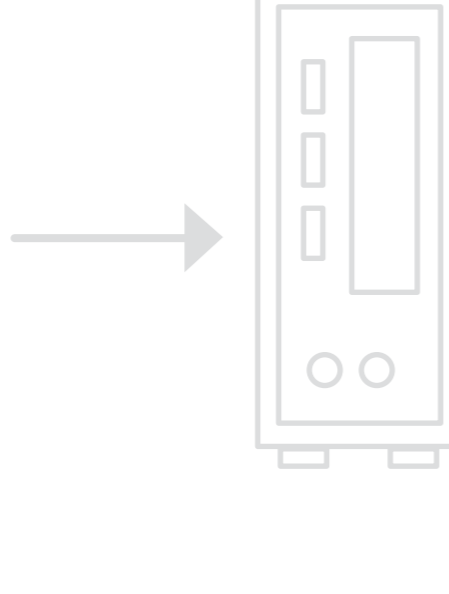


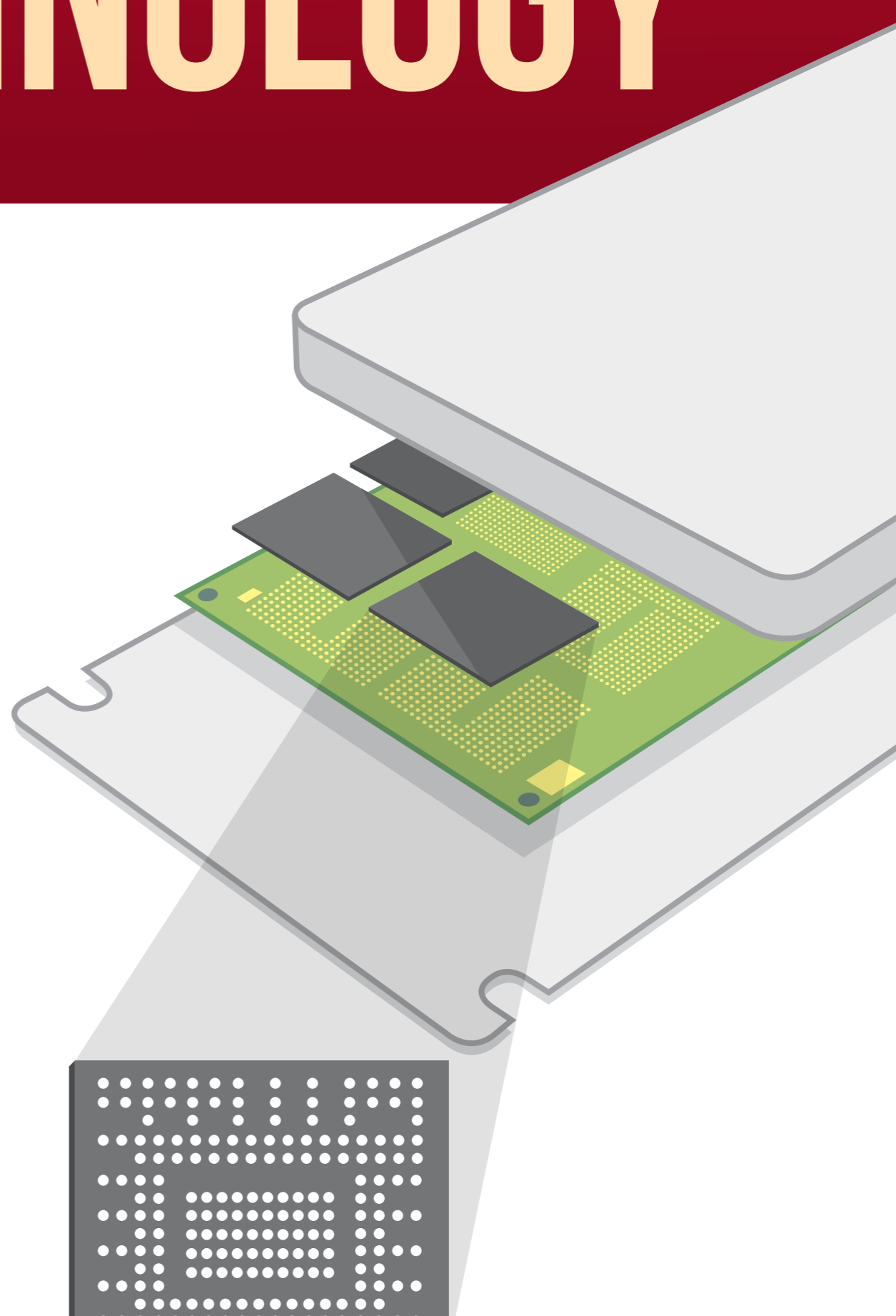
UNDERSTANDING WHAT'S NEW IN SSD TECHNOLOGY

