VMware® VMmark® V2.5.2 Results

Vendor and Hardware Platform: HP ProLiant DL380 Gen9 Virtualization Platform: VMware ESXi 5.5.0 U2 Build 1909291 VMware vCenter Server : VMware vCenter Server 5.5.0 U2 Build 1909363	VMmark V2.5.2 Server PPKW Score = 17.6899 @ 20 Tiles

Number of Hosts: 2	Uniform Hosts [yes/no]: yes	Total sockets/cores/threads in test: 4/72/144

Tested By: Hewlett-Packard	Test Date: 08-19-2014

Performance Section	Configuration Section	Notes Section
Performance	Configuration	Notes for Workload

Performance

	mailserver			olio			dvdstoreA			dvdstoreB			dvdstoreC			
TILE_0	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.80	0.99	73.58	4649.85	1.00	199.55	4214.55	1.92	56.33	3061.07	2.02	60.78	2193.90	2.07	63.84	1.51
p1	330.85	1.00	73.00	4630.05	1.00	210.90	4157.07	1.89	58.35	3119.88	2.05	62.59	2374.25	2.24	65.17	1.54
p2	326.68	0.99	73.00	4618.88	1.00	226.53	4019.35	1.83	63.23	2911.50	1.92	68.10	2090.57	1.98	71.13	1.47
TILE_1	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	328.18	0.99	74.00	4645.88	1.00	194.47	4206.98	1.91	56.31	3170.05	2.09	59.90	2312.88	2.19	62.71	1.54
p1	328.82	1.00	74.00	4634.65	1.00	206.17	4193.75	1.91	56.85	3043.20	2.00	61.08	2285.75	2.16	63.99	1.52
p2	325.12	0.98	81.75	4618.35	1.00	227.44	4047.62	1.84	62.15	2926.20	1.93	67.19	2096.97	1.98	70.64	1.47
TILE_2	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	328.48	0.99	74.00	4648.25	1.00	199.84	4096.70	1.86	60.35	3086.78	2.03	64.18	2240.85	2.12	67.72	1.52
p1	326.43	0.99	74.00	4649.07	1.00	213.75	4115.75	1.87	59.76	2977.00	1.96	64.88	2226.72	2.10	68.24	1.50
p2	327.27	0.99	79.75	4620.30	1.00	223.15	3970.12	1.81	65.48	2875.68	1.89	70.21	2049.25	1.94	74.36	1.46
TILE_3	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.15	0.99	68.90	4673.07	1.01	191.59	4197.75	1.91	56.98	3148.18	2.07	61.04	2406.65	2.27	63.22	1.57
p1	327.65	0.99	74.00	4653.02	1.00	204.45	4239.02	1.93	55.72	3074.32	2.02	60.07	2211.57	2.09	62.92	1.52
p2	328.82	1.00	74.00	4627.65	1.00	224.32	4081.50	1.86	60.92	3088.85	2.03	64.40	2244.50	2.12	67.26	1.55
TILE_4	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.43	0.99	74.00	4652.23	1.00	193.54	4192.62	1.91	56.58	3096.12	2.04	58.85	2256.45	2.13	59.66	1.52
p1	320.18	0.97	77.50	4632.80	1.00	208.35	4158.40	1.89	57.70	3165.60	2.08	59.91	2343.90	2.22	60.71	1.53
p2	327.48	0.99	84.00	4649.02	1.00	216.69	4005.78	1.82	63.31	2939.95	1.94	66.42	2249.32	2.13	66.89	1.49
TILE_5	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	333.30	1.01	73.47	4628.85	1.00	201.81	4218.82	1.92	55.87	3100.88	2.04	58.54	2253.15	2.13	59.61	1.53

