MSA 1060/2060/2062 FAQ

System and Architecture Questions

Question: **What are the 10GBase-T options for the MSA 1060/2060/2062?**
Answer: 10GBase-T will be available on the MSA 1060 platform at initial NPI to replace 1GbE Copper connectivity. Initially, the MSA 2060/2062 will use SFP+ optical/DAC iSCSI connections. 10GBase-T is being studied for inclusion in MSA 2060/2062 product lines after the initial Gen6 launch.

Question: **Does the MSA 1060 10GBase-T auto-shift down to 1GbE?**
Answer: Yes

Question: **What are the SFP+ (Optical) connectivity options for the MSA 1060/2060/2062?**
Answer: MSA 1060 iSCSI Systems will NOT offer a 10GbE SFP+ Optical connection. Customers wanting this combination will need to move up to MSA 206x. The MSA 2060/2062 will use SFP+ optical/DAC iSCSI connections.

Question: **What cabling options are offered for the SFP+ (optical) connections on MSA 206X?**
Answer: For the MSA 206x iSCSI systems, Optical SFPs and cables are supported along with DAC cables and new QSFP breakout (1 to 4) cables are also supported. All supported cables are listed in the MSA 2060/2062 Quick Specs.

Question: **Is 32Gb Fiber Channel supported on MSA 1060/206x?**
Answer: At initial release, MSA 1060/206X will only support 16Gb FC on the array end. We will support 8/16/32 Gb FC connections via FC negotiation done on the switch or HBA. We are a native 16Gb device. 32Gb FC is being investigated and may be supported later depending on market trends in the entry storage segment. Today, 32Gb infrastructure (HBA/Switches) is just too expensive to get much traction.

Question: **Is 8Gb Fiber Channel supported on MSA 1060/206x?**
Answer: At initial release, 1060/206X will only support 16Gb FC on the array end. We will support 8/16/32 Gb FC connections via FC negotiation done on the switch or HBA. We are a native 16Gb device.

Question: **Do MSA 2050 SAN controllers support FC and iSCSI at the same time?**
Answer: No. For MSA 2050/2052 we supported iSCSI/FC on one Converged SAN controller. The I/O Chips used to make this happen are no longer being manufactured by any vendor. Gen6 arrays, 1060/2060/2062 use separate SKUs and controllers to offer iSCSI *or* FC *or* SAS.

Question: **It is becoming mandatory on bids and tenders to have 32Gb Fiber Channel support on new arrays. What should we bid?**
Answer: On Gen6, we have the ability to support new protocols/link rates via a simple host interface module in our controllers. A 32Gb FC module is not currently in process but the MSA team is investigating the market opportunity for 32Gb. Adoption is very low currently due to switch and HBA costs. Until such a time as MSA has a formal plan, bid Nimble.

