

VMware® VMmark™ V1.1 Results

Vendor and Hardware Platform: IBM System x3950 M2
Virtualization Platform: VMware ESX 4.0 (Build 157813)

VMmark V1.1 Score =
33.66 @ 24 Tiles

Tested By: IBM Inc., RTP, NC

Test Date: 05/24/2009

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Performance

	webservers		javaservers		mailservers		fileservers		databases		
TILE_0	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1600.28	1.57	17871.03	1.08	1800.35	1.64	17.45	1.36	2284.12	1.53	1.42
p1	1883.67	1.85	17898.20	1.08	1648.75	1.50	17.42	1.36	2292.50	1.54	1.44
p2	1931.03	1.90	17829.38	1.07	1600.12	1.46	17.46	1.36	2296.50	1.54	1.44
TILE_1	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1860.60	1.83	17826.75	1.07	1748.08	1.59	17.30	1.35	2298.90	1.54	1.45
p1	1835.88	1.80	17816.40	1.07	1901.15	1.73	17.25	1.34	2307.43	1.55	1.47
p2	1821.20	1.79	17337.12	1.04	1721.25	1.57	16.97	1.32	2309.10	1.55	1.43
TILE_2	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1894.50	1.86	17988.65	1.08	1662.62	1.52	12.40	0.97	2283.62	1.53	1.35
p1	1896.17	1.86	17998.53	1.08	1787.60	1.63	11.88	0.93	2287.30	1.53	1.36
p2	1885.00	1.85	17985.67	1.08	1608.97	1.47	11.86	0.92	2287.55	1.53	1.33
TILE_3	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1844.05	1.81	17433.70	1.05	1694.97	1.55	18.58	1.45	2340.88	1.57	1.46
p1	1822.45	1.79	17890.50	1.08	1805.62	1.65	18.42	1.44	2340.80	1.57	1.48
p2	1798.70	1.77	17882.97	1.08	1710.22	1.56	18.35	1.43	2350.53	1.58	1.46

TILE_4	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1846.88	1.81	17780.03	1.07	1699.70	1.55	16.01	1.25	2285.75	1.53	1.42
p1	1828.33	1.79	17778.17	1.07	1772.67	1.62	16.16	1.26	2290.12	1.53	1.43
p2	1798.30	1.76	17778.08	1.07	1750.85	1.60	17.06	1.33	2290.53	1.53	1.44
TILE_5	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1863.30	1.83	17276.30	1.04	1666.97	1.52	7.21	0.56	2338.72	1.57	1.21
p1	1839.55	1.81	17724.55	1.07	1830.05	1.67	7.25	0.57	2338.78	1.57	1.23
p2	1803.12	1.77	17697.22	1.07	1739.10	1.59	7.12	0.56	2350.20	1.57	1.21
TILE_6	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1949.08	1.91	17518.40	1.05	1704.85	1.55	9.96	0.78	2283.55	1.53	1.30
p1	1939.45	1.90	17983.25	1.08	1774.53	1.62	9.40	0.73	2286.78	1.53	1.30
p2	1940.78	1.90	17979.95	1.08	1577.67	1.44	9.64	0.75	2288.35	1.53	1.28
TILE_7	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1918.08	1.88	17712.05	1.07	1743.58	1.59	18.03	1.41	2284.53	1.53	1.47
p1	1904.17	1.87	17711.83	1.07	1710.30	1.56	17.70	1.38	2289.75	1.53	1.46
p2	1881.80	1.85	17729.00	1.07	1733.22	1.58	17.63	1.37	2292.57	1.54	1.46
TILE_8	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1949.58	1.91	17832.47	1.07	1740.97	1.59	18.04	1.41	2312.50	1.55	1.48
p1	1943.33	1.91	17839.03	1.07	1720.17	1.57	18.19	1.42	2312.25	1.55	1.48
p2	1941.47	1.91	17810.58	1.07	1726.28	1.57	18.35	1.43	2316.90	1.55	1.48
TILE_9	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1924.38	1.89	17683.53	1.06	1595.12	1.45	19.13	1.49	2326.45	1.56	1.47
p1	1910.05	1.87	17687.97	1.06	1551.22	1.41	18.85	1.47	2331.15	1.56	1.45
p2	1890.95	1.86	17723.50	1.07	1434.95	1.31	18.80	1.46	2341.43	1.57	1.43
TILE_10	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1865.17	1.83	17921.28	1.08	1651.10	1.51	12.49	0.97	2205.93	1.48	1.34
p1	1820.75	1.79	17933.30	1.08	1482.75	1.35	12.26	0.96	2217.85	1.49	1.30
p2	1904.08	1.87	17930.83	1.08	1608.75	1.47	12.10	0.94	2218.47	1.49	1.33
TILE_11	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1911.05	1.88	17850.80	1.07	1674.72	1.53	11.85	0.92	2328.85	1.56	1.35
p1	1891.35	1.86	17866.72	1.08	1671.40	1.52	9.83	0.77	2337.10	1.57	1.30

