VMware® VMmark® V2.5 Results

Vendor and Hardware Platform: HP ProLiant DL380p Gen8 **Virtualization Platform: VMware ESX 4.1.0 U3 Build 800380** **VMware vCenter Server : VMware vCenter Server 5.0.0 Build 455964**	**VMmark V2.5 Score = 12.11 @ 10 Tiles**

Number of Hosts: 2	**Uniform Hosts [yes/no]: yes**	**Total sockets/cores/threads in test: 4/32/64**
Tested By: Hewlett-Packard	**Test Date: 05-22-2013**	

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	324.40	0.98	54.00	4678.12	1.01	165.98	4077.88	1.85	61.85	2906.00	1.91	68.82	2139.90	2.02	68.44	1.48
p1	331.70	1.00	53.80	4665.00	1.01	169.68	4036.25	1.84	63.12	3006.12	1.98	68.91	2231.25	2.11	69.14	1.51
p2	324.48	0.98	53.55	4661.55	1.00	172.53	4011.18	1.82	64.26	2857.03	1.88	72.11	2191.78	2.07	71.57	1.48
TILE_1	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.10	0.99	53.50	4674.45	1.01	164.86	4182.43	1.90	57.92	2973.93	1.96	65.41	2223.03	2.10	62.90	1.51
p1	330.73	1.00	53.20	4670.32	1.01	167.13	4061.45	1.85	62.18	3016.28	1.99	68.47	2343.47	2.21	67.92	1.52
p2	325.40	0.99	53.10	4665.93	1.01	165.08	4063.85	1.85	62.29	2896.93	1.91	69.70	2159.68	2.04	67.39	1.48
TILE_2	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.75	0.99	43.00	4682.77	1.01	152.72	3925.93	1.79	68.26	2955.43	1.95	72.18	2112.53	2.00	77.89	1.47
p1	326.93	0.99	43.00	4679.60	1.01	162.07	3948.28	1.80	67.56	2854.28	1.88	72.88	2113.80	2.00	77.86	1.46
p2	324.52	0.98	43.00	4698.82	1.01	155.84	3839.32	1.75	72.17	2867.25	1.89	77.67	2037.72	1.93	84.44	1.45
TILE_3	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.40	0.99	43.00	4700.27	1.01	153.10	3839.65	1.75	71.81	2896.82	1.91	75.75	2160.30	2.04	81.47	1.47
p1	324.85	0.98	43.12	4690.43	1.01	161.62	3933.68	1.79	67.71	2953.60	1.95	72.26	2117.30	2.00	77.52	1.47
p2	329.40	1.00	43.00	4695.35	1.01	151.14	3823.78	1.74	72.55	2771.62	1.83	77.64	1945.40	1.84	84.50	1.43
TILE_4	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	329.70	1.00	53.45	4678.80	1.01	164.53	4092.43	1.86	61.20	2942.55	1.94	67.23	2248.97	2.13	67.28	1.50
p1	326.00	0.99	53.92	4675.62	1.01	171.51	4050.72	1.84	62.94	2917.53	1.92	68.73	2129.25	2.01	69.59	1.48
p2	328.30	0.99	53.95	4683.62	1.01	165.23	4004.40	1.82	64.77	3062.60	2.02	71.42	2285.62	2.16	71.88	1.51
TILE_5	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	330.77	1.00	55.23	4672.07	1.01	164.01	4162.45	1.89	58.85	2966.20	1.95	66.05	2177.10	2.06	65.41	1.50
p1	328.43	0.99	53.62	4684.55	1.01	170.11	3967.03	1.80	66.55	2928.20	1.93	73.53	2144.28	2.03	75.59	1.48