Question: **Do the SAS Y-Cables (fan-out) degrade performance?**

Answer:	No. 12 Gb SAS is made up of 4 x 12Gbs physical lanes. Fan-out cables take the four physical lanes of the standard SAS cable and divide them by two. The connectivity to the host is 2 lanes @ 12Gb/sec. reaching a Maximum sequential throughput of ~2.4Gb/sec per 2 wide cables.
Question:	**Is there any chance to have Y or fan-out cable on MSA206x?**
Answer:	Not planned. The GUI implementation is a challenge offering little benefit. 4 SAS ports/controller is a natural upper-bound due to SAS HBA port counts and crossover cabling.
Question:	**MSA's connect via SAS sometimes need to be connected to older servers. How can I tell which arrays can be connected via which Smart Array controllers? Why are older Smart Array controllers not certified on newer severs? And Vice versa?**
Answer:	The Compute Shared Options roadmap for supported SAS HBA and Smart Array controllers is driven by that group. By policy, they don't test newer controllers to older servers nor older controllers on newer servers to cut development and sustaining engineering costs on both platforms. The MSA Development team adheres to their roadmap and lifecycle dates. Always refer to SPOCK for current support information (https://h20272.www2.hpe.com/spock/index.aspx).
Question:	**Are there any roadmap items for NVMe disks?**
Answer:	No, The current architecture is still 100% SAS focused.
Question:	**How many GB's controller cache are available on Gen6 controllers? How about ASICs?**
Answer:	12Gb Cache per controller, 24GB Cache per system. Each controller contains a RAID acceleration ASIC.
Question:	**Any though or plan to add NVMe caching rather than using disk slots for Read Cache and Tiering?**
Answer:	MSA 6th Gen arrays do not have any internal integration for NVMe. Performance tier and Read-cache are achieved by SAS SSD (RI) drives installed in the enclosure slots.
Question:	**Can Disk Enclosures be connected between MSA Gen5 and Gen6 systems?**
Answer:	This subject is covered nicely in training materials. Gen5 disk enclosures and all media are NOT compatible with Gen6 arrays. Additionally, Gen6 Disk Enclosures and Media are NOT compatible with Gen5 arrays.
Question:	**Are MSA's prior "Data in Place" upgrades possible?**
Answer:	No, data in place upgrades will not be available from Gen5 to Gen6. The underlying Gen5 metadata is not compatible with Gen6. Additionally, the drive carriers are different for Gen6 arrays and Disk Enclosures. Data will need to be migrated or replicated from the Gen5 array to the new Gen6 system. MSA's Remote Snap Replication can be setup to accomplish this without host side server impact. Online Migrations using tools such as VMware Storage vMotioncan be used. Backup and Restore, there are many options. There will be a Migration Whitepaper will be available shortly after the Gen6 NPI.
Question:	**Are the MSA Gen6 HDDs compatible with Gen 10/Gen 10+ HDDs?**
Answer:	No, The Gen 10/Gen10+ HDDs are based on Smart Carriers. They will not fit in an MSA (Gen 1-6).
Question:	**Will MSA Gen6 drive SKUs have 6-Pack Drive Bundles again? Would it be possible to embed the ala carte' drive capacity in the Bundle's SKU name?**
Answer:	Yes, 6-packs will be offered again. We will be driving more of a preference toward the Bundles moving forward. At list price, 6-Packs will have a 25% delta to the single drives at a "per drive" level. We are looking into the SKU naming suggestion.
Question:	**What are the addition software features coming with MSA Gen6?**

Answer: The Advanced Data Services SW Suite (ADS) is still the only SW license available on MSA Gen6. It includes Performance Tiering, Snapshot increase for 64 (std) to 512 and Remote Snapshot Replication. New for Gen6 are some enhancements to the Snapshot functionality which allow the system to now do failover and failback. Additionally, the Performance Tiering engine gets a substantial revamp, termed Tiering 2.0, which streamlines the page move algorithm to be more effective with incoming Writes and with how it deals with free space on the SSDs. The results – The new Tiering 2.0 system delivers up to 45% more performance than the same workload run against a Gen5 array. The Tiering 1.0 or Tiering 2.0 engines are both very, very efficient and deliver amazing application acceleration to a wide variety of workloads. Responding to dynamically changing workloads is this system's forte. Though time, we have integrated some tools into the tiering ecosystem which can help analyze hybrid system dynamics from inside the GUI. Lear about the I/O Workload tool. While not a licensed feature, the new MSA-DP+ data protection capability is very important going forward. It is covered in depth in our trainings materials, whitepapers, etc. We will build on this new RAID type for years to come. Dig in and understand it.

Question: **Does the new Gen6 MSA allow online drive FW upgrades w/o shutting down all hosts?**
Answer: Not yet. It is on the development roadmap. This feature is now much easier to implement than in the past when the HDD/SSD vendors had differing levels of support for online FW updates.