p2	1876.72	1.84	17839.90	1.07	1686.38	1.54	11.09	0.86	2347.12	1.57	1.33
TILE_12	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1909.35	1.87	17291.00	1.04	1650.67	1.50	11.86	0.92	2334.45	1.56	1.34
p1	1888.03	1.85	17818.28	1.07	1793.50	1.64	11.45	0.89	2344.28	1.57	1.35
p2	1867.05	1.83	17792.40	1.07	1726.53	1.57	10.02	0.78	2292.62	1.54	1.30
TILE_13	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1907.33	1.87	17935.47	1.08	1623.38	1.48	12.60	0.98	2335.57	1.57	1.36
p1	1893.17	1.86	17981.80	1.08	1660.25	1.51	12.11	0.94	2338.60	1.57	1.35
p2	1862.22	1.83	17973.75	1.08	1688.75	1.54	11.97	0.93	2345.47	1.57	1.35
TILE_14	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1870.53	1.84	17909.88	1.08	1639.78	1.50	16.55	1.29	2315.97	1.55	1.43
p1	1860.90	1.83	17887.08	1.08	1627.92	1.48	17.06	1.33	2320.30	1.55	1.43
p2	1827.20	1.79	17895.17	1.08	1630.58	1.49	17.23	1.34	2327.60	1.56	1.43
TILE_15	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1943.17	1.91	17896.42	1.08	1595.88	1.46	17.73	1.38	2346.55	1.57	1.45
p1	1933.85	1.90	17880.62	1.08	1666.15	1.52	17.50	1.36	2351.00	1.58	1.46
p2	1934.03	1.90	17876.67	1.08	1660.28	1.51	17.36	1.35	2358.07	1.58	1.46
TILE_16	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1933.38	1.90	17912.45	1.08	1641.40	1.50	17.59	1.37	2199.03	1.47	1.44
p1	1926.10	1.89	17907.40	1.08	1652.83	1.51	17.45	1.36	2214.32	1.48	1.44
p2	1889.88	1.85	17908.90	1.08	1776.38	1.62	17.41	1.36	2219.15	1.49	1.46
TILE_17	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1924.62	1.89	17526.33	1.05	1566.78	1.43	17.46	1.36	2302.50	1.54	1.43
p1	1911.97	1.88	17963.17	1.08	1766.80	1.61	17.29	1.35	2306.65	1.55	1.47
p2	1892.55	1.86	17974.17	1.08	1654.45	1.51	17.36	1.35	2304.68	1.54	1.45
TILE_18	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1815.83	1.78	17921.97	1.08	1563.00	1.43	17.50	1.36	2251.95	1.51	1.41
p1	1809.22	1.78	17902.45	1.08	1640.62	1.50	17.20	1.34	2258.80	1.51	1.42
p2	1804.60	1.77	17919.47	1.08	1651.40	1.51	17.38	1.35	2255.72	1.51	1.43
TILE_19	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1909.08	1.87	17885.00	1.08	1530.38	1.40	17.54	1.37	2345.28	1.57	1.43

