

VMware® VMmark™ V1.0.0 Results
(Approved by VMware for Independent Publication)

Vendor and Hardware Platform:
IBM X3850 M2
Virtualization Platform: VMware
ESX 3.5.0 Update 1 (Build 82663)

VMmark V1.0.0 Score =
13.50 @ 10 Tiles

Tested By: IBM Inc., RTP, NC

Test Date: June-11-2008

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Performance

	webserver		javaserver		mailserver		fileserver		database		
TILE_0	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1590.47	1.56	18031.92	1.09	1732.00	1.58	19.20	1.50	1981.70	1.33	1.40
p1	1545.70	1.52	18113.65	1.09	1605.80	1.46	19.19	1.50	2002.62	1.34	1.37
p2	1550.22	1.52	18041.10	1.09	1448.60	1.32	19.05	1.48	2000.92	1.34	1.34
TILE_1	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1552.47	1.52	18027.20	1.09	1617.28	1.47	19.33	1.51	1957.55	1.31	1.37
p1	1528.25	1.50	18048.75	1.09	1640.90	1.50	19.19	1.50	1966.10	1.32	1.37
p2	1518.85	1.49	18045.15	1.09	1551.15	1.41	19.09	1.49	1981.45	1.33	1.35
TILE_2	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1548.40	1.52	17601.25	1.06	1648.38	1.50	19.17	1.49	1948.55	1.31	1.36
p1	1520.03	1.49	18067.62	1.09	1636.47	1.49	18.86	1.47	1977.85	1.33	1.36
p2	1501.70	1.47	18089.47	1.09	1569.22	1.43	18.96	1.48	1991.88	1.33	1.35
TILE_3	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1563.08	1.53	18104.62	1.09	1602.92	1.46	19.41	1.51	1945.78	1.30	1.37
p1	1535.30	1.51	18032.45	1.09	1710.47	1.56	19.25	1.50	1951.08	1.31	1.38
p2	1556.35	1.53	18044.72	1.09	1654.70	1.51	19.17	1.49	1969.67	1.32	1.38
TILE_4	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1549.75	1.52	18021.33	1.08	1539.72	1.40	19.55	1.52	1944.83	1.30	1.36
p1	1534.53	1.51	17555.92	1.06	1608.20	1.47	19.10	1.49	1956.42	1.31	1.35

Configuration

System Under Test (SUT)	
Processor Vendor and Model	Quad-Core Intel Xeon X7350
Processor Speed (GHz)	2.93
# of Sockets/Cores per Socket	4 Sockets / 4 Cores per Socket (16 Cores Total)
Primary Cache	32KB(I) + 32KB(D) on chip, per core
Secondary Cache	8MB(I+D) on chip, per chip, 4MB shared/2 cores
Other Cache	None
Memory	64GB (32x2GB) PC2-5300 667MHz Registered ECC DDR2 DIMM
Disk Subsystem	FC SAN (OS + VMs)
# of Disk Controllers	1
Host Bus Adapters Vendor and Model	2 x QLogic Corp QLA2462
# of Host Bus Adapters	2
# of Network Controllers	4
Network Controllers Vendor and Model	Intel PRO 1000PT Dual Port 1GbE
Network Switches Vendor and Model	Extreme Networks Summit 400-48t
Network Speed	Gigabit Ethernet TX
Other Hardware	None
Other Software	None
Hardware Availability Date	Dec-2007
Software Availability Date	Apr-2008
Virtualization Platform	
Vendor, Product, and Version	VMware ESX 3.5.0 Update 1
Virtualization Type	Hardware Virtualization
Supplemental Software	None
Virtualization Platform Availability Date	Apr-2008

Storage	
Array Vendor and Model/ Firmware Version	<ol style="list-style-type: none"> 1. IBM System Storage DS4800, version 06.60.08.00 2. IBM System Storage DS4800, version 06.60.08.00 3. IBM System Storage EXP 810 storage expansion unit, firmware version 98B3 4. IBM System Storage EXP 810 storage expansion unit, firmware version 98B3 5. IBM System Storage EXP 810 storage expansion unit, firmware version 98B3 6. IBM System Storage EXP 810 storage expansion unit, firmware version 98B3 7. IBM System Storage EXP 810 storage expansion unit, firmware version 98B3 8. IBM System Storage EXP 810 storage expansion unit, firmware version 98B3 9. IBM System Storage EXP 810 storage expansion unit, firmware version 98B3 10. IBM System Storage EXP 810 storage expansion unit, firmware version 98B3 11. IBM System Storage EXP 810 storage expansion unit, firmware version 98B3 12. IBM System Storage EXP 810 storage expansion unit, firmware version 98B3 13. IBM System Storage EXP 810 storage expansion unit, firmware version 98B3 14. IBM System Storage EXP 810 storage expansion unit, firmware version 98B3 15. IBM System Storage EXP 810 storage expansion unit, firmware version 98B3 16. IBM System Storage EXP 810 storage expansion unit, firmware version 98B3 17. IBM System Storage EXP 810 storage expansion unit, firmware version 98B3
Fibre Channel Switches Vendor and Model	None
Used GB	792GB
Array Cache GB	<ol style="list-style-type: none"> 1. IBM System Storage DS4800, 4GB 2. IBM System Storage DS4800, 4GB

