VMware® VMmark® V2.5.2 Results

Vendor and Hardware Platform: HPE ProLiant ML350 Gen9 **Virtualization Platform: VMware ESXi 6.0.0 U1 Build 3193039** **VMware vCenter Server : VMware vCenter Server 6.0.0 U1 Build 3018524**	**Non-Compliant**

Number of Hosts: 2	**Uniform Hosts [yes/no]: yes**	**Total sockets/cores/threads in test: 4/88/176**
Tested By: Hewlett Packard Enterprise Company		**Test Date: 03-25-2016**

Performance Section	**Configuration Section**	**Notes Section**
Performance	Configuration	Notes for Workload

It has been determined that this result was not in compliance with the VMmark Run and Reporting Rules. Specifically, this result used software that is not generally available and therefore was not in compliance with section 3.3 of the Run and Reporting Rules.

Performance – all data has been removed = NC

	mailserver			**olio**			**dvdstoreA**			**dvdstoreB**			**dvdstoreC**			
TILE_0	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_1	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_2	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_3	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_4	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM

p0																
p1																
p2																
TILE_5	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_6	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_7	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_8	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_9	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_10	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_11	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_12	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM

p0																
p1																
p2																
TILE_13	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_14	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_15	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_16	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_17	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_18	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_19	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_20	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM

p0																
p1																
p2																
TILE_21	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_22	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_23	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_24	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_25	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_26	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_27	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																

p0_score:	NC

p1_score:	NC
p2_score:	NC

Infrastructure_Operations_Scores:	vmotion	svmotion	deploy
Completed_Ops_PerHour	NC	NC	NC
Avg_Seconds_To_Complete	NC	NC	NC
Failures	NC	NC	NC
Ratio	NC	NC	NC
Number_Of_Threads	NC	NC	NC

Summary	NC	Turbo_Setting:0
	Number_Of_Compliance_Issues - NC	Median_Phase(NC)
Unreviewed_VMmark2_Applications_Score	NC	
Unreviewed_VMmark2_Infrastructure_Score	NC	
Unreviewed_VMmark2_Score	NC	

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Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 6.0.0 U1 Build 3193039 / 04-01-2016
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server 6.0.0 U1 Build 3018524 / 09-10-2015
Supplemental Software	none
Servers	
Quantity	2
Server Manufacturer and Model	HPE ProLiant ML350 Gen9
Processor Vendor and Model	Intel Xeon E5-2699 v4

Processor Speed (GHz)	2.20
Total Sockets/Total Cores/Total Threads	2 Sockets / 44 Cores / 88 Threads
Primary Cache	32 KB I + 32 KB D on chip per core
Secondary Cache	256 KB I+D on chip per core
Other Cache	55 MB I+D on chip per chip
BIOS Version	P92 02/22/2016
Memory Size (in GB, Number of DIMMs)	512 GB, 16 x 32 GB DIMMs
Memory Type and Speed	DDR4 2400 MHz RDIMM
Disk Subsystem Type	FC SAN
Number of Disk Controllers	1
Disk Controller Vendors and Models	HPE Smart Array P440ar
Number of Host Bus Adapters	1
Host Bus Adapter Vendors and Models	1 x HPE SN1000Q PCIe dual port 16 Gb Fibre HBA
Number of Network Controllers	2
Network Controller Vendors and Models	HPE Ethernet 1 Gb 4-port 331i Adapter, 1 x HPE Ethernet 10Gb 2-port 560SFP+ Adapter
Other Hardware	none
Other Software	none
Hardware Availability Date (MM-DD-YYYY)	03-31-2016
Software Availability Date (MM-DD-YYYY)	03-31-2016
Network	
Network Switch Vendors and Models	1 x H3C S5820X-28S
Network Speed	H3C S5820X-28S - 24 x 10 GbE ports, 4 x 1 GbE ports
Storage	
Array Vendors, Models, and Firmware Versions	Fusion-io ION Data Accelerator, FW version 2.5.0
Fibre Channel Switch Vendors and Models	HPE SN6000B 16Gb 48-port Fibre Channel Switch

