

VMmark® 3.0 Results

Vendor and Hardware Platform: HPE ProLiant DL380 Gen10
 Virtualization Platform: VMware ESXi 6.5.0 Patch 02 Build 7388607
 VMware vCenter Server : VMware vCenter Server 6.5 U1 Build 5973321

**VMmark 3.0 Score =
8.01 @ 8 Tiles**

Number of Hosts: 2	Uniform Hosts [yes/no]: yes	Total sockets/cores/threads in test: 4/112/224
Tested By: Hewlett Packard Enterprise		Test Date: 02-25-2018
Performance Section Performance	Configuration Section Configuration	Notes Section Notes for Workload

Performance

	weathervane			weathervaneE			dvdstoreA			dvdstoreB			dvdstoreC			
TILE_0	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3601.65	1.00	0.35 0.00	573.29	1.00	0.69 0.50	970.40	1.32	776.70	706.20	1.41	901.32	491.62	1.42	1030.07	1.22
p1	3602.48	1.00	0.36 0.00	574.46	1.00	0.46 0.36	988.12	1.35	736.17	690.55	1.38	877.68	498.00	1.44	1000.49	1.22
p2	3600.38	1.00	0.32 0.00	573.67	1.00	0.54 0.30	979.23	1.33	757.83	688.40	1.38	893.64	476.12	1.37	1020.08	1.20
TILE_1	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3601.79	1.00	0.34 0.00	573.85	1.00	0.53 0.59	996.27	1.36	710.72	726.15	1.45	832.18	534.55	1.54	931.78	1.25
p1	3602.03	1.00	0.35 0.00	572.75	1.00	0.68 0.46	1005.80	1.37	697.53	707.20	1.41	820.30	492.73	1.42	921.11	1.22
p2	3601.11	1.00	0.34 0.00	573.10	1.00	0.77 0.48	989.62	1.35	718.70	726.85	1.45	823.32	512.30	1.48	931.84	1.24
TILE_2	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3599.86	1.00	0.34 0.00	573.81	1.00	0.48 0.41	976.92	1.33	759.47	683.30	1.37	902.62	497.98	1.44	1014.36	1.21
p1	3595.50	1.00	0.34 0.00	574.33	1.00	0.31 0.31	969.25	1.32	785.37	679.23	1.36	925.84	466.52	1.35	1051.20	1.19
p2	3596.34	1.00	0.32 0.00	571.67	1.00	0.51 0.27	957.62	1.30	802.64	697.92	1.39	929.74	511.02	1.47	1038.20	1.22
TILE_3	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3598.99	1.00	0.32 0.00	573.84	1.00	0.58 0.38	995.90	1.36	714.53	702.33	1.40	846.69	481.02	1.39	975.98	1.22
p1	3602.10	1.00	0.33 0.00	572.31	1.00	0.47 0.39	987.05	1.34	735.87	723.27	1.45	847.89	503.30	1.45	979.01	1.23
p2	3598.70	1.00	0.29 0.00	572.50	1.00	0.61 0.44	985.02	1.34	737.86	693.08	1.38	865.86	502.48	1.45	978.03	1.22
TILE_4	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3598.38	1.00	0.32 0.00	574.09	1.00	0.61 0.47	989.67	1.35	728.72	693.35	1.39	860.83	480.75	1.39	982.74	1.21
p1	3597.96	1.00	0.34 0.00	571.92	1.00	0.45 0.46	961.83	1.31	791.59	703.70	1.41	917.19	518.40	1.49	1014.89	1.22
p2	3598.36	1.00	0.31 0.00	573.73	1.00	0.60 0.51	978.85	1.33	758.13	680.95	1.36	897.47	474.85	1.37	1011.58	1.20
TILE_5	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM

p0	3602.43	1.00	0.35 0.00	572.74	1.00	0.38 0.33	957.65	1.30	817.00	666.77	1.33	963.88	480.25	1.38	1092.67	1.19
p1	3602.17	1.00	0.34 0.00	571.38	1.00	0.45 0.41	951.35	1.30	832.40	662.48	1.32	981.19	475.48	1.37	1117.89	1.19
p2	3590.98	1.00	0.32 0.00	573.49	1.00	0.50 0.41	952.45	1.30	820.98	664.70	1.33	975.94	455.93	1.31	1126.80	1.18
TILE_6	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3600.26	1.00	0.31 0.00	573.27	1.00	0.57 0.39	967.45	1.32	781.62	729.55	1.46	906.52	511.85	1.48	1044.53	1.23
p1	3602.77	1.00	0.31 0.00	572.01	1.00	0.46 0.28	988.20	1.35	733.35	667.48	1.33	879.09	473.12	1.36	1011.72	1.20
p2	3593.27	1.00	0.31 0.00	571.37	1.00	0.44 0.26	970.98	1.32	767.62	708.23	1.42	903.50	489.70	1.41	1037.23	1.21
TILE_7	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3598.56	1.00	0.36 0.00	574.70	1.00	0.56 0.39	982.23	1.34	747.25	710.25	1.42	891.43	499.93	1.44	995.12	1.22
p1	3597.47	1.00	0.35 0.00	572.24	1.00	0.50 0.39	984.10	1.34	742.78	667.40	1.33	875.14	475.85	1.37	1019.48	1.20
p2	3599.19	1.00	0.32 0.00	573.75	1.00	0.60 0.36	971.65	1.32	770.61	705.45	1.41	895.49	518.02	1.49	1009.68	1.23
p0_score:	9.75															
p1_score:	9.67															
p2_score:	9.70															

Infrastructure_Operations_Scores:	vMotion	SVMotion	XVMotion	Deploy
Completed_Ops_PerHour	26.00	26.00	20.00	12.00
Avg_Seconds_To_Complete	17.71	87.40	131.05	267.32
Failures	0.00	0.00	0.00	0.00
Ratio	1.00	1.44	1.11	1.50
Number_Of_Threads	1	1	1	1

Summary	Run_Is_Compliant	Turbo_Setting:0
	Number_Of_Compliance_Issues(0)*	Median_Phase(p2)
Unreviewed_VMmark3_Applications_Score	9.70	
Unreviewed_VMmark3_Infrastructure_Score	1.25	
Unreviewed_VMmark3_Score	8.01	

Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD- YYYY)	VMware ESXi 6.5 Patch 02 Build 7388607 / 12-19-2017

Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server 6.5 U1 Build 5973321 / 07-27-2017
Supplemental Software	none
Servers	
Number of Servers in System Under Test (all subsequent fields in this section are per server)	2
Server Manufacturer and Model	HPE ProLiant DL380 Gen10
Processor Vendor and Model	Intel Xeon Platinum 8180
Processor Speed (GHz)	2.5
Total Sockets/Total Cores/Total Threads	2 Sockets / 56 Cores / 112 Threads
Primary CPU Cache	32KB I + 32KB D on chip per core
Secondary CPU Cache	1MB I + D on chip per core
Other CPU Cache	38.5 MB I + D on chip per chip
BIOS Version	U30 v1.26
Memory Size (in GB, Number of DIMMs)	768 GB, 24
Memory Type and Speed	32GB 2Rx4 DDR4 2666MHz RDIMM
Disk Subsystem Type	FC SAN
Number of Disk Controllers	1
Disk Controller Vendors and Models	HPE SmartArray P408i-a SR Gen10
Total Number of Physical Disks for Hypervisor	2
Disk Vendors, Models, Capacities, and Speeds	HPE 400 GB 15K RPM SAS SFF
Number of Host Bus Adapters	1
Host Bus Adapter Vendors and Models	HPE SN1100Q Dual port 16GB Dual port FC HBA
Number of Network Controllers	2
Network Controller Vendors and Models	1 x HPE Ethernet 1Gb 4-port 331FLR Adapter, 2 x HPE Ethernet 10Gb 2-port 562SFP+ Adapter
Other Hardware	none