Question: **Are there any plans to offer DeDup or Compression on the MSA platform?**
Answer: Not currently, we are optimizing around hybrid flash implementations. We have a new set of Tiering 2.0 on Gen6. All Flash Arrays (AFAs) must have dedupe and compression to be competitive. In MSA's hybrid tiering world, there is not much performance benefit to compressing and deduping the SSD tier. The work required to compact the data and then uncompact it just don't balance out. It is more work than the possible benefits. Bottom line - MSA is not an AFA. Sell AF20 Nimble for that.

Question **There has been no reference to all-flash configs. Is this not recommended?**
Answer: As mentioned above, successful AFA's need Compression and Dedup. MSA continues to evolve and optimize the Performance Tiering engine for Hybrid efficiency. MSA users can configure all flash configurations and they do. There are Reference Architectures out there for SAP HANA configs which only use SSDs. This is a unique configuration where there is an ability to take advantage of MSA's raw horsepower in these configs….it is not the standard. If a customer is looking for a general purpose AFA, Sell Nimble or Primera.

Question: **How does MSA deliver encrypted solutions?**
Answer: To provide MSA's full disk encryption (FDE) feature we use SED-FIPS drives (HDDs/SDs). The implementation is similar to the 3PAR implementation without multi-tenancy or Centralized key management. There are no plans to provide any Key Management systems.

Question: **Are the MSA SED solutions considered Data at Rest encryption?**
Answer: SEDs drives for MSA do provide Data at Rest Encryption. All drives must be SED to do encryption. We continue to sell SED drives and non-SED or regular HDD/SSDs.

Question: **Why do we not support encryption on the MSA 2062?**
Answer: The MSA 2062 comes with 2 non-SED SSD drives. To build an FDE option, it would require users to remove those drives and replace them with all SED media to enable the encryption. It would be better to create an MSA 2060 system with the ADS license and purchase SED-FIPS drives.

Question: **Doe MSA plan a software encryption option?**

Hewlett Packard
Enterprise

Answer:	No, MSA Encryption is accomplished SED HW based encryption capabilities in the HDD/SSDs. SW-based encryption is not offered or supported.

**Question:	Are there any plans to offer a Centralized Key Management system?**
Answer:	No. There are no plans to qualify or develop any External or Centralized Key Management system for the MSA Full Disk Encryption solutions.

**Question:	Can we please do better documentation of the cabling with this release?**
Answer:	Backend cabling has been simplified to only using the straight thru cabling with Gen6. Host side cabling is recommended to utilize the same ports on both controllers but with the move to explicit only mapping and mapping to all ports the host side cables can be connected to any port on the opposite controller for redundancy. Please let us know where you are seeing difficulties so we can help make it better.

**Question	Is it mandatory to populate SFF slots in an MSA 1060, or can we just add the 3 LFF shelves and only populate them?**
Answer:	That could be done but the configuration does not make much sense financially, the delta between MSA 1060 and 2060 is not much difference when compared to a LFF 2060. Take a look at the math.

**Question:	How much of the MSA architecture or SW is HPE IP?**
Answer:	The MSA is an OEM product that we integrate into the HPE ecosystem. HPE heavily influences our OEM Vendor's roadmap to give HPE special features through time. We also drive standard features which become available to all companies taking this OEM's products. The focus moving forward will continue along this dual path approach. The MSA Gen6 arrays are going to be unique to HPE for a solid period of time. HPE is the first OEM partner to take the vendor's Gen6 RAID acceleration ASIC.

**Question:	Are there any plans to implement synchronous replication on MSA?**
Answer:	MSA has no plans to support controller-based synchronous replication. We do offer Zerto Virtual Replication that supports MSA and is available thru HPE Complete.

**Question:	Has performance measurement and reporting, especially history reporting, improved over the existing units?**
Answer:	Yes. The new SMU v4 GUI is far better than previous version. Performance monitoring and dashboard is far advanced to v3.

**Question:	VRO/QLC SSD drives haven't been mentioned. What is MSA's plan as far as support for these new SSDs?**
Answer:	We are looking in to it for sure. AFA arrays are first to pick it up. We would see it as a potential replacement for 10k HDDs, however the cost math is not really lining up. It will at some point and we will productize Gen6 SSD media.