Disk Space Used	22.8 TB
Array Cache Size	N/A
Total Number of Physical Disks Used	10 (2 per SUT OS, 2 for Fusion ION OS per storage system), 9 x PCI-e flash
Total Number of Enclosures/Pods/Shelves Used	3
Number of Physical Disks Used per Enclosure/Pod/Shelf	Internal: 2 disks per host Enclosure: 2 disks and 3 x PCI-e flash for Fusion ION OS per storage system (3 systems total)
Total Number of Storage Groups Used	0
Number of LUNs Used	35
LUN Size and Number of Disks Per LUN	All LUNs used a single PCI-e flash card in Direct Access Mode under the control of the SanDisk ION Data Accelerator software 16 LUNs: 650 GB 8 LUNs: 540 GB 11 LUNs: 450 GB
RAID Type	RAID 0 for enclosures, RAID 1 for OS drives
Number of Members per RAID Set	RAID 1: 2 RAID 0: 15
Disk Vendors, Models, and Speeds	10 x HPE 146GB 15K RPM SAS SFF (P/N 652605-B21) 3 x HPE 2410GB Multi Level Cell G2 PCIe ioDrive2 Duo 6 x HPE 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator

Datacenter Management Server	
System Model	HPE ProLiant BL685c G7
Processor Vendor and Model	AMD Opteron 6380
Processor Speed (GHz)	2.50
Total Sockets/Total Cores/Total Threads	4 Sockets / 64 Cores / 64 Threads
Memory	256 GB
Network Controller(s) Vendors and Models	2 x Integrated HPE NC551i Dual Port FlexFabric 10Gb Converged Network Adapter
Operating System, Version, Bitness, and Service Pack	VMware ESXi 5.1.0 U2 Build 1483097
Other Hardware	none
Other Software	Microsoft® Windows® 2008 R2 Enterprise (64-bit)

Clients	
Total Number of Clients / Total Physical Clients /	29 / 1 / 12

Total Virtual Client Hosts	
System Model(s)	Prime Client: HPE ProLiant DL360 G5 Virtual Client Hosts 1-2, 7-8: HPE ProLiant BL465c G7 Virtual Client Hosts 3-6, 9-12: HPE BL460c G6
Processor Vendor(s) and Model(s)	Prime Client: Intel Xeon 5160 Virtual Client Hosts 1-2, 7-8: AMD Opteron 6174 Virtual Client Hosts 3-5, 9-11: Intel Xeon X5570 Virtual Client Hosts 6 & 12: Intel Xeon X5670
Processor Speed(s) (GHz)	Prime Client: 3.0 Virtual Client Hosts 1-2, 7-8: 2.20 Virtual Client Hosts 3-5, 9-11: 2.93 Virtual Client Hosts 6 & 12: 2.93
Total Sockets/Total Cores/Total Threads	Prime Client: 2 Sockets / 8 Cores / 8 Threads Virtual Client Hosts 1-2, 7-8: 2 Sockets / 24 Cores / 24 Threads Virtual Client Hosts 3-5, 9-11: 2 Sockets / 8 Cores / 16 Threads Virtual Client Hosts 6 & 12: 2 Sockets / 12 Cores / 24 Threads
Memory per Physical Client	Prime Client: 8 GB Virtual Client Hosts 1-2, 7-8: 64 GB Virtual Client Hosts 3-5, 9-11: 32 GB Virtual Client Hosts 6 & 12: 64 GB
Network Controller(s) Vendors and Models	Prime Client: HPE NC373i dual port Gigabit Virtual Client Hosts 1-2, 7-8: HPE NC551i embedded dual port FlexFabric 10Gb Adapter, 1xHPE NC542m dual port Flex-10 10 GbE adapter Virtual Client Hosts 3-6, 9-12: HPE NC532i embedded dual port Flex-10 10 GbE adapter, 1xHPE NC542m dual port Flex-10 10 GbE adapter
Operating System, Version, Bitness, and Service Pack	Prime Client: Microsoft® Windows® 2008 R2 (64-bit) Virtual Client Hosts 1-12: VMware ESXi 5.5 U1 (Build 1623387) Virtual Clients 0-27: Microsoft® Windows® 2008 R2 Enterprise (64-bit)
Number of Virtual Clients	28
Number of vCPUs Per Virtual Client	4
Number of vMem (GB) Per Virtual Client	4

