

VMware® VMmark® V2.1.1 Results

Vendor and Hardware Platform: HP ProLiant BL460c Gen8
 Virtualization Platform: VMware ESXi 5.0.0 Build 469512
 VMware vCenter Server: VMware vCenter Server 5.0.0 Build 455964

**VMmark V2.1.1 Score =
9.98 @ 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: 03-02-2012
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	328.27	0.99	171.75	4603.73	0.99	248.39	2885.93	1.31	121.63	2023.90	1.33	100.93	1443.15	1.36	77.08	1.19
p1	319.15	0.97	156.40	4635.38	1.00	213.00	2898.05	1.32	122.98	2102.88	1.38	104.74	1492.83	1.41	82.72	1.20
p2	327.45	0.99	158.75	4643.18	1.00	199.73	2873.20	1.31	127.11	1971.03	1.30	107.74	1462.33	1.38	86.71	1.18
TILE_1	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	324.55	0.98	101.62	4663.68	1.00	174.81	3087.45	1.40	112.20	2167.28	1.43	92.95	1538.12	1.45	71.88	1.24
p1	324.27	0.98	94.25	4632.48	1.00	197.43	2895.15	1.32	126.56	2073.78	1.37	108.86	1533.35	1.45	89.94	1.21
p2	325.12	0.98	104.00	4667.88	1.01	181.86	2958.90	1.35	122.50	2057.35	1.35	102.31	1441.72	1.36	80.43	1.20
TILE_2	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.43	0.99	101.50	4641.52	1.00	203.10	2980.50	1.36	121.26	2161.57	1.42	103.03	1542.47	1.46	80.67	1.23
p1	324.45	0.98	97.50	4639.82	1.00	203.44	3008.62	1.37	119.13	2102.78	1.38	98.98	1524.95	1.44	82.39	1.22
p2	327.43	0.99	108.75	4644.88	1.00	191.16	3003.25	1.37	119.86	2112.75	1.39	98.92	1475.12	1.39	78.54	1.21
TILE_3	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	330.02	1.00	104.00	4651.12	1.00	173.11	3008.80	1.37	120.60	2145.53	1.41	104.78	1571.53	1.49	87.63	1.24
p1	328.73	1.00	108.50	4645.43	1.00	197.58	3127.05	1.42	109.99	2189.43	1.44	91.77	1503.00	1.42	74.23	1.24
p2	327.95	0.99	114.00	4672.90	1.01	180.75	3037.57	1.38	115.04	2213.15	1.46	98.21	1547.70	1.46	79.48	1.24
TILE_4	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	328.38	0.99	104.00	4637.82	1.00	194.13	3056.30	1.39	113.33	2160.20	1.42	93.02	1621.60	1.53	73.69	1.25
p1	328.05	0.99	103.90	4539.73	0.98	366.25	3025.20	1.38	115.33	2144.07	1.41	94.12	1523.50	1.44	72.62	1.22
p2	322.32	0.98	104.00	4612.32	0.99	249.71	2934.97	1.33	126.06	2191.35	1.44	110.61	1590.45	1.50	87.62	1.23
TILE_5	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	328.75	1.00	117.15	4679.38	1.01	175.72	3166.03	1.44	106.45	2128.78	1.40	86.85	1587.28	1.50	67.70	1.25
p1	323.48	0.98	114.00	4653.35	1.00	191.73	3159.05	1.44	108.15	2254.18	1.48	94.92	1640.97	1.55	72.58	1.27