p1	330.45	1.00	73.58	4628.88	1.00	209.85	4194.95	1.91	56.53	3190.57	2.10	59.02	2458.85	2.32	59.48	1.56
p2	329.68	1.00	82.90	4631.27	1.00	207.96	4052.70	1.84	61.61	2964.32	1.95	64.95	2168.40	2.05	65.48	1.49
TILE_6	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.15	0.98	74.25	4648.18	1.00	190.26	2718.70	1.24	53.58	3083.00	2.03	59.63	2240.20	2.12	61.11	1.39
p1	324.52	0.98	74.00	4629.45	1.00	209.70	2570.00	1.17	53.91	3174.15	2.09	60.10	2431.40	2.30	61.72	1.41
p2	325.93	0.99	83.50	4614.88	0.99	233.16	2515.75	1.14	57.01	2991.38	1.97	64.41	2051.97	1.94	66.36	1.34
TILE_7	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.52	0.99	67.92	4665.05	1.01	190.11	4197.32	1.91	56.72	3195.78	2.10	59.05	2353.72	2.22	60.30	1.55
p1	326.85	0.99	74.00	4650.20	1.00	206.03	4237.23	1.93	55.60	3096.55	2.04	58.81	2351.93	2.22	60.37	1.54
p2	331.00	1.00	74.00	4628.27	1.00	213.28	4090.07	1.86	60.55	3006.25	1.98	63.42	2171.45	2.05	65.73	1.51
TILE_8	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	328.38	0.99	84.00	4663.73	1.00	188.67	4195.50	1.91	56.43	3108.68	2.05	58.02	2379.20	2.25	58.44	1.54
p1	324.95	0.98	84.00	4651.62	1.00	207.71	4152.05	1.89	57.67	3091.93	2.04	58.93	2254.80	2.13	59.70	1.52
p2	326.50	0.99	84.00	4619.32	1.00	215.45	4000.90	1.82	63.42	3059.72	2.01	65.27	2358.75	2.23	65.75	1.52
TILE_9	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	329.50	1.00	73.45	4649.50	1.00	188.89	4234.75	1.93	55.42	3130.18	2.06	57.32	2393.28	2.26	57.92	1.55
p1	330.50	1.00	73.47	4632.27	1.00	204.46	4217.98	1.92	55.78	3128.97	2.06	57.37	2286.45	2.16	58.05	1.54
p2	326.45	0.99	73.28	4622.43	1.00	210.59	4058.65	1.85	61.50	3107.07	2.05	63.19	2398.25	2.27	63.85	1.53
TILE_10	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	329.55	1.00	83.38	4634.55	1.00	207.82	4114.82	1.87	59.36	3041.80	2.00	61.27	2225.70	2.10	61.84	1.51
p1	329.38	1.00	83.92	4624.82	1.00	222.22	4106.05	1.87	59.56	3148.65	2.07	61.08	2335.93	2.21	61.14	1.53
p2	327.18	0.99	84.00	4624.75	1.00	212.78	3963.15	1.80	64.80	2936.72	1.93	66.59	2251.82	2.13	66.96	1.49
TILE_11	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	331.57	1.00	83.17	4659.60	1.00	197.81	4205.27	1.91	56.32	3102.35	2.04	58.49	2261.00	2.14	59.26	1.55
p1	331.48	1.00	84.00	4645.55	1.00	214.95	4202.38	1.91	56.12	3206.90	2.11	58.55	2470.40	2.33	58.77	1.60
p2	324.18	0.98	84.00	4638.18	1.00	207.68	4077.38	1.85	60.84	2991.15	1.97	63.97	2187.05	2.07	64.45	1.51
TILE_12	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	322.95	0.98	73.47	4662.48	1.00	191.04	4212.23	1.92	56.17	3328.32	2.19	58.11	2432.20	2.30	61.32	1.57
p1	324.93	0.98	73.92	4631.75	1.00	213.34	4169.55	1.90	57.64	3069.97	2.02	60.28	2301.12	2.17	63.33	1.52
p2	327.85	0.99	74.00	4614.73	0.99	211.36	4031.03	1.83	62.80	2977.72	1.96	65.05	2122.68	2.01	69.10	1.48
TILE_13	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	324.40	0.98	83.00	4669.73	1.01	190.35	4209.00	1.91	55.88	3216.30	2.12	57.89	2443.72	2.31	60.14	1.56
p1	327.30	0.99	75.75	4640.65	1.00	205.39	4206.65	1.91	56.17	3108.53	2.05	58.39	2218.45	2.10	62.02	1.52
p2	327.77	0.99	84.00	4631.73	1.00	214.25	4039.45	1.84	62.00	3089.95	2.03	63.98	2248.25	2.12	66.95	1.51
TILE_14	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM

p0	328.30	0.99	84.00	4648.85	1.00	192.74	4118.27	1.87	59.37	3046.78	2.01	61.23	2297.78	2.17	63.83	1.55
p1	327.15	0.99	84.00	4623.00	1.00	210.19	4128.68	1.88	58.92	3061.82	2.02	60.59	2203.50	2.08	63.55	1.53
p2	327.60	0.99	84.00	4612.98	0.99	221.33	3968.80	1.80	64.90	3035.57	2.00	66.97	2302.60	2.18	69.83	1.53
TILE_15	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	331.10	1.00	83.12	4662.65	1.00	187.10	3406.85	1.55	54.54	3068.68	2.02	57.72	2241.68	2.12	60.73	1.49
p1	328.88	1.00	83.95	4637.48	1.00	206.50	3409.68	1.55	53.86	3240.38	2.13	56.63	2395.75	2.26	56.79	1.56
p2	327.95	0.99	84.00	4660.30	1.00	206.07	3321.68	1.51	57.79	3032.20	2.00	61.92	2314.15	2.19	62.28	1.48
TILE_16	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.25	0.99	84.67	4648.05	1.00	190.77	4175.90	1.90	57.46	3032.18	2.00	61.76	2180.65	2.06	64.81	1.51
p1	329.15	1.00	84.00	4639.82	1.00	201.51	4161.15	1.89	57.84	3102.65	2.04	63.21	2359.82	2.23	65.83	1.54
p2	327.55	0.99	84.00	4632.93	1.00	222.33	4013.32	1.82	63.33	2901.70	1.91	68.37	2081.55	1.97	71.79	1.47
TILE_17	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.77	0.99	78.75	4663.30	1.00	192.29	4240.07	1.93	55.36	3197.88	2.11	59.20	2325.22	2.20	61.93	1.55
p1	327.77	0.99	74.00	4646.85	1.00	191.43	4221.20	1.92	56.26	3059.15	2.01	60.81	2303.55	2.18	63.52	1.53
p2	323.70	0.98	80.75	4624.25	1.00	228.31	4066.60	1.85	61.67	2944.43	1.94	66.57	2100.35	1.99	70.80	1.47
TILE_18	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.32	0.99	83.62	4654.00	1.00	198.76	4117.60	1.87	60.06	3196.18	2.10	63.60	2356.70	2.23	66.49	1.57
p1	325.57	0.99	83.22	4628.27	1.00	220.96	4118.07	1.87	59.75	2977.40	1.96	64.78	2237.22	2.11	67.67	1.55
p2	324.80	0.98	83.50	4628.40	1.00	224.00	3969.95	1.81	65.40	2883.75	1.90	69.88	2064.62	1.95	73.57	1.50
TILE_19	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.12	0.99	84.00	4666.30	1.01	185.45	4203.18	1.91	56.58	3160.85	2.08	60.47	2411.45	2.28	62.56	1.58
p1	327.85	0.99	84.00	4651.88	1.00	202.72	4231.25	1.92	55.58	3063.03	2.02	60.06	2208.15	2.09	62.97	1.56
p2	327.07	0.99	83.95	4641.05	1.00	209.54	4059.53	1.85	61.68	3060.93	2.02	65.12	2230.12	2.11	67.77	1.54
p0_score:	30.67															
p1_score:	30.63															
p2_score:	29.80															

Infrastructure_Operations_Scores:	vmotion	svmotion	deploy
Completed_Ops_PerHour	17.00	11.00	5.50
Avg_Seconds_To_Complete	32.24	14.50	307.28
Failures	0.00	0.00	0.00
Ratio	1.06	1.22	1.38
Number_Of_Threads	1	1	1

PTD_Summary:	
Number_of_PTD_Daemons	3

Number_of_PTD_Phases	3						
PTD_Phase_Timing	2400secs						
PtdTiming:	ptd0	ptd1	ptd2				
p0	0	0	---				
p1	0	0	---				
p2	0	0	---				
PTD_Results:							
p0	Target	Avg_Watts	Avg_Volts	Avg_Amps	Avg_PF	Samples	UnCert%
ptd0	SERVER	695.04	209.55	3.32	1.00	2399.00	0.00
ptd1	SERVER	703.75	218.03	3.23	1.00	2399.00	0.00
p1	Target	Avg_Watts	Avg_Volts	Avg_Amps	Avg_PF	Samples	UnCert%
ptd0	SERVER	695.70	209.33	3.33	1.00	2400.00	0.00
ptd1	SERVER	703.06	217.48	3.24	1.00	2400.00	0.00
p2	Target	Avg_Watts	Avg_Volts	Avg_Amps	Avg_PF	Samples	UnCert%
ptd0	SERVER	696.84	208.78	3.34	1.00	2400.00	0.00
ptd1	SERVER	702.42	216.44	3.25	1.00	2400.00	0.00

