VMware® VMmark® V2.1.1 Results

Vendor and Hardware Platform: HP ProLiant BL685c G7 **Virtualization Platform: VMware ESXi 5.0.0 Build 469512** **VMware vCenter Server: VMware vCenter Server 5.0.0 Build 455964**	**Code Defect**

Number of Hosts: 2	**Uniform Hosts [yes/no]: yes**	**Total sockets/core/threads in test: 8/128/128**
Tested By: Hewlett-Packard		**Test Date: 11-01-2011**

Performance Section	Configuration Section	Notes Section
Performance	Configuration	Notes for Workload

VMware has discovered a code defect in the VMmark v2 scoring script. The score for operations that fail to complete is not calculated correctly. This result experienced failed operations that the scoring script did not score correctly. Therefore the results presented here are not comparable with any other VMmark result.

Performance - all data has been removed = CD

	mailserver			olio			dvdstoreA			dvdstoreB			dvdstoreC			
TILE_0	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_1	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_2	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_3	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_4	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM

p0																
p1																
p2																
TILE_5	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_6	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_7	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_8	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_9	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_10	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_11	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_12	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																
TILE_13	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM

p0																
p1																
p2																
TILE_14	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0																
p1																
p2																

p0_score:	CD
p1_score:	CD
p2_score:	CD

Infrastructure_Operations_Scores:	vmotion	svmotion	deploy
Completed_Ops_PerHour	CD	CD	CD
Avg_Seconds_To_Complete	CD	CD	CD
Failures	CD	CD	CD
Ratio	CD	CD	CD
Number_Of_Threads	CD	CD	CD

Summary	CD	CD	CD

Unreviewed_VMmark2_Applications_Score	CD
Unreviewed_VMmark2_Infrastructure_Score	CD
Unreviewed_VMmark2_Score	CD

Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 5.0.0 Build 469512/ 08-24-2011

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 BL685c G7
Processor Vendor and Model	AMD Opteron 6276
Processor Speed (GHz)	2.3
Total Sockets/Total Cores/Total Threads	4 Sockets / 64 Cores / 64 Threads
Primary Cache	512 KB I + 256 KB D on chip per chip, 64 KB I shared / 2 cores, 16 KB D per core
Secondary Cache	16 MB I+D on chip per chip, 2 MB shared / 2 cores
Other Cache	16 MB I+D on chip per chip, 8 MB shared / 8 cores
BIOS Version	A20 10/02/2011
Memory Size (in GB, Number of DIMMs)	256 GB, 32 x 8 GB DIMMs
Memory Type and Speed	dual rank PC3-10600 Registered DDR3
Disk Subsystem Type	FC SAN
Number of Disk Controllers	1
Disk Controller Vendors and Models	HP Smart Array P410i
Number of Host Bus Adapters	1
Host Bus Adapter Vendors and Models	LPe12005 dual port 8Gb Fibre HBA
Number of Network Controllers	2
Network Controller Vendors and Models	HP NC551i embedded dual port FlexFabric 10Gb Converged Network adapter, HP NC552m dual port Flex-10 10 GbE adapter
Other Hardware	none
Other Software	none
Hardware Availability Date (MM-DD-YYYY)	11-14-2011
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	7xHP StorageWorks MSA 2012, 25xHP StorageWorks MSA 2212, 2xHP StorageWorks MSA 2324, 2xHP StorageWorks P2000
Fibre Channel Switch Vendors and Models	2 x HP StorageWorks SAN Switch 8/24, 2 x HP B-series 8/24c SAN Switch for BladeSystem c-Class
Disk Space Used	64.96 TB
Array Cache Size	1GB
Total Number of Physical Disks Used	480
Total Number of Enclosures/Pods/Shelves Used	36
Number of Physical Disks Used per Enclosure/Pod/Shelf	Internal: 2 disks per host 32 enclosures: 12 disks 4 enclosures: 24 disks
Total Number of Storage Groups Used	0
Number of LUNs Used	45
LUN Size and Number of Disks Per LUN	32 LUNs: 1.60 TB on 12 disks 4 LUNs: 818.50 GB on 12 disks 4 LUNs: 1.60 TB on 12 disks 5 LUNs: 819.50 GB on 12 disks
RAID Type	RAID 1 and RAID 0
Number of Members per RAID Set	12
Disk Vendors, Models, and Speeds	48 HP 72GB 15K RPM SAS SFF 384 HP 146GB 15K RPM SAS LFF 48 HP 146GB 15K RPM SAS SFF

