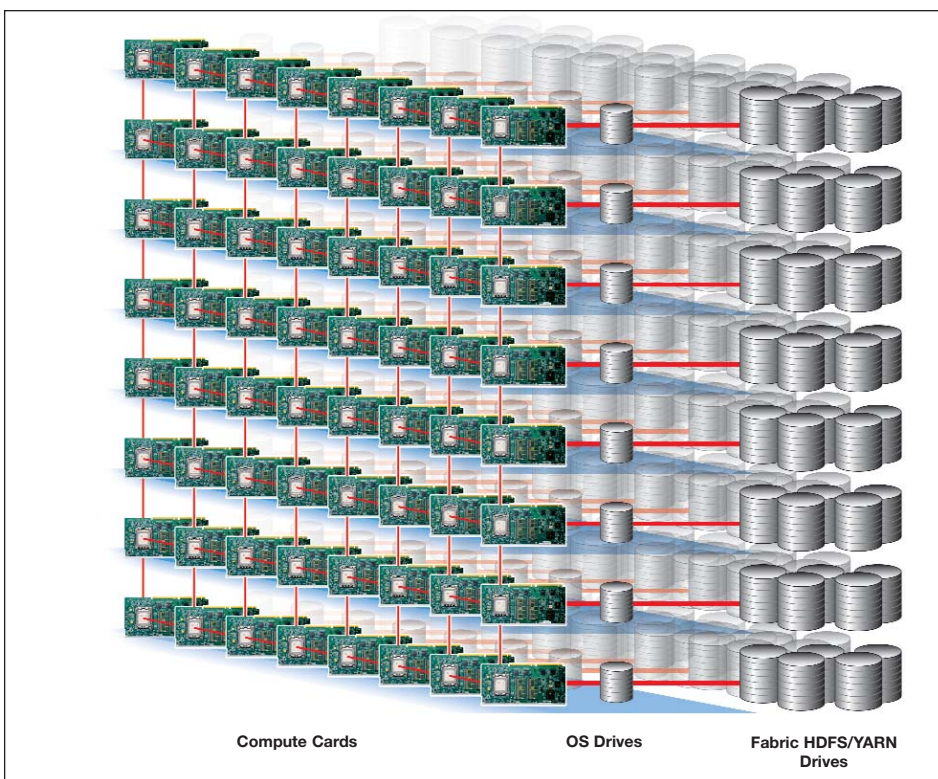


Figure 2: SeaMicro SM15000 and Hadoop 2.0 Architecture Leveraging Freedom Fabric

SeaMicro SM15000 Compute Card and Drive Configuration

All 64 compute cards (0-63) within a chassis are grouped in sets of eight compute cards. Each set of compute cards corresponds to a different storage card numbered from 0 to 7. Each storage card has eight internal drives that serve the OS for each compute card. Each storage card also provides the Hadoop-distributed file system (HDFS) to those same compute cards through one fabric storage device directly attached through a mini SAS cable of 4 x 6 Gbps. Provided that each compute card will use only 2 to 5 disks from the fabric storage device for HDFS, the eight compute cards will need a total of 16 to 40 disks respectively, all being served from the same storage card connected to the same fabric storage device. Since a fabric storage device has many more drives than the required 16–40 drives, the fabric storage device can be partitioned into two zones. If you would like to receive the paper “Technology Brief on SAS Zoning Configuration” for details on how to partition and assign disks from fabric storage devices through specific storage cards and to specific compute cards, please contact your AMD sales representative or email seamicro@amd.com.

Industry Recognition and Certifications

The SeaMicro SM15000 server is recognized as the industry-leading server platform for efficient, high density data center computing. It has been deployed in some of the most demanding computing and storage environments by tier one customers worldwide. To learn more about the SeaMicro SM15000 or the SeaMicro SM15000 and Hadoop 2.0 solution, go to: www.seamicro.com.