Summary	Run_Is_Compliant	Turbo_Setting:0
	Number_Of_Compliance_Issues(0)*	Median_Phase(p1)
Unreviewed_VMmark2_Avg_Watts	1398.76	
Unreviewed_VMmark2_Applications_Score	30.63	
Unreviewed_VMmark2_Infrastructure_Score	1.21	
Unreviewed_VMmark2_Score	24.74	
Unreviewed_VMmark2_PPKW	17.6899	

Configuration

PTD Configuration	
Number of Power Meters	2
Power Meter Vendors and Models	Voltech PM1000+
Power Meter PTD Target(s) (SERVER/EXT_STOR)	2 x SERVER
Power Meter Connection Type(s) (Eth/GPIB/Serial/USB)	Serial
Power Meter Calibration Date(s) (MM-DD-YYYY)	03-06-2014
Power Meter Calibration Info (Calibrated By/Duration)	HP Metrology / 03-06-2015
Power Meter(s) Volt/Amp Range	215.0 Volts / 4.0 Amps
PTD Client Configuration	

Number of Power Meter Clients	1
System Model(s)	HP ProLiant DL360 G5
Processor Vendor(s) and Model(s)	Intel Xeon X5160
Processor Speed(s) (GHz)	3.00
Total Sockets/Total Cores/Total Threads	2 Sockets / 4 Cores / 4 Threads
Memory Per Power Meter Client	8 GB
Network Controller(s) Vendors and Models	1 x HP NC373i embedded Dual Port Gigabit Adapter
Operating System, Version, and Service Pack	Microsoft® Windows® 2008 R2 (64-bit)
Other Hardware	1 x AmazonBasics 4-port USB 2.0 ultra-mini hub 3 x IOGear USB-to-serial adapter (GUC232A)
Other Software	None

Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 5.5.0 U2 Build 1909291/ 09-09-2014
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server 5.5.0 U2 Build 1909363 / 09-09-2014
Supplemental Software	none
Servers	
Quantity	2
Server Manufacturer and Model	HP ProLiant DL380 Gen9
Processor Vendor and Model	Intel Xeon E5-2699 v3
Processor Speed (GHz)	2.30
Total Sockets/Total Cores/Total Threads	2 Sockets / 36 Cores / 72 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	45 MB I+D on chip per chip L3
BIOS Version	P89 07/11/2014
Memory Size (in GB, Number of DIMMs)	512 GB, 16 x 32 GB DIMMs

Memory Type and Speed	Quad Rank PC4-2133 ECC DDR4 2133 MHz LRDIMM
Disk Subsystem Type	FC SAN
Number of Disk Controllers	1
Disk Controller Vendors and Models	HP Smart Array P440ar
Number of Host Bus Adapters	2
Host Bus Adapter Vendors and Models	HP SN1000Q PCIe dual port 16Gb Fibre HBA
Number of Network Controllers	2
Network Controller Vendors and Models	1 x HP Ethernet 1 Gb 4-port 331FLR Adapter, 1 x HP Ethernet 10Gb 2-port 560SFP+ Adapter
Other Hardware	none
Other Software	none
Hardware Availability Date (MM-DD-YYYY)	09-09-2014
Software Availability Date (MM-DD-YYYY)	09-15-2014
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	SanDisk ION Accelerator, FW 2.5.0
Fibre Channel Switch Vendors and Models	HP SN3000B 16Gb 24-port Fibre Channel Switch
Disk Space Used	7.8 TB
Array Cache Size	N/A
Total Number of Physical Disks Used	6 (2 per SUT OS, 2 for SanDisk ION OS), 3 x PCI-e Flash
Total Number of Enclosures/Pods/Shelves Used	1
Number of Physical Disks Used per Enclosure/Pod/Shelf	Internal: 2 disks per host Enclosure: 2 disks for SanDisk ION OS, 3 x PCI-e Flash
Total Number of Storage Groups Used	0
Number of LUNs Used	14

LUN Size and Number of Disks Per LUN	All LUNs spread across 3 x HP PCIe Workload Accelerator cards under the control of the SanDisk ION Accelerator 12 LUNs: 600 GB 1 LUN: 200 GB 1 LUN: 100 GB
RAID Type	RAID 0 for enclosure, RAID 1 for OS drives
Number of Members per RAID Set	RAID 0: 3 RAID 1: 2
Disk Vendors, Models, and Speeds	6 x HP 146GB 15K RPM SAS SFF (P/N 652605-B21) 3 x HP 2.6 TB HH/HL Light Endurance (LE) PCIe Workload Accelerator (P/N 775670-B21)

