



[The Storage Networking Industry Association](#) (SNIA) and the [SCSI Trade Association](#) (STA) recently provided their insights on prominent storage technologies that are shaping the market in a live webcast titled “What’s Next in Storage: Analysts and Experts Share their Predictions.” If you missed the live event, it’s now available on-demand [here](#). During the webcast, attendees asked our experts Rick Kutcipal, president of STA and Don Jeanette, vice president of [TRENDFOCUS](#) a lot great questions. Here are answers to them all:

Q. You mentioned that NVMe needs to overcome serviceability – can you clarify that statement?

A. If you think of service in the data center today, IT professionals rely on surprise add / removal of drives. You have to be able to yank the drive and not lose or corrupt any data. That still has to be addressed within NVMe. It can absolutely be overcome, but NVMe is still very early in its development cycle.

Q. Are you planning to have a 24G SAS Plugfest anytime soon?

A. The STA is the governing body of the SAS Plugfest. We hold them at the University of New Hampshire’s [Interoperability Laboratory](#), and right now we’re trying to pin down the time for the first 24G SAS Plugfest. Check the [STA website](#) for updates – it’s on the list and we will be publishing a date soon.

Q. The cost/GB TRENDFOCUS quoted in its SSD forecast – is that acquisition only or total cost of ownership (TCO). If TCO, for what period of time?

A. That is acquisition cost. Finished device shipping to customer and the user capacity are the cost-per-gig market averages.

Q. Don, the stock market is punishing Western Digital Corp. (WDC) and to a lesser extent Seagate. This has been attributed to the so-called death of hard disk drives (HDDs). It seems you agree that it’s a definite overreaction. Any additional comments?

Q. I completely agree that it’s an overaction. Especially for WDC – every storage vendor that has NAND supply has seen fantastic profitability for the last eight plus quarters because of the NAND environment and the shortage. Exiting Q4 of 2017 and now through Q1 of 2018, the pricing of NAND has seen some healthy declines. Now we’re going to return to the storage industry we’ve known and loved for decades. With the NAND shortage we’ve experienced over the past two years, it’s been great business, and now it’s back to the drawing board to maintain profit.

Q. What is the breakdown by form factor for NVMe at hyperscalers?

A. I’m not going to break that out specifically, but in terms of one of the quarters that just recently ended, we did about 1.4 million units for enterprise PCIe, about 900,000 in M.2, about 400,000 were U.2 and the remaining were traditional add-in cards. That will fluctuate over time. With different hyperscale companies transitioning to NVMe, I think you’ll see different hyperscale companies choosing different form factors, whether it be M.2 or U.2, so you’ll see the volumes ebb and flow each quarter depending on which hyperscale company is deploying a new buildout and which form factor they’re choosing. Overall in the future, you’re going to see lots and lots of volumes for years with either form factor module.

Q. How do your observations play in the context of cloud storage provider adoption?

A. When we talk to many of our clients worldwide and we see certain companies continuing to see compelling technologies from system OEMs at price takedowns, they’ll continue to build their own storage and data centers but move over to cloud storage providers. That’s their choice based on what workloads they’re using or the security they need, and then the cloud storage providers themselves are procuring hardware and building out their data centers. They’re not bending metal and selling it to their end customers, they’re selling faster load pages to buy shoes for our kids online. They’re not selling boxes to

the end market, so they have many avenues they can go in, and if they find storage vendors that give them very compelling prices for various technologies, they can go internal and do whatever they want with them and not have to worry about an end customer from a hardware perspective.

Q. In the future will SSD be available in protocols other than SAS/SATA or PCIe, CCIX, Gen-Z etc.?

A. From a market adoption and how we see protocols end-of-life, I like to use an example of how parallel ATA went to serial ATA (SATA) in 2003. That was a huge industry effort and the market made the switch all at once. We were maximizing out at 100 MB/s at the connector, so the whole industry agreed we needed SATA and we did it.

SAS, SATA and PCIe are reflected in our forecast for the applications and markets they serve - they're good enough, and in some cases, they're an up-sell that's going to dictate higher pricing. When they're good enough, I think they're going to continue for a long time. But in the near-term, displacing SATA is especially going to be difficult, especially from a price-point and elasticity perspective. As long as Intel supports it from a chipset driver perspective, and its free on the motherboard—free is always better. Certain protocols are going to stay around for a long time until the support infrastructure decides to do away with it as well, even though they might have support from a different protocol in the same offerings.

The industry is not seeing push towards these technologies. I think especially with the treadmill of PCIe going to Gen 5 so rapidly, I don't think there's an advantage of going to a new protocol. Right now, I'm thinking we're not going to see alternative protocols for storage.

Q. What are your views on client SSD attach rates to notebooks / PCs? With HDD being tight and NAND pricing coming down, do you see an acceleration of attach rates in 2018?

A. In 2017, we saw a 38 percent attach rate across notebook systems and around 17 or 18 percent for desktop systems. That would've been around 44 percent if we weren't in the NAND shortage, so it did relax or pull back on the attach rates that system OEMs were taking on SSDs. The other thing is that it also pulled back on the mix of products, so in 2017, we actually saw the average capacity go down for notebook PC computers and SSDs. That was a function of SSD pricing at a dollar-per-gig metric going up greater than 30 percent in six quarters. That's going to have a lot of people pause on what they're actually going to buy.

Going forward, if we go off of 2022, we see that growing to 80 percent plus or minus, so call it 75 to low 80s from a percentage perspective on the attach rates. You have to remember on the commercial or consumer markets have two very different buying behaviors. The capacity is not as big of a concern for the commercial market as it is for the consumer market, so a 256 and even in some cases, a 128 may be good enough because you don't have all your personal data stored on your PC at work. Whereas in the consumer market, historically it really hasn't changed that much.

There are two major metrics you're going to use when buying your system, and those are capacity and price point. If the vast majority of the world has had a 500GB or greater hard disk drive in their system, and the average system is less than \$4.

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Want to learn more? You can find more resources at:

SCSI Trade Association

www.scsita.org

Storage Networking Industry Association

www.snia.org

TRENDFOCUS

<http://www.trendfocus.com/>