

# VMware® VMmark™ V1.1 Results

**Vendor and Hardware Platform: Dell PowerEdge M610**  
**Virtualization Platform: VMware ESX version 4.0**

**VMmark V1.1 Score =**  
**23.90 @ 17 Tiles**

**Tested By: Dell Inc.**

**Test Date: 04/02/2009**

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## Performance

	webservers		javaserver		mailserver		fileserver		database		
<b>TILE_0</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1820.20	1.79	18132.08	1.09	1700.83	1.55	15.73	1.23	2317.55	1.55	1.42
<b>p1</b>	1825.55	1.79	18127.62	1.09	1639.38	1.49	16.25	1.27	2329.90	1.56	1.42
<b>p2</b>	1824.80	1.79	18116.72	1.09	1647.67	1.50	16.37	1.28	2330.38	1.56	1.42
<b>TILE_1</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1824.97	1.79	18106.40	1.09	1628.70	1.48	16.05	1.25	2345.55	1.57	1.42
<b>p1</b>	1775.45	1.74	18127.28	1.09	1636.42	1.49	16.11	1.26	2346.12	1.57	1.41
<b>p2</b>	1656.53	1.63	18106.08	1.09	1567.60	1.43	16.24	1.27	2342.35	1.57	1.38
<b>TILE_2</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1809.45	1.78	18125.55	1.09	1237.60	1.13	15.74	1.23	2358.97	1.58	1.33
<b>p1</b>	1817.08	1.78	18127.35	1.09	1312.53	1.20	15.69	1.22	2373.75	1.59	1.35
<b>p2</b>	1819.08	1.79	18109.97	1.09	1234.30	1.13	15.70	1.22	2378.30	1.59	1.34
<b>TILE_3</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1802.22	1.77	18116.10	1.09	1689.55	1.54	16.27	1.27	2386.75	1.60	1.43
<b>p1</b>	1811.15	1.78	17675.55	1.06	1630.53	1.49	16.11	1.26	2388.72	1.60	1.41
<b>p2</b>	1811.50	1.78	18117.20	1.09	1647.97	1.50	16.19	1.26	2385.03	1.60	1.42
<b>TILE_4</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1871.03	1.84	18122.15	1.09	1564.12	1.43	16.43	1.28	2347.20	1.57	1.42
<b>p1</b>	1868.83	1.83	18112.42	1.09	1652.35	1.51	16.59	1.29	2347.57	1.57	1.44
<b>p2</b>	1868.65	1.83	18103.53	1.09	1491.20	1.36	16.32	1.27	2348.18	1.57	1.40
<b>TILE_5</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1839.00	1.80	18126.45	1.09	1650.70	1.51	15.73	1.23	2178.72	1.46	1.40
<b>p1</b>	1837.12	1.80	18115.53	1.09	1624.10	1.48	15.64	1.22	2172.57	1.46	1.39
<b>p2</b>	1835.42	1.80	18101.12	1.09	1550.65	1.41	15.76	1.23	2183.40	1.46	1.38
<b>TILE_6</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1838.88	1.80	18138.83	1.09	1689.05	1.54	15.89	1.24	2234.80	1.50	1.41

<b>p1</b>	1840.72	1.81	18136.75	1.09	1587.17	1.45	15.92	1.24	2240.70	1.50	1.40
<b>p2</b>	1789.42	1.76	17631.33	1.06	1680.50	1.53	16.00	1.25	2234.45	1.50	1.40
<b>TILE_7</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1793.65	1.76	18144.92	1.09	1670.97	1.52	15.72	1.22	2228.80	1.49	1.40
<b>p1</b>	1797.55	1.76	18162.58	1.09	1767.45	1.61	15.80	1.23	2223.47	1.49	1.42
<b>p2</b>	1762.35	1.73	17681.62	1.06	1706.17	1.56	15.89	1.24	2225.28	1.49	1.40
<b>TILE_8</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1843.40	1.81	18110.58	1.09	1628.53	1.48	15.44	1.20	2208.95	1.48	1.39
<b>p1</b>	1849.65	1.82	18121.55	1.09	1672.97	1.53	15.60	1.22	2206.72	1.48	1.40
<b>p2</b>	1849.17	1.81	18104.30	1.09	1690.97	1.54	15.64	1.22	2204.50	1.48	1.41
<b>TILE_9</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1831.35	1.80	18153.22	1.09	1657.75	1.51	15.87	1.24	2210.35	1.48	1.40
<b>p1</b>	1838.80	1.80	18130.65	1.09	1608.50	1.47	15.95	1.24	2206.20	1.48	1.40
<b>p2</b>	1833.90	1.80	18124.33	1.09	1691.20	1.54	15.92	1.24	2194.45	1.47	1.41
<b>TILE_10</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1869.58	1.83	17679.15	1.06	1329.75	1.21	16.29	1.27	2347.55	1.57	1.36
<b>p1</b>	1878.20	1.84	18126.42	1.09	1285.75	1.17	16.28	1.27	2350.18	1.57	1.36
<b>p2</b>	1871.25	1.84	18094.40	1.09	1334.55	1.22	16.47	1.28	2350.22	1.57	1.38
<b>TILE_11</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1859.70	1.83	17646.05	1.06	1605.10	1.46	15.72	1.23	2327.90	1.56	1.40
<b>p1</b>	1866.95	1.83	18083.30	1.09	1634.33	1.49	15.83	1.23	2327.93	1.56	1.42
<b>p2</b>	1873.08	1.84	18071.97	1.09	1584.20	1.44	15.98	1.25	2329.90	1.56	1.41
<b>TILE_12</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1773.00	1.74	17699.42	1.07	1556.35	1.42	16.56	1.29	2418.97	1.62	1.41
<b>p1</b>	1788.38	1.76	18165.25	1.09	1659.95	1.51	16.68	1.30	2416.32	1.62	1.44
<b>p2</b>	1796.50	1.76	18158.40	1.09	1554.28	1.42	16.56	1.29	2414.45	1.62	1.42
<b>TILE_13</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1874.72	1.84	17662.03	1.06	1507.40	1.37	16.27	1.27	2406.00	1.61	1.41
<b>p1</b>	1866.60	1.83	18107.28	1.09	1664.45	1.52	16.41	1.28	2404.97	1.61	1.44
<b>p2</b>	1870.28	1.84	18088.17	1.09	1643.17	1.50	16.34	1.27	2404.00	1.61	1.44
<b>TILE_14</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1878.35	1.84	17648.60	1.06	1358.42	1.24	16.63	1.30	2404.68	1.61	1.38
<b>p1</b>	1756.25	1.72	18100.60	1.09	1596.60	1.46	16.61	1.29	2404.75	1.61	1.42
<b>p2</b>	1798.38	1.76	18078.15	1.09	1707.53	1.56	16.67	1.30	2404.12	1.61	1.44
<b>TILE_15</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1867.88	1.83	18109.60	1.09	1337.03	1.22	16.08	1.25	2416.28	1.62	1.38
<b>p1</b>	1861.75	1.83	17651.85	1.06	1553.55	1.42	15.98	1.25	2427.72	1.63	1.41
<b>p2</b>	1866.62	1.83	18080.00	1.09	1633.20	1.49	16.26	1.27	2426.30	1.63	1.44

