

VMware® VMmark® V2.1.1 Results		
Vendor and Hardware Platform: HP ProLiant DL380p Gen8 Virtualization Platform: VMware ESXi 5.1.0 Build 799733 VMware vCenter Server: VMware vCenter Server 5.1.0 Build 799731		VMmark V2.1.1 Score = 11.66 @ 10 Tiles
Number of Hosts: 2	Uniform Hosts [yes/no]: yes	Total sockets/core/threads in test: 4/32/64
Tested By: Hewlett-Packard		Test Date: 12-17-2012
Performance Section Performance	Configuration Section Configuration	Notes Section 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	323.00	0.98	248.75	4622.77	1.00	204.73	3071.78	1.40	92.94	2117.70	1.39	102.76	1494.70	1.41	105.76	1.22
p1	320.50	0.97	227.15	4655.73	1.00	201.00	3287.85	1.50	84.45	2411.65	1.59	93.22	1845.05	1.74	95.08	1.32
p2	328.30	0.99	218.25	4657.32	1.00	186.71	3211.57	1.46	90.92	2224.18	1.46	100.13	1631.03	1.54	103.29	1.27
TILE_1	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.43	0.99	64.00	4679.20	1.01	144.45	4034.47	1.83	64.57	2918.20	1.92	69.28	2049.97	1.94	75.85	1.47
p1	324.60	0.98	64.00	4692.45	1.01	145.26	3835.57	1.74	73.01	2843.53	1.87	78.80	2119.32	2.00	84.63	1.45
p2	329.43	1.00	64.00	4704.07	1.01	140.41	3792.00	1.72	75.23	2708.05	1.78	82.49	1891.60	1.79	89.87	1.41
TILE_2	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.38	0.99	54.67	4702.70	1.01	130.41	3873.45	1.76	72.12	2933.55	1.93	74.96	2017.97	1.91	86.03	1.45
p1	328.95	1.00	53.90	4701.77	1.01	135.03	3771.32	1.71	77.47	2661.72	1.75	85.79	1918.28	1.81	95.84	1.41
p2	329.80	1.00	53.77	4721.57	1.02	143.59	3731.70	1.70	79.60	2688.72	1.77	85.87	1810.90	1.71	99.25	1.39
TILE_3	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.38	0.99	64.00	4698.70	1.01	133.36	3714.32	1.69	79.04	2727.62	1.80	86.72	2020.40	1.91	93.40	1.42
p1	323.32	0.98	64.00	4654.98	1.00	139.63	3775.62	1.72	76.14	2699.38	1.78	83.16	1871.25	1.77	91.92	1.40
p2	326.62	0.99	64.00	4701.60	1.01	143.50	3637.05	1.65	83.47	2695.85	1.78	89.91	1893.28	1.79	98.78	1.39
TILE_4	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	322.82	0.98	65.00	4702.57	1.01	137.90	3957.07	1.80	66.83	2915.12	1.92	69.64	2272.78	2.15	73.49	1.49
p1	329.23	1.00	64.00	4701.20	1.01	139.11	3963.22	1.80	67.03	2946.18	1.94	68.38	1977.42	1.87	74.53	1.46
p2	326.68	0.99	64.00	4683.77	1.01	146.04	3749.88	1.71	76.35	2926.78	1.93	80.45	2109.35	1.99	86.49	1.46
TILE_5	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	321.98	0.97	72.75	4692.43	1.01	137.69	3914.40	1.78	68.94	2804.03	1.85	70.26	2034.22	1.92	77.16	1.44
p1	325.48	0.99	64.00	4688.43	1.01	146.70	3778.85	1.72	74.92	2851.38	1.88	78.79	2025.70	1.91	85.41	1.44