Other Software	none
Hardware Availability Date (MM-DD-YYYY)	07-11-2017
BIOS Availability Date (MM-DD-YYYY)	11-14-2017
Software Availability Date (MM-DD-YYYY)	02-09-2018
Network	
Network Switch Vendors and Models	1 x H3C S5820x-28S
Network Speed	24 x 10 GbE ports, 4 x 1 GbE ports
Storage	
Array Vendors, Models, and Firmware Versions	SanDisk ION Data Accelerator, FW versions 2.5.5
Fibre Channel Switch Vendors and Models	HPE SN6000B 16 Gb 48/48 Active FC switch
Disk Space Used	15 TB
Array Cache Size	N/A
Total Number of Physical Disks Used	8 (2 per SUT OS, 2 for SanDisk ION OS per storage system), 6 x PCI-e flash
Total Number of Enclosures/Pods/Shelves Used	2
Number of Physical Disks Used per Enclosure/Pod/Shelf	Internal: 2 disks per host Enclosure: 2 disks and 3 x PCI-e flash per storage system (2 systems total)
Total Number of Storage Groups Used	0
Number of LUNs Used	18
LUN Size and Number of Disks Per LUN	Each LUN was in a single storage pool consisting of 3 x PCI-e flash storage <ul style="list-style-type: none"> • 4 x 1200 GB LUNs • 4 x 800 GB LUNs • 4 x 600 GB LUNs • 2 x 150 GB LUNs • 4 x 100 GB LUNs
RAID Type	RAID 0 for enclosures, RAID 1 for OS drives
Number of Members per RAID Set	RAID 1: 2 RAID 0: 3
Disk Vendors, Models, and Speeds	4 x HPE 400 GB 15K RPM SAS SFF (HPE P/N 872374-B21) for SUT host OS 2 x HPE 146 GB 15K RPM SAS SFF (HPE P/N 512547-B21) for storage box #1 OS

2 x HPE 300 GB 15K RPM SAS SFF (HPE P/N 759208-B21) for storage box #2 OS
 3 x HPE 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator
 3 x HPE 2.4TB HH/HL Light Endurance (LE) PCIe Workload Accelerator

Datacenter Management Server

System Model	HPE ProLiant DL380 Gen9
Processor Vendor and Model	Intel Xeon E5-2699A v4
Processor Speed (GHz)	2.4
Total Sockets/Total Cores/Total Threads	2 Sockets / 44 Cores / 88 Threads
Memory Size (in GB, Number of DIMMs)	512, 16
Network Controller(s) Vendors and Models	1 x HPE Ethernet 1Gb 4-port 331i Adapter 2 x HPE Ethernet 10Gb 2-port 562SFP+ Adapter
Operating System, Version, Bitness, and Service Pack	VMware ESXi 6.5.0 Build 4564106
Virtual Center VM Number of vCPUs	8
Virtual Center VM Virtual Memory (in GB)	24
Virtual Center VM Operating System, Version, Bitness, and Service Pack	none
Other Hardware	none
Other Software	none

Clients

Total Number of Virtual Clients / Virtual Client Hosts	9 / 4
System Model(s)	HPE ProLiant DL360 Gen9
Processor Vendor(s) and Model(s)	Intel Xeon E5-2680 v4
Processor Speed(s) (GHz)	2.4
Total Sockets/Total Cores/Total Threads	2 Sockets / 14 Cores / 28 Threads
Memory per Virtual Client Host	256 GB
Network Controller(s) Vendors and Models	1 x HPE Ethernet 1Gb 4-port 331i Adapter 1 x HPE Ethernet 10Gb 2-port 533FLR-T Adapter 1 x HPE Ethernet 10Gb 2-port 560SFP+ Adapter

