VMware® VMmark® V2.5 Results

Vendor and Hardware Platform: HP ProLiant DL385p 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 = 9.22 @ 8 Tiles

Number of Hosts: 2	Uniform Hosts [yes/no]: yes	Total sockets/cores/threads in test: 4/64/64

Tested By: Hewlett-Packard	Test Date: 03-18-2013

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	325.38	0.99	139.00	4664.48	1.00	160.22	3856.75	1.75	72.42	2670.65	1.76	83.17	1860.88	1.76	91.03	1.40
p1	328.32	0.99	108.60	4681.35	1.01	169.89	3667.50	1.67	81.05	2625.32	1.73	92.59	1932.42	1.83	100.38	1.39
p2	327.18	0.99	97.00	4662.75	1.00	174.93	3641.53	1.66	82.80	2487.40	1.64	96.64	1717.47	1.62	106.18	1.34
TILE_1	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	323.02	0.98	66.92	4686.23	1.01	160.25	3829.05	1.74	74.11	2768.25	1.82	83.68	1959.10	1.85	90.73	1.42
p1	329.50	1.00	64.00	4654.65	1.00	172.58	3798.20	1.73	76.14	2617.78	1.72	87.95	1902.80	1.80	95.98	1.40
p2	329.10	1.00	64.00	4652.27	1.00	173.07	3612.20	1.64	86.22	2474.38	1.63	99.68	1692.92	1.60	110.91	1.34
TILE_2	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.52	0.99	67.17	4690.30	1.01	152.74	3684.12	1.68	81.25	2636.07	1.74	92.43	1939.65	1.83	100.30	1.40
p1	328.23	0.99	64.00	4681.07	1.01	158.38	3833.07	1.74	74.33	2656.03	1.75	85.39	1825.83	1.73	95.42	1.39
p2	323.95	0.98	63.00	4668.60	1.01	163.36	3786.22	1.72	76.75	2715.12	1.79	87.53	1889.58	1.79	97.43	1.40
TILE_3	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.23	0.99	65.58	4698.07	1.01	150.30	3954.00	1.80	68.68	2764.70	1.82	78.28	2022.70	1.91	84.93	1.44
p1	322.82	0.98	64.00	4689.70	1.01	160.97	3892.28	1.77	71.86	2696.53	1.78	82.58	1866.40	1.76	91.38	1.41
p2	324.27	0.98	56.08	4673.18	1.01	162.14	3844.45	1.75	76.08	2882.82	1.90	85.59	2030.88	1.92	95.84	1.44
TILE_4	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.93	0.99	64.00	4684.62	1.01	163.88	3888.68	1.77	71.62	2707.35	1.78	81.83	1889.17	1.79	89.11	1.41
p1	325.50	0.99	64.00	4644.45	1.00	181.27	3826.82	1.74	74.48	2758.70	1.82	84.39	1944.28	1.84	92.25	1.42
p2	326.60	0.99	64.00	4663.48	1.00	165.33	3719.80	1.69	79.78	2649.90	1.75	91.58	1956.38	1.85	99.10	1.40
TILE_5	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	331.18	1.00	65.50	4696.95	1.01	161.20	3869.12	1.76	72.28	2698.22	1.78	82.58	1880.78	1.78	89.94	1.41
p1	321.55	0.97	63.05	4660.82	1.00	180.71	3735.20	1.70	77.93	2790.18	1.84	87.48	2003.33	1.89	94.18	1.42

p2	327.50	0.99	63.15	4660.93	1.00	167.44	3728.35	1.70	80.16	2550.18	1.68	93.33	1861.35	1.76	101.15	1.38
TILE_6	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	323.57	0.98	65.50	4695.65	1.01	150.94	3851.38	1.75	73.78	2771.95	1.83	84.07	1937.33	1.83	92.83	1.42
p1	324.52	0.98	64.00	4675.82	1.01	160.00	3880.05	1.76	72.56	2781.75	1.83	83.28	2047.97	1.94	90.58	1.44
p2	323.32	0.98	56.25	4691.93	1.01	160.72	3909.78	1.78	71.32	2701.43	1.78	82.74	1864.95	1.76	91.77	1.41
TILE_7	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	324.00	0.98	64.00	4685.10	1.01	155.60	3864.85	1.76	72.62	2894.82	1.91	81.41	2062.97	1.95	89.42	1.45
p1	325.10	0.98	63.75	4687.43	1.01	161.71	3882.30	1.77	72.82	2663.50	1.75	84.72	1852.25	1.75	93.07	1.40
p2	327.70	0.99	54.75	4706.07	1.01	159.18	3890.78	1.77	71.79	2710.43	1.78	81.93	1967.92	1.86	90.03	1.43

p0_score:	11.36
p1_score:	11.27
p2_score:	11.14

Infrastructure_Operations_Scores:	vmotion	svmotion	deploy
Completed_Ops_PerHour	15.50	10.00	4.00
Avg_Seconds_To_Complete	52.77	35.99	475.63
Failures	0.00	0.00	0.00
Ratio	0.97	1.11	1.00
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	11.27	
Unreviewed_VMmark2_Infrastructure_Score	1.02	
Unreviewed_VMmark2_Score	9.22	