p2	326.93	0.99	64.00	4678.27	1.01	142.88	3714.45	1.69	78.35	2755.45	1.81	85.38	2046.55	1.93	91.85	1.43
TILE_6	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.15	0.99	62.10	4706.88	1.01	133.56	3928.65	1.79	69.29	2767.93	1.82	72.77	1947.25	1.84	77.48	1.43
p1	328.68	1.00	53.38	4696.68	1.01	134.80	3786.28	1.72	76.05	2898.78	1.91	82.41	2133.65	2.02	85.62	1.46
p2	325.23	0.98	54.00	4703.93	1.01	142.91	3783.93	1.72	76.30	2725.07	1.79	82.43	2051.97	1.94	85.75	1.43
TILE_7	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	323.38	0.98	63.73	4708.48	1.01	133.18	3725.05	1.69	78.17	2656.55	1.75	85.01	1917.12	1.81	87.61	1.40
p1	325.02	0.98	63.90	4672.20	1.01	140.52	3776.70	1.72	75.37	2802.95	1.85	81.91	2129.82	2.01	84.92	1.45
p2	325.48	0.99	64.00	4689.82	1.01	148.26	3696.70	1.68	79.85	2665.20	1.76	85.44	1905.35	1.80	89.47	1.40
TILE_8	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	332.77	1.01	75.80	4701.43	1.01	136.07	3941.30	1.79	67.72	2979.75	1.96	71.28	2183.62	2.06	72.89	1.49
p1	328.48	0.99	72.50	4706.25	1.01	144.71	3967.20	1.80	67.15	2880.93	1.90	72.23	2147.25	2.03	75.83	1.48
p2	329.57	1.00	64.00	4705.57	1.01	147.78	3753.05	1.71	76.69	2709.15	1.78	82.60	1933.35	1.83	86.78	1.41
TILE_9	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	330.38	1.00	150.82	4697.43	1.01	140.77	3947.43	1.79	67.19	3016.53	1.99	68.84	2299.05	2.17	71.18	1.51
p1	328.12	0.99	102.00	4715.77	1.02	139.72	3853.22	1.75	71.15	2805.53	1.85	75.02	2038.72	1.93	76.37	1.44
p2	323.60	0.98	87.10	4669.75	1.01	150.12	3777.00	1.72	74.91	2814.62	1.85	80.50	2074.62	1.96	81.36	1.44
p0_score:	14.32															
p1_score:	14.30															
p2_score:	14.02															
Infrastructure_Operations_Scores:										vmotion		svmotion		deploy		
Completed_Ops_PerHour										15.50		11.00		4.50		
Avg_Seconds_To_Complete										44.08		22.16		390.45		
Failures										0.00		0.00		0.00		
Ratio										0.97		1.22		1.12		
Number_Of_Threads										1		1		1		
Summary						Run_Is_Compliant			Number_Of_Compliance_Issues(0)*				Median_Phase(p1)			
Unreviewed_VMmark2_Applications_Score						14.30										
Unreviewed_VMmark2_Infrastructure_Score						1.10										
Unreviewed_VMmark2_Score						11.66										

Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 5.1.0 Build 799733 / 09-10-2012
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server 5.1.0 Build 799731 / 09-10-2012
Supplemental Software	none
Servers	
Quantity	2
Server Manufacturer and Model	HP ProLiant DL380p Gen8
Processor Vendor and Model	Intel Xeon E5-2690
Processor Speed (GHz)	2.90
Total Sockets/Total Cores/Total Threads	2 Sockets / 16 Cores / 32 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	20 MB I+D on chip per chip L3
BIOS Version	P70 08/20/2012
Memory Size (in GB, Number of DIMMs)	256 GB, 16 x 16 GB DIMMs
Memory Type and Speed	dual rank PC3-12800 Registered DDR3/1600 MHz
Disk Subsystem Type	FC SAN
Number of Disk Controllers	1
Disk Controller Vendors and Models	HP Smart Array P420i Controller
Number of Host Bus Adapters	1
Host Bus Adapter Vendors and Models	HP 82Q PCIe dual port 8Gb Fibre HBA
Number of Network Controllers	2
Network Controller Vendors and Models	HP Ethernet 1Gb 4-port 331FLR Adapter 1 x Intel X520-DA2 Dual Port 10GbE Server Adapter
Other Hardware	none
Other Software	The following drivers were installed as part of the HP-customized image for ESXi5.1: misc-cnic-register: 1.72.1.v50.1-1OEM.500.0.0.472560