p2	328.23	0.99	53.98	4677.15	1.01	164.06	4045.22	1.84	63.26	2978.53	1.96	70.60	2296.65	2.17	71.17	1.51
TILE_6	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.82	0.99	49.35	4686.32	1.01	155.43	3937.28	1.79	68.00	2850.47	1.88	72.78	2016.97	1.91	78.18	1.45
p1	322.70	0.98	43.00	4689.35	1.01	157.21	3911.30	1.78	69.11	3023.10	1.99	73.72	2205.97	2.08	77.81	1.49
p2	325.25	0.98	43.00	4681.12	1.01	157.70	3793.78	1.73	74.31	2718.40	1.79	80.68	2018.35	1.91	85.88	1.42
TILE_7	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	329.65	1.00	43.77	4687.00	1.01	148.35	3816.25	1.74	73.19	2859.32	1.88	77.83	2033.00	1.92	84.83	1.45
p1	326.38	0.99	43.00	4688.88	1.01	155.34	3894.30	1.77	69.56	2899.38	1.91	75.46	2183.55	2.06	79.62	1.47
p2	322.62	0.98	43.00	4675.88	1.01	162.38	3818.18	1.74	73.27	2741.05	1.81	79.29	1940.42	1.83	85.01	1.41
TILE_8	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	329.30	1.00	54.95	4672.05	1.01	159.11	4091.35	1.86	61.69	3132.80	2.06	67.81	2358.05	2.23	67.42	1.54
p1	328.85	1.00	53.67	4671.18	1.01	159.37	4052.85	1.84	63.05	2901.43	1.91	69.79	2218.43	2.10	69.98	1.49
p2	328.40	0.99	54.00	4673.35	1.01	160.58	4045.75	1.84	63.30	2894.95	1.91	70.08	2127.00	2.01	69.94	1.48
TILE_9	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.45	0.99	57.95	4671.98	1.01	162.10	4190.95	1.91	57.94	3066.32	2.02	66.18	2405.90	2.27	64.26	1.54
p1	323.60	0.98	53.27	4698.43	1.01	159.28	4058.65	1.85	62.85	2893.95	1.91	70.08	2120.53	2.00	70.21	1.48
p2	331.43	1.00	53.73	4685.62	1.01	159.53	4080.75	1.86	61.56	3032.18	2.00	67.98	2258.12	2.13	67.16	1.52
p0_score:	14.91															
p1_score:	14.85															
p2_score:	14.69															

Infrastructure_Operations_Scores:	vmotion	svmotion	deploy
Completed_Ops_PerHour	16.50	11.00	4.50
Avg_Seconds_To_Complete	35.89	25.99	422.22
Failures	0.00	0.00	0.00
Ratio	1.03	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	14.85	
Unreviewed_VMmark2_Infrastructure_Score	1.12	
Unreviewed_VMmark2_Score	12.11	

Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESX 4.1.0 U3 Build 800380 / 08-30-2012
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 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 03/01/2013
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
Number of Host Bus Adapters	1
Host Bus Adapter Vendors and Models	Emulex LPe16002 PCIe dual port 16Gb Fibre HBA
Number of Network Controllers	2
Network Controller Vendors and Models	HP Ethernet 1 Gb 4-port 331FLR Adapter, 1 x Intel X520-DA2 Dual Port 10 GbE Server Adapter
Other Hardware	none
Other Software	none

