Pure Storage vs HPE 3PAR – A Seed Unit Bake Off

In May of 2016, our hospital system was approached by Pure Storage to try out one of their FA-405 solid state arrays as a seed unit for just the cost of 1 year's maintenance. This was a "last year's model" type of proposition as the //m series had recently become generally available. As Pure utilizes a same O/S across all of their models the seed unit was still considered a fair representation of what Pure could do.

We parlayed this offering into an additional opportunity by asking HPE to respond to such a fantastic offer. HPE stepped up and presented a similar seed unit. A base 3PAR 8200 all flash array at a very nice price point whose initial cost was actually cheaper than the Pure offer.

We purchased both units. This gave us a unique opportunity to compare two similar SSD arrays side by side and see how each stacked up to our needs. We are a 3 hospital system with around 3,000 users and are highly virtualized for both servers and workstations. Like all hospitals, performance and reliability are of paramount importance. Any solution we introduce must be able to perform at a high level, be available 24/7/365, and offer disaster continuity options in the case of corruption or failure.

This analysis will provide a side-by-side assessment of the two arrays purchased. The comparison will cover the following sections: Purchasing/Procurement, Pre-install/Installation, Array Capabilities, and Support/Maintenance. Because of our need to put these arrays into production we were not able to side-by-side compare them in actual performance. Suffice to say any all SSD array runs circles around spinning disk, it's just a matter of degree.

Purchasing/Procurement

Pure	HPE
Pure offered us an FA-405 array with 5.5TB raw space. This was equal to 3.18TB usable before any data reduction or compression. We were told that we could expect a 4:1 usable ratio depending on our expected workload so 12TBs usable was the expectation. They offered us this seed unit for only the price of maintenance. We could choose between 1 year or 3 year terms. Pure also guarantees that maintenance will never increase in subsequent years. Additionally, all software and features are included. Our final quote had just two line items – 1) the FA-405 array at $0 and 2) Maintenance for 1 year. We have since bought a second array to have a replication partner for this seed unit and the purchasing experience was exactly the same.	HPE's initial offer was for a 3PAR 8200 flash array with 2.9TB raw / 1.9TB usable before any data reduction. The initial quote was simple and essentially 1 line for a 3 year maintenance deal; the hardware was free. While this offering was cheaper than the Pure offer, this array was a base system with no features such as replication, snapshots, deduplication, and so on. Our intention for this array was to use it for an application that would require several of these features as well as more usable space. Our VAR determined that we would need 8 additional 400GB drives, 2 additional HBA's, an additional shelf, and various software licenses. At 16 drives we were now at 5.8TB raw or 4.2TB usable. Our price was now substantially higher though still a nice offering all things considered. The quote was very confusing as HPE charges one line item for the software and an additional line item charge per drive. Maintenance was done similarly charging a line item for software maintenance and subsequent charges for software per drive.
Winner: Pure **With a 2 line invoice, maintenance price guarantee, and all software included the Pure Array was much easier to purchase.**	

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Pre-Install / Installation

Pure	HPE
Pre-Install: After purchasing the array we were contacted by our local Pure Sales Engineer to set a date for installation. He sent over a 1/2 page pre-installation checklist to fill out to prepare for the installation (sample). This list asked for things like Array Name, DNS Servers, IP addresses, etc. All told it was less than 10 questions. We scheduled an install date and the SE requested only 1 hour for the engagement.	**Pre-Install:** Once the array was purchased our VAR coordinated with HPE on a date and started the installation process. We received a pre-installation macro-enable Excel spreadsheet to fill out prior to installation (sample). This checklist was extensive and HPE had not filled out all of their part so some of the macros and calculations were incorrect. With help from the VAR we were able to eventually get all the pertinent data supplied and sent back to HPE to schedule resources. HPE schedules two separate resources for the installation. One resource is responsible for the physical installation. The second resource is responsible for configuration and knowledge transfer to the customer. We were also required to prepare a small VM appliance called a Service Processor (SP) responsible for configuration and maintenance of the array. Each 3PAR array requires its own SP.
Installation: When the array arrived we elected to go ahead and rack prior to the install date. The array came with a poster/diagram that made the job simple. With our racks no tools were actually needed but a multi-bit and Torx screwdriver was included in the box just in case. Also included were 4x8GB FC SFPs. We learned from the SE later that one of the founders of Pure insisted that the installation should be able to be performed by his 12 year old son. I feel they succeeded. On installation day the Pure SE hooked up a console cable to the array, and using the pre-installation checklist, entered the configuration information. After about 15 minutes the array was available on the network. The next 30-45 minutes was spent performing some basic configurations and knowledge transfer. Administration of Pure arrays is all done via an HTML 5 web page hosted directly on the array. It works extremely well. By the time the hour was up we had installed a VMware VCenter plug-in, integrated the array into Active Directory for administration, and offered up a LUN to a virtual host.	**Installation:** Upon arrival we chose to rack prior to installation. The box contained all of the needed hardware but no tools (we used the Torx wrench from the Pure install). The single page leaflet pointing to a web address for documentation was an invalid address. The unit did come with 4x16GB FC SFPs as well as 4x5M FC cables; a nice bonus. Day 1 was the physical install performed by an HPE engineer onsite. The install involved firmware updates to the units, the drives, and the drive cages. All told the physical installation took ~7 hours. Day 2 of the installation was performed by an HPE resource remotely. This was mostly a knowledge transfer with some basic configuration tasks such as getting phone home functionality set up. As we already operate other 3PAR arrays much of this was refresher and we were able to move quickly. There are a lot of considerations around things like Deduplication, RAID, and CPGs. This makes the system more configurable but considerably more complicated to operate. Administration of the array works through either a JAVA based application or via an HTML 5 compatible browser if you install another management virtual machine for this purpose. We tried both but continue to use the JAVA app currently as it seems better.

