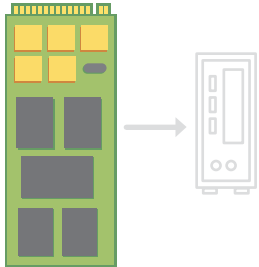
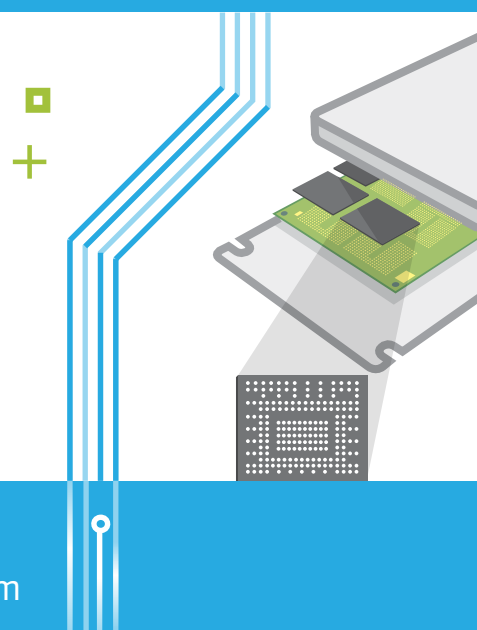


NVMe (Non-Volatile Memory Express) is a communications interface and driver that defines a command set and feature set for PCIe-based SSDs with the goals of increased and efficient performance and interoperability on a broad range of enterprise and client systems.



NVMe was designed for SSD. It communicates between the storage interface and the System CPU using high-speed PCIe sockets, independent of storage form factor.

Input/Output tasks performed using NVMe drivers begin faster, transfer more data, and finish faster than older storage models using older drivers, such as AHCI (Advanced Host Controller Interface) a feature of SATA SSDs. Because it was designed specifically for SSDs, NVMe is becoming the new industry standard.

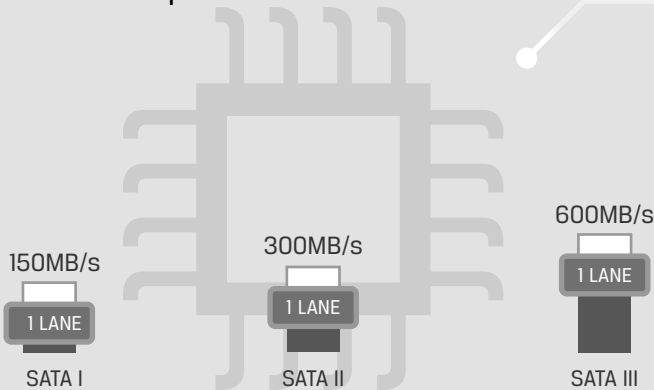


Storage: Then and Now

DATA BUSES: Transport data within a system

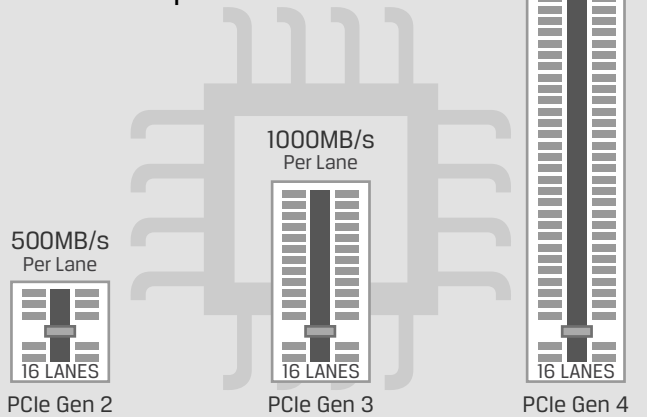
SATA

Transfers up to...



PCIe

Transfers up to...



Using 16 lanes, PCIe Gen 4 can transfer data at **32,000MB/s**

Communication Drivers

Used by Operating Systems to communicate data with storage devices

AHCI

- Designed for Hard Drives with Spinning Disk technology
- Has only 1 command queue
- Can only send 32 commands per queue
- Commands utilize High CPU cycles

NVMe

- Designed for SSDs with Flash technology
- Has 64K command queues
- Can send 64K commands per queue
- Commands utilize Low CPU cycles

AHCI

- Has a latency of 6 microseconds
- Must communicate with the SATA controller
- IOPs up to 100K

NVMe

- Has a latency of 2.8 microseconds
- Communicates directly with the System CPU
- IOPs over 1 million

SSD Form Factors: The shapes and sizes of solid-state storage

	SATA	(designed for smaller form factor systems)	(supports AHCI version)
	2.5"	mSATA	M.2
PCIe	HHHL – Half Height, Half Length (also called AIC or Add-In Card)	M.2 (supports NVMe version)	U.2 (only available in NVMe)

- AHCI versions of these drives plug into the PCIe slot, but use the AHCI drivers
- Some older versions of HHHL use proprietary drivers
- NVMe versions typically use native OS drivers

Beyond the Numbers: Benefits of NVMe Technology

Optimal Performance



Superior Storage

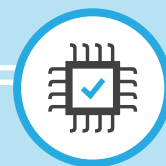
PCIe sockets transfer **>25x more data** than their SATA equivalent



Superior Speed

NVMe begins sending commands more than **2x faster** than AHCI drivers

NVMe Input/Output Operations per Second exceeds 1 million and is up to **900% faster** than its AHCI equivalent



Superior Compatibility

NVMe cuts out the middle man by **communicating directly with the System CPU**

NVMe-based drives work with all major Operating Systems, regardless of form factor

Contact your local Kingston representative to find out which Kingston SSD drive is right for you, or visit: kingston.com/en/solutions/servers-data-centers