Virtual Client Networking Notes	Each virtual client host used two 2 vSwitches the client VMs:
	• vSwitch1 used 1 port from embeded NIC at 10 Gb/s
	  ○ 1 or 2 virtual clients
	• vSwitch2 used 1 port from NC542m NIC at 10 Gb/s
	  ○ 1 virtual client

Virtual Client Storage Notes	Virtual client hosts used: • 2 x 146 GB SFF SAS drives in RAID1 for OS. • shared storage on 4 x HPE P2000 G3 MSA array systems Each HPE P2000 G3 MSA array system had: • 2 volumes

	○ each volume used 11 x 146 GB SFF SAS drives in RAID5 with 1 x 146 GB SFF SAS drive configured as online spare
Other Hardware	HPE BladeSystem c7000 Enclosure 4 x HPE VC Flex-10 Ethernet Modules 4 x HPE B-series 8/24c SAN Switch BladeSystem c-Class 4 x HPE P2000 G3 MSA array system
Other Software	HPE BladeSystem c7000 Onboard Administrator Version 4.30 HPE Virtual Connect Manager Version 4.10

Notes for Workload

Virtualization Software Notes

- All VMs used virtual hardware V8 - except for Deploy Template, which used virtual hardware V7
- All VMs (except for Standby VMs and Deploy Template) had VMware tools version 9536 installed and running
- All Standby VMs had VMware tools version 9356 installed and running
- Ethernet adapter type set to vmxnet3 for all VMs (default vmxnet2)
- Logging was disabled for all VMs (default enabled)
- CD and floppy devices were removed on all VMs (default enabled)
- All VMs (except for Standbys and Deploy Template): Paravirtual Controller (default LSI Logic)
- Cluster DRS Automation Level set to Fully Automated
- DrsMigrationThreshold set to level 2
- Logical CPU layout changed for all Linux VMs to 1 socket w/ multiple cores. (default Single core per socket)
- All DS2DB VMs had CPU shares set to 11500 (default Normal)
- All Mailserver VMs had CPU shares set to 3300 (default Normal)
- All OlioWeb VMs had CPU shares set to 3000 (default Normal)
- All Standby VMs had CPU shares set to 10 (default Normal)
- sched.mem.maxmemctl set to 0 for all VMs
- sched.mem.pin set to TRUE for all VMs except for Deploy Template (default FALSE)
- ethernet0.coalescingScheme = static for all OlioWeb VMs
- monitor_control.disable_flexpriority = "FALSE" added to /etc/vmware/config
- Config.HostAgent.log.level set to warning (default info)
- Vpx.Vpxa.config.log.level set to warning (default verbose)
- Syslog.global.defaultSize set to 112 (default 1024)

Advanced Settings:

- Cpu.CreditAgePeriod = 1961 (default 3000)
- Cpu.HTWholeCoreThreshold = 0 (default 200)
- DataMover.HardwareAcceleratedInit = 0 (default 1)
- DataMover.HardwareAcceleratedMove = 0 (default 1)
- Disk.ReqCallThreshold = 1 (default 8)
- Mem.CtlMaxPercent = 0 (default 65)
- Mem.ShareScanGHz = 0 (default 4)
- Mem.VMOverheadGrowthLimit = 0 (default 4294967295)
- Net.MaxNetifRxQueueLen = 1000 (default 100)
- Net.MaxNetifTxQueueLen = 2000 (default 500)

- Net.MaxPortRxQueueLen = 160 (default 80)
- Numa.LTermFairnessInterval = 0 (default 5)
- Numa.MigImbalanceThreshold = 57 (default 10)
- Numa.PageMigEnable = 0 (default 1)
- Numa.PreferHT = 1 (default 0)
- Numa.RebalancePeriod = 60000 (default 2000)
- Numa.SwapLoadEnable = 0 (default 1)
- Numa.SwapLocalityEnable = 0 (default 1)
- VMFS3.HardwareAcceleratedLocking = 0 (default 1)
- Power.CpuPolicy = static (default balanced)

Server OS (ESXi 6.0.0 U1 Build 3193039) was installed using VMware-ESXi-6.0.0-Update1-3193039-HPE-600.9.5.30-Mar2016.iso, which was preloaded with HP device drivers. No driver upgrades were made after the OS was installed.