Datacenter Management Server	
System Model	HP ProLiant BL685c G7
Processor Vendor and Model	AMD Opteron(TM) Processor 6380
Processor Speed (GHz)	2.5
Total Sockets/Total Cores/Total Threads	4 Sockets / 64 Cores / 64 Threads
Memory	256 GB
Network Controller(s) Vendors and Models	1 x HP NC551i Dual Port FlexFabric 10GbE 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 / Total Virtual Client Hosts	21 / 1 / 4
System Model(s)	HP ProLiant DL360 G5 (prime client) Virtual Client Hosts: HP ProLiant BL465c G7 (virtual client hosts)
Processor Vendor(s) and Model(s)	Prime client: Intel Xeon X5160 Virtual Client Hosts: AMD Opteron 6174
Processor Speed(s) (GHz)	Prime Client: 3.00 Virtual Client Hosts: 2.2
Total Sockets/Total Cores/Total Threads	Prime Client: 2 Sockets / 4 Cores / 4 Threads Virtual Client Hosts: 2 Sockets / 24 Cores / 24 Threads
Memory per Physical Client	Prime Client: 8 GB Virtual Client Hosts: 64 GB
Network Controller(s) Vendors and Models	Prime Client: 1 x HP NC373i embedded Dual Port Gigabit Adapter Virtual Client Hosts: 1 x HP NC551i Dual Port FlexFabric 10GbE Adapter, 1 x HP NC542m Dual Port Flex-10 10GbE BL-c Adapter
Operating System, Version, Bitness, and Service Pack	Prime Client: Microsoft® Windows® 2008 R2 (64-bit) Virtual Client Hosts: VMware ESXi 5.1 U2 (Build 1483097)

Number of Virtual Clients	20
Number of vCPUs Per Virtual Client	4
Number of vMem (GB) Per Virtual Client	4
Virtual Client Networking Notes	none
Virtual Client Storage Notes	Details in Client Notes section
Other Hardware	4 x HP QMH2562 8 Gb Dual Port Fibre Channel HBA (1 per virtual client host) 1 x HP BladeSystem c7000 Enclosure 4 x HP Virtual Connect Flex-10 10Gb Ethernet Module 4 x HP B-series 8/24c 24 port 8 Gb SAN Switch 4 x HP P2000 G3 FC MSA storage enclosure 96 x 146 GB 15K SFF SAS disk drive
Other Software	HP BladeSystem c7000 Onboard Administrator Version 4.00, HP Virtual Connect Manager Version 4.10

Notes for Workload

Virtualization Software Notes

- All VMs used virtual hardware V7
- All VMs (except for Deploy Template) had VMware tools version 8305 installed and running
- Ethernet adapter type set to vmxnet3 for all VMs (default vmxnet2)
- Logging was disabled for all VMs (default enabled)
- CD & floppy devices were removed on all VMs (default enabled)
- All VMs besides standbys: Paravirtual Controller
- Cluster DRS Automation Level set to Fully Automated
- DrsMigrationThreshold set to level 2
- Logical CPU layout changed for all multi-cpu VMs to 1 socket with multiple cores. (default Single core per socket)
- All DS2DB VMs had CPU shares set to High (default Normal)
- ethernet0.coalescingScheme = static for all OlioWeb VMs

Advanced Settings:

- Cpu.CoschedCrossCall = 0 (default 1)
- Cpu.CreditAgePeriod = 1000 (default 3000)
- Cpu.HTWholeCoreThreshold =0 (default 200)
- DataMover.HardwareAcceleratedInit = 0 (default 1)
- DataMover.HardwareAcceleratedMove = 0 (default 1)
- Irq.BestVcpuRouting = 1 (default 0)
- Mem.BalancePeriod = 0 (default 15)
- Mem.SamplePeriod = 0 (default 60)
- Mem.ShareScanGHz = 0 (default 4)
- Misc.TimerMaxHardPeriod = 4000 (default 100000)