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	8 physical servers (15 virtual clients)

System Model(s)	HP ProLiant DL360 G5
Processor Vendor(s) and Model(s)	Physical Clients 0-4,6-7: Intel Xeon E5450 Physical Client 5: Intel Xeon E5440
Processor Speed(s) (GHz)	Physical Clients 0-4,6-7: 3.00 Physical Client 5: 2.83
Total Sockets/Total Cores/Total Threads	2 Sockets / 8 Cores / 8 Threads
Memory per Client	Physical Clients 0-1,3-7: 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 0-7: VMware ESX 4.1 U1 (Build 260247) Virtual Clients 0-14: 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 = 128 (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.LTermFairnessinterval = 0 (default 5)
- Numa.MonMigEnable = 0 (default 1)
- Numa.SwapLoadEnable = 0 (default 1)
- Numa.SwapLocalityEnable = 0 (default 1)

Driver Options:

- /vmkernel/module/lpfc820.o/options = "lpfc_lun_queue_depth=128 lpfc_cr_count=5 lpfc_cf_delay=1" (default 31, 1, and 0)

Fibre attached Datastore Path Settings:

- MultiPath Policy set to Round Robin

Server Notes

Server BIOS settings:

- HP Power Profile set to Maximum Performance (default: Balanced Performance)
- Thermal Configuration set to Increased Cooling (default: Optimal Cooling)
- Hardware Prefetch training on Software Prefetch set to Disabled (default: Enabled)
- CPU Core Hardware Prefetcher set to Disabled (default: Enabled)

Networking Notes

vSwitch Configuration:

- vSwitch0 for the Service Console on vmnic0 at 10Gb/s
- vSwitch1 defined as vmkernel vMotion connection on vmnic8 at 10Gb/s
    - Jumbo frames were enabled
- vSwitch2 for all VMs, except for oliodb and olioweb VMs, on vmnic1 and vmnic9 at 10Gb/s
- vSwitch3 for all oliodb and olioweb VMs on vmnic16 and vmnic17 at 10Gb/s

Storage Notes

- ESX was installed on two disks configured as RAID 1 in the internal server storage bay
- All fibre attached LUNs were striped across 12 disk drives.
    - All standby VMs were on a single LUN
    - 4 LUNs each contained the DS2WebA, DS2WebB, DS2WebC, OlioDB, and OlioWeb VMs for two tiles.
    - 7 LUNs each contained the DS2WebA, DS2WebB, DS2WebC, OlioDB, and OlioWeb VMs for one tile.
    - 4 LUNs each contained the mailserver VMs for two tiles.
    - 7 LUNs each contained the mailserver VM for one tile.
    - 7 LUNs each contained the DS2DB VMs for two tiles.
    - 1 LUN contained the DS2DB VM for one tile.
    - The target for the sVMotion and Deploy operations was a single dedicated LUN.
    - All LUNs were RAID 0 and were formatted with VMFS3 filesystem.
- The following is a list of VMs and which type of enclosure it was stored on:
    -

VM	Enclosure Type	Storage Controller Firmware
DS2db for tiles 2, 3, 6, 7, 10, 11, 14	P2000	T201P02
DS2db for tiles 0, 1, 4, 5, 8, 9, 12, 13	MSA2324	M100R18
(target for deploy VM and SVMotion)	MSA2012	J200P19
DS2WebA1,DS2WebB1,DS2WebC1,OlioDB1,OlioWeb1, DS2WebA12,DS2WebB12,DS2WebC12,OlioDB12,OlioWeb12, mailserver for tiles 0, 6, 11	MSA2012	J200P24
mailserver for tiles 2, 13	MSA2212	J200P24

mailserver10	MSA2212	J200P19
All remaining VMs not listed above in this table.	MSA2212	J200P16

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)

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.
- Eight HP ProLiant DL360 G5 clients ran two client virtual machines.
- One HP ProLiant DL360 G5 client ran one client virtual machine.
- All client operating systems were updated via Windows Update.

Other Notes

None