Server Notes

Server BIOS settings:

- Power Profile set to Maximum Performance (default: Balanced Power and Performance)
- Thermal Configuration set to Maximum Cooling (default: Optimal Cooling)
- Memory Refresh Rate set to 1x Refresh (default: 2x Refresh)
- QPI Snoop Configuration set to Cluster on Die (default: Home Snoop)
- Intel Turbo Boost Enabled (frequency boost to 3.6 GHz) (default: Enabled)

Networking Notes

- vSwitch0 for the Service Console on vmnic0 at 1Gb/s
- vSwitch1 defined as vmkernel vMotion connection on vmnic1 at 1Gb/s
- vSwitch2 for the DS2 workloads on vmnic4 at 10 Gb/s
- vSwitch3 for the Mailserver, Olio, Standby, and deploy workloads on vmnic5 at 10 Gb/s

Storage Notes

- ESXi was installed on two disks configured as RAID1 in the internal server storage bay
- All LUNs were configured as block devices and no system memory was used for write caching
- All ION LUNs had "No. of outstanding IOs with competing worlds" set to 256 (default 32)
- Storage box #1
    - Hardware Configuration
        - HP ProLiant DL380p Gen8
            - 2 x Intel Xeon E5-2690 2.90 GHz processors
            - 256 GB Memory 16 x 16 GB DIMMs dual rank PC3-12800 Registered DDR3)
            - 3 x HP 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator flash cards
            - 2 x HP SN1000Q dual port 16 GB fibre HBAs
            - 1 x HP Smart Array 420i controller for ION OS
            - 2 x 146 GB 15K RPM SAS SFF for ION OS
            - SanDisk ION Accelerator version 2.5.0
    - Software Configuration
        - Each HP 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator flash card is recognized as a 2600 GB device.

        - Storage Pools were created using Direct Access storage profile.
            - one storage pool per device
            - total of 3 storage pools
        - 4 x RAID0 volumes were created for each storage pool.
            - Total: 12 x 650 GB volumes
            - each volume was exported as a single LUN
        - HP 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator flash card #1
            - Storage Pool #1, Volume #1, LUN #1
            - Storage Pool #1, Volume #2, LUN #2
            - Storage Pool #1, Volume #3, LUN #3
            - Storage Pool #1, Volume #4, LUN #4
        - HP 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator flash card #2
            - Storage Pool #2, Volume #1, LUN #5
            - Storage Pool #2, Volume #2, LUN #6
            - Storage Pool #2, Volume #3, LUN #7
            - Storage Pool #2, Volume #4, LUN #8
        - HP 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator flash card #3
            - Storage Pool #3, Volume #1, LUN #9
            - Storage Pool #3, Volume #2, LUN #10
            - Storage Pool #3, Volume #3, LUN #11
            - Storage Pool #3, Volume #4, LUN #12
    - LUN/VM layout
        - LUN1: Tile 0: Mailserver, OlioDB, OlioWeb, Standby
        - LUN2: Tile 1: Mailserver, OlioDB, OlioWeb, Standby
        - LUN3: Tile 2: Mailserver, OlioDB, OlioWeb, Standby
        - LUN4: Tile 3: Mailserver, OlioDB, OlioWeb, Standby
        - LUN5: Tile 5: Mailserver, OlioDB, OlioWeb, Standby
        - LUN6: Tile 4: Mailserver, OlioDB, OlioWeb, Standby
        - LUN7: Tile 7: Mailserver, OlioDB, OlioWeb, Standby
        - LUN8: Tile 6: Mailserver, OlioDB, OlioWeb, Standby
        - LUN9: Tile 8: Mailserver, OlioDB, OlioWeb, Standby
        - LUN10: Tile 9: Mailserver, OlioDB, OlioWeb, Standby
        - LUN11: Deploy Template
        - LUN12: Tile 11: Mailserver, OlioDB, OlioWeb, Standby
- Storage box #2
    - Hardware Configuration
        - HP ProLiant DL380p Gen8
            - 2 x Intel Xeon E5-2697 2.70 GHz processors
            - 128 GB Memory (16 x 8 GB DIMMs dual rank PC3-12800 Registered DDR3)
            - 3 x HP 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator flash cards configured in RAID 0
            - 2 x HP SN1000Q dual port 16 GB fibre HBAs
            - 1 x HP Smart Array 420i controller for ION OS
            - 2 x 146 GB 15K RPM SAS SFF for ION OS
            - SanDisk ION Accelerator version 2.5.0
    - Software Configuration
        - Each HP 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator flash card is recognized as a 2600 GB device.
        - Storage Pools were created using Direct Access storage profile.
            - one storage pool per device

