

VMware® VMmark™ V1.1 Results

Vendor and Hardware Platform: Dell PowerEdge R900
Virtualization Platform: VMware ESX 3.5 Update 3 (build 123630)

VMmark V1.1 Score =
19.99 @ 14 Tiles

Tested By: Dell Inc.

Test Date: 12/13/2008

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Performance

	webservers		javaserver		mailserver		fileserver		database		
TILE_0	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1842.33	1.81	17990.15	1.08	1845.38	1.68	17.99	1.40	2185.20	1.46	1.47
p1	1800.03	1.77	17974.47	1.08	1829.50	1.67	17.68	1.38	2185.55	1.46	1.45
p2	1810.05	1.78	17973.35	1.08	1797.60	1.64	17.65	1.38	2171.15	1.45	1.45
TILE_1	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1874.00	1.84	17557.42	1.06	1776.28	1.62	18.06	1.41	2206.35	1.48	1.46
p1	1852.22	1.82	18021.97	1.08	1762.22	1.61	17.88	1.39	2202.30	1.48	1.45
p2	1777.78	1.74	18032.90	1.09	1916.00	1.75	17.32	1.35	2200.18	1.47	1.46
TILE_2	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1850.12	1.82	17980.05	1.08	1652.20	1.51	18.14	1.41	2202.78	1.48	1.44
p1	1842.65	1.81	17849.75	1.07	1789.65	1.63	18.14	1.41	2198.12	1.47	1.46
p2	1808.33	1.77	17927.72	1.08	1808.60	1.65	17.84	1.39	2191.43	1.47	1.45
TILE_3	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1887.55	1.85	17989.70	1.08	1704.90	1.55	18.18	1.42	2140.53	1.43	1.45
p1	1857.78	1.82	17977.55	1.08	1821.12	1.66	17.90	1.39	2130.10	1.43	1.46
p2	1835.28	1.80	17973.28	1.08	1736.67	1.58	17.82	1.39	2130.72	1.43	1.44
TILE_4	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1882.83	1.85	17548.40	1.06	1634.62	1.49	18.08	1.41	2122.95	1.42	1.42
p1	1860.47	1.83	18044.35	1.09	1842.70	1.68	17.95	1.40	2122.75	1.42	1.46
p2	1856.33	1.82	17951.75	1.08	1868.15	1.70	17.82	1.39	2113.97	1.42	1.46
TILE_5	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1833.65	1.80	17506.88	1.05	1728.90	1.58	17.61	1.37	2040.60	1.37	1.41
p1	1845.38	1.81	17947.88	1.08	1849.78	1.69	17.46	1.36	2040.97	1.37	1.44
p2	1819.53	1.79	17955.85	1.08	1740.58	1.59	17.16	1.34	2033.72	1.36	1.41
TILE_6	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1838.17	1.80	17961.22	1.08	1629.30	1.49	17.55	1.37	2115.55	1.42	1.41

p1	1843.35	1.81	17505.65	1.05	1645.33	1.50	17.31	1.35	2106.05	1.41	1.40
p2	1771.67	1.74	17947.25	1.08	1845.40	1.68	17.15	1.34	2107.97	1.41	1.43
TILE_7	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1870.35	1.84	17919.75	1.08	1523.25	1.39	17.66	1.38	2117.07	1.42	1.40
p1	1845.30	1.81	17897.65	1.08	1670.85	1.52	17.42	1.36	2120.25	1.42	1.42
p2	1830.05	1.80	17925.60	1.08	1789.20	1.63	17.32	1.35	2118.60	1.42	1.43
TILE_8	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1832.90	1.80	17485.70	1.05	1521.20	1.39	17.42	1.36	2050.07	1.37	1.37
p1	1830.45	1.80	17971.05	1.08	1618.17	1.48	17.39	1.36	2050.28	1.37	1.40
p2	1794.45	1.76	17932.22	1.08	1818.65	1.66	17.33	1.35	2042.28	1.37	1.42
TILE_9	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1867.35	1.83	17999.50	1.08	1428.45	1.30	17.71	1.38	2046.60	1.37	1.37
p1	1841.58	1.81	17547.20	1.06	1554.75	1.42	17.12	1.33	2049.53	1.37	1.38
p2	1788.03	1.75	17995.25	1.08	1787.70	1.63	17.16	1.34	2036.80	1.36	1.41
TILE_10	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1929.20	1.89	17998.12	1.08	1445.85	1.32	18.10	1.41	2136.80	1.43	1.40
p1	1896.97	1.86	17989.80	1.08	1597.03	1.46	17.99	1.40	2124.82	1.42	1.42
p2	1871.97	1.84	18010.30	1.08	1721.83	1.57	17.83	1.39	2120.57	1.42	1.44
TILE_11	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1917.38	1.88	17956.28	1.08	1357.03	1.24	18.04	1.41	2256.45	1.51	1.40
p1	1885.20	1.85	17465.92	1.05	1621.60	1.48	17.86	1.39	2253.62	1.51	1.43
p2	1871.20	1.84	17956.17	1.08	1732.62	1.58	17.86	1.39	2244.65	1.50	1.46
TILE_12	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1885.60	1.85	18012.60	1.08	1245.12	1.14	18.22	1.42	2142.90	1.44	1.36
p1	1885.72	1.85	17952.83	1.08	1543.50	1.41	18.20	1.42	2129.95	1.43	1.42
p2	1864.67	1.83	17914.67	1.08	1586.03	1.45	17.87	1.39	2126.45	1.42	1.41
TILE_13	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1902.85	1.87	17957.92	1.08	1191.58	1.09	18.40	1.43	2146.28	1.44	1.35
p1	1887.08	1.85	17916.03	1.08	1455.33	1.33	18.05	1.41	2139.28	1.43	1.40
p2	1860.75	1.83	17927.33	1.08	1655.72	1.51	17.71	1.38	2127.57	1.43	1.42
p0_score:	19.72										
p1_score:	19.99										
p2_score:	20.09										
Unreviewed_VMmark_Score:	19.99										