	net-bnx2: 2.2.11.v50.1-1OEM.500.0.0.472560 net-bnx2x: 1.72.54.v50.2-1OEM.500.0.0.472560 net-cnic: 1.72.50.v50.1-1OEM.500.0.0.472560 net-tg3: 3.123b.v50.1-1OEM.500.0.0.472560 scsi-bnx2fc: 1.72.51.v50.1-1OEM.500.0.0.406165 scsi-bnx2i: 2.72.10.v50.2-1OEM.500.0.0.472560 scsi-bfa: 3.0.0.0-1OEM.500.0.0.406165 ima-be2iscsi: 4.2.324.12-1OEM.500.0.0.472629 scsi-be2iscsi: 4.2.324.12-1OEM.500.0.0.472629 char-hpcru: 5.0.3.09-1OEM.500.0.0.434156 char-hpilo: 500.9.0.0.9-1OEM.500.0.0.434156 scsi-hpsa: 5.0.0-28OEM.500.0.0.472560 scsi-hpvsa: 5.0.0-36OEM.500.0.0.472560 net-igb: 3.2.10-1OEM.500.0.0.472560 scsi-mpt2sas: 13.10.02.00.1vmw-1OEM.500.0.0.472560 net-mlx4-en: 1.6.1.2-1OEM.500.0.0.406165 net-qlcnic: 5.0.741-1OEM.500.0.0.472560 scsi-qla4xxx: 624.01.43-1OEM.500.0.0.472560 scsi-qla2xxx: 911.k1.1-26OEM.500.0.0.472560
Hardware Availability Date (MM-DD-YYYY)	04-02-2012
Software Availability Date (MM-DD-YYYY)	09-10-2012
Network	
Network Switch Vendors and Models	1 x HP ProCurve 2910-al-24G 1 x H3C S5820X-28S
Network Speed	HP ProCurve 2910-al-24G: 24 x 1 GbE ports with 2 x 10GbE uplinks H3C S5820X-28S: 24 x 10 GbE ports, 4 x 1 GbE ports
Storage	
Array Vendors, Models, and Firmware Versions	1 x VS-SmartArray Storage Servers by id ₇ Limited System BIOS: P70 08/12/2012 HP SmartArray P420i firmware: 3.02 HP SmartArray P420 firmware: 3.02
Fibre Channel Switch Vendors and Models	none. hosts were directly cabled to the storage
Disk Space Used	6692 GB
Array Cache Size	HP SmartArray P420i: 2 GB HP SmartArray P420: 1 GB
Total Number of Physical Disks Used	20
Total Number of Enclosures/Pods/Shelves Used	1

Number of Physical Disks Used per Enclosure/Pod/Shelf	Internal: 2 disks per host (OS) 1 enclosure: 16 disks		
Total Number of Storage Groups Used	0		
Number of LUNs Used	8		
LUN Size and Number of Disks Per LUN	8 LUNs: 742 GB on 8 disks		
RAID Type	RAID 0 for enclosures, RAID 1 for OS drives		
Number of Members per RAID Set	RAID 1: 2 RAID 0: 8		
Disk Vendors, Models, and Speeds	4 x HP 146GB 15K RPM SAS SFF (P/N 652605-B21) 16 x HP 400GB 6G SAS SFF SSD (P/N 653082-B21)		
Datacenter Management Server			
System Model		HP ProLiant DL360 G5	
Processor Vendor and Model		Intel Xeon E5440	
Processor Speed (GHz)		2.83	
Total Sockets/Total Cores/Total Threads		1 Sockets / 4 Cores / 4 Threads	
Memory		4 GB	
Network Controller(s) Vendors and Models		2 x HP NC373i embedded Gigabit adapters	
Operating System, Version, and Service Pack		Microsoft® Windows® 2008 R2 Enterprise (64-bit)	
Other Hardware		none	
Other Software		none	
Clients			
Number of Clients	6 physical servers 1 physical server used for non-virtualized prime client 5 physical servers hosting 10 virtual clients (2 virtual clients per physical server)		
System Model(s)	HP ProLiant DL360 G5		
Processor Vendor(s) and Model(s)	Prime client: Intel Xeon X5440 Physical Clients: Intel Xeon E5450		
Processor Speed(s) (GHz)	Prime Client: 2.83 Physical Clients: 3.00		
Total Sockets/Total Cores/Total Threads	2 Sockets / 8 Cores / 8 Threads		
Memory per Client	Prime Client: 4 GB Physical Clients: 16 GB		
Network Controller(s) Vendors and Models	2 x HP NC373i embedded Gigabit adapters 1 x NC360T dual port Gigabit adapter		