            - total of 3 storage pools
        - 4 x RAID0 volumes were created for each storage pool.
            - Total: 12 x volumes
                - 1 pool had 4 x 650 GB volumes
                - 2 pools had 4 x 540 GB volumes
            - each volume was exported as a single LUN
        - HP 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator flash card #1
            - Storage Pool #1, Volume #1, LUN #1
            - Storage Pool #1, Volume #2, LUN #2
            - Storage Pool #1, Volume #3, LUN #3
            - Storage Pool #1, Volume #4, LUN #4
        - HP 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator flash card #2
            - Storage Pool #2, Volume #1, LUN #5
            - Storage Pool #2, Volume #2, LUN #6
            - Storage Pool #2, Volume #3, LUN #7
            - Storage Pool #2, Volume #4, LUN #8
        - HP 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator flash card #3
            - Storage Pool #3, Volume #1, LUN #9
            - Storage Pool #3, Volume #2, LUN #10
            - Storage Pool #3, Volume #3, LUN #11
            - Storage Pool #3, Volume #4, LUN #12
    - LUN/VM layout
        - LUN1: Tiles 0, 9, 16, 25: All DS2 VMs
        - LUN2: Tiles 1, 8, 17, 24: All DS2 VMs
        - LUN3: Tiles 2, 11, 18, 27: All DS2 VMs
        - LUN4: Tiles 3, 10, 19, 26: All DS2 VMs
        - LUN5: Tiles 4, 13, 20: All DS2 VMs
        - LUN6: Tiles 5, 12, 21: All DS2 VMs
        - LUN7: Tiles 6, 15, 22: All DS2 VMs
        - LUN8: Tiles 7, 14, 23: All DS2 VMs
        - LUN9: Tiles 13, 20: Mailserver, OlioDB, OlioWeb, Standby
        - LUN10: Tiles 12, 21: Mailserver, OlioDB, OlioWeb, Standby
        - LUN11: Tiles 10, 23: Mailserver, OlioDB, OlioWeb, Standby
        - LUN12: Deploy target, SVmotion target
- Storage box #3
    - Hardware Configuration
        - HP ProLiant DL380p Gen8
            - 2 x Intel Xeon E5-2680 2.70 GHz processors
            - 512 GB Memory (16 x 32 GB LRDIMMs quad rank 1333 MHz)
            - 3 x HP 2410GB Multi Level Cell G2 PCIe ioDrive2 Duo flash cards
            - 2 x HP SN1000Q dual port 16 GB fibre HBAs
            - 1 x HP Smart Array 420i controller for ION OS
            - 2 x 146 GB 15K RPM SAS SFF for ION OS
            - SanDisk ION Accelerator version 2.2.0
    - Software Configuration
        - Each HP 2410GB Multi Level Cell G2 PCIe ioDrive2 Duo flash card is recognized as 2 x 1205 GB devices.
        - Storage Pools were created using Direct Access storage profile.
            - one storage pool per device