Configuration

Server and Network

Server Manufacturer and Model	Dell PowerEdge R900
Processor Vendor and Model	Intel Xeon X7460
Processor Speed (GHz)	2.67
Number of Sockets/Cores per Socket	4 Sockets / 6 Cores per Socket (24 Cores Total)
Primary Cache	32 KB I + 32 KB D on chip per core
Secondary Cache	9 MB on chip (3 MB shared per 2 cores)
Other Cache	16 MB I+D L3 on chip per chip
Memory	96 GB (12 x 8 GB) 667 MHz ECC CL5 DDR2 FB-DIMM
Disk Subsystem Type	SAS (OS), FC SAN (VMs)
Number of Disk Controllers	N/A
Number of Host Bus Adapters	4
Host Bus Adapter Vendors and Models	1 x Dell PowerEdge Expandable RAID Controller (PERC) 6/i 3 x QLogic Corp QLE2462 Dual Port
Number of Network Controllers	8
Network Controller Vendors and Models	8 x Broadcom NetXtreme II BCM5708 (4 onboard)
Network Switch Vendors and Models	Dell PowerConnect 6248
Network Speed	1000Base-T
Other Hardware	None
Other Software	None
Hardware Availability Date	04/13/2009
Software Availability Date	11/06/2008

Virtualization Software

Vendor, Product, Version, and Build	VMware ESX 3.5 Update 3 (build 123630)
Virtualization Type	Hardware Virtualization
Supplemental Software	None
Virtualization Software Availability Date	11/06/2008

Storage

Array Vendor, Model, and Firmware Version	3 x Dell/EMC CX3-40f, version 03.26.040.5.011
Fibre Channel Switch Vendors and Models	None
Disk Space Used	868 GB for VMs
Array Cache Size	8 GB per array
Number and Size of LUNs	14 LUNs, each ~300 GB
RAID Type	RAID0

Number of Members per RAID Set	10
Disk Vendor, Model, and Speed	Hitachi HUS151P7/Seagate STT73455 15K
Clients	
Number of Clients	14
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
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
Number of Sockets/Cores per Socket	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)
Memory	2 GB except client10, which had 8 GB

Network Controller Vendor and Model	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

- The PERC 6/i onboard controller contained 1 73GB/15K drive for OS
- BIOS settings:
 - Optical Drive Controller = Off (default On)
 - User Accessible USB Ports = All Ports Off (default All Ports On)
- Qlogic HBA BIOS settings:
 - Fibre Channel tape support disabled (default enabled)
 - Data rate option set to 3 (default 2)
 - Interrupt Delay timer set to 15 (default 0)
 - Maximum queue depth 64 (default 32)
- Array settings:
 - Storage Processor cache High/Low watermark - 40/20 (default 80/60)
- Network Settings:
 - 3 physical NICs (vmnic8,9,11) bound to vSwitch0
 - 5 physical NICs (vmnic0,1,2,3,10) bound to vSwitch1
 - vSwitches set to 120 ports (default 56)
 - Service console was shared with vSwitch0
 - Database, FileServer, JavaServer, MailServer, and Standby VMs attached to vSwitch0
 - WebServer VMs attached to vSwitch1
- Storage Notes:
 - For all VMs, each tile was stored on its own LUN

Virtualization Software Notes

- Virtualized MMU was enabled on all VMs (default Automatic)
- Disk.SchedNumReqOutstanding was set to 128 (default 32)
- VMFS3.MaxHeapSizeMB was set to 64 (default 16)
- Misc.RunningVCpuLimit was set to 192 (default 128)
- COW.MaxHeapSizeMB was set to 64 (default 32)
- VMkernel.Boot.cpuCellSize was set to 6 (default 0)
- BufferCache.SoftMaxDirty was set to 85 (default 15)
- Ethernet Adapter type was set to Enhanced vmxnet for all VMs
- Logging was disabled for all VMs (default enabled)
- IDE and Floppy devices were removed on all VMs (default enabled)
- vmfs2 module unloaded at boot

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.

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