Operating System, Version, and Service Pack	Prime Client: Microsoft® Windows® 2003 Enterprise SP2 (32-bit) Physical Clients: VMware ESXi 4.1.0 (Build 260247) Virtual Clients 0-9: Microsoft® Windows® 2008 R2 Enterprise (64-bit)
Other Hardware	none
Other Software	none

Notes for Workload

Virtualization Software Notes

- all VMs used virtual hardware V9
- ethernet adapter type set to vmxnet3 for all VMs (default vmxnet2)
- logging was disabled for all VMs (default enabled)
- IDE & floppy devices were removed on all VMs (default enabled)
- firewall was disabled in the console os (default enabled)
- All VMs use PVSCSI Controller except for Standby and Mailserver boot VHDs
- Cluster DRS Automation Level set to Fully Automated
- DrsMigrationThreshold set to level 2
- Power Management Settings: High performance (default Balanced)
- Logical CPU layout changed for all multi-cpu VM's to 1 socket w/ multiple cores. (default Single core per socket)

Advanced Settings:

- Cpu.CoschedCrossCall = 0 (default 1)
- Cpu.HTWholeCoreThreshold = 0 (default 200)
- DataMover.HardwareAcceleratedInit = 0 (default 1)
- DataMover.HardwareAcceleratedMove = 0 (default 1)
- Disk.SchedNumReqOutstanding = 256 (default 32)
- Irq.BestVcpuRouting = 1 (default 0)
- Mem.BalancePeriod = 0 (default 15)
- Mem.SamplePeriod = 0 (default 60)
- Mem.ShareScanGHz = 0 (default 4)
- Mem.VMOverheadGrowthLimit = 0 (default 4294967295)
- Misc.TimerMaxHardPeriod = 4000 (default 100000)
- Misc.TimerMinHardPeriod = 2000 (default 30)
- Net.MaxNetifRxQueueLen = 500 (default 100)
- Net.MaxNetifTxQueueLen = 1000 (default 500)
- Net.NetTxCompletionWorldlet = 0 (default 1)
- Numa.LargeInterleave = 0 (default 1)
- Numa.AutoSplitVM = 0 (default 1)
- Numa.LTermFairnessInterval = 0 (default 5)
- 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)
- Power.CpuPolicy = "static" (default balanced)
- VMFS3.HardwareAcceleratedLocking = 0 (default 1)
- vmkernel.iovDisableIR = TRUE (default FALSE)

Driver Options:

- /vmkernel/module/qla2xxx.o/options = "ql2xmaxqdepth=256 ql2xintrdelaytimer=7 ql2xenablemsi=1 " (default 32, 0, and 1)
- /vmkernel/module/ixgbe.o/options = "VMDQ=16,16 InterruptThrottleRate=2000,2000 InterruptType=2,2" " (default 8 , 16000 and 2)

Server Notes

- Server BIOS settings:
 - HP Power Profile set to Maximum Performance (default: Balanced Power and Performance)
 - Thermal Configuration set to Max Cooling (default: Optimal Cooling)
 - HW Prefetcher set to Disabled (default: Enabled)
 - Adjacent Sector Prefetch set to Disabled: (default: Enabled)
 - Processor Power and Utilization Monitoring set to Disabled: (default: Enabled)
 - Memory Pre-Failure Notification set to Disabled: (default: Enabled)

Networking Notes

vSwitch Configuration:

- vSwitch0 for the Service Console on vmnic0 at 1Gb/s
- vSwitch1 defined as vmkernel vMotion connection on vmnic1 at 1Gb/s
 - MTU set to 9000 (default:1500)
- vSwitch2 for the DS2* workloads and deploy workloads on vmnic4 at 10Gb/s
- vSwitch3 for the Olio* workloads on vmnic5 at 10Gb/s
- vSwitch4 for the mailserver workloads on vmnic2 at 1Gb/s
- vSwitch5 for the standby on vmnic3 at 1Gb/s

Storage Notes

- ESX was installed on two disks configured as RAID1 in the internal server storage bay
- "VS-SmartArray Storage Server" by id₇ Limited uses LUNs configured as block devices; as such no system memory is used for write caching.
- "VS-SmartArray Storage Server" by id₇ Limited hardware configuration details as below:
 - HP ProLiant DL380p Gen8 server
 - Processor Configuration
 - 2 x Intel Xeon E5-2690 2.9 GHz processors
 - 128 GB memory (16 x 8 GB dual rank PC3-12800 Registered DDR3 / 1600 MHz DIMMS)
 - HP 380/385 Gen8 8-SFF Cage/Bkpln Kit
 - 2xHP 82Q PCIe dual port 8Gb Fibre HBA
 - 1 x 32 GB SDHC memory card
 - used for OS and id₇ VS-SmartArray
 - HP Smart Array P420i controller with 2 GB FBWC

- Array A - 8 x HP 400GB SAS SSD SFF disks
 - Logical disk 1
 - 742 GB, RAID 0
 - exported as fibre target LUN
 - Logical disk 2
 - 742 GB, RAID 0
 - exported as fibre target LUN
 - Logical disk 3
 - 742 GB, RAID 0
 - exported as fibre target LUN
 - Logical disk 4
 - 742 GB, RAID 0
 - exported as fibre target LUN
 - HP Smart Array P420 controller with 1 GB FBWC
 - Array A - 8 x HP 400GB SAS SSD SFF disks
 - Logical disk 1
 - 742 GB, RAID 0
 - exported as fibre target LUN
 - Logical disk 2
 - 742 GB, RAID 0
 - exported as fibre target LUN
 - Logical disk 3
 - 742 GB, RAID 0
 - exported as fibre target LUN
 - Logical disk 4
 - 742 GB, RAID 0
 - exported as fibre target LUN
- VM Layout on the id₇ VS-SmartArray's as below:
 - id₇ VS-SmartArray
 - P420i:Logical Drive 1
 - All VMs except standby for tiles 0 and 8
 - P420i:Logical Drive 2
 - All VMs except standby for tile 1
 - P420i:Logical Drive 3
 - All VMs except standby for tile 2
 - P420i:Logical Drive 4
 - All VMs for tile 3 and all standbys
 - DeployTemplate
 - P420:Logical Drive 1
 - All VMs except standby for tile 4
 - P420:Logical Drive 2
 - All VMs except standby for tile 5 and 9
 - P420:Logical Drive 3
 - All VMs except standby for tile 6
 - P420:Logical Drive 4
 - All VMs except standby for tile 7

- SVmotion Target LUN
- Deploy Target LUN

Datacenter Management Server Notes

- none

Operating System Notes

- All mailserver VMs running Microsoft® Windows® 2008 R2 Enterprise (64-bit)
- All standby VMs running Microsoft® Windows® 2003 Enterprise SP2 (32-bit)
- All Linux VMs running SuSE Enterprise Linux 11 SP2

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® 2003 Enterprise SP2 (32-bit).
- Prime client was running VMware vSphere PowerCLI 5.0 build 435427
- All client drivers were run on virtual machines that were each defined with 4 virtual cpus, 4GB of memory, 1 vmxnet3 network, and 32GB of disk space.
- Five HP ProLiant DL380 G5 clients ran two client virtual machines each
- All client operating systems were updated via Windows Update.

Other Notes

- The service "WinHTTP Web Proxy Auto-Discovery Service" was running on mailservers 7 and 9.

This is a full disclosure report for a VMmark benchmark result. All published VMmark results must be from fully-compliant tests for which a full disclosure report is publicly available.

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