p2	324.48	0.98	114.00	4649.18	1.00	193.25	3110.28	1.41	110.50	2167.45	1.43	92.77	1633.42	1.54	73.04	1.25
TILE_6	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.25	0.99	114.00	4668.65	1.01	171.27	2847.18	1.29	133.40	1935.40	1.27	114.30	1344.15	1.27	90.37	1.16
p1	329.02	1.00	105.25	4637.20	1.00	219.88	2930.40	1.33	124.95	2096.85	1.38	107.69	1548.90	1.46	89.35	1.22
p2	327.07	0.99	104.00	4620.50	1.00	276.57	2907.05	1.32	128.20	1979.75	1.30	109.04	1379.45	1.30	86.20	1.17
TILE_7	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.40	0.99	104.00	4666.15	1.01	176.57	2673.43	1.22	118.37	2267.35	1.49	94.39	1542.60	1.46	71.20	1.21
p1	321.73	0.97	103.25	4654.73	1.00	198.05	2568.20	1.17	103.94	2325.28	1.53	89.30	1711.72	1.62	74.85	1.23
p2	323.98	0.98	104.00	4676.85	1.01	190.89	2574.72	1.17	104.93	2222.95	1.46	88.90	1563.10	1.48	69.84	1.20
TILE_8	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.77	0.99	108.72	4670.60	1.01	171.55	3084.65	1.40	114.30	2232.85	1.47	97.62	1572.65	1.49	78.23	1.25
p1	323.55	0.98	108.25	4643.18	1.00	201.67	3077.07	1.40	113.20	2134.60	1.41	95.41	1570.03	1.48	77.95	1.23
p2	325.35	0.99	104.00	4675.82	1.01	174.73	2962.07	1.35	124.20	2061.78	1.36	103.60	1421.45	1.34	82.72	1.20
TILE_9	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	328.18	0.99	117.62	4650.80	1.00	182.90	3130.28	1.42	109.49	2256.07	1.49	94.40	1694.53	1.60	76.65	1.28
p1	326.82	0.99	114.00	4644.68	1.00	195.06	2929.30	1.33	122.53	1978.78	1.30	98.86	1368.95	1.29	76.34	1.17
p2	329.35	1.00	114.00	4656.52	1.00	175.52	3023.68	1.37	116.75	2268.18	1.49	101.97	1643.42	1.55	80.40	1.26
p0_score:	12.28															
p1_score:	12.20															
p2_score:	12.15															

Infrastructure_Operations_Scores:	vmotion	svmotion	deploy
Completed_Ops_PerHour	17.00	10.00	4.50
Avg_Seconds_To_Complete	29.96	31.36	423.61
Failures	0.00	0.00	0.00
Ratio	1.06	1.11	1.12
Number_Of_Threads	1	1	1

Summary	Run_Is_Compliant	Number_Of_Compliance_Issues(0)*	Median_Phase(p1)
Unreviewed_VMmark2_Applications_Score	12.20		
Unreviewed_VMmark2_Infrastructure_Score	1.10		
Unreviewed_VMmark2_Score	9.98		

Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build /	VMware ESXi 5.0.0 Build 469512/ 08-24-2011

Availability Date (MM-DD-YYYY)	
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server 5.0.0 Build 455964 / 08-24-2011
Supplemental Software	none
Servers	
Quantity	2
Server Manufacturer and Model	HP ProLiant BL460c Gen8
Processor Vendor and Model	Intel Xeon E5-2680
Processor Speed (GHz)	2.7
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
BIOS Version	I31 12/45/2012
Memory Size (in GB, Number of DIMMs)	256 GB, 16 x 16 GB DIMMs
Memory Type and Speed	dual rank PC3-12800 Registered DDR3
Disk Subsystem Type	FC SAN
Number of Disk Controllers	1
Disk Controller Vendors and Models	HP Smart Array P220i Controller
Number of Host Bus Adapters	1
Host Bus Adapter Vendors and Models	QLogic QMH2572 8Gb FC HBA for HP BladeSystem c-Class
Number of Network Controllers	2
Network Controller Vendors and Models	embedded HP FlexFabric 10Gb 2-port 554FLB Adapter, HP NC555m 10Gb 2-port FlexFabric Adapter
Other Hardware	none
Other Software	none
Hardware Availability Date (MM-DD-YYYY)	04-02-2012
Software Availability Date (MM-DD-YYYY)	08-24-2011
Network	

Network Switch Vendors and Models	HP ProCurve 2910-al-24G
Network Speed	1 GbE with 10GbE uplinks
Storage	
Array Vendors, Models, and Firmware Versions	1 x Violin V-3200 Memory Array with 3.4 TB Flash - version A3.7.2-18917 (5.25 TB raw capacity -- formatted for 84% capacity at 3.4 TB) 1 x Violin gateway server
Fibre Channel Switch Vendors and Models	2 x HP B-series 8/24c SAN Switch for BladeSystem c-Class
Disk Space Used	3.375 TB
Array Cache Size	0 GB
Total Number of Physical Disks Used	4 x 146 GB 15K RPM SAS SFF 40 x 128 GB Flash VIMMs
Total Number of Enclosures/Pods/Shelves Used	1
Number of Physical Disks Used per Enclosure/Pod/Shelf	Internal: 2 disks per host 1 enclosures: 42 Flash VIMMs
Total Number of Storage Groups Used	0
Number of LUNs Used	5
LUN Size and Number of Disks Per LUN	5 LUNs: 690.75 GB on 42 VIMMs
RAID Type	RAID 1 for OS, RAID 0 for remaining volumes
Number of Members per RAID Set	42
Disk Vendors, Models, and Speeds	4 x HP 146GB 15K RPM SAS SFF (for host OS) 42 x Violin 128 GB Flash VIMMs