Virtual Client Networking Notes	1 x vmnic for management (1 Gb/s) 1 x vmnic for vMotion (1 Gb/s) 2 x vmnic for workload (10 Gb/s)
Virtual Client Storage Notes	1 x P2000 G3 FC storage enclosure containing 24 x 146 GB HDD 2 x 1466.5 GB RAID 5 LUNs for client VMs
Other Hardware	HPE SN1000Q 16Gb Dual Port FC HBA
Other Software	VMware ESXi 6.5 Patch 02 Build 7388607

Notes for Workload

Virtualization Software Notes

- Logging was disabled for all VMs except clients and PrimeClient (default enabled)
- CD and Floppy devices were removed from all VMs except clients and PrimeClient (default installed)
- Except clients and PrimeClient, logical CPU layout changed for all multi-CPU VMs to 1 socket with multiple cores (default single core per socket)
- All DS3DB VMs had CPU and Memory Shares set to High (default Normal)
- All memory reserved for DS3DB VMs (default 0 - no memory reserved)
- All standby VMs had CPU shares set to Low (default Normal)
- Cluster DRS Automation Level set to Fully Automated
- DRSMigration Threshold set to level 2
- monitor_control.disable_flexpriority = "FALSE" added to /etc/vmware/config

Advanced Settings:

- Config.HostAgent.log.level = warning (default info)
- Cpu.CreditAgePeriod = 1000 (default 3000)
- Cpu.HTWholeCoreThreshold = 0 (default 800)
- DataMover.HardwareAcceleratedInit = 0 (default 1)
- DataMover.HardwareAcceleratedMove = 0 (default 1)
- Disk.IdleCredit = 64 (default 32)
- Disk.ReqCallThreshold = 1 (default 8)
- Mem.CtlMaxPercent = 0 (default 65)
- Mem.ShareScanGHz = 0 (default 4)
- Misc.TimerMaxHardPeriod = 4000 (default 500000)
- 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)
- Power.CpuPolicy = static (default balanced)
- Syslog.global.defaultSize = 112 (default 1024)
- VMFS3.HardwareAcceleratedLocking = 0 (default 1)
- Vpx.Vpxa.config.log.level = warning (default verbose)

Server Notes

Server BIOS settings:

- HPE Workload Profile set to 'Virtualization - Max Performance' (default: General Power Efficient Compute)
 - After changing to 'Virtualization - Max Performance' which modifies other settings, changed to 'Custom' to unlock settings to allow for modification.
- Thermal Configuration set to Maximum Cooling (default: Optimal Cooling)
- Sub-Numa Cluster set to Disabled (default: Enabled)
- Embedded Serial Port COM1 set to Disabled (default: Enabled)
- XPT Prefetcher set to Disabled (default: Auto)
- Intel Turbo Boost Enabled (frequency boost to 3.8 GHz) (default: Enabled)

Networking Notes

- vSwitch configuration
 - vSwitch0 on vmnic0 for service console (1Gb/s)
 - vSwitch1 on vmnic1 for vMotion (1Gb/s)
 - vSwitch2 on vmnic4 for Auction*, Standby, Deploy VMs (10Gb/s)
 - vSwitch3 on vmnic5 for DS3*, Elastic* VMs (10Gb/s)