p1	1889.03	1.85	17913.92	1.08	1629.25	1.49	17.22	1.34	2347.62	1.57	1.44
p2	1867.42	1.83	17919.50	1.08	1703.35	1.55	17.18	1.34	2350.47	1.57	1.45
TILE_20	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1870.35	1.84	17865.35	1.08	1326.60	1.21	17.12	1.33	2337.55	1.57	1.38
p1	1860.80	1.83	17880.22	1.08	1504.65	1.37	16.85	1.31	2337.60	1.57	1.41
p2	1844.15	1.81	17400.47	1.05	1587.03	1.45	16.64	1.30	2339.00	1.57	1.41
TILE_21	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1858.62	1.82	17814.67	1.07	1348.92	1.23	17.41	1.36	2344.78	1.57	1.39
p1	1860.35	1.83	17833.35	1.07	1481.25	1.35	17.05	1.33	2282.88	1.53	1.40
p2	1856.22	1.82	17387.80	1.05	1780.47	1.62	17.26	1.35	2344.95	1.57	1.46
TILE_22	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1869.00	1.83	17827.00	1.07	1294.67	1.18	17.58	1.37	2324.85	1.56	1.38
p1	1856.40	1.82	17337.88	1.04	1480.22	1.35	16.36	1.28	2323.88	1.56	1.38
p2	1852.88	1.82	17843.25	1.07	1616.67	1.47	16.27	1.27	2330.82	1.56	1.42
TILE_23	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1914.15	1.88	17913.88	1.08	1215.35	1.11	17.43	1.36	2334.85	1.56	1.37
p1	1908.60	1.87	17876.33	1.08	1448.58	1.32	17.42	1.36	2339.03	1.57	1.41
p2	1886.85	1.85	17893.47	1.08	1615.55	1.47	17.39	1.36	2341.25	1.57	1.44
p0_score:	33.51										
p1_score:	33.69										
p2_score:	33.66										
Unreviewed_VMmark_Score:	33.66										

Configuration

Server and Network

Server Manufacturer and Model	IBM System x3950 M2
Processor Vendor and Model	6-Core Intel Xeon™ MP Processor X7460
Processor Speed (GHz)	2.66
Number of Sockets/Cores per Socket	8 Sockets / 6 Cores per Socket (48 Cores Total)
Primary Cache	32 KB(I) + 32KB(D) on chip, per core
Secondary Cache	3 MB per core pair, 9 MB per socket, 72 MB Total
Other Cache	16MB per socket, 128MB Total L3 cache
Memory	256 GB (64 x 4 GB PC2-5300 667MHz Registered ECC DDR2 DIMM)
Disk Subsystem Type	FC SAN (OS + VMs)
Number of Disk Controllers	4
Number of Host Bus Adapters	4
Host Bus Adapter Vendors and Models	4 x QLogic QLE2462
Number of Network Controllers	4
Network Controller Vendors and Models	Intel PRO 1000PT Dual Port 1GbE
Network Switch Vendors and Models	Nortel Passport 8010 Gigabit Switch
Network Speed	Gigabit Ethernet TX
Other Hardware	None
Other Software	None
Hardware Availability Date	10/10/2008
Software Availability Date	10/10/2008

Virtualization Software

Vendor, Product, Version, and Build	VMware ESX 4.0 Build 157813
Virtualization Type	Hardware Virtualization
Supplemental Software	None
Virtualization Software Availability Date	05/21/2009

Storage	
Array Vendor, Model, and Firmware Version	IBM System Storage DS4800, version 09.60.G5.46 19x IBM System Storage EXP 810 storage expansion unit, version B977
Fibre Channel Switch Vendors and Models	None
Disk Space Used	1804 GB
Array Cache Size	IBM System Storage DS4800, 4GB
Number and Size of LUNs	Total of 49 LUNs LUN0: 100GB LUN20-43: 100GB each LUN200-223: 33GB each
RAID Type	LUN0: RAID 5 LUN20-LUN223: RAID 0
Number of Members per RAID Set	LUN0: 16 members LUN20-LUN43: 8 members LUN200-LUN223: 3 members
Disk Vendor, Model, and Speed	Seagate Technologies Inc., ST336753FC, 15K RPM Seagate Technologies Inc., ST3146855FC, 15K RPM Seagate Technologies Inc., ST373455FC, 15K RPM Seagate Technologies Inc., ST373554FC, 15K RPM