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 primeclient 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)	Primeclient: Intel Xeon E5440 Physical Clients 0-4: Intel Xeon E5450
Processor Speed(s) (GHz)	Primeclient: 2.83 Physical Clients 0-4: 3.00
Total Sockets/Total Cores/Total Threads	2 Sockets / 8 Cores / 8 Threads
Memory per Client	Primeclient: 4 GB Physical Clients 0-1,3-4: 16 GB Physical Client 2: 32 GB
Network Controller(s) Vendors and Models	2 x HP NC373i embedded Gigabit adapters, 1 x HP NC360T dual port Gigabit adapter
Operating System, Version, and Service Pack	Prime Client: Microsoft® Windows® 2003 Enterprise SP2 (32-bit) Physical Clients 0-4: VMware ESX 4.1 U1 (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 V7
- 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 Mailserver VMs: Hard Disk 1 on LSI Logic SAS controller, Hard Disk 2 on Paravirtual controller
- Cluster DRS Automation Level set to Fully Automated level 1
- All VMs were running VMware tools installed from ESX 4.1 U1.

Advanced Settings:

- Disk.SchedNumReqOutstanding = 256 (default 32)
- Mem.BalancePeriod = 0 (default 15)
- Mem.SamplePeriod = 0 (default 60)
- Mem.ShareScanGHz = 0 (default 4)
- Misc.TimerMaxHardPeriod = 4000 (default 100000)
- Misc.TimerMinHardPeriod = 2000 (default 100)
- Net.MaxNetifRxQueueLen = 500 (default 100)
- Net.MaxNetifTxQueueLen = 1000 (default 500)
- Net.TxCompletionWorldlet = 0 (default 1)
- Net.TxWordlet = 0 (default 2)

- Numa.MonMigEnable = 0 (default 1)
- Numa.SwapLoadEnable = 0 (default 1)
- Numa.SwapLocalityEnable = 0 (default 1)

Driver Options:

- /vmkernel/module/qla2xxx.o/options = "ql2xmaxqdepth=256 ql2xqfulltracking=0 ql2xintrdelaytimer=3; (default 32, 1, and 0)

Updated Drivers:

- scsi-hpsa 5.0.0-18OEM.381646

Server Notes

Server BIOS settings:

- HP Power Profile set to Maximum Performance (default: Balanced Performance)
- Thermal Configuration set to Maximum Cooling (default: Optimal Cooling)
- HW Prefetcher set to Disabled (default: Enabled)
- Adjacent Sector Prefetch set to Disabled (default: Enabled)
- Intel® Turbo Boost Technology set to Optimized for Performance (default: Optimized for Performance)
 - Intel® Turbo Boost Technology up to 3.5GHz @ 1 core

Networking Notes

vSwitch Configuration:

- vSwitch0 for the Service Console on vmnic0 at 10Gb/s
- vSwitch1 defined as vmkernel vMotion connection on vmnic2 at 10Gb/s
- vSwitch2 for all VMs, except for oliodb and olioweb VMs, on vmnic1 at 10Gb/s
- vSwitch3 for all oliodb and olioweb VMs on vmnic16 and vmnic8 at 10Gb/s

Storage Notes

- ESXi was installed on two disks configured as RAID1 in the internal server storage bay
- All fibre attached LUNs were striped across 40 Violin Flash VIMMs.
 - The 2 remaining Violin Flash VIMMs were configured as spares.
- Below is the layout of VMs across the 5 LUNs.
 - LUN #1
 - All VMs from tiles 0 & 5 except for standby VMs.
 - LUN #2
 - All VMs from tiles 1 & 6 except for standby VMs.
 - All standby VMs from tiles 0 - 9.
 - LUN #3
 - All VMs from tiles 2 & 7 except for standby VMs.
 - SV Motion target
 - LUN #4
 - All VMs from tiles 3 & 8 except for standby VMs.
 - Deploy target
 - LUN #5
 - All VMs from tiles 4 & 9 except for standby VMs.

Datacenter Management Server Notes

None

Operating System Notes

- All mailserver VMs running Microsoft® Windows® 2008 R2 Enterprise (64-bit)
 - The Microsoft Exchange System Attendant service was not running on mailserver5.
- All standby VMs running Microsoft® Windows® 2003 Enterprise SP2 (32-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® 2003 Enterprise SP2 (32-bit).
- Prime client was running VMware vSphere PowerCLI 4.1 U1 build 332441
- 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 DL360 G5 clients ran two client virtual machines.
- All client operating systems were updated via Windows Update.

Other Notes

None

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