**Question:	Is Direct Connect Supported?**
Answer:	Yes. Same as Gen5. Check SPOCK to be sure your HBA supports Direct Connect (https://h20272.www2.hpe.com/spock/index.aspx).

**Question:	MSA Gen6 has new SMU v4. What is special about it?**
Answer:	The SMU v4 is has been rewritten from the ground up. The Dell ME4 is still on the old one. The new GUI worked very hard to improve and modernize the dashboard so you can get a great "at-a -glance" view with abilities to drill in. It is MUCH better thanv3 SMU. We now have accurate performance reporting

Hewlett Packard
Enterprise

and also a historical change log. It looks MUCH more modern and fresh visually. Second big area of improvement is the use of "guided workflows" to help a user do complex tasks that they might only do once in a long while. Examples – Creating Disk Groups and Volumes, initial unit setup. By guiding the user through the workflow, we can eliminate making mistakes, errors, skipped steps and needing a manual. GUI guides the user through the tough stuff.

Question: Has TLS 1.0 been disabled in Gen6?
Answer: TLS 1.0 and 1.1 have both been disabled. 6th Gen uses TLS 1.2

Question: What coding is the new SMU v4 GUI based on?
Answer: The SMU v4 is HTML based

RAID and MSA-DP+

Question: **Does Gen6 have the same limit of 16 virtual disk groups per virtual pool as Gen5?**
Answer: Yes, but when using many drives in the same tier you can create an MSA-DP+ disk group of up to 128 drives, which counts as a single disk group.

Question: **What is the min number of drives required to start the array?**
Answer: 2 drives (RAID 1) is the minimum configuration.

Question: **Do we have to use MSA-DP+ or are the old RAID types still available?**
Answer: MSA-DP+ is highly recommended for HDDs, but other levels of RAID are supported as well.

Question: **Please clarify the "we don't recommend this (MSA-DP+) for SSDs" comment. I assume this is a performance related issue, but real customers are often willing to trade top-end performance for manageability, especially in the SMB space.**
Answer: It is absolutely NOT a performance issue. It has to do with the fact that MSA-DP+ requires that you start with 12 drives. Very few MSA customers require so many SSD drives upfront. Additionally, SSDs do not commonly fail and the resiliency MSA-DP+ provides would not be as advantageous as with HDDs.

Question: **Does this mean that the "power of 2 method" of placing disks in a disk group falls away?**
Answer: Yes and no. With MSA-DP+ the stripes will be configured to follow the Power of 2 conventions without having a power of 2 # of drives in the disk-group. The minimum of 12 drives makes it so under the covers. For any other RAID types, Power of 2 rule still applies.

Question: **What is the parity overhead with MSA-DP+?**
Answer: Each stripe zone will be configured as a RAID 6 stripe using segments from 10 drives, meaning the parity overhead will be 2 drives for every 10 drives in the disk group. But you need to include spare capacity to the overhead as well. In a 12 drive disk group the overhead is 4 drives by default (2x parity, 2x spares). If spare capacity is not manually increased, that overhead decreases as more drives are added.

Question: **For MSA-DP+ disk groups, the type of disk must be the same (though different in capacity) or can it be different disk type?**
Answer: Correct, the MSA-DP+ disk group will conform to the tiers for the drive types (SSD, SAS, MDL-SAS) but you can have an MSA-DP+ disk group on each of those tiers. 1x MSA-DP+ disk group of SAS drives and a different disk group of MDL-SAS drives in a different disk group.

Hewlett Packard
Enterprise

Question: **Does MSA-DP+ require a minimum number of drives?**

Answer: Yes the minimum number of drives for MSA-DP+ is 12 drives, with a maximum of 128.

