

# Pure Storage announces new DirectMemory (SCM), FlashArray//C, & other enhancements at //Accelerate

Silverton Consulting, Inc. StorInt™ Briefing

At Pure//Accelerate conference this month, Pure announced DirectMemory for FlashArray//X70R2 & //X90R2 storage, a new, capacity-optimized FlashArray//C, increases to the size of FlashBlade clusters and GA for their Cloud Block Store product.

## Pure Storage DirectMemory

Pure Storage FlashArray//X always had an NVRAM cache used to buffer any data being written to the system. But with DirectMemory, they added Optane storage class memory for read caching. DirectMemory is only offered on FlashArray//X70R2 and //X90R2 storage and comes in 3TB SSD packs or 6TB packs of 4 or 8 750GB DirectMemory modules with Intel Optane based storage class memory. These memory modules are plug compatible (NVMe) with current FlashArray flash storage modules and can be inserted in the 1<sup>st</sup> 4 or 8 slots of the FlashArray//X chassis. FlashArray's Purity software will use DirectMemory as a read-only cache for heavily read data to reduce response time.

At the conference, Pure showed a chart modeling their current FlashArray//X field workloads indicating that ~80% of all X70R2 & X90R2 FlashArrays should see a 20% decrease in read response times and ~40% should see 30-50% decrease in read response time. Any response time reductions will be function of workload locality of reference (how often the same block is read).

## Pure Storage FlashArray//C

Pure also announced FlashArray//C, a new capacity optimized AFA that will support ~5PB of effective capacity in 9U. It's intended for tier 2 storage and as such will be slower than current FlashArray//X systems. FlashArray//C flash module microcode has been redesigned to support higher capacity storage rather than higher performance. The product will ship initially with TLC NAND but it's been optimized for QLC NAND, which will be phased in at a later date. It's intended that both TLC and QLC NAND flash modules will offer the same effective capacity.

## Pure Storage Cloud Block Store GA

Pure also announced GA of CloudBlockStore (CBS) for AWS and revealed a lot more about the architecture of this software defined block storage solution for AWS. Essentially, they re-architected Purity Software for the AWS environment to provide FlashArray-like functionality on AWS native storage backends. It offers highly available, iSCSI compressed and deduplicated storage, using (9 = 2-high powered networked frontend controllers + 7 virtual drive backend) EC2 instances with EBS IO1, EBS , Instance Store and S3 storage. The virtual drive EC2 instances use IO1 storage as a persistent write cache and Instance Store for non-persistent

read data access. Amazon S3 storage provides durable persistent storage for all data and can be used to reload (all) virtual drives for additional resiliency in the event of outages.

At the moment CBS offers iSCSI storage which is not supported by VCF. Therefore guest VMs cannot boot from CBS. However, guest VMs can still connect to CBS using in-guest iSCSI connections just like any other EC2 host. Although VCF does not support external storage today, there are rumors that VMware will add external iSCSI-support to VCF which would simply storage provisioning as well as dramatically improve storage efficiency.

## Significance

DirectMemory seems simple enough that any vendor should be able to do it for their storage. Yet Pure seems first to have taken this approach. Pure is not the only vendor going after enterprise disk storage with QLC flash but it's a nice addition into their current Purity storage lineup.

At the show, we were pretty impressed with Pure's approach to AWS block storage. It seemed logical and made effective use of AWS capabilities to re-implement FlashArray on the cloud. Other vendors have either ported their storage software directly to AWS or attached their storage directly (or indirectly) to AWS regions. Pure took a different approach, trying to recreate highly available, high performance AFA storage on top of AWS. Will see if the market reacts as positively to their solution as we have to their architecture.

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*Silverton Consulting, Inc. is a Storage, Strategy & System consulting services company, based in the USA offering products and services to the data storage community.*