- Net.MaxNetifRxQueueLen =500 (default 100)
- Net.MaxNetifTxQueueLen =1000 (default 500)
- Net.NetTxCompletionWorldlet = 0 (default 1)
- Net.NetTxWorldlet = 1 (default 2)
- Numa.LargeInterleave = 0 (default 1)
- Numa.LTermFairnessInterval = 0 (default 5)
- Numa.MigImbalanceThreshold = 57 (default 10)
- Numa.MonMigEnable = 0 (default 1)
- Numa.PageMigEnable = 0 (default 1)
- Numa.PreferHT = 1 (default 0)
- Numa.RebalancePeriod = 60000 (default 2000)
- Numa.SwapInterval = 1 (default 3)
- Numa.SwapLoadEnable =0 (default 1)
- Numa.SwapLocalityEnable =0 (default 1)
- VMFS3.HardwareAcceleratedLocking =0 (default 1)

Driver Options:

- /vmkernel/module/qlnativefc/options = "ql2xmaxqdepth=256 ql2xintrdelaytimer=2 ql2xenablemsix=1"
- The VMkernel limit for all the LUNs was set to 256.

Server OS (ESXi 5.5 U2 build 190921) was installed using HP-ESXi-5.5.0-Update2-iso-5.76.30 ISO, which was preloaded with HP device drivers. No driver upgrades were made after the OS was installed.

Server Notes

Server BIOS settings:

- HP Power Profile set to Maximum Performance (default: Balanced Power and Performance)
- Thermal Configuration set to Maximum Cooling (default: Optimal Cooling)
- HW Prefetcher set to Disabled (default: Enabled)
- Adjacent Sector Prefetcher set to Disabled (default: Enabled)
- QPI mode Early Snoop (default: Home Snoop)
- Memory Refresh Rate set to 1x Refresh (default: 2x Refresh)
- 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 VMernel vMotion connection on vmnic1 at 1Gb/s
- vSwitch2 for the DVD store workload on vmnic4 at 10Gb/s
- vSwitch3 for the Olio workload on vmnic5 at 10Gb/s
- vSwitch4 for the Mail server workload on vmnic2 at 1Gb
- vSwitch5 for the standby and deploy workloads on vmnic3 at 1Gb/s

Storage Notes

- ESXi was installed on two disks configured as RAID1 in the internal server storage bay on each SUT
- All LUNs were spread across three HP 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator cards in RAID0 within a single HP ProLiant DL380p Gen8 running SanDisk ION Accelerator software

- Physical Configuration for SanDisk ION Accelerator:
  - HP ProLiant DL380p Gen8
    - 2 x Intel Xeon E5-2680 2.90 GHz processors
    - 128 GB (16 x 8 GB DIMMs dual rank PC3-12800 Registered DDR3)
    - 3 x HP 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator cards configured in RAID0
    - 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
- Software Configuration for SanDisk ION Accelerator:
  - 12 LUNs at 600 GB
    - 8 LUNs had all VMs from 2 tiles (except for standby VM)
    - 4 LUNs had all VMs from 1 tile (except for standby VM)
  - 1 LUN at 200 GB
    - All standby VMs and the deploy template
  - 1 LUN at 100 GB
    - Used for deploy target and sVmotion target

Datacenter Management Server Notes

- HP 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)

Operating System Notes

- All mailserver VMs running Microsoft® Windows® 2008 R2 Enterprise (64-bit)
  - Microsoft Exchange System Attendant not running on mailservers 8 & 13
- 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
- Prime client had the following storage configuration
  - 2 x 72 GB 15K SFF disk drives for OS
  - 2 x 300 GB 10K SFF disk drives for extra storage capacity
- All PTDs were run from the prime client
- All power meters were connected to the prime client
- 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.
- Four HP ProLiant BL465c G7 hosted 20 virtual machines combined as follows:

- system 1: hosted vclients 0,4,8,12,16
- system 2: hosted vclients 1,5,9,13,17
- system 3: hosted vclients 2,6,10,14,18
- system 4: hosted vclients 3,7,11,15,19

- All client operating systems were updated via Windows Update.
  - Application Experience was running on only clients 0 & 2
  - SPP Notification Service was running only on clients 14-17.
  - Software Protection was running only on clients 14-17
- Virtual client hosts were configured to use a fibre attached storage that was separate from the storage used by the SUT hosts.
  - 1 x HP QMH2562 8 Gb Dual Port Fibre Channel HBA per virtual client host
  - 4 x HP B-series 8/24c 24 port 8 Gb SAN Switch
  - 4 x HP P2000 G3 FC MSA storage enclosure
  - 96 x 146 GB 15K SFF SAS disk drives for client virtual machines
  - 2 x 146 GB 15K SFF SAS disk drives in internal drive bays for virtual client host OS

Other Notes

None