Hardware Availability Date (MM-DD-YYYY)	03-26-2013
Software Availability Date (MM-DD-YYYY)	04-02-2013
Network	
Network Switch Vendors and Models	1 x H3C S5820X-28S 4 x HP Virtual Connect Flex-10 10Gb Ethernet Module for BladeSystem
Network Speed	H3C S5820X-28S - 24 x 10 GbE ports, 4 x 1 GbE ports HP Virtual Connect Flex-10 - 10 GbE
Storage	
Array Vendors, Models, and Firmware Versions	Fusion-io ION Data Accelerator, FW 2.0.1
Fibre Channel Switch Vendors and Models	none (hosts were directly cabled to the storage)
Disk Space Used	3.6 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 9 LUNs: 350 GB 1 LUN: 320 GB 1 LUN: 65 GB 1 LUN: 64 GB
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 1.2 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	11 / 1 / 2
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 0-1: 1 x HP NC551i Dual Port FlexFabric 10GbE Adapter
Operating System, Version, Bitness, and Service Pack	Prime Client: Microsoft® Windows® 2008 R2 (64-bit) Virtual Client Hosts 0-1: VMware ESXi 4.1 U1 (Build 348481) Virtual Clients 0-9: Microsoft® Windows® 2008 R2 Enterprise (64-bit)
Number of Virtual Clients	10
Number of vCPUs Per Virtual Client	4
Number of vMem (GB) Per Virtual Client	4
Virtual Client Networking Notes	none
Virtual Client Storage Notes	none
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)
- All mailserver VMs used Hard Disk 1 on LSI Logic SAS controller, Hard Disk 2 on paravirtual controller
- All DS2DB, DS2WebA, DS2WebB, DS2WebC, OlioDB and OlioWeb used Hard Disk on paravirtual controller
- Cluster DRS Automation Level set to Fully Automated
- DrsMigrationThreshold set to level 1
- 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 = 500 (default 3000)
- Cpu.HaltingIdleMsecPenalty = 0 (default 100)
- DataMover.HardwareAcceleratedInit = 0 (default 1)
- DataMover.HardwareAcceleratedMove = 0 (default 1)
- Disk.SchedNumReqOutstanding = 256 (default 32)
- Irq.BestVcpuRouting = 1 (default 0)
- Irq.RoutingPolicy = 0 (default 2)
- 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)
- Misc.WorldletHTSharing = 45 (default 90)
- Net.AllowPT = 1 (default 0)
- Net.MaxNetifRxQueueLen = 500 (default 100)
- Net.MaxNetifTxQueueLen = 1000 (default 500)
- Net.NetTxCompletionWorldlet = 0 (default 1)
- Net.NetTxWordlet = 0 (default 2)
- 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)
- VMFS3.HardwareAcceleratedLocking = 0 (default 1)
- VMkernel.Boot.netNetqueueEnabled = False (default True)

Driver Options:

- Updated drivers:
  - scsi-hpsa-400.4.1.0-18
  - scsi-lpfc820-400.8.2.1.126.50-1
  - net-be2net-400.4.1.334.0-1vmw.2.17.249663
  - net-tg3-400.3.122g.v40.2-1vmw.2.17.00000
- /vmkernel/module/lpfc820.o/options = "lpfc_lun_queue_depth=128 lpfc_cr_count=30 lpfc_cr_delay=2 " (default 30, 1, and 0)
- /vmkernel/module/ixgbe.o/options = "MQ=0,0 InterruptThrottleRate=2000,2000 InterruptType=2,2 " (default 1, 16000, and 2)

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 Prefetcherset to Disabled (default: Enabled)
- Adjacent Sector Prefetcher set to Disabled: (default: Enabled)
- Processor Power and Utilization Monitoring set to Disabled: (default: Enabled)
- Memory Pre-Failure Notification set to Disabled: (default: Enabled)
- Memory Refresh Rate set to 1x Refresh (default: 2x Refresh)

Networking Notes

- vSwitch0 for the Service Console on vmnic0 at 1Gb/s
- vSwitch1 defined as vmkernel vMotion connection on vmnic1 at 1Gb/s
- vSwitch2 for the DS2* 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 and deploy workloads on vmnic3 at 1Gb/s

Storage Notes

- ESX was installed on two disks configured as RAID1 in the internal server storage bay
- All LUNs were spread across three 1.2 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 Meomory (16 x 16 GB DIMMs dual rank PC3-12800 Registered DDR3)
  - 3 x 1.2 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:

    - 9 LUNs at 350 GB
        - each had all VMs from only 1 tile (except for the standby VM)
    - 1 LUN at 320 GB
        - all VMs from only 1 tile (except for the standby VM)
    - 1 LUN at 65 GB
        - Deploy Template
        - all standby VMs
    - 1 LUN at 64 GB
        - deploy target
        - sVmotion target
- All LUNs were distributed across all three 1.2 TB Fusion-io ioDrive2 Duo Flash cards in RAID0
- 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
        - 4 virtual CPUs
        - 8 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 (64-bit)
- 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 793489
- Two HP ProLiant BL465c G7 clients host 10 virtual clients total; one physical host running 6 virtual clients and the other one running 4 virtual clients
- All client operating systems were updated via Windows Update.

Other Notes

None

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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