Clients	
Number of Clients	24
System Model(s)	21x IBM eServer xSeries 336, 3x IBM eServer xSeries 335
Processor Vendor(s) and Model(s)	Intel Xeon
Processor Speed(s) (GHz)	3.2GHz in x336, 3.06GHz in x335
Number of Sockets/Cores per Socket	2 Sockets / 1 Cores per Socket (2 Cores Total), Hyper-Threading Enabled for all systems
Memory	3 GB memory in x336, 2.5GB memory in x335
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

Other Software

None

Notes for Workload

Server and Network Notes

- Onboard SAS disabled (default enabled)
- Onboard Ethernet disabled (default enabled)
- Serial Port A disabled (default Port 3F8, IRQ4)
- Primary IDE Channel disabled (default enabled)
- Planar Ethernet PXE/DHCP disabled (default enabled)
- USB Disk disabled (default enabled)
- Boot on POST/BIOS Error disabled (default enabled)
- Cluster Mode set to Physical (default logical)

Virtualization Software Notes

- Eight vSwitches: vSwitch0-7
All vSwitches are configured with 120 ports (default 24 for vSwitch0 and 56 for all others)
- vSwitch0-7 were attached to vmnic0-7, respectively
- Webserver 0-5 are attached to vSwitch1
- Webserver 6-11 are attached to vSwitch3
- Webserver 12-17 are attached to vSwitch5
- Webserver 18-23 are attached to vSwitch7
- Database 0-4, Fileserver/ Java/Mail/Standby 0-5 and Service console are attached to vSwitch0
- Database 5-9, Fileserver/ Java/Mail/Standby 6-11 are attached to vSwitch2
- Database 10-17, Fileserver/ Java/Mail/Standby 12-17 are attached to vSwitch4
- Database 18-23, Fileserver/ Java/Mail/Standby 18-23 are attached to vSwitch6
- Network adapter type was set to vmxnet3 for all VMs

- All database VMs were stored on LUNs 200-223 each database on its own LUN (numbered 200+ Tile Number)
- All other VMs were stored on LUNs 20-43 each tile on its own LUN (numbered 20+Tile Number)
- Path policy of each LUN storage is set to “Fixed” (default “Most Recently Used)
- ESX boot image was on LUN 0
- Stopped Crond, Firewall, IPTables, IP6tables processes on ESX host prior to run
- VMFS2 module was unloaded prior to run
- Disabled ESX logging on all VMs
- Disk.SchedNumReqOutstanding was set to 128 (default 32)
- EtherswitchHashSize was set to 4 (default 1)
- BufferCache.SoftMaxDirty was set to 85 (default 15)
- Cpu.CoschdHandoffLLC was set to 1 (default 0)
- Net.MaxNetifRxQueueLen was set to 300 (default 100)
- Net.MaxNetifTxQueueLen was set to 1000 (default 500)
- Net.MaxPortRxQueueLen was set to 160 (default 80)
- IDE and Floppy devices were removed on all VMs prior to run
- Hardware Version is 7 for all VMs

Operating System Notes

- Microsoft Windows Server 2003 R2 Enterprise Edition Service Pack 2 on Windows-based virtual machines
- KB 933360 was applied
- Suse Linux Enterprise Server 10 (32- and64-bit) Service Pack 2 on all Linux-based virtual machines

Software Notes

Client Notes

- Microsoft Windows Server 2003 R2 Enterprise Edition, Service Pack 2

- [KB 933360](#) was applied

Other Notes

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 QLA2462

- Loop reset delay 8 (default 5)
- PortDownRetryCount 14 (default 30)
- Operation Mode 5 (default 0)
- 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)
- Maximum queue depth 128 (default 32)

VMmark.conf

- TILEDELAY=500 (default 600)

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.

For information about VMmark and the rules regarding its usage visit www.vmware.com/products/vmmark.

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