

VMware® VMmark™ V1.1.1 Results

Vendor and Hardware Platform: Dell PowerEdge R710
Virtualization Platform: VMware ESX version 4.0 (build 164009)

VMmark V1.1.1 Score =
24.27 @ 17 Tiles

Tested By: Dell Inc

Test Date: 07-20-2009

Performance Section
[Performance](#)

Configuration Section
[Configuration](#)

Notes Section
[Notes for Workload](#)

Performance

	webserver		javaserver		mailserver		fileserver		database		
TILE_0	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1812.78	1.78	18159.40	1.09	1611.00	1.47	15.95	1.24	2383.57	1.60	1.41
p1	1814.00	1.78	18162.67	1.09	1587.28	1.45	16.09	1.25	2381.82	1.60	1.41
p2	1821.83	1.79	17701.58	1.07	1580.60	1.44	16.14	1.26	2381.55	1.60	1.41
TILE_1	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1697.08	1.67	18127.22	1.09	1714.75	1.56	15.85	1.24	2408.93	1.61	1.41
p1	1767.55	1.73	18140.88	1.09	1708.90	1.56	15.81	1.23	2410.22	1.62	1.42
p2	1777.10	1.74	18135.35	1.09	1642.40	1.50	16.15	1.26	2406.80	1.61	1.42
TILE_2	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1855.40	1.82	18128.45	1.09	1581.88	1.44	17.01	1.33	2419.90	1.62	1.44
p1	1883.20	1.85	18118.40	1.09	1608.38	1.47	17.35	1.35	2413.88	1.62	1.45
p2	1879.10	1.84	18113.65	1.09	1584.88	1.44	17.24	1.34	2416.15	1.62	1.45
TILE_3	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1751.62	1.72	18143.90	1.09	1581.50	1.44	16.79	1.31	2420.18	1.62	1.42
p1	1810.65	1.78	18128.25	1.09	1677.35	1.53	17.25	1.34	2427.15	1.63	1.45
p2	1816.97	1.78	18116.20	1.09	1671.75	1.52	17.29	1.35	2426.65	1.63	1.45
TILE_4	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1860.70	1.83	18114.67	1.09	1638.85	1.49	15.71	1.22	2399.03	1.61	1.42
p1	1865.92	1.83	18151.90	1.09	1602.80	1.46	16.14	1.26	2405.88	1.61	1.43
p2	1876.00	1.84	18105.28	1.09	1583.67	1.44	15.96	1.24	2406.20	1.61	1.42
TILE_5	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1874.83	1.84	18110.65	1.09	1725.88	1.57	16.02	1.25	2218.18	1.49	1.42
p1	1894.85	1.86	18117.35	1.09	1742.17	1.59	16.40	1.28	2210.45	1.48	1.44
p2	1886.90	1.85	18131.97	1.09	1695.25	1.55	16.37	1.28	2210.82	1.48	1.43

