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Meet the New POWER8 LC Servers

December 2015 | by Jaqui Lynch

On October 5, 2015 IBM made some significant new announcements. Part of that announcement series included some new Linux-only servers, specifically the S812LC and two versions of the S822LC (one HPC and one commercial). This announcement further illustrates IBM's commitment to Linux on POWER, analytics, cloud and high-performance computing (HPC).

The three servers announced bear many similarities—they are all 2U in a rack and are provisioned with either 8 core 3.32 GHz or 10 core 2.92 GHz chips and allow for up to 1TB of memory. All three come with a default hardware warranty of three years 9-5 next business day. All of them are supported running Ubuntu (LE or BE) at a minimum level of 14.04.03 TLS for POWER8, although IBM is working with Red Hat on RHEL7 support. PowerVM is not supported on any of the servers but PowerKVM is supported on the S812LC and the S822LC commercial. None of the servers support AME (active memory expansion) and there is no support for I/O drawers (both disk and PCIe) or for an internal DVD. Disk can be added by using HBAs. All three servers have two internal disks (HDD or SSD), but the S812LC also has some additional internal disk options. Supported internal disks are either 1TB hard drives or 960GB SSDs. OS installation can be done over the network or using a USB drive.

S812LC 8348-21C

The S812LC is designed for big data, Hadoop, Spark and LAMP workloads. It's a single-socket server and supports Ubuntu running either bare metal or under PowerKVM. This server has eight memory DIMMs allowing for 32GB to 1TB of memory, depending on the DIMM size. Memory DIMM sizes can be mixed on this system. It has one processor that is either 8 or 10 cores. There are three PCIe3 x 8 slots and one PCIe3 x 16 slot for adapter cards, which are all low profile slots and are not hot pluggable. Adapter options include an 8Gb 2-port fibre HBA, a 4-port 10Gb + 1Gb SR and RJ45 network card, a 2-port 10Gb + 1Gb BaseT RJ45 network card and a 4-port Gb network card. Additionally 12 hot plug disk bays can be provisioned with hard drives or SSDs. These are accessed using one of two RAID cards—EC3S or EC3Y. The EC3S is a RAID card that includes protected write cache and takes two PCIe slots (slots 1 and 4). The EC3Y has unprotected write cache and takes only one slot (slot 4).

The S812LC also includes a VGA adapter, 3 x USB 3.0 for general use and 1 x USB 1.1 for firmware upgrades. It runs on 200-240v and has maximum requirements for 3500 watts, 3.57 kVa and up to 11940 btu/hour.

S822LC HPC 8335-GTA

The HPC version of the S822LC is designed for technical and HPC workloads. It's a 2-socket server with either 16 or 20 cores. There are eight DIMM slots and memory ranges from 128GB to 1TB, and memory DIMM sizes must all be identical on this server. Additionally, all DIMM slots must be filled. There are five PCIe3 slots—three are low profile and two are full profile. The two full profile slots are dedicated to the 2 x K80 NVIDIA GPUs that are built into this server. The GPUs are designed for HPC, computational science and big data analytics. There are two internal hot pluggable SFF4 disk bays for either hard drives or SSDs—all other disks must be accessed via fibre HBAs or over the network. Adapters include 2-port 16Gb fibre HBAs, and various 10Gb and 1Gb network adapters. The 4-port FC5260 1Gb RJ45 network adapter is required as are the 2 x K80 NVIDIA GPUs, which leaves two adapter slots free for other adapters. This server doesn't support PowerKVM—all OSs run on bare metal.

S822LC Commercial 8335-GCA

The commercial version of the S822LC is designed for commercial cloud workloads. It's a 2-socket server with either 16 or 20 cores. There are eight DIMM slots and memory ranges from 32GB to 1TB. Memory DIMM sizes can be mixed on this server. There are five PCIe3 slots—three are low profile and two are full profile. There are two internal hot pluggable SFF4 disk bays for either hard drives or SSDs—all other disks must be accessed via fibre HBAs or over the network. Adapters include 2-port 16Gb fibre HBAs, and various 10Gb and 1Gb network adapters. The 4-port FC5260 1Gb RJ45 network adapter is required, which leaves four adapter slots free for other adapters. This server supports the OS running on bare metal or virtualized using PowerKVM.

Both S822LC models include a VGA adapter, 3 x USB 3.0 for general use and 1 x USB 1.1 for firmware upgrades. They run on 200-240v and have maximum requirements for 2000 watts, 2.1 kVa and up to 6826 btu/hour.

Performance

These servers are designed to provide incredible performance in a 2U profile. Potential memory bandwidth is shown in the following table:

	S812LC		S822LC	
Total Cores	10	8	20	16
L1 Total GB/s	1402	1275	2803	2550
L2 Total GB/s	1402	1275	2803	2550
L3 Total GB/s	1869	1700	3738	3400
Memory Total GB/s	115	115	230	230
PCIe Interconnect Total 128	128	128	128	

Potential I/O bandwidth is shown in the following table:

	S812LC	S822LC
Total I/O Simplex	32GB/s	64GB/s
Total I/O Duplex	64GB/s	128GB/s

These numbers are taken from the Technical Overview Redbooks publications and show the incredible potential provided by these servers.

The Next Linux Step

The new line of servers is designed for clouds, clusters and big data analytics. Among the three servers, a great deal of flexibility is provided in putting together these environments. Additionally, pricing is very attractive and makes these a feasible option for those wanting to move to Linux. Linux on Power has come a long way from when it started out. Linux is now supported on all IBM platforms including the mainframe, and many options are provided ranging from Linux-only boxes to IFLs (integrated facility for Linux) to just running Linux on regular cores. Additionally, various virtualization and management options are available. These new LC servers are the next step in IBM's journey into Linux and should merit serious consideration for the cloud, Hadoop, etc. workloads they are designed for. They provide performance and reliability in a very small space, which means they can be clustered together very effectively.

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