

VMware® VMmark® V2.5.1 Results

Vendor and Hardware Platform: HP ProLiant BL460c Gen8
 Virtualization Platform: VMware ESXi 5.1.0 U1 Build 1065491
 VMware vCenter Server : VMware vCenter Server 5.1.0 Build 799731

**VMmark V2.5.1 Score =
16.47 @ 14 Tiles**

Number of Hosts: 2	Uniform Hosts [yes/no]: yes	Total sockets/cores/threads in test: 4/48/96
Tested By: Hewlett-Packard		Test Date: 08-19-2013
Performance Section Performance	Configuration Section Configuration	Notes Section Notes for Workload

Performance

TILE_0	mailserver			olio			dvdstoreA			dvdstoreB			dvdstoreC			GM
	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	
p0	322.77	0.98	164.50	4644.27	1.00	173.85	3381.10	1.54	85.42	2345.45	1.54	91.50	1547.33	1.46	96.83	1.28
p1	323.73	0.98	159.00	4675.77	1.01	157.50	3496.72	1.59	80.92	2636.45	1.74	84.90	1973.60	1.87	90.56	1.38
p2	330.88	1.00	148.25	4674.70	1.01	160.27	3486.85	1.59	82.91	2479.32	1.63	90.49	1759.95	1.66	95.94	1.34
TILE_1	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.65	0.99	64.00	4728.10	1.02	121.35	3925.12	1.78	68.43	2858.10	1.88	72.19	2020.15	1.91	77.62	1.45
p1	329.07	1.00	64.00	4685.43	1.01	132.18	3851.65	1.75	71.33	2904.70	1.91	74.78	2156.62	2.04	81.00	1.47
p2	332.57	1.01	64.00	4706.10	1.01	137.28	3754.15	1.71	75.82	2697.80	1.78	81.93	1893.33	1.79	88.95	1.41
TILE_2	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	329.57	1.00	63.73	4733.10	1.02	116.22	3953.68	1.80	67.43	3003.18	1.98	69.89	2129.50	2.01	77.17	1.49
p1	324.23	0.98	64.00	4713.48	1.02	120.52	3826.85	1.74	73.19	2740.30	1.80	80.05	2004.95	1.89	87.30	1.43
p2	324.25	0.98	64.00	4728.15	1.02	122.17	3785.85	1.72	75.35	2732.15	1.80	81.02	1881.83	1.78	90.99	1.41
TILE_3	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	328.10	0.99	64.00	4721.05	1.02	115.18	3865.55	1.76	71.05	2892.12	1.90	75.93	2160.15	2.04	81.45	1.47
p1	326.77	0.99	64.00	4720.18	1.02	118.74	3816.95	1.74	73.15	2726.53	1.80	80.50	1925.45	1.82	85.92	1.42
p2	328.00	0.99	64.00	4713.15	1.02	122.65	3735.43	1.70	76.92	2791.32	1.84	82.14	1981.72	1.87	89.14	1.43
TILE_4	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.27	0.99	72.67	4716.43	1.02	129.89	3904.38	1.78	68.52	2834.72	1.87	73.31	2142.68	2.03	75.75	1.47
p1	323.45	0.98	74.00	4695.20	1.01	133.22	3886.65	1.77	69.36	2865.93	1.89	71.71	2050.05	1.94	75.48	1.45
p2	332.05	1.01	72.75	4704.85	1.01	143.07	3757.85	1.71	74.80	2832.38	1.87	79.22	2153.05	2.03	81.76	1.46
TILE_5	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	328.48	0.99	72.20	4729.50	1.02	123.40	3920.18	1.78	67.90	2871.95	1.89	71.19	2069.62	1.96	74.10	1.46
p1	321.62	0.97	64.00	4704.52	1.01	126.95	3874.72	1.76	69.79	2955.15	1.95	71.77	2135.75	2.02	75.75	1.47

Infrastructure_Operations_Scores:	vmotion	svmotion	deploy
Completed_Ops_PerHour	17.50	11.00	4.50
Avg_Seconds_To_Complete	25.88	23.68	422.57
Failures	0.00	0.00	0.00
Ratio	1.09	1.22	1.12
Number_Of_Threads	1	1	1
Summary	Run_Is_Compliant	Turbo_Setting:0	
	Number_Of_Compliance_Issues(0)*	Median_Phase(p1)	
Unreviewed_VMmark2_Applications_Score	20.30		
Unreviewed_VMmark2_Infrastructure_Score	1.15		
Unreviewed_VMmark2_Score	16.47		

Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 5.1.0 U1 Build 1065491/ 04-25-2013
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server 5.1.0 Build 799731 / 11-19-2012
Supplemental Software	none
Servers	
Quantity	2
Server Manufacturer and Model	HP ProLiant BL460c Gen8
Processor Vendor and Model	Intel Xeon E5-2697 v2
Processor Speed (GHz)	2.70
Total Sockets/Total Cores/Total Threads	2 Sockets / 24 Cores / 48 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	30 MB I+D on chip per chip L3
BIOS Version	I31 09/08/2013
Memory Size (in GB, Number of DIMMs)	256 GB, 16 x 16 GB DIMMs
Memory Type and Speed	Dual Rank PC3-14900R-13 1866 MHz
Disk Subsystem Type	FC SAN
Number of Disk Controllers	1
Disk Controller Vendors and Models	HP Smart Array P420i
Number of Host Bus Adapters	1
Host Bus Adapter Vendors and Models	HP QMH2572 8Gb Fibre HBA
Number of Network Controllers	2
Network Controller Vendors and Models	HP FlexFabric 10Gb 2-port 554FLB Adapter, HP Flex-10 10Gb 2-port 530M Adapter
Other Hardware	none
Other Software	none
Hardware Availability Date (MM-DD-YYYY)	09-10-2013
Software Availability Date (MM-DD-YYYY)	08-21-2013
Network	
Network Switch Vendors and Models	4 x HP Virtual Connect Flex-10 10Gb Ethernet Module for BladeSystem
Network Speed	HP Virtual Connect Flex-10 - 10 GbE
Storage	
Array Vendors, Models, and Firmware Versions	Fusion-io ION Data Accelerator, FW 2.1.10
Fibre Channel Switch Vendors and Models	Brocade 8Gb SAN Switch
Disk Space Used	7.2 TB
Array Cache Size	N/A
Total Number of Physical Disks Used	6 (2 per SUT OS, 2 for Fusion ION OS), 3 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 Fusion ION OS, 3 PCI-e Flash
Total Number of Storage Groups Used	0
Number of LUNs Used	12
LUN Size and Number of Disks Per LUN	All LUNS spread across 3 x Fusion-io PCIe cards under the control of the Fusion-io ION Data Accelerator Details in section Storage Notes
RAID Type	RAID 0 for enclosure, RAID 1 for OS drives
Number of Members per RAID Set	RAID 1: 2 RAID 0: 3
Disk Vendors, Models, and Speeds	6 x HP 146GB 15K RPM SAS SFF (P/N 652605-B21) 3 x Fusion-io 2.4 TB ioDrive2 Duo

Datacenter Management Server

System Model	HP ProLiant BL460c G7
Processor Vendor and Model	Intel Xeon X5675
Processor Speed (GHz)	3.06
Total Sockets/Total Cores/Total Threads	2 Sockets / 12 Cores / 24 Threads
Memory	24 GB
Network Controller(s) Vendors and Models	1 x HP NC553i Dual Port FlexFabric 10Gb Adapter
Operating System, Version, Bitness, and Service Pack	Microsoft® Windows® 2008 R2 Enterprise (64-bit)
Other Hardware	none
Other Software	none

Clients

Total Number of Clients / Total Physical Clients / Total Virtual Client Hosts	15 / 1 / 3
System Model(s)	HP ProLiant BL460c G7 (prime client) HP ProLiant BL465c G7 (virtual client hosts)
Processor Vendor(s) and Model(s)	Prime client: Intel Xeon X5675 Virtual Client Hosts: AMD Opteron 6174
Processor Speed(s) (GHz)	Prime Client: 3.06 Virtual Client Hosts: 2.2
Total Sockets/Total Cores/Total Threads	Prime Client: 2 Sockets / 12 Cores / 24 Threads Virtual Client Hosts: 2 Sockets / 24 Cores / 24 Threads
Memory per Physical Client	Prime Client: 24 GB Virtual Client Hosts: 64 GB

Network Controller(s) Vendors and Models	Prime Client: 1 x HP NC553i Dual Port FlexFabric 10GbE Adapter Virtual Client Hosts 0-2: 1 x HP NC551i Dual Port FlexFabric 10GbE Adapter, 1 x HP 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 0-2: VMware ESXi 4.1 U1 (Build 348481) Virtual Clients 0-13: Microsoft® Windows® 2008 R2 Enterprise (64-bit)
Number of Virtual Clients	14
Number of vCPUs Per Virtual Client	4
Number of vMem (GB) Per Virtual Client	4
Virtual Client Networking Notes	none
Virtual Client Storage Notes	Client VMs stored on local media respective to their ESX host. 1x300GB 6G 10K rpm SFF SAS disk per Physical Client
Other Hardware	HP BladeSystem c7000 Enclosure, 4xHP Virtual Connect Flex-10 10Gb Ethernet Module
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)
- Firewall was disabled in the console OS (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 w/ multiple cores. (default Single core per socket)