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.



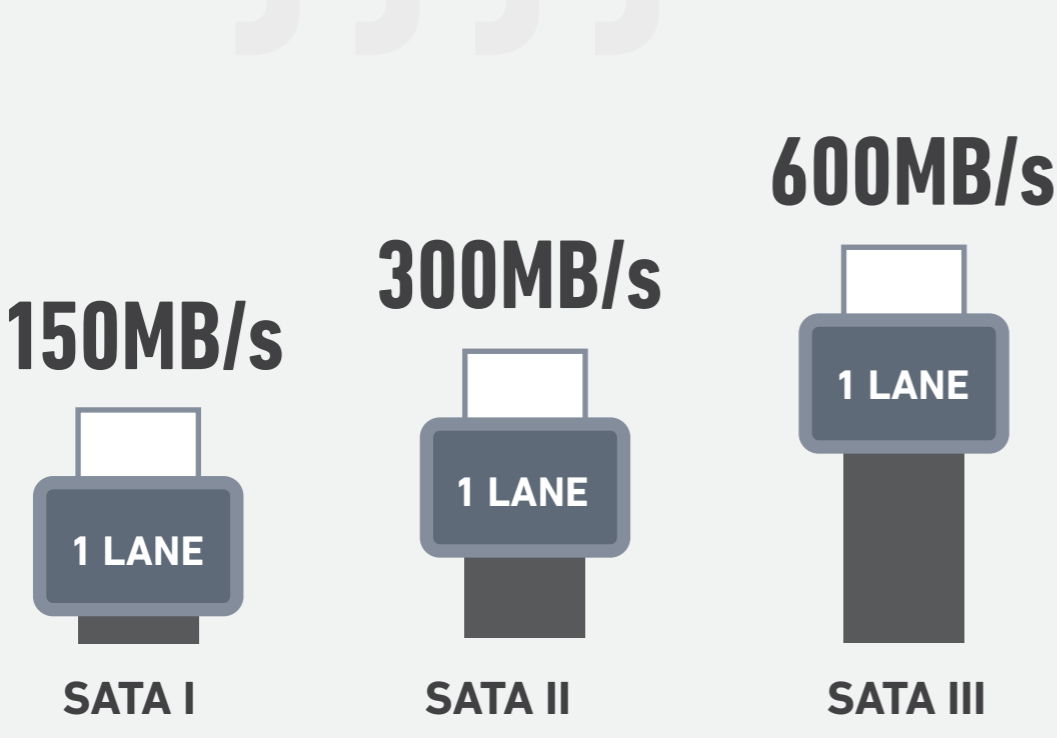
Input/Output tasks performed using NVMe drivers begin faster, transfer more data, and finish faster than older storage models using older drivers, such as AHCI (Advanced Host Controller Interface). Because it was designed specifically for SSDs, NVMe is becoming the new industry standard.