Number and Size of LUNs	LUN0: 130GB LUN1: 130GB LUN2: 130GB LUN3: 130GB LUN4: 130GB LUN5: 130GB LUN6: 130GB LUN7: 130GB LUN8: 130GB LUN9: 130GB LUN10: 270GB LUN11: 80GB LUN12: 407GB LUN13: 407GB LUN14: 407GB LUN15: 407GB LUN16: 407GB LUN17: 407GB LUN18: 407GB LUN19: 407GB LUN20: 407GB LUN21: 407GB LUN22: 270GB
RAID Type	LUN0: RAID10 LUN1: RAID10 LUN2: RAID10 LUN3: RAID10 LUN4: RAID10 LUN5: RAID10 LUN6: RAID10 LUN7: RAID10 LUN8: RAID10 LUN9: RAID10 LUN10: RAID10 LUN11: RAID5 LUN12: RAID0 LUN13: RAID0 LUN14: RAID0 LUN15: RAID0 LUN16: RAID0 LUN17: RAID0 LUN18: RAID0 LUN19: RAID0 LUN20: RAID0

	LUN21: RAID0 LUN22: RAID10
Number of Members per RAID Set	LUN0: 10 members LUN1: 10 members LUN2: 10 members LUN3: 10 members LUN4: 10 members LUN5: 10 members LUN6: 10 members LUN7: 10 members LUN8: 10 members LUN9: 10 members LUN10: 16 members LUN11: 16 members LUN12: 6 members LUN13: 6 members LUN14: 6 members LUN15: 6 members LUN16: 6 members LUN17: 6 members LUN18: 6 members LUN19: 6 members LUN20: 6 members LUN21: 6 members LUN22: 16 members
Disk Vendor and Model/Speed	Seagate Technologies Inc. ST373455FC /15K RPM Seagate Technologies Inc. ST3146954FC /15K RPM Seagate Technologies Inc. ST3146855FC /15K RPM

Clients

# of Clients	10
System Model	10 x IBM eServer xSeries x335
Processor Vendor and Model	Intel Xeon
Processor Speed (GHz)	3.06 GHz
# of Sockets/# of Cores	2/2
Memory	2.5 GB
Network Controller Vendor and Model	Broadcom NetXtreme Gigabit Ethernet
Operating System, Version, and Service Pack	Microsoft Windows Server 2003 R2 Enterprise Edition SP2
Other Hardware	None

Notes for Workload

SUT Notes

- Processor Hardware Prefetch disabled (default enabled)
- Onboard Ethernet disabled (default enabled)
- Onboard SAS disabled (default enabled)

Virtualization Platform Notes

- VMware ESX 3.5.0 Update 1 (Build 82663)
- Six vSwitch0, vSwitch1, vSwitch2, vSwitch3, vSwitch4 and vSwitch5 bound to vmnic0, vmnic3, vmnic4, vmnic6, vmnic7 and vmnic8 (physical NICs) respectively.
- Each vSwitch was configured to 120 ports (default 56).
- Each vSwitch was configured to “1000 Mb, Full Duplex” (default “Auto negotiate”).
- Service Console was shared with vSwitch0.
- Database VMs were attached to vSwitch0; Javaserer, Standby and Webserver VMs 0-2 were attached to vSwitch1; Javaserer, Standby and Webserver VMs 3-5 were attached to vSwitch2, Mailserver VMs were attached to vSwitch3, Fileserver VMs were attached to vSwitch4, Javaserer, Standby and Webserver VMs 6-9 were attached to vSwitch5.
- Database0-5 VMs were stored on LUN 10. Database6-9 VMs were stored on LUN 22.
- Each file server VM was stored on its own LUN from LUN12 to LUN21.
- For all other VMs, each tile was stored on its own LUN from LUN0 to LUN9. LUN11 has an 80GB partition for VMware ESX3.5.0 Update 1 OS.
- Path policy of each LUN storage is set to “Fixed” (default “Most Recently Used”).
- In all file server VMs, clock is set to “pit” in /boot/grub/menu.lst (default clock=pmtmr).
- Network adapter type was set to enhanced vmxnet for all VMs.
- vmfs2 module was unloaded prior to the benchmark run.
- Disk.SchedNumReqOutstanding 128 (default 32)

Operating System Notes

- Microsoft Windows Server 2003 R2 Enterprise Edition Service Pack 2 on Windows-based virtual machines
- [KB 933360](#) was applied

Software Notes

Client Notes

- Microsoft Windows Server 2003 R2 Enterprise Edition, Service Pack 2
- [KB 933360](#) was applied

Other Notes

2 x IBM System Storage DS4800

- Cache block size 16KB (default 4KB)
- Background media scan disabled (default enabled)
- Write caching with mirroring disabled (default enabled)
- Write caching without batteries disabled (default enabled)

QLogic 2462

- Loop reset delay 8 (default 5)
 - PortDownRetryCount 14 (default 30)
 - Interrupt Delay Timer 10 (default 0)
 - Enable Target Reset No (default Yes)
 - Link down timeout 60 (default 30)
 - Execution Throttle 256 (default 16)
 - LUNs per Target 256 (default 128)
 - Operation Mode 5 (default 0)
 - Maximum queue depth 64 (default 32)
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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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