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 /	VMware vCenter Server 5.0.0 Build 455964 / 08-24-2011

Availability Date (MM-DD-YYYY)	
Supplemental Software	none
Servers	
Quantity	2
Server Manufacturer and Model	HP ProLiant DL385p Gen8
Processor Vendor and Model	AMD Opteron 6386 SE
Processor Speed (GHz)	2.80
Total Sockets/Total Cores/Total Threads	2 Sockets / 32 Cores / 32 Threads
Primary Cache	512 KB I (64KB shared / 2 cores) + 256 KB D (16KB/core on chip per chip)
Secondary Cache	16 MB I+D on chip per chip (2 MB share / 2 cores)
Other Cache	16 MB I+D on chip per chip L3
BIOS Version	A28 08/14/2012
Memory Size (in GB, Number of DIMMs)	128 GB, 8 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	HP 82Q PCIe dual port 8Gb Fibre HBA
Number of Network Controllers	2
Network Controller Vendors and Models	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)	12-04-2012
Software Availability Date (MM-DD-YYYY)	08-30-2012
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 - 10GbE
Storage	
Array Vendors, Models, and Firmware Versions	2 x VS-SmartArray Storage Servers by id_7 Limited System BIOS: P70 05/30/2012 HP SmartArray P420i firmware: 3.02 HP SmartArray P420 firmware: 3.02
Fibre Channel Switch Vendors and Models	1 x HP StorageWorks SAN Switch 8/24
Disk Space Used	13.64 TB
Array Cache Size	2 GB, 1 GB
Total Number of Physical Disks Used	40
Total Number of Enclosures/Pods/Shelves Used	2
Number of Physical Disks Used per Enclosure/Pod/Shelf	Internal: 4 disks per host (2 for OS, 2 unused) 2 enclosures: 16 disks each
Total Number of Storage Groups Used	0
Number of LUNs Used	10
LUN Size and Number of Disks Per LUN	10 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	8 x HP 146GB 15K RPM SAS SFF (P/N 652605-B21) 32 x HP 400GB 6G SAS SFF SSD (P/N 653082-B21)
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	9 / 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 0-7: Microsoft® Windows® 2008 R2 Enterprise (64-bit)
Number of Virtual Clients	8
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.HaltingIdleMsecPenalty = 0 (default 800)
- DataMover.HardwareAcceleratedInit = 0 (default 1)
- DataMover.HardwareAcceleratedMove = 0 (default 1)
- Disk.SchedNumReqOutstanding = 256 (default 32)
- 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.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)

Driver Options:

- Updated Drivers:
- /vmkernel/module/qla2xxx.o/options = "ql2xmaxqdepth=256 ql2xintrdelaytimer=3 ql2xenablemsi=1 " (default 32, 0, and 0)
- /vmkernel/module/ixgbe.o/options = "MQ=0,0 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 Maximum Cooling (default: Optimal Cooling)
- Hardware Prefetch training on Software Prefetch set to Disabled (default: Enabled)

- CPU Core Hardware 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)

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
  - Additionally, each host had 2 unused disks configured as RAID1 in the internal server storage bay.
- All two "VS-SmartArray Storage Server" by id$_7$ Limited uses LUNs configured as block devices; as such no system memory is used for write caching.
- All two "VS-SmartArray Storage Server" by id$_7$ Limited hardware configuration details as below:
  - HP ProLiant DL380p Gen8 server
    - Processor Configuration
      - Server #1: 2 x Intel Xeon E5-2690 2.9 GHz processors
      - Server #2: 2 x Intel Xeon E5-2643 3.3 GHz processors
    - 64 GB memory (8 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 id$_7$ VS-SmartArray
    - HP Smart Array P420i controller
      - FBWC (Flash Backed Write Cache)
        - Server #1: 2 GB
        - Server #2: 1 GB
      - 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
      - FBWC (Flash Backed Write Cache)

        - Server #1: 2 GB
        - Server #2: 1 GB
    - 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 id$_7$ VS-SmartArray's as below:
    - id$_7$ VS-SmartArray #1
        - P420i:Logical Drive 1
            - All VMs except standby for tile 0
        - 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 except standby for tile 3
            - DeployTemplate
        - P420:Logical Drive 1
            - All VMs except standby for tile 4
        - P420:Logical Drive 2
            - All VMs except standby for tile 5
        - P420:Logical Drive 3
            - All VMs except standby for tile 6
        - P420:Logical Drive 4
            - All VMs except standby for tile 7
            - standby VMs for tiles 0 - 7
    - id$_7$ VS-SmartArray #2
        - P420i:Logical Drives 1-3
            - Accessible and usable by both hosts
            - Not used in the benchmark
        - P420i:Logical Drive 4
            - Deploy Target LUN
        - P420:Logical Drives 1-3
            - Accessible and usable by both hosts
            - Not used in the benchmark
        - P420:Logical Drive 4
            - Standby Target LUN

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 8 virtual clients total; one physical host running 6 virtual clients and the other one running 2 virtual clients
- All client operating systems were updated via Windows Update.

Other Notes

None