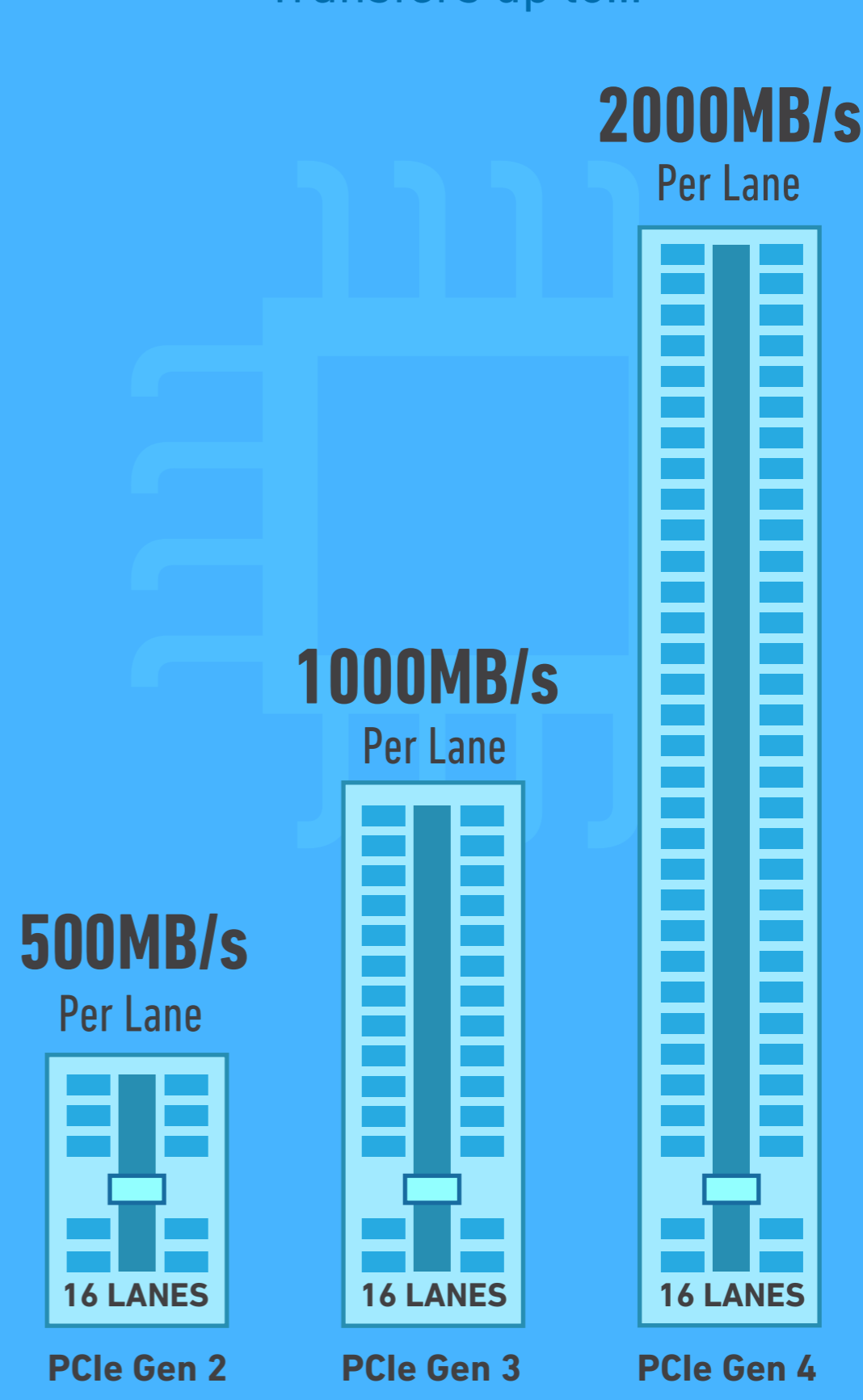
WHAT SHOULD YOU KNOW? STORAGE: THEN AND NOW

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	NVMe
	Designed for Hard Drives with Spinning Disk technology	Designed for SSDs with Flash technology
1	Has only 1 command queue	Has 64K command queues
32	Can only send 32 commands per queue	Can send 64K commands per queue
	Commands utilize High CPU cycles	Commands utilize Low CPU cycles
	Has a latency of 6 microseconds	Has a latency of 2.8 microseconds
	Must communicate with the SATA controller	Communicates directly with the System CPU
	IOPs up to 100K	IOPs over 1 million