Question: **With the past generations of MSA the maximum number of disks within a group was 16 or 32 disk (if you configure RAID 50) With the MSA-DP+ it is possible to make groups bigger than 16/32 disk independently of the raid?**

Answer: MSA-DP+ should be treated as a RAID level. You can have between 12 and 128 drives in an MSA-DP+ disk group. RAID 50 has not been supported on virtual storage since its introduction on Gen 4 arrays. Only the now obsolete linear disk groups supported this and is no longer required to achieve the same benefits (wide-striping).

Question: **MSA-DP+ stripe zones have a minimum drive quantity of 10, but you can grow it one by one?**

Answer: The minimum number of drives is 12 for an MSA-DP+ disk group due to the included spare capacity. The disk group can then be expanded by 1 or many drives. The disk group will rebalance the stripe zones when a new drive is added.

Question: **In this case, customers have to start with 12 HDDs per pool?**

Answer: To use MSA-DP+ disk group the customer will need to have a minimum of 12 of the same type of drive (SSD, SAS or MDL-SAS) to create the MSA-DP+ disk group. We recommend MSA-DP+ for HDD tiers, but other RAID types that require fewer drives (e.g. RAID 6) is also supported. However, we do not recommend RAID 5 for HDDs.

Question: **Will this performance impact/rebuild time table be available in a white paper somewhere once the Gen6 announcement is made?**

Answer: This is documented in the sixth-generation virtual storage technical reference guide. MSA-DP+ is big going forward.

Question: **Can you possibly share some basic calculation method to calculate usable capacity until a sizing tool is available?**

Answer: This is especially for MSA-DP+ it is absolutely coming - Sizer, examples, best practices.

Question: **If I want to use both controllers (2 pools) and MSA-DP+ with tiering, what's the minimum number of disks?**

Answer: 4x SSDs and 24x SAS. Each Pool would have 2x SSDs (R1 pair) and 12x HDDs (MSA-DP+ group)

Question: **Is MSA-DP+ only available for the SSD layer?**

Answer: MSA-DP+ is available for all tiers of storage, MDL-SAS, SAS or SSD. It really makes the most sense with MDL-SAS or SAS as the cost to create a SSD MSA-DP+ disk group is substantial. Additionally, SSDs are not susceptible to mechanical failures and would benefit less from the resiliency MSA-DP+ provides.

Automated Tiering and Read Cache

Question: **What is the maximum Read cache per array?**

Answer: Per Pool the limitations are: Max 2x SSDs and 4TB (max). Both pools can be configured for Read Cache

Question: **Is the flash to disk ratio based on RAW or Usable capacities of the capacity tier?**

Answer: Useable

Hewlett Packard
Enterprise

Question: **So, are you seeing (or advocating) MSA configs where all drives and SSDs are run by just one controller, with the 2nd controller as a standby controller, similar to how Nimble runs? Your comments about SMB customers not exceeding the performance of one controller seem to point to this scenario.**

Answer: Yes. With the controller performance available today MSA no longer requires Dual Pool (active active) for most SMB customers. You can get a LOT more performance than most SMBs need with one Pool (Active Passive) configs like Nimble does. However, this options remains available when very high performance is required and lowers the $/IOP ratio.

Ecosystem Questions - InfoSight, OneView, RMC, Veeam

Question: **Will MSA Gen6 have support for Veeam snapshot integration?**

Answer: We will not have this support at launch. Please contact MSA Product Management if this is of interest to help set prioritization for future releases. We do support Veeam target-based snapshots today.

Question: **Is Infosight support in the roadmap for the MSA family?**

Answer: Health Check for MSA has already done the algorithms we would do in Infosight, so that is done. The REST interface is next step and it is here in Gen6, so the pieces are coming together. There is a big Infosight project which will come out to centralize and streamline integration for all Infosight integration partners. It might be a good place for new guys like MSA to join the train. ;)

Question: **Will MSA get OneView support with Gen6?**

Answer: In time, MSA's new RESTful interface makes it possible to begin conversations with the OneView team. If this functionality is important to you customers, send a note out to an MSA Product Manager.