TILE_6	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1757.60	1.72	18050.05	1.09	1700.67	1.55	15.31	1.19	2265.80	1.52	1.39
p1	1781.17	1.75	18084.95	1.09	1665.45	1.52	15.38	1.20	2264.35	1.52	1.39
p2	1794.38	1.76	18099.53	1.09	1774.25	1.62	15.59	1.22	2254.38	1.51	1.42
TILE_7	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1827.50	1.79	18123.58	1.09	1658.15	1.51	15.39	1.20	2253.30	1.51	1.40
p1	1832.95	1.80	18137.17	1.09	1745.22	1.59	15.49	1.21	2238.05	1.50	1.41
p2	1841.58	1.81	18134.20	1.09	1742.47	1.59	15.65	1.22	2235.88	1.50	1.42
TILE_8	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1731.97	1.70	18153.83	1.09	1650.62	1.50	15.29	1.19	2230.45	1.49	1.38
p1	1787.78	1.75	18155.70	1.09	1756.03	1.60	15.59	1.21	2217.70	1.49	1.41
p2	1798.33	1.76	18128.75	1.09	1652.62	1.51	15.69	1.22	2213.10	1.48	1.39
TILE_9	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1805.62	1.77	18083.53	1.09	1680.72	1.53	15.94	1.24	2230.82	1.49	1.41
p1	1882.95	1.85	18082.15	1.09	1804.30	1.65	16.36	1.28	2223.90	1.49	1.44
p2	1864.88	1.83	18075.08	1.09	1680.45	1.53	16.39	1.28	2222.88	1.49	1.42
TILE_10	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1893.47	1.86	18045.33	1.09	1344.38	1.23	16.12	1.26	2400.05	1.61	1.38
p1	1916.30	1.88	18082.25	1.09	1360.03	1.24	16.32	1.27	2398.82	1.61	1.39
p2	1912.30	1.88	18114.62	1.09	1328.83	1.21	16.53	1.29	2398.72	1.61	1.39
TILE_11	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1803.03	1.77	18139.53	1.09	1632.53	1.49	16.64	1.30	2409.55	1.61	1.43
p1	1807.85	1.77	18138.08	1.09	1646.55	1.50	17.21	1.34	2406.03	1.61	1.44
p2	1823.20	1.79	17678.83	1.06	1710.67	1.56	17.22	1.34	2406.78	1.61	1.45
TILE_12	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1854.58	1.82	18087.80	1.09	1601.38	1.46	16.52	1.29	2276.28	1.53	1.42
p1	1860.60	1.83	18100.97	1.09	1585.45	1.45	17.04	1.33	2307.45	1.55	1.43
p2	1866.25	1.83	18107.50	1.09	1607.67	1.47	17.05	1.33	2320.20	1.55	1.43
TILE_13	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1856.97	1.82	18075.80	1.09	1449.88	1.32	16.53	1.29	2421.90	1.62	1.41
p1	1857.92	1.82	18080.42	1.09	1621.20	1.48	17.05	1.33	2422.62	1.62	1.45
p2	1864.58	1.83	18096.12	1.09	1626.88	1.48	17.14	1.34	2420.53	1.62	1.45
TILE_14	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1896.17	1.86	18124.33	1.09	1444.10	1.32	16.00	1.25	2415.07	1.62	1.40
p1	1916.62	1.88	18136.62	1.09	1714.25	1.56	16.29	1.27	2418.50	1.62	1.46
p2	1917.90	1.88	18096.28	1.09	1760.45	1.61	16.46	1.28	2419.18	1.62	1.47

TILE_15	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1861.80	1.83	17619.28	1.06	1295.15	1.18	16.63	1.30	2387.55	1.60	1.37
p1	1862.60	1.83	18113.47	1.09	1536.72	1.40	16.93	1.32	2382.78	1.60	1.43
p2	1866.58	1.83	18073.55	1.09	1611.58	1.47	16.75	1.31	2386.18	1.60	1.44
TILE_16	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1646.08	1.62	18040.85	1.09	1239.45	1.13	16.04	1.25	2378.80	1.59	1.32
p1	1825.25	1.79	17649.30	1.06	1583.50	1.44	16.37	1.28	2388.75	1.60	1.41
p2	1829.35	1.80	18103.20	1.09	1649.05	1.50	16.31	1.27	2382.05	1.60	1.43
p0_score:	23.83										
p1_score:	24.27										
p2_score:	24.28										
Unreviewed_VMmark_Score:	24.27										

