

Samsung SSDs open a new chapter with fail-in-place

September 21 2019, by Nancy Cohen



Samsung Electronics has a new series of PCIe 4.0 SSDs that demonstrate technologies to benefit data centers and businesses. The solid state drives

(SSDs) use the PCIe 4.0 standard, whereby sequential read and write speeds are improved.

PCIe stands for Peripheral Component Interconnect Express.

Samsung's targeted takers with this technology are not the consumer but rather enterprise and data center [markets](#), said James Dawson in *KitGuru*.

The SSDs were being described as fail-proof. What's so special about their so-called fail-in-place technology? It detects faulty chips, scans their data, and relocates the data to normally operating chips, said *ZDNet*.

Andy Patrizio in *Network World* was able to clearly translate what that brings to computing environments that use SSDs (solid state drives). These drives operate by writing to cells in the [chip](#), and after so many writes, the cell dies off. A 1TB drive may actually have about 1.2TB of capacity, and as chips [die](#) off from repeated writes, new ones are brought online to keep the 1TB capacity.

That's where SSD memory chips with fail-in-place (FIP) tech comes in.

As reported in *ZDNet*, Samsung's technology is such that the 30.72TB PCIe Gen4 SSDs continue operating smoothly even if a [NAND](#) chip fails, said Seoul-based Cho Mu-hyun. He covers Samsung and other tech news in Asia. Data centers will see the light in potential cost savings. "NAND chip defects usually require whole systems to be turned off when swapping the malfunctioning SSD or performing data backups, Samsung said."



Yet here, this FIP technology allows a drive to cope with a failure, said Patrizio, "by working around the dead chip and allowing the SSD to keep operating and just not using the bad chip."

In full, the title is the "PCIe Gen4 [solid state drive](#) (SSD) series." What is more, the PCIe Gen4 SSDs will have virtualization software dividing a single SSD into 64 smaller units; multiple users could use it simultaneously and independently. This will allow cloud operators to offer more users services with the same SSD resources and cut the virtualization workload of server CPUs, as the SSD itself can handle the

load, said *ZDNet*.

As for machine learning projects, there is something good to say about the SSDs for that, too. They will have V-NAND machine learning technology.

Cho Mu-hyun: "Using [big data](#), it will allow an accurate reading of data during ultra-fast processing by reading the electricity difference between circuits and cells within a NAND level."

That last area for Samsung appeared to be an attractive focal point. Kye Hyun Kyung, executive vice president of Memory Solution Product and Development, said they planned even more innovation, "led by our most advanced (sixth-generation) [V-NAND](#) in helping to trigger a lot more growth in the global IT market."

The tech can help to predict and verify cell characteristics, and spot any variation among circuit patterns through big data analytics. Why that matters: "This ensures superior data reliability as increasing SSD speeds pose a challenge in reading and verifying data through the extremely rapid voltage [pulses](#)," said *Guru3D.com*.

KitGuru said "These new SSDs from Samsung could be the most interesting drives we've seen in a long time. Not only are the speeds super high, but this new 'fail in place' technology could also be a huge improvement for SSD reliability and data recovery."

In the absence of any pricing information on what's to come in solid-state drives, JC Torres in [SlashGear](#) nonetheless predicted that "Although these are targeted more at enterprise customers and businesses, these technologies will eventually make their way down to products as well."

More information: [news.samsung.com/global/samsun...-storage-performance](https://news.samsung.com/global/samsung-ssds-open-a-new-chapter-with-fail-in-place)

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