

VMware® VMmark® V2.1.1 Results

Vendor and Hardware Platform: IBM BladeCenter HS22V
 Virtualization Platform: VMware ESX 4.1.0 Build 260247
 VMware vCenter Server: VMware vCenter Server 4.1.0 build 258902

**VMmark V2.1.1 Score =
7.52 @ 7 Tiles**

Number of Hosts: 2

Uniform Hosts [yes/no]: yes

Total sockets/core/threads in test: 4/24/48

Tested By: IBM

Test Date: 09-29-2011

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	325.98	0.99	87.00	4533.57	0.98	203.21	3080.93	1.40	102.96	2370.97	1.56	90.51	1676.97	1.58	73.55	1.27
p1	322.93	0.98	86.50	4664.70	1.01	191.36	3144.80	1.43	109.18	2205.85	1.45	90.77	1590.12	1.50	76.45	1.25
p2	326.80	0.99	84.00	4638.50	1.00	207.40	3090.32	1.41	113.16	2157.28	1.42	94.10	1495.92	1.41	75.11	1.23
TILE_1	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	330.40	1.00	78.75	4674.55	1.01	169.90	3470.20	1.58	85.29	2625.40	1.73	68.37	2011.67	1.90	56.60	1.39
p1	326.82	0.99	74.00	4648.52	1.00	182.70	3376.75	1.54	94.33	2431.10	1.60	76.24	1761.80	1.67	56.90	1.32
p2	325.30	0.99	74.00	4653.40	1.00	182.51	3289.28	1.50	98.85	2469.47	1.63	80.89	1818.30	1.72	60.54	1.33
TILE_2	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	324.57	0.98	77.75	4586.00	0.99	192.20	3011.68	1.37	106.56	2084.57	1.37	87.92	1514.10	1.43	68.51	1.21
p1	329.95	1.00	74.00	4663.27	1.00	179.19	3017.55	1.37	117.35	2095.97	1.38	98.30	1556.45	1.47	79.35	1.23
p2	329.77	1.00	74.00	4660.77	1.00	177.82	3011.55	1.37	117.03	2219.68	1.46	106.35	1640.65	1.55	81.20	1.25
TILE_3	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	322.93	0.98	74.00	4633.20	1.00	177.03	3556.85	1.62	81.05	2628.55	1.73	61.65	1844.72	1.74	48.21	1.37
p1	329.07	1.00	66.50	4653.55	1.00	177.95	3516.15	1.60	86.71	2682.97	1.77	68.84	1901.85	1.80	55.75	1.38
p2	329.35	1.00	64.00	4679.00	1.01	171.79	3482.80	1.58	88.39	2641.90	1.74	70.98	1960.28	1.85	59.38	1.39
TILE_4	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.60	0.99	95.95	4544.68	0.98	212.61	3013.05	1.37	105.93	2163.97	1.43	82.24	1494.28	1.41	63.63	1.22
p1	327.38	0.99	94.00	4644.65	1.00	184.83	2932.25	1.33	122.03	2282.85	1.50	93.13	1689.85	1.60	77.49	1.26
p2	329.15	1.00	90.75	4641.62	1.00	197.67	2920.20	1.33	123.09	2263.12	1.49	94.31	1600.33	1.51	75.85	1.24
TILE_5	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	323.98	0.98	84.75	4574.68	0.99	192.74	3578.72	1.63	80.58	2664.93	1.75	69.72	2000.72	1.89	50.77	1.39
p1	323.05	0.98	74.00	4686.85	1.01	161.01	3545.28	1.61	85.13	2606.05	1.72	72.65	2045.60	1.93	54.90	1.40
p2	326.80	0.99	65.50	4665.10	1.01	161.09	3424.20	1.56	92.14	2402.07	1.58	77.54	1784.78	1.69	55.53	1.33

TILE_6	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	323.88	0.98	84.10	4607.40	0.99	223.10	3024.93	1.38	106.06	2216.78	1.46	89.14	1756.72	1.66	73.11	1.27
p1	324.65	0.98	83.47	4669.27	1.01	188.70	3091.97	1.41	111.12	2306.18	1.52	91.78	1618.35	1.53	66.58	1.26
p2	326.68	0.99	83.33	4641.20	1.00	198.20	3054.57	1.39	113.82	2314.82	1.52	91.48	1645.05	1.55	73.04	1.27
p0_score:	9.12															
p1_score:	9.11															
p2_score:	9.04															

Infrastructure_Operations_Scores:			
Completed_Ops_PerHour	vmotion	svmotion	deploy
Avg_Seconds_To_Complete	16.00	10.00	5.50
Failures	27.44	31.90	245.82
Ratio	1.00	0.00	0.00
Number_Of_Threads	1.00	1.11	1.38
	1	1	1

Summary			
Run_Is_Compliant	Number_Of_Compliance_Issues(0)*	Median_Phase(p1)	
Unreviewed_VMmark2_Applications_Score	9.11		
Unreviewed_VMmark2_Infrastructure_Score	1.15		
Unreviewed_VMmark2_Score	7.52		

Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESX 4.1.0 Build 260247 / 07-13-2010
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server 4.1.0. build 25890 / 07-13-2010
Supplemental Software	None
Servers	

Quantity	2
Server Manufacturer and Model	IBM BladeCenter HS22V
Processor Vendor and Model	Intel Xeon X5690
Processor Speed (GHz)	3.46 GHz
Total Sockets/Total Cores/Total Threads	2 Sockets / 12 Cores / 24 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	12 MB I + D on chip per chip L3
BIOS Version	P9E154U
Memory Size (in GB, Number of DIMMs)	96 GB, 12 x 8 GB
Memory Type and Speed	Dual rank PC3-10600 CL9 ECC DDR3 1333MHz VLP RDIMM
Disk Subsystem Type	SAS/SATA
Number of Disk Controllers	1
Disk Controller Vendors and Models	LSI 1064E SAS/SATA (unused)
Number of Host Bus Adapters	1
Host Bus Adapter Vendors and Models	Qlogic 8Gb Fibre Channel Expansion Card (CIOv) for IBM BladeCenter
Number of Network Controllers	2
Network Controller Vendors and Models	Integrated Broadcom NetXtreme II BCM5709 1000Base-SX, Intel 10Gb 2-port Ethernet Expansion Card for IBM BladeCenter
Other Hardware	One Cisco Catalyst Switch 3110G for IBM BladeCenter One BNT Virtual Fabric 10Gb Switch Modules for IBM BladeCenter Two Qlogic 8Gb Fibre Channel Switch Modules for IBM BladeCenter
Other Software	None
Hardware Availability Date (MM-DD-YYYY)	02-24-2011
Software Availability Date (MM-DD-YYYY)	03-23-2011
Network	
Network Switch Vendors and Models	1 x Cisco Catalyst 6506 Enhanced 6-slot chassis 2 x Cat6500 48-port GE Module WS-X6748-GE TX 1 x Cat6500 Series 4-port 10GE Module WS-X6704-10GE
Network Speed	1Gb for SUT management, 10Gb for all VMs and VMotion
Storage	
Array Vendors, Models, and Firmware Versions	2 x IBM System Storage DS5300, version 07.70.38.00 1 x IBM Storwize V7000 Midrange Disk System, version 6.2.0.2 (build 36.3.1107080000)
Fibre Channel Switch Vendors and Models	None
Disk Space Used	1603GB
Array Cache Size	4GB for System Storage DS5300, 8GB for Storwize V7000

Total Number of Physical Disks Used	143
Total Number of Enclosures/Pods/Shelves Used	12
Number of Physical Disks Used per Enclosure/Pod/Shelf	One enclosure with 8 (8 x 300GB 15K disks) Two enclosures with 6 each (6 x 300GB 15K disks) Seven enclosures with 10 each (10 x 300GB 15K disks) One enclosure with 21 (21 x 300GB SSD) One enclosure with 16 (16 x 300GB 15K disks) for boot
Total Number of Storage Groups Used	2
Number of LUNs Used	17
LUN Size and Number of Disks Per LUN	All LUNs with SSD drives are located in IBM Storwize V7000, All LUNs with HDD drives are located in IBM System Storage DS5300 1 LUN at 80GB (Deployment Template), set over 1 x 300GB SSD 1 LUN at 80GB (Deployment Target), set over 6 x 300GB 15K disks 1 LUN at 140GB (Standby Source), set over 6 x 300GB 15K disks 1 LUN at 140GB (Standby Target), set over 8 x 300GB 15K disks 7 LUNs at 600GB (Mailserver, OlioWeb, DS2Web), each set over 10 x 300GB 15K disks 2 LUNs at 300GB (Even OlioDb and Odd OlioDB), each set over 5 x 300GB SSDs 2 LUNs at 600GB (Even DS2DB and Odd DS2DB), each set over 5 x 300GB SSDs 2 LUNs at 140GB (boot), each set over 16 x 300GB 15K disks
RAID Type	RAID 0 except RAID 5 for boot
Number of Members per RAID Set	1 RAID 0 RAID set each over 1 x 300GB SSDs 1 RAID 0 RAID set each over 5 x 300GB SSDs 1 RAID 0 RAID set each over 6 x 300GB 15K disks 1 RAID 0 RAID set each over 8 x 300GB 15K disks 1 RAID 0 RAID set each over 10 x 300GB 15K disks 1 RAID 0 RAID set each over 16 x 300GB 15K disks
Disk Vendors, Models, and Speeds	Seagate Technology Inc. ST3300657FC, 300GB, 15K RPM STEC 300 GB 2.5-inch E-MLC SSD

Datacenter Management Server

System Model	IBM System x3550 M2
Processor Vendor and Model	Intel Xeon E5520
Processor Speed (GHz)	2.27
Total Sockets/Total Cores/Total Threads	2 Sockets / 8 Cores / 16 Threads
Memory	32 GB
Network Controller(s) Vendors and Models	Onboard Broadcom BCM5709C NetXtreme II GigE Intel PRO/1000 PT Quad Port LP Server Adapter
Operating System, Version, and Service Pack	Microsoft Windows Server 2008 R2 Enterprise 64-bit
Other Hardware	None
Other Software	None