Configuration

Server and Network	
Server Manufacturer and Model	Dell PowerEdge R710
Processor Vendor and Model	Intel Xeon X5570
Processor Speed (GHz)	2.93
Total Sockets/Total Cores/Total Threads	2 Sockets / 8 Cores / 16 Threads
Primary Cache	32KB(I)+32KB(D) per core
Secondary Cache	256KB per core
Other Cache	8MB L3
BIOS Version	1.3.1
Memory Size (in GB, Number of DIMMs)	96GB
Memory Type and Speed	12x8GB DDR3-1066MHz Dual Rank REG RDIMMs
Disk Subsystem Type	SAS (OS), FC SAN (VMs)
Number of Disk Controllers	1
Disk Controller Vendors and Models	Dell PowerEdge Expandable RAID Controller (PERC) 6/i
Number of Host Bus Adapters	3
Host Bus Adapter Vendors and Models	Qlogic Corp QLE2462 Dual Port
Number of Network Controllers	3
Network Controller Vendors and Models	2 x dual-port embedded Broadcom NetXtreme II BCM5709 1 x Intel Gigabit VT Quad Port Server Adapter

Network Switch Vendors and Models	Dell PowerConnect 6248
Network Speed	1000Base-T
Other Hardware	None
Other Software	None
Hardware Availability Date	03/30/2009
Software Availability Date	05/21/2009
Virtualization Software	
Vendor, Product, Version, and Build	VMware ESX version 4.0 build 164009
Virtualization Type	Hardware Virtualization
Supplemental Software	None
Virtualization Software Availability Date	05/21/2009
Storage	
Array Vendors, Models, and Firmware Versions	3 x Dell/EMC CX3-40f, version 03.26.040.5.025
Fibre Channel Switch Vendors and Models	None
Disk Space Used	1054 GB for VMs
Array Cache Size	8GB per array
Total Number of Physical Disks Used	98
Total Number of Enclosures/Pods/Shelves Used	6 enclosures
Total Number of Physical Disks per Enclosures/Pods/Shelves Used	15 Physical Disks per Enclosure
Total Number of Storage Groups Used	6
Number LUNs Used	19
LUN Size and Number of Disks Per LUN	~300GB, 10 disks per LUN
RAID Type	RAID0
Number of Members per RAID Set	10
Disk Vendors, Models, and Speeds	Hitachi HUS151P7/Seagate STT73455 15K for DATA /8 Dell SAS 73GB 15k for OS
Clients	
Number of Clients	17

System Model(s)	client0: PowerEdge 1750 client1: PowerEdge 1750 client2: PowerEdge 1750 client3: PowerEdge 1750 client4: PowerEdge 1850 client5: PowerEdge 1650 client6: PowerEdge 1650 client7: PowerEdge 1650 client8: PowerEdge 1650 client9: PowerEdge 1650 client10: PowerEdge 1850 client11: PowerEdge 1850 client12: PowerEdge 1850 client13: PowerEdge 1850 client14: PowerEdge 1850 client15: PowerEdge 1850 client16: PowerEdge 1850
Processor Vendor(s) and Model(s)	Intel Xeon
Processor Speed(s) (GHz)	client0: 3.06 client1: 3.06 client2: 3.20 client3: 3.20 client4: 2.80 client5: 1.40 client6: 1.40 client7: 1.40 client8: 1.40 client9: 1.40 client10: 3.40 client11: 3.60 client12: 3.60 client13: 3.60 client14: 3.60 client15: 3.60 client16: 3.60
Total Sockets/Total Cores/Total Threads	client0: 2 Sockets / 1 Core per Socket (2 Cores Total) client1: 2 Sockets / 1 Core per Socket (2 Cores Total) client2: 2 Sockets / 1 Core per Socket (2 Cores Total) client3: 2 Sockets / 1 Core per Socket (2 Cores Total) client4: 1 Socket / 2 Cores per Socket (2 Cores Total) client5: 2 Sockets / 1 Core per Socket (2 Cores Total) client6: 2 Sockets / 1 Core per Socket (2 Cores Total) client7: 2 Sockets / 1 Core per Socket (2 Cores Total) client8: 2 Sockets / 1 Core per Socket (2 Cores Total) client9: 2 Sockets / 1 Core per Socket (2 Cores Total) client10: 2 Sockets / 1 Core per Socket (2 Cores Total) client11: 2 Sockets / 1 Core per Socket (2 Cores Total) client12: 2 Sockets / 1 Core per Socket (2 Cores Total) client13: 2 Sockets / 1 Core per Socket (2 Cores Total)

