

VMware® VMmark™ V1.1.1 Results

Vendor and Hardware Platform: Dell PowerEdge R905
Virtualization Platform: VMware ESX version 4.0 (Build 164009)

VMmark V1.1.1 Score =
29.51 @ 20 Tiles

Tested By: Dell Inc.

Test Date: 07-01-2009

	webserver		javaserver		mailserver		fileserver		database		
TILE_0	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1984.70	1.95	18113.65	1.09	1793.78	1.64	18.06	1.41	2295.47	1.54	1.50
p1	1948.60	1.91	18112.33	1.09	1784.45	1.63	18.10	1.41	2313.53	1.55	1.49
p2	1932.55	1.90	18116.65	1.09	1808.35	1.65	17.96	1.40	2323.32	1.56	1.49
TILE_1	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1845.35	1.81	18145.72	1.09	1769.65	1.61	19.26	1.50	2360.95	1.58	1.50
p1	1898.33	1.86	18146.80	1.09	1812.83	1.65	19.00	1.48	2362.82	1.58	1.51
p2	1905.12	1.87	18132.92	1.09	1874.08	1.71	18.88	1.47	2365.28	1.58	1.52
TILE_2	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1977.95	1.94	18100.40	1.09	1788.45	1.63	17.46	1.36	2325.30	1.56	1.49
p1	1961.35	1.92	18105.12	1.09	1886.28	1.72	17.48	1.36	2338.53	1.57	1.50
p2	1959.85	1.92	18105.10	1.09	1833.97	1.67	17.27	1.35	2352.75	1.58	1.49
TILE_3	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1877.35	1.84	18122.72	1.09	1784.35	1.63	17.42	1.36	2294.43	1.54	1.47
p1	1870.78	1.84	18120.17	1.09	1739.92	1.59	17.43	1.36	2314.97	1.55	1.46
p2	1856.60	1.82	18108.75	1.09	1665.80	1.52	17.37	1.35	2327.45	1.56	1.45
TILE_4	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1940.17	1.90	18141.78	1.09	1897.50	1.73	18.04	1.41	2344.05	1.57	1.51
p1	1943.85	1.91	17681.67	1.06	1859.90	1.70	17.91	1.40	2349.38	1.57	1.50
p2	1949.20	1.91	18151.47	1.09	1815.35	1.66	17.94	1.40	2348.90	1.57	1.50
TILE_5	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1954.88	1.92	18155.62	1.09	1784.45	1.63	17.29	1.35	2203.78	1.48	1.47
p1	1936.47	1.90	18135.70	1.09	1805.38	1.65	16.90	1.32	2200.45	1.47	1.46
p2	1887.78	1.85	18151.58	1.09	1721.67	1.57	16.62	1.30	2195.40	1.47	1.43
TILE_6	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1867.90	1.83	18148.35	1.09	1779.97	1.62	17.14	1.34	2222.00	1.49	1.45
p1	1910.78	1.88	18142.95	1.09	1913.42	1.74	16.83	1.31	2215.97	1.48	1.47
p2	1925.08	1.89	18146.55	1.09	1838.03	1.68	17.47	1.36	2216.22	1.49	1.48
TILE_7	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM

p0	1894.78	1.86	18113.62	1.09	1755.92	1.60	17.40	1.36	2240.88	1.50	1.46
p1	1884.70	1.85	18116.62	1.09	1845.00	1.68	17.36	1.35	2242.85	1.50	1.47
p2	1829.20	1.80	17659.55	1.06	1747.40	1.59	17.24	1.34	2241.93	1.50	1.44
TILE_8	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1955.62	1.92	18114.50	1.09	1700.53	1.55	17.45	1.36	2230.30	1.49	1.46
p1	1939.55	1.90	18102.33	1.09	1796.85	1.64	17.41	1.36	2229.30	1.49	1.47
p2	1891.83	1.86	18109.42	1.09	1777.10	1.62	17.25	1.34	2223.60	1.49	1.46
TILE_9	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1968.92	1.93	18116.95	1.09	1636.25	1.49	17.57	1.37	2227.38	1.49	1.45
p1	1928.12	1.89	18115.30	1.09	1771.03	1.61	17.31	1.35	2216.47	1.49	1.46
p2	1913.83	1.88	18112.85	1.09	1865.08	1.70	17.19	1.34	2209.62	1.48	1.47
TILE_10	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1999.42	1.96	18109.70	1.09	1445.55	1.32	18.18	1.42	2401.25	1.61	1.45
p1	1970.10	1.93	18117.40	1.09	1396.35	1.27	18.12	1.41	2398.60	1.61	1.44
p2	1946.72	1.91	18113.62	1.09	1310.05	1.19	18.16	1.42	2399.15	1.61	1.41
TILE_11	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	2006.00	1.97	18143.03	1.09	1732.55	1.58	16.79	1.31	2442.40	1.64	1.49
p1	1992.20	1.96	18107.22	1.09	1768.75	1.61	17.18	1.34	2445.62	1.64	1.50
p2	1989.40	1.95	18099.72	1.09	1748.83	1.59	16.15	1.26	2446.32	1.64	1.48
TILE_12	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1987.50	1.95	18113.55	1.09	1602.65	1.46	17.91	1.40	2386.80	1.60	1.47
p1	1974.28	1.94	18129.97	1.09	1706.47	1.56	18.02	1.40	2382.18	1.60	1.49
p2	1978.65	1.94	18113.65	1.09	1695.80	1.55	17.93	1.40	2384.30	1.60	1.49
TILE_13	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1907.10	1.87	18141.20	1.09	1599.50	1.46	19.41	1.51	2397.78	1.61	1.49
p1	1897.83	1.86	18104.50	1.09	1641.65	1.50	19.27	1.50	2396.30	1.61	1.49
p2	1890.97	1.86	18148.15	1.09	1786.53	1.63	19.13	1.49	2393.70	1.60	1.51
TILE_14	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1928.72	1.89	18145.90	1.09	1499.30	1.37	17.69	1.38	2444.97	1.64	1.45
p1	1928.40	1.89	18157.65	1.09	1654.00	1.51	17.55	1.37	2448.95	1.64	1.48
p2	1939.80	1.90	18151.03	1.09	1743.95	1.59	17.51	1.36	2445.28	1.64	1.49
TILE_15	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1996.05	1.96	18133.67	1.09	1579.28	1.44	18.29	1.43	2335.62	1.57	1.47
p1	1976.50	1.94	18119.33	1.09	1680.75	1.53	18.14	1.41	2351.05	1.58	1.49
p2	1975.67	1.94	18102.58	1.09	1723.50	1.57	18.00	1.40	2360.55	1.58	1.49
TILE_16	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM

p0	1932.45	1.90	18127.00	1.09	1349.35	1.23	19.11	1.49	2341.88	1.57	1.43
p1	1935.33	1.90	18122.17	1.09	1589.20	1.45	18.88	1.47	2347.82	1.57	1.47
p2	1941.15	1.91	18124.97	1.09	1695.45	1.55	18.85	1.47	2357.45	1.58	1.49
TILE_17	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1928.90	1.89	18143.50	1.09	1380.05	1.26	18.34	1.43	2339.22	1.57	1.42
p1	1917.70	1.88	18126.92	1.09	1624.10	1.48	18.30	1.43	2346.65	1.57	1.47
p2	1910.30	1.87	18141.65	1.09	1765.05	1.61	18.28	1.42	2356.05	1.58	1.49
TILE_18	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1897.25	1.86	18105.88	1.09	1350.75	1.23	19.02	1.48	2412.62	1.62	1.43
p1	1889.67	1.85	18105.62	1.09	1487.85	1.36	18.95	1.48	2412.15	1.62	1.46
p2	1877.45	1.84	17655.28	1.06	1754.53	1.60	18.50	1.44	2413.85	1.62	1.49
TILE_19	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1936.72	1.90	18125.97	1.09	1182.80	1.08	17.65	1.38	2361.57	1.58	1.37
p1	1938.83	1.90	17665.35	1.06	1521.22	1.39	17.28	1.35	2369.25	1.59	1.43
p2	1942.88	1.91	18130.53	1.09	1641.45	1.50	16.23	1.26	2365.97	1.59	1.44
p0_score:	29.22										
p1_score:	29.51										
p2_score:	29.52										
Unreviewed_VMmark_Score:	29.51										