Question: **In the future, will the HPE MSA integrate with StoreOnce and RMC?**

Answer: The POC is already done with RMC/MSA Gen6. We are scoping the release mechanisms. It would give us data mobility in HPE ecosystem and application awareness for our replication services. It will take some time, but we would like to be on the next big RMC platform release.

Question: **Any plans for a multi-array / multi-site management tool?**

Answer: No plan to write our own. Today, Arxscan is a great tool for fleet monitoring. There is special pricing out there for MSA/3PAR on this tool. It is available in the HPE Complete portfolio.

Question: **CSI plugin for MSA in plans? When?**

Answer: No plans initially.

Question: **Will SAF tools be able to collect performance data from this generation product?**

Answer: No SAF integration, use and understand the I/O Workload tool within the capacity section of the new GUI.

Question: **iLO5 Silicon Root Trust ASCI on the arrays?**

Answer: Looking at a storage implementation on this for later.

Performance, Sizing & Quoting Tools

Question: **When will MSA Gen6 be available to quote in OCA?**
Answer: On the NPI date of September 8, 2020.

Question: **Will the MSA be available within HPE NinjaSTARS?**
Answer: HPE is in process of releasing a new sizer tool (NinjaStars.next platform, name TBC). MSA Gen6 is the first storage product to release on this new platform. It's been a challenge but it is happening. We anticipate the tool to be open for sizing about 1 month after the Gen6 platform launches. The HPE Storage Sizing Tool is gone...finally.

Question: **Is there a way to size and MSA before the new tool is released?**
Answer: Yes. We plan to make a simple Capacity sizing tool to the field which will facilitate figuring out useable capacity and configurations on the new Gen6 platform. To accompany this simple tool, we will release a PPT with a number of simple but common examples. For those we will include the performance data curves which come from the PEM (Performance Estimation Module) datasets the Ninja-based tool will be pulling from. As a final tie-in, we will do a TekTalk-on-Point which will walk through these examples. When the official Ninja.next tool is released, we will follow up with an official TToP on how to size/configure using that too.

Question: **Will we detail the R/W ratio and I/O sizes along with the 350K IOP numbers?**
Answer: The performance numbers for our "hero" specs will be included in the QuickSpecs as they have been with previous generations of the MSAs. Details of the tests are included along maximum Random Read and Write numbers as well as Sequential.

Question: **Are those IOPS only considering backend? Or are there new metrics that take controller performance into consideration?**
Answer: The 325k IOPs are as measured from the host in an end-to-end configuration.

Competitive

Question: **Who else is OEM'ing these same boxes from Seagate? Will Lenovo have the same product?**
Answer: Dell purchases a very similar solution from Seagate (ME4). It is a half-generation behind MSA Gen6. We have the newest acceleration ASIC, new GUI, RESTful interface, Tiering 2.0, MSA Health Check, and a few other things. Lenovo used to purchase a G4/Gen5 product from Seagate but they have dissolved that relationship and moved to a new joint venture with the LSI side of NetApp.

Question: **What are our key differentiators' vs the Dell ME4?**
Answer: Dell purchases a similar array from Seagate but they are now ½ generation behind the MSA Gen6. Dell ONLY productizes the MSA 2060- equivalent configs. MSA has the low-end MSA 1060 series and the MSA 2062 models. HPE MSA has the newest acceleration ASIC (improves performance on various RAID calculations), New GUI (this is a big deal with simplicity, guided workflows and better dashboard), RESTful interface, Tiering 2.0 and a few other things.

Question: **Lenovo has a NetApp OEM offering that is very aggressive. Nimble HF20H is good but has limitations from storage capacity upgrades. Will MSA compete against this?**
Answer: Yes, MSA will compete with the lowest end offerings. Lenovo seems to continue to thrash as to Entry Storage Strategy year to year. They were taking IBM's v3700, then the OEM'd from DotHill for a couple years, now they have this new Joint Venture with NepApp...these shifts to leave customers hung out to

dry. The JV with NetApp is new so no clue if it will work out in long term. Should be easy enough to sell against. It is not just a price game remember.