        - total of 6 storage pools
    - 2 x RAID0 volumes were created for each storage pool.
        - Total: 12 x 450 GB volumes
        - each volume was exported as a single LUN
    - HP 2410GB Multi Level Cell G2 PCIe ioDrive2 Duo flash card #1
        - Storage Pool #1, Volume #1, LUN #1
        - Storage Pool #1, Volume #2, LUN #2
        - Storage Pool #2, Volume #1, LUN #3
        - Storage Pool #2, Volume #2, LUN #4
    - HP 2410GB Multi Level Cell G2 PCIe ioDrive2 Duo flash card #2
        - Storage Pool #3, Volume #1, LUN #1
        - Storage Pool #3, Volume #2, LUN #2
        - Storage Pool #4, Volume #1, LUN #3
        - Storage Pool #4, Volume #2, LUN #4
    - HP 2410GB Multi Level Cell G2 PCIe ioDrive2 Duo flash card #3
        - Storage Pool #5, Volume #1, LUN #1
        - Storage Pool #5, Volume #2, LUN #2
        - Storage Pool #6, Volume #1, LUN #3
        - Storage Pool #6, Volume #2, LUN #4
- LUN/VM layout
    - LUN1: Tile 15: Mailserver, OlioDB, OlioWeb, Standby
    - LUN2: Tile 14: Mailserver, OlioDB, OlioWeb, Standby
    - LUN3: Tile 17: Mailserver, OlioDB, OlioWeb, Standby
    - LUN4: Tile 16: Mailserver, OlioDB, OlioWeb, Standby
    - LUN5: Tile 18: Mailserver, OlioDB, OlioWeb, Standby
    - LUN6: Tile 19: Mailserver, OlioDB, OlioWeb, Standby
    - LUN7: Tile 26: Mailserver, OlioDB, OlioWeb, Standby
    - LUN8: Tile 27: Mailserver, OlioDB, OlioWeb, Standby
    - LUN9: Tile 25: Mailserver, OlioDB, OlioWeb, Standby
    - LUN10: Tile 24: Mailserver, OlioDB, OlioWeb, Standby
    - LUN11: not used
    - LUN12: Tile 22: Mailserver, OlioDB, OlioWeb, Standby

Datacenter Management Server Notes

- HPE ProLiant BL685c G7 running ESXi 5.1.0 U2 Build 1483097 with one virtual machine for vCenter for SUT
    - vCenter for SUT
        - 2 virtual CPUs
        - 8 GB virtual memory
        - Microsoft® Windows® 2008 R2 Enterprise (64-bit)
        - VMware vCenter Server 5.5.0 Build 1800108

Operating System Notes

- All mailserver VMs running Microsoft® Windows® 2008 R2 Enterprise SP1 (64-bit)
- All standby VMs running Microsoft® Windows® 2003 Enterprise SP2 (32-bit)
- All DS2DB, DS2WebA, DS2WebB, DS2WebC, OlioDB and OlioWeb running SUSE® Linux Enterprise Server 11 SP2 (64-bit)

Software Notes

- Microsoft® Exchange Server 2007 Enterprise SP3 (64-bit) was installed on each mailserver VM

Client Notes

- Prime client functionality was split from the client0 driver and was run on a non-virtualized copy of Microsoft® Windows® 2008 R2 Enterprise (64-bit).
- Prime client was running VMware vSphere PowerCLI 5.5 Release 2 Build 1671586
- All client drivers were run on virtual machines that were each defined with 4 virtual CPUs, 4 GB of memory, 1 vmxnet2 network, and 32 GB of disk space.
- Virtual client layou:
  - Virtual Client Host 1 hosted vclients: 0, 12, 24,
  - Virtual Client Host 2 hosted vclients: 1, 13, 25
  - Virtual Client Host 3 hosted vclients: 2, 14, 26
  - Virtual Client Host 4 hosted vclients: 3, 15, 27
  - Virtual Client Host 5 hosted vclients: 4, 16
  - Virtual Client Host 6 hosted vclients: 5, 17
  - Virtual Client Host 7 hosted vclients: 6, 18
  - Virtual Client Host 8 hosted vclients: 7, 19
  - Virtual Client Host 9 hosted vclients: 8, 20
  - Virtual Client Host 10 hosted vclients: 9, 21
  - Virtual Client Host 11 hosted vclients: 10, 22
  - Virtual Client Host 12 hosted vclients: 11, 23
- All client operating systems were updated via Windows Update.
  - The "SPP Notification Service" and "Software Protection" services were not running on client0.

Other Notes

- TILEDELAY set to 30 (default 60)
