



# SK hynix Develops PCIe Gen4 Enterprise SSD Portfolio

SK hynix is not only the world's third-largest semiconductor company and the second-largest memory chipmaker, they also use their technological acumen to make a well-regarded line of SATA and NVMe flash storage devices.



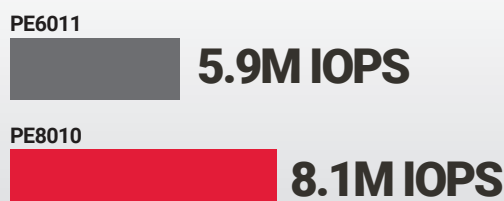
For our testing, we used a single proc **Lenovo SR635** with an **AMD 7742 CPU**.

The SR635 is a 1U, single-socket server that supports 2nd gen AMD EPYC CPUs and up to 2TB of 3200MHz of DRAM. Moreover, and most importantly for our testing, it supports PCIe 4.0 from end-to-end, depending on the backplane installed.

## 1

For our initial testing in CentOS 7 with ten PE6011 versus ten PE8010 NVMe SSDs, we look at traditional “four-corners” throughput and bandwidth tests using 4K random and 64K sequential workloads.

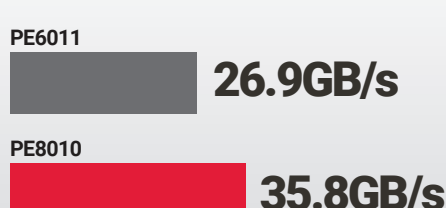
### 4K RANDOM 100% READ



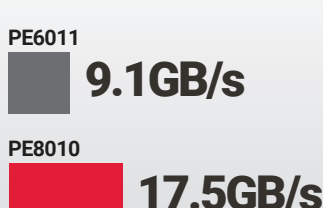
### 4K RANDOM 100% WRITE



### 64K SEQUENTIAL 100% READ



### 64K SEQUENTIAL 100% WRITE

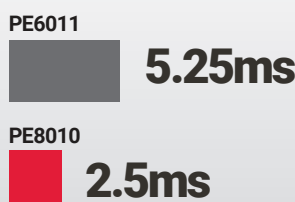


## 2

Next, we change our software environment to VMware ESXi 6.7u3 and compare the performance of a smaller SSD group size. For SQL Server we use 4 NVMe SSDs each, or one per VM, with our SQL Server 2014 instance running our 1,500 scale TPC-C workload profile.

### SQL SERVER: 4 SSDs

Average latency

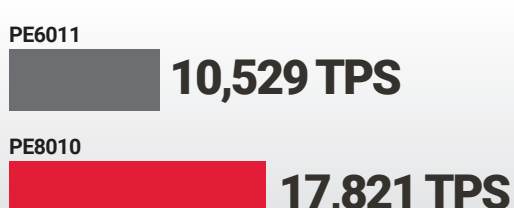


## 3

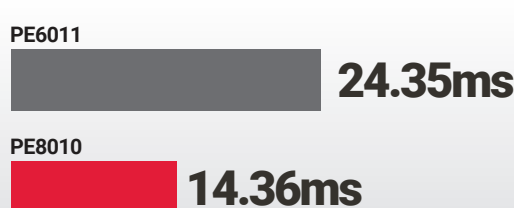
Lastly, we concentrate our MySQL Sysbench workload onto 2 SSDs from each group, with 8VMs placed evenly across the pair of SSDs. This gives us a workload footprint of 4VMs per SSD, focusing on the storage impact of the environment.

### MYSQL SYSBENCH: 2 SSDs

Aggregate TPS



Average latency



**The PE8010 has the strongest performance of all the NVMe devices that we have tested to date.**

It can deliver sequential read speeds of up to **35.8GB/s**, and sequential write speeds of up to **17.5GB/s**, with random reads and writes of up to **8.1M** and **3.97M** input/output operations per second (IOPS), respectively.

Compared to the PE6011, the company's previous PCIe-based Gen3 solution, the PE8010 offers a substantial performance improvement of **133%** for sequential reads, and **192%** for random writes.

## Conclusion

Many times, new technologies fall far short of their performance expectations, but in this case, we were very impressed with the PE8010's actual performance. Given the fact that the PE8010 is expected to carry a small premium compared to PCIe Gen3 devices, we expect it will be a winner for SK hynix. We also expect Gen4 drives to push overall server performance to new levels, and SK hynix is out of the gate early by already shipping Gen4 devices and being a clear leader in this technology.

[Learn More About the Test](#)