Question: **How do we compete with NetApp's unified product lines?**

Answer: NetApp has kind of vacated the sub $20k market segment and seems to be focusing on the Mid-Range segment. Adding file and block services by design has a cost impact (memory and processor power) which makes it very difficult to keep the entry price points low enough to compete in the $10k range. While HPE has been using the File Controller strategy, we have seen sales of the low-end General File Controller drop to very near zero. For MSA, we are working on some solution whitepapers on how customers deal with this through hosted VMs and/or StoreEasy appliances. Many customers are already doing things this way today.

Question: **How do we match up with IBM Storwize 5030E?**

Answer: Very well. The V5030E is a mid-Range box stripped down to be offered for a lower price. We don't see them being any more successful than the low-end EMC VNX, Unity machines we've seen in the past. To really do entry segment well you need a product design to hit the price point's not just stripped and marketed to hit the price points in a sustainable way. See the comprehensive MSA Competitive Deck that is posted in Seismic. It has been recently refreshed.

Positioning

Question: **What is MSA's position in the HPE Primary Storage Family?**

Answer: Position MSA where the budgets are $20k or less. From a Host connectivity standpoint, MSA ships with FC, iSCSI or SAS connectivity. FC is ~50%, iSCSI 25% and SAS is 25%. MSA 1060 series is designed for lowest starting at price point. MSA 2060 is the building block flexible config array and the MSA 2062 is the Hybrid Flash model from day one.

Question: **Is MSA an All Flash Array (AFA)?**

Answer: Strictly speaking, MSA would not fare well in the AFA category. Without Compression and Dedupe, the AFA competitors would be very quickly less expensive than MSA as they would only require ½ less SSD media to meet a specific capacity point. MSA does allow "all flash" configurations but we do not position MSA as AFA. Nimble and Primera are proper AFA competitors.

Question: **Are there specific workloads or deployment methods where MSA is perfect? How about not so perfect?**

Answer: MSA is best positioned as a "general purpose" shared storage arrays. It is run in virtual deployments a high percentage of the time. For SMBs using an array like MSA, the array is expected to run ALL VMs (applications) it takes to run the business. MSA is also sometimes selected to run on application (like SAP HANA) and optimized for speed. The other common deployment mode for MSA is that of Branch sites (ROBO).....the more of them the better for MSA. This deployment method really depends on optimized costs per site ($$/Site).

Question: **Does HPE have a low cost, general SAN Software Defines Storage (SDS) solution now that StoreVirtual is end of life?**

Answer: Yes. StorMagic is sold via HPE Complete.

Question: **Should MSA and File Controllers still be positioned for mix File/Block requirements?**

Hewlett Packard
Enterprise

Answer: Standard (low performance models) are already EOL announced but they are still shipping. Performance models are still shipping. They will be going away as the Primera/Nimble customers will have a new strategy going forward. While HPE has been using the File Controller strategy, we have seen sales of the low-end General File Controller has dropped to very near zero. For MSA, we are working on some solution whitepapers on how customers deal with this through hosted VMs and/or StoreEasy appliances. Many customers are already doing things this way today.

Question: **I see that you have StoreEasy in the slide. With Microsoft apparently discontinuing the Windows Storage Server on 2019, what is our strategy going forward?**

Answer: Our StoreEasy platform will continue as it has regardless of Microsoft's licensing strategy. Customers who want a turn-key appliance will always have StoreEasy option. If they want to roll their own file server, they don't want/need an appliance. Simplicity is at the heart of StoreEasy appliances.

Question: **So I've heard, however I run into a lot of customers who do not want to deal supporting both hypervisor resources and OS updates for their File environment.**

Answer: For mid-range, high end this is a common ask. Coming up far less frequently in <$20k space. Customers often host a file system VM on the block array. Not worth having the HW dedicated just to file. Make it fast for block and optimize there. Don't sacrifice on block for just little amount of file requirements.