	client14: 2 Sockets / 1 Core per Socket (2 Cores Total) client15: 2 Sockets / 1 Core per Socket (2 Cores Total) client16: 2 Sockets / 1 Core per Socket (2 Cores Total)
Memory per Client	2 GB except client10, which had 8 GB
Network Controller Vendors and Models	Intel PRO/1000 XT Network Connection (1650), Broadcom NetXtreme Gigabit Ethernet (1750), Intel PRO/1000 MT Network Connection (1850)
Operating System, Version, and Service Pack	Microsoft Windows Server 2003 Enterprise Edition SP2
Other Hardware	None
Other Software	None

Notes for Workload

Server and Network Notes

- Server BIOS settings:
 - Intel Turbo Boost Technology up to 3.33 GHz (default)
 - Virtualization Technology = Enabled
 - Embedded SATA = Off (default On)
 - Internal USB port = Off (default On)
 - User Accessible USB Ports = All Ports Off (default On)
 - Qlogic HBA BIOS settings:
 - Data rate option set to 3 (default 2)
- Array settings:
 - Storage Processor cache High/Low watermark - 40/20 (default 80/60)
- Storage Configuration:
 - Each tile was stored on its own LUN

Network Settings:

- Broadcom NICs (vmmnic0,1,2,3) bound to vSwitch0,1,2,3 respectively
- Two Intel ports (vmmnic4,5) bound to vSwitch4,5 respectively (2 unused)
- Service console and WebServer0,2-7 attached to vSwitch0
- JavaServer, MailServer, and Standby VMs attached to vSwitch1
- Database VMs attached to vSwitch2
- WebServer1,8-15 VMs attached to vSwitch3
- WebServer16 VM attached to vSwitch4
- FileServer VMs attached to vSwitch5
- vSwitch0 is configured with 64 ports (default 24)
- vSwitch1,2,3,4,5 are configured with 128 port (default 56)

Virtualization Software Notes

- Hardware support for both CPU and MMU virtualization enabled on all VMs (default Automatic)
- Disk.EnableNaviReg set to 0 (default 1)
- Disk.SchedNumReqOutstanding was set to 128 (default 32)

- IRQ.RoutingPolicy = 0 (default 2)
- Net.EtherswitchHashSize was set to 4 (default 1)
- BufferCache.SoftMaxDirty was set to 85 (default 15)
- VMFS3.MaxHeapSizeMB was set to 64 (default 80)
- All VMs' hardware upgraded to version 7
- Ethernet Adapter type was set to VMXNET3 for all VMs
- Logging was disabled for all VMs (default enabled)
- IDE and Floppy devices were removed on all VMs (default enabled) for all but Webserver09
- ip6tables and firewall services disabled at boot
- vmfs2 module unloaded at boot
- /vmkernel/module/qla2xxx.o/options="ql2xmaxqdepth=64" set in /etc/vmware/esx.conf (default 32)

Operating System Notes

- Microsoft Windows Server 2003 virtual machines were updated to Service Pack 2, and KB951072-v2 was applied
- SUSE Linux Enterprise Server 10 virtual machines were updated to Service Pack 2

Software Notes

Client Notes

- KB951072-v2 was applied

Other Notes

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.

VMware and VMmark are trademarks or registered trademarks of VMware, Inc. VMware® VMmark™ is a product of [VMware, Inc.](http://www.vmware.com) VMmark utilizes SPECjbb®2005 and SPECweb®2005, which are available from the [Standard Performance Evaluation Corporation \(SPEC®\)](http://www.spec.org).