Winner: Pure

The Pure array was extremely simple to install and we had storage presented to hosts within an hour. By far the fastest SAN array installation I've been a part of. The 3Par array was a more traditional install. The HP engineers were professional and very detailed but this came at the cost of time and simplicity. Our preference for installation was Pure.

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Array Capabilities

Pure	HPE
The Pure array has the capabilities one would expect from a modern SAN array. Snapshots, replication (via Ethernet), compression, deduplication, thin provisioning, encryption, double parity RAID, various plugins to 3rd party integration, all running on a pair of HA controllers. All of these capabilities are included in the price of the array. Outside of snapshots and replication, these features are turned on and not configurable. This adds to the simplicity of both administration and design but some may find the lack of control limiting. The Array can scale up by adding shelves and non-disruptively upgrading the 2 controllers but is limited to 2 controllers. The //M70 model can provide up to 1.5PB of storage supporting 370,000 32K IOPS @ <1ms latency so scale out is really dependent on your needs.	The 3Par 8200 array offers a wide array of capabilities in a more traditional SAN approach. Snapshots, replication, deduplication, thin provisioning, various RAID options, File Persona (HPE's approach to SMB shares), plugins for 3rd party integration, multitenancy, and dual active-active controllers. The 8200 can scale up to 750TB supporting 320K 8K IOPS @ <1ms latency. If you need more capacity you can scale out to the 8400 series which can scale up to 3PB of storage on 4 controllers in a Mesh-Active cluster. Replication options are extensive. You can replicate from a SSD array to a spinning disk array, replication can take place over both Ethernet and FC. Peer Persistence and federation allow support for VMware Metro Storage Clustering and automated failover and failback capabilities for true non-disruptive fault tolerance. The 3Par also easily integrates with HPE's StoreOnce backup appliances as well as StoreEver Tape solutions. All in all we couldn't think of a feature or capability that the 3Par couldn't provide.

Winner: HPE 3PAR

With the ability to scale both up and out to 4 controllers along with more replication options and configurable RAID and compression settings, HPE 3PAR holds the advantage here, at least for now. Pure continues to add to its capabilities with firmware updates which are included at no additional cost. HPE will need to continue to innovate both with their technology and their sales approach to stay ahead.

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Support / Maintenance

Pure	HPE
Pure support has been outstanding thus far. Support for US costumers is 100% US based. In performing a non-disruptive system update we worked with an engineer out of Utah and talked NBA basketball while waiting for tasks to complete. Pure1 is a portal type support web page that delivers a consolidated view of all of your Pure arrays. Up to the minute analytics are displayed for performance, capacity, and replication. Forecasts for load and capacity are also provided. Any alerts or open cases are also viewed here. Additionally a phone app is available allowing you to view much of the same up to the minute data as well as the ability to receive push alerts and even open cases. It's a very polished presentation and has continued to improve.	HPE support has been challenging. US support is 100% over seas and generally via chat. After filling out an extensive Excel spreadsheet (sample) to request a firmware update we waited several days for a response. Ultimately we had to engage our sales rep to move the process along. Connecting with the resource in India for the upgrade was also not without problems and he had to forgo his direct connection and relay on a Web-Ex to complete our upgrade tying up one of our engineers in the process. StoreFront Remote is HPE's portal system allowing you to view data about all of your HPE storage components. This is a relatively new offering from HPE and has changed significantly in a short time. It shows promise but still lacks some basic functionality such as the ability to open a case.

Winner: Pure

This category wasn't even close. Our experience with support on the Pure array was the best we've experienced with any storage vendor. If support is an important consideration in storage array, Pure is a must-see.

Performance

Unfortunately because of time constraints and the need to put these to array's into production we were not able to do a head to head comparison on performance in a controlled test. The arrays were purchased as point solutions and both are performing well for their intended use.

The most notable difference between the two isn't speed (they are both fast) but rather their data reduction abilities. The HPE 3Par only offers deduplication at our current version of firmware. The reduction rates were so low as to not warrant usage. Some of this may be related to the EMR workload but likely also due to 3Pars large 16k block size.

For the Pure, data reduction is probably its most impressive feature. For a mixed workload of virtual workstation linked clones and a dozen high demand SQL servers we averaged almost a 4:1 overall reduction in storage. As an extreme example we offered up a 3TB LUN to support a pool of 650 Windows 7 linked clone desktops. Actual consumed space for these 650 desktops was only 105GB!

Tl;dr:

Both of these storage arrays were tremendous bargains due to the seed unit pricing. They both perform as one would expect an all solid state array to perform.

While the HPE 3Par offered more overall capabilities that was its only true differentiator. For a company and storage system that has been around so long with a proven history it feels as if HPE is falling behind in both innovation and business model. While it seems they are making efforts to shore up some of these differences they are playing from behind.

Between Pure's disruptive pricing and "forever flash" business model along with their execution of a purpose built solid state array it's hard to find a negative. We have since purchased a second Pure array and intend to continue to grow our SSD footprint with Pure.