Configuration

Server and Network	
Server Manufacturer and Model	Dell PowerEdge R905
Processor Vendor and Model	Six Core AMD Opteron 8439 SE
Processor Speed (GHz)	2.8GHz
Total Sockets/Total Cores/Total Threads	4 sockets/ 24 cores/ 24 threads
Primary Cache	64KB I + 64KB D on chip per core
Secondary Cache	512 I+D on chip per core
Other Cache	6MB I+D L3 on chip
BIOS Version	4.0.2
Memory Size (in GB, Number of DIMMs)	128 GB
Memory Type and Speed	16x8GB PC2-5300 667MHz Registered ECC DDR2 DIMMs
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	6
Network Controller Vendors and Models	4x Broadcom NetXtreme II BCM5708(onboard) 2x Single Port Broadcom NetXtreme II BCM5708
Network Switch Vendors and Models	Dell PowerConnect 6248
Network Speed	1000Base-T
Other Hardware	None
Other Software	None
Hardware Availability Date	05-18-2009
Software Availability Date	05-21-2009

Virtualization Software

Vendor, Product, Version, and Build	VMware ESX version 4.0 build 164009
Virtualization Type	Hardware
Supplemental Software	None
Virtualization Software Availability Date	05-21-2009

Storage

Array Vendors, Models, and Firmware Versions	3x Dell/EMC CX3-40f, version 03.26.040.5.025
Fibre Channel Switch Vendors and Models	None
Disk Space Used	1240 GB for VMs
Array Cache Size	8GB per array
Total Number of Physical Disks Used	91 Physical Disks
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	18 LUNs (6 per Enclosure)
LUN Size and Number of Disks Per LUN	~300GB, 10 per LUN

RAID Type	RAID0
Number of Members per RAID Set	10
Disk Vendors, Models, and Speeds	Hitachi HUS151P7 CLAR72 73GB 15K RPM

Clients

Number of Clients	20
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 client17: PowerEdge 1850 client18: PowerEdge 1850 client19: 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 client17: 3.60 client18: 3.60

	client19: 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) client17: 2 Sockets / 1 Core per Socket (2 Cores Total) client18: 2 Sockets / 1 Core per Socket (2 Cores Total) client19: 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

- **BIOS settings:**
 - Virtualization Technology = Enabled
 - Internal USB port = Off(default On)
- **Array settings:**
 - Storage Processor cache High/Low watermark - 40/20(default 60/80)
- **Network Settings:**
 - Broadcom NICs (vnic0,1,2,3,4,5) bound to vSwitch0,1,2,3,4,5 respectively
 - Service Console and Standby VMs attached to vSwitch0
 - Fileserver, Javasever and Mailserver VMs attached to vSwitch1
 - Database VMs attached to vSwitch2
 - Webserver 00-06, 15 attached to vSwitch3
 - Webserver 07-13 attached to vSwitch4
 - Webserver 14,16-19 attached to vSwitch5
 - vSwitch0,2,3 configured with 128 ports (default 56)

- vSwitch1 configured with 256 ports (default 56)
- vSwitch4,5 configured with 64 ports (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 set to 128 (default 32)
- Net.EtherswitchHashSize set to 4 (default 1)
- BufferCache.SoftMaxDirty set to 85 (default 15)
- IRQ.RoutingPolicy set to 0 (Default 2)
- VMFS3.MaxHeapSizeMB set to 64 (Default 80)
- All VM's hardware upgraded to version 7
- Iptables and firewall were disabled for the COS
- Ethernet Adapter type set to VMXNET3 for all VMs
- Logging was disabled for all VMs (default enabled)
- IDE and Floppy devices were removed from all VMs (default enabled) for all but MailServers 17,18,19 and Webserver09
- iptables and firewall services disabled at boot
- Net.MaxNetifRxQueueLen = 300 (default 100)
- Net.MaxNetifTxQueueLen = 1000 (default 500)
- Net.MaxPortRxQueueLen = 160 (default 80)
- Net.Vmxnet2PinRxBuf = 1 (default 0)
- /vmkernel/module/qla2xxx.o/options="ql2xmaxqdepth=128(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

- None

Client Notes

- KB951072-v2 was applied

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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