Storage Notes

- ESXi was installed on two disks configured as RAID1 in the internal server storage bays on each SUT.
- All LUNs were configured as block devices and no system memory was used for write caching.
- A total of 24 LUNs were configured and all 24 LUNs were seen by both SUT hosts. However, 6 LUNs were not used.
- Storage Box #1
 - Hardware Configuration
 - HPE ProLiant DL380p Gen8
 - 2 x Intel Xeon E5-2690 2.90 GHz processors
 - 128GB (16 x 8 GB RDIMM)
 - 3 x HPE 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator flash cards
 - 2 x HPE SN1000Q dual port 16 Gb fibre HBAs
 - 1 x HPE SmartArray 420i controller for ION OS
 - 2 x 146 GB 15K RPM SAS SFF for ION OS
 - SanDisk ION Accelerator version 2.5.5
 - Software Configuration
 - A single storage pool was created using 3 x HPE 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator flash cards.
 - All LUNs are RAID0.
 - LUN details:
 - LUN1 (800 GB): Auction* VMs for tiles 3 , 6
 - LUN2 (600 GB): Elastic* VMs for tiles 0, 5
 - LUN3 (1200 GB): DS3* VMs for tiles 1, 4
 - LUN4 (800 GB): Auction* VMs for tiles 1, 4
 - LUN5 (1200 GB): DS3* VMs for tiles 3, 6
 - LUN6 (600 GB): Elastic* VMs for tiles 2, 7
 - LUN7 (100 GB): XVmotion target
 - LUN8 (100 GB): deploy target
 - LUN9 (150 GB): standby* VMs for tiles 1, 2, 5, 6
 - LUN10 (400 GB): unused
 - LUN11 (300 GB): unused

- LUN12 (600 GB): unused
 - Storage Box #2
 - Hardware Configuration
 - HPE ProLiant DL380p Gen8
 - 2 x Intel Xeon E5-2680 2.70 GHz processors
 - 512 GB (16 x 32 GB LRDIMM)
 - 3 x HPE 2.4TB HH/HL Light Endurance (LE) PCIe Workload Accelerator flash cards
 - 2 x HPE SN1000Q dual port 16 Gb fibre HBAs
 - 1 x HPE SmartArray 420i controller for ION OS
 - 2 x 300 GB 15K RPM SAS SFF for ION OS
 - SanDisk ION Accelerator version 2.5.5
 - Software Configuration
 - A single storage pool was created using 3 x HPE 2.4TB HH/HL Light Endurance (LE) PCIe Workload Accelerator flash cards.
 - All LUNs are RAID0.
 - LUN details:
 - LUN1 (800 GB): Auction* VMs for tiles 0, 5
 - LUN2 (600 GB): Elastic* VMs for tiles 1, 6
 - LUN3 (1200 GB): DS3* VMs for tiles 0, 5
 - LUN4 (800 GB): Auction* VMs for tiles 2, 7
 - LUN5 (1200 GB): DS3* VMs for tiles 2, 7
 - LUN6 (600 GB): Elastic* VMs for tiles 3, 4
 - LUN7 (100 GB): template VM
 - LUN8 (100 GB): SVmotion target
 - LUN9 (150 GB): standby* VMs for tiles 0, 3, 4, 7
 - LUN10 (400 GB): unused
 - LUN11 (300 GB): unused
 - LUN12 (600 GB): unused

Datacenter Management Server Notes

The vCenter was configured in a VM using the VMware-VCSA-all-6.5.0-5973321.iso available from VMware.

- Number of vCPUs: 8
- Virtual Memory: 24 GB
- vCenter VM

Operating System Notes

VMware ESXi 6.5 Patch 02 Build 7388607 was installed using 'HPE Custom Image for VMware ESXi 6.5 U1 Install CD' download named 'VMware-ESXi-6.5.0-Update1-7388607-HPE-650.U1.10.2.0.23-Feb2018.iso'.

- VMware ESXi 6.5 Patch 02 Build 7388607 was released by VMware on 12-19-2017.
- The HPE customized ISO image was released by HPE on 02-09-2018.

Software Notes

None

Client Notes

Advanced Settings:

- Power.CpuPolicy = static (default balanced)

Prime Client was deployed on one of the 4 x HPE Proliant DL360 Gen 9 used for client hosts

- Client host 1: clients 0, 5
- Client host 2: clients 1, 4
- Client host 3: clients 2, 7
- Client host 4: clients 3, 6, PrimeClient

Client and SUT hosts used the same fiber switch, which was configured so that only SUT hosts had access to the SUT storage and only client hosts had access to the client storage.

Other Notes

None

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