Web Exclusive

A Look at the Technical Specifications of POWER9 S914, S922 and S924 Servers

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On February 13, 2018, IBM announced the scale-out POWER9 servers: the H922, H924, L922, S914, S922 and S924, along with some associated software. In this article, we'll focus on the S series servers, along with the prerequisites that need to be in place in order to install and use them.

Technical Specifications

The scale-out servers are all designed to fit into a 19" rack and will be GA on March 20, 2018. They all come with a default warranty of 9-5 for 3 years, but an uplift to 24-7 support can be purchased. The S914 is a 1 socket 4U server, the S922 is a 2 socket 2U server and the S924 is a 2 socket 4U server. The servers support PCIe Gen 4 but are also backwards compatible with earlier PCIe generations. Power plug requirements are still the same as POWER8 scale-out servers (C13/C14) and all the systems require 220V power with the exception that the S914 (tower only) can run on 110V.

For all three servers, all cores and memory must be active. Additionally, there are three backplane options—one with 12 SFF-3 Bays one with 18 SFF-3 bays with write cache and a third with 12 SFF-3 bays with dual IOA and write cache. The split backplane option applies to the first 12 SFF-3 bay backplane. If you plan to boot two VIO servers from internal disks, then make sure the server is configured with the split backplane feature and with at least four disks (two per VIO). This allows you to assign half the internal disks to one VIO server and the other half to the other VIO server. Having four disks allows you to mirror rootvg in case of a disk failure.

S914

This is a single socket server that is available in 4, 6 or 8 core versions with up to 1TB of memory. Core speeds range from 2.3 to 3.8GHz. The 4-core S914 server has seven PCIe Gen3 slots. One slot is used by one 4-port 1 Gb Ethernet adapter. If the expanded function backplane is chosen, another PCIe slot is used, leaving five slots. The 6 and 8 core modules have eight PCIe slots (2 x Gen4 and 6 x Gen3). One of the Gen3 slots (C11) is reserved for a mandatory LAN adapter. The 6 and 8 core models also support adding an I/O expansion drawer, any of the EXP12SX or EXP24SX disk drawers or the EMX0 PCIe adapter drawer. The IBM i tier is P05 on the 4 core and P10 on the 6 or 8 core servers.

S922

The S922 is a 1 or 2 socket server that offers 4, 8, 16 (2 x 8), 10 or 20 (2 x 10) cores and up to 4TB of memory. Chip core speeds on the 4 core are 2.8 to 3.8GHz, on the 8 core are 3.4 to 3.9 GHz and on the 10 core are 2.9 to 3.8 GHz. The single socket version provides up to 6 PCIe (2 x Gen4 and 4 x Gen3) slots and the two socket version provides up to 9 slots (3 more Gen4 slots). One slot is used by a mandatory Ethernet adapter. Depending on what is attached, up to three of those slots may be reserved for other purposes. IBM i is only supported on the 6 cores and 8 core processors and is limited to 4 cores of IBM i with a software tier of P10.

S924

The S924 is a 2 socket server with either 8, 16, 10, 20 or 24 cores and up to 4TB of memory. Chip core speeds on the 8 core are 3.8 to 4.0 GHz, on the 10 core are 3.5 to 3.9 GHz and on the 12 core are 3.4 to 3.9 GHz. The single socket version provides up to 8 PCIe (2 Gen4 and 6 Gen3) slots and the two socket version provides up to 11 slots (5 Gen4 and 6 Gen3). One slot is used by a mandatory Ethernet adapter. Depending on what is attached, several slots may be reserved for other purposes. IBM i software tier is P20.

Disks

If you are ordering I/O drawers it is important to understand that only 4K disks are supported in the EXP12SX and EXP24SX drawers. I highly recommend ordering 4k disks for the internal disks as you cannot combine 512 byte and 4k disks in the same volume group which can lead to problems in the future if you want to move volume groups around. You should also check whether there are any issues using 4k disks with the software you plan to run.

Management

PowerVM Enterprise Edition is now included with every POWER9-equipped box. It's a zero-cost item, although you will still need to purchase SWMA to get software support. Additionally, if you don't have PowerVM Enterprise Edition on your source POWER7 or POWER8 server, you can request a free 60-day activation for that server to facilitate migration.

An HMC or vHMC (virtual HMC) is required to manage POWER9 servers in a PowerVM environment. The HMC or vHMC is also required for concurrent firmware maintenance. For POWER9 the HMC must be a 7063-CR1 or later or a vHMC (x86 or POWER based). The vHMC requires 4 cores, at least 8GB memory and a minimum of 500GB of disk space. This means it is highly likely you will be buying a new HMC. The 7063 runs HMC code 8.8.7 or higher – this level does not support classic mode for the HMC. The new HMC can be used to manage POWER6 and higher servers.

Gotchas

None of these servers have an internal DVD drive so you need to attach an external USB drive. You can purchase this from IBM or you can use an external. All of the POWER9 servers ship with the security patches for Meltdown and Spectre installed and enabled. The POWER performance report states that the numbers in that report don't include performance tests done with those patches applied.

You can have up to 4 x 400GB internal NVMe devices – these are designed to be used for booting VIOS, AIX or Linux. They are not hot swappable and there is no initial support for booting IBM i from NVMe devices. Power requirements are a little higher so I highly recommend moving to the #EPTN 30 amp high function PDUs. These include 12 x C13 receptacles with a 20amp circuit breaker on each receptacle. The 9188/7188 PDU also has 12 x C13 receptacles rated at 10 amps, but there is a 15amp circuit breaker per pair of receptacles.

Prerequisite Software

POWER9 requires specific minimum releases of AIX, Linux, IBM I and VIOS in order to run. In particular, VIOS needs to be upgraded to 2.2.6.21 or later if you plan to use VIOS on the server. LPM also requires specific minimum levels at the source in order to work. You can only migrate workloads from POWER7 or higher to a POWER9 box using LPM. Any POWER6 workloads will need to be migrated to a POWER7 or POWER8 and rebooted prior to using LPM to migrate to the Power9.

Summary

The POWER9 scaleout server announcement is the second in the POWER9 series. The servers show incredible gains in performance and there are several new software releases that need to be considered. When you bring in your first POWER9 server I would recommend requesting a TDA (technical delivery assessment) to ensure no power, HMC or software requirements are missed.