Clients

Number of Clients	8 (1 Dedicated Prime client, 7 clients)
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System Model(s)	IBM System x3550 M2
Processor Vendor(s) and Model(s)	Intel Xeon E5520
Processor Speed(s) (GHz)	2.27
Total Sockets/Total Cores/Total Threads	2 Sockets / 8 Cores / 16 Threads
Memory per Client	32 GB
Network Controller(s) Vendors and Models	Onboard Broadcom BCM5709C NetXtreme II GigE Intel PRO/1000 PT Quad Port LP Server Adapter
Operating System, Version, and Service Pack	Prime Client: Microsoft Windows Server 2003 Enterprise 32-bit, Service Pack 2 Clients: Microsoft Windows Server 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 VMXNET 3 for all VMs (default VMXNET 2)
- Logging was disabled for all VMs (default enabled)
- Floppy and CDROM were removed for all VMs (default enabled)
- /adv/Cpu/HaltingIdleMsecPenalty = "0" (default 100)
- /adv/Irq/RoutingPolicy = "0" (default 2)
- /adv/Mem/BalancePeriod = "0" (default 15)
- /adv/Mem/SamplePeriod = "0" (default 60)
- /adv/Mem/ShareScanGHz = "0" (default 4)
- /adv/Misc/NMILint1IntAction = "2" (default 3)
- /adv/Misc/TimerMaxHardPeriod = "4000" (default 100000)
- /adv/Misc/TimerMinHardPeriod = "2000" (default 100)

- /adv/Net/MaxNetifRxQueueLen = "500" (default 100)
- /adv/Net/MaxNetifTxQueueLen = "1000" (default 500)
- /adv/Net/NetTxWorldlet = "1" (default 2)
- /adv/Numa/LTermFairnessInterval = "0" (default 5)
- /adv/Numa/PageMigEnable = "0" (default 1)
- /vmkernel/module/qla2xxx.o/options = "ql2xmaxqdepth=256" (default 32)
- /vmkernel/iovDisableIR = "TRUE" (default FALSE)
- Firewall disabled for Console OS (default enabled)
- Crond daemon is disabled for Console OS (default enabled)
- IP6tables is disabled for Console OS (default enabled)
- Cluster DRS Automation Level set to "Fully Automated", Level 1 ("Aggressive")

Server Notes

- Intel Turbo Boost Technology up to 3.73 GHz
- Intel Turbo Mode: Enable (default Disable)
- Intel Turbo Boost: Traditional (default Power Optimized)
- Power C-States: Enable (default Disable)
- Virtualization Technology VT-d: Enable (default: Disabled)
- Cache Data Prefetcher: Disable (default: Enabled)
- Data Reused: Disabled (default: Enabled)
- Memory LV-DIMM Power: Enhanced Performance (default Low Power)
- Memory Demand Scrub: Disable (default Enable)
- Onboard Planar SAS: Disable (default Enable)
- Power Management: Maximum Performance (default: Active Power Controller)

Networking Notes

- vSwitch0 for Service Console Port is connected to vmnic4 at 1Gb/s

- vSwitch1 for VMkernel ports is connected to vmnic7s. Jumbo Frames was enabled for VMkernel Port at 10Gb/s. MTU size set to 9000.
- vSwitch2 for Virtual Machine Ports for all VMs is connected to vmnic6 at 10Gb/s.

Storage Notes

- There was 1x 80GB RAID 0 LUN, created over 1 x 300GB SSD. This LUN contained Deployment Template.
- There was 1x 80GB RAID 0 LUN, created over 6 x 300GB 15K disks. This LUN contained Deployment Target.
- There was 1x 140GB RAID 0 LUN, created over 6 x 300GB 15K disks. This LUN contained Standby Source.
- There was 1x 140GB RAID 0 LUN, created over 8 x 300GB 15K disks. This LUN contained Standby Target.
- There were 7x 600GB RAID 0 LUNs, each created over 10 x 300GB 15K disks. These LUNs contained Mailserver, OlioWeb, DS2Web VMs.
- There were 2x 300GB RAID 0 LUNs, each created over 5 x 300GB SSDs. These LUNs contained Even OlioDb and Odd OlioDB.
- There were 2x 600GB RAID 0 LUNs, each created over 5 x 300GB SSDs. These LUNs contained Even DS2DB and Odd DS2DB.
- There were 2x 140GB RAID 5 LUNs, each created over 16 x 300GB 15K disks. These LUNs were used for booting ESX over SAN.
- Multipath policy: Round-robin (default Most Recently Used)

Datacenter Management Server Notes

None

Operating System Notes

- All Standby VMs running Microsoft Windows Server 2003 Enterprise SP2 (32-bit). Updates KB926028 and KB933360 were installed.
- All Mailserver VMs running Microsoft Windows Server 2008 R2 Enterprise (64-bit)
- Storage Controller for all Exchange Database Virtual Disks set to Paravirtual

Software Notes

None

Client Notes

- VMware vSphere PowerCLI 4.1 build 264274

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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