Advanced Settings:

- Cpu.CoschedCrossCall = 0 (default 1)
- Cpu.CreditAgePeriod = 533 (default 3000)
- 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)
- Irq.IRQRebalancePeriod = 20000 (default 50)
- 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 100)
- 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.MigImbalanceThreshold = 57 (default 10)
- Numa.MonMigEnable = 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:

- Updated drivers:
 - misc-cnic-register_1.72.1.v50.2-1OEM.500.0.0.472560
 - net-bnx2_2.2.3e.v50.1-1OEM.500.0.0.472560
 - net-bnx2x_1.74.17.v50.1-1OEM.500.0.0.472560
 - net-cnic_1.74.04.v50.1-1OEM.500.0.0.472560
 - scsi-bnx2fc_1.74.02.v50.2-1OEM.500.0.0.406165
 - scsi-bnx2i_2.74.07.v50.1-1OEM.500.0.0.472560
 - net-be2net_4.2.327.0-1OEM.500.0.0.472560
- /vmkernel/module/qla2xxx/options = "ql2xmaxqdepth=256 ql2xintrdelaytimer=2 ql2xenablesix=1"

Server Notes

Server BIOS settings:

- HP Power Profile set to Maximum Performance (default: Balanced Power and Performance)
- Memory Power Savings Mode set to Maximum Performance (default: Balanced)
- Thermal Configuration set to Maximum Cooling (default: Optimal Cooling)
- HW Prefetcher set to Disabled (default: Enabled)
- Adjacent Sector Prefetcher set to Disabled: (default: Enabled)
- Memory Refresh Rate set to 1x Refresh (default: 2x Refresh)
- Intel Turbo Boost Enabled (frequency boost to 3.5 GHz) (default: Enabled)

Networking Notes

- vSwitch0 for the Service Console on vmnic0 at 10Gb/s
- vSwitch1 defined as vmkernel vMotion connection on vmnic2 at 10Gb/s
- vSwitch2 for the Olio* workloads on vmnic1 at 10Gb/s

- vSwitch3 for the DS2* workloads on vmnic8 at 10Gb/s
- vSwitch4 for the mailserver workloads, standby and deploy workloads on vmnic9 at 10Gb/s

Storage Notes

- ESX was installed on two disks configured as RAID1 in the internal server storage bay
- All LUNs were spread across three 2.4 TB Fusion-io ioDrive2 Duo PCI-e Flash cards in RAID0 within a single HP ProLiant DL380p Gen8 running Fusion-io ION Data Accelerator software.
- Physical Configuration for Fusion-io ION Data Accelerator:
 - 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 2.4 TB Fusion-io ioDrive2 Duo PCI-e Flash Cards configured in RAID0
 - 2 x HP 82Q dual port 8 GB fibre HBAs
 - 1 x HP Smart Array 420i controller for ION OS
 - 2 x 146 GB 15K RPM SAS SFF for ION OS
- Virtual Configuration for Fusion-io ION Data Accelerator:
 - 6 x 700GB volumes, each hosting 2 tiles except for the standby VMs
 - 2 x 700GB volumes, each hosting 1 tile except for the standby VM
 - 1 x 200GB volume, for all the standby VMs
 - 1 x 20GB volume, for SVmotion Target
 - 1 x 20GB volume, for DeployTemplate
 - 1 x 20GB volume, for Deploy Target
- All LUNs were configured as block devices and no system memory was used for write caching

Datacenter Management Server Notes

- HP ProLiant BL460c G7 had ESXi 5.0.0 installed and had 2 virtual machines
 - vCenter for SUT
 - 2 virtual CPUs
 - 4 GB virtual memory
 - Microsoft® Windows® 2008 R2 Enterprise (64-bit)
 - vCenter for clients
 - 2 virtual CPUs
 - 4 GB virtual memory
 - Microsoft® Windows® 2008 R2 Enterprise (64-bit)

Operating System Notes

- All mailserver VMs running Microsoft® Windows® 2008 R2 Enterprise SP1 (64-bit) and were updated with all critical updates via windows update on July 20, 2012.
- The Shell Hardware Detection service was not running on mailserver VMs.
- 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 5.1 U1 Build 793510
- Three HP ProLiant BL465c G7 clients host 14 virtual clients total; two physical hosts each running 6 virtual clients and the other one running 2 virtual clients
- All client operating systems were updated via Windows Update.

Other Notes

None

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