SSD FORM FACTORS

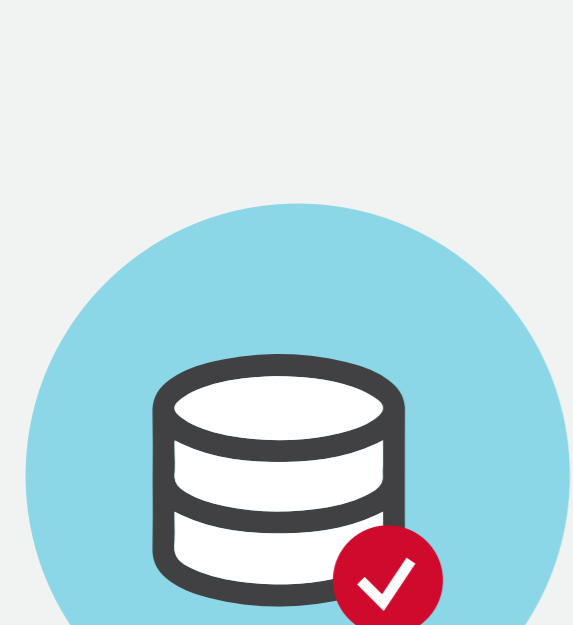
The shapes and sizes of solid-state storage

SATA	2.5"	1.8"	mSATA (designed for smaller form factor systems)	M.2 (supports AHCI version)
PCIe	HHHL – Half Height, Half Length (also called AIC or Add-In Card) <ul style="list-style-type: none"> 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 		M.2 (supports NVMe version)	U.2 (only available in NVMe)

BEYOND THE NUMBERS

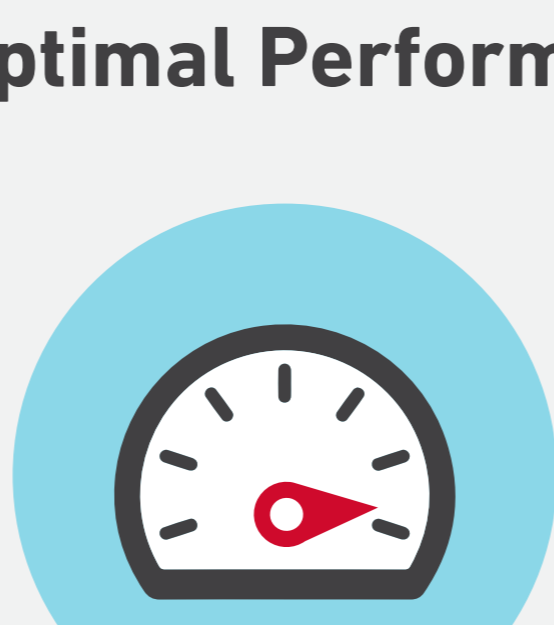
Benefits of NVMe Technology

Optimal Performance



Superior Storage

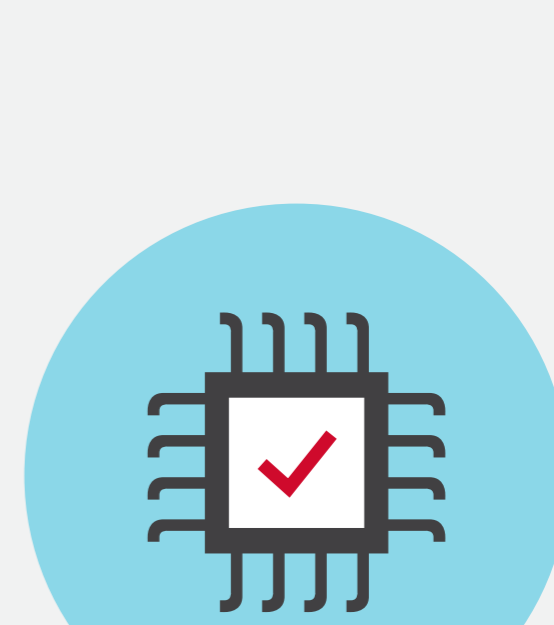
PCIe sockets transfer **>25x more data** than their SATA equivalent



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

