



SSD RAID Arrays

Accelerating System Performance with SSD RAID Arrays

SSDs and RAID

SSDs are popular performance upgrades for notebooks, desktops and purpose-built systems and are praised for their speed and durability. However, SSDs can offer tremendous gains in performance in workstations and servers when SSDs are grouped together into RAID arrays and presented to the host operating system as a logical drive. RAID storage accomplishes two main objectives:

- to make drives redundant so that when one fails the system will still be up and running, and without data loss, and
- to increase the I/O performance of the storage. There are several RAID levels available that offer different levels of redundancy, performance and usable capacity. SSDs offer a new level of RAID performance never seen before with traditional hard drives.

Most SAS RAID Controllers Support SATA as Well

Most RAID controllers today that support SAS drives also support SATA drives. This means that a user can attach either SAS or SATA drives to the same backplanes and RAID controllers. Users didn't have this

flexibility several years ago when previous drive interfaces had to exist in their own systems. This flexibility gives the user the benefit of designating certain drives for specific workloads within the same system which has ROI benefits as well as less hardware to manage for administrators.

NVMe RAID Controllers

NVMe SSDs are becoming popular for servers and will enable the next big leap in scalable SSD performance. NVMe SSDs can be attached to RAID controllers just like SATA and SAS SSDs and in some cases are supported on RAID controllers that support all 3 interfaces. These RAID controllers are called Tri-Mode RAID Controllers. NVMe SSDs offer the highest level of RAID performance available in data storage technology today.

Kingston SSD Testing with RAID Controllers

Here at Kingston we test our SSDs with several RAID controllers from third-party vendors as well as RAID controllers that are built into mainstream servers. RAID testing is an important aspect of enterprise SSD testing to ensure that the SSD will be compatible in a multi drive RAID array and deliver expected performance levels.

Benefits of Using SSD RAID

Today's mainstream desktops and workstations feature built-in RAID controllers on the motherboard. These RAID arrays are configured in a separate RAID BIOS accessible on system bootup. Just using two SSDs in a RAID 0 stripe can double drive performance at a minimal cost. Or use two SSDs to mirror (RAID 1) your system drive in the event one drive fails the secondary drive will take over and the user is still up and running without data loss.

Modern RAID controllers are now optimized to address the increased performance capabilities that SSDs can offer. These changes have come in the way of new RAID processing engines, multi core CPUs and high-speed DRAM cache buffers. Additionally some RAID vendors are offering software with their RAID controllers for greater performance, better security of the data and better overall management of the storage volumes.

For servers, SSD RAID arrays are now ideal for all workloads from boot drives to a wide variety of online application data storage.

For desktops and workstations, configuring a small multi drive RAID array can offer large gains in overall system performance and accelerate applications that are IO bound by slow hard drives. RAID arrays are easy to configure and are a cost-effective way to increase performance and reliability on these platforms.

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