<b>TILE_16</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1864.78	1.83	18089.50	1.09	1233.33	1.12	15.84	1.23	2383.82	1.60	1.35
<b>p1</b>	1873.70	1.84	18096.00	1.09	1402.33	1.28	15.89	1.24	2382.65	1.60	1.38
<b>p2</b>	1869.17	1.83	17648.15	1.06	1636.47	1.49	16.08	1.25	2390.10	1.60	1.42
<b>p0_score:</b>	23.71										
<b>p1_score:</b>	23.91										
<b>p2_score:</b>	23.90										
<b>Unreviewed_VMmark_Score:</b>	23.90										

## Configuration

<b>Server and Network</b>	
Server Manufacturer and Model	Dell PowerEdge M610
Processor Vendor and Model	Intel Xeon X5570
Processor Speed (GHz)	2.93
Number of Sockets/Cores per Socket	2 Sockets / 4 Cores per Socket / 2 Threads per Core (8 Cores, 16 Threads Total with Intel Hyper-Threading Capability)
Primary Cache	32KB(I)+32KB(D) per core
Secondary Cache	256KB per core
Other Cache	8MB L3
Memory	96GB (12x8GB) DDR3-1066MHz Dual Rank REG RDIMMs
Disk Subsystem Type	SAS (OS), FC SAN (VMs)
Number of Disk Controllers	N/A
Number of Host Bus Adapters	2
Host Bus Adapter Vendors and Models	1 x Dell PowerEdge CERC6i SAS RAID Controller 1 x Dual-port Emulex LPe1205-M Fibre Channel I/O card
Number of Network Controllers	2
Network Controller Vendors and Models	1 x Dual-port embedded Broadcom NetXtreme II BCM5709 1 x Dual-port Broadcom NetXtreme II BCM5709 I/O card
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	06/30/2009
<b>Virtualization Software</b>	
Vendor, Product, Version, and Build	VMware ESX version 4.0 build 155251
Virtualization Type	Hardware Virtualization

Supplemental Software	None
Virtualization Software Availability Date	06/30/2009

**Storage**

Array Vendor, Model, and Firmware Version	3 x Dell/EMC CX3-40f, version 03.26.040.5.025
Fibre Channel Switch Vendors and Models	Brocade SilkWorm 3200 Brocade SilkWorm 3800
Disk Space Used	1054 GB for VMs
Array Cache Size	8GB per array
Number and Size of LUNs	17 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	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
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) 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	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 CERC 6/i controller contained 1 73GB/15K drive for OS
- BIOS settings:
  - Intel Turbo Boost Technology up to 3.33 GHz (default)
  - Virtualization Technology = Enabled
  - Internal USB port = Off (default On)
  - User Accessible USB Ports = All Ports Off (default On)
- Array settings:
  - Storage Processor cache High/Low watermark - 40/20 (default 80/60)
- Network Settings:
  - Broadcom NICs 0,1(vmnic0,1) bound to vSwitch0
  - Broadcom NICs 2,3(vmnic2,3) bound to vSwitch1
  - Service console and WebServer0-16 attached to vSwitch0
  - All other VMs attached to vSwitch1
  - vSwitch1 configured with 120 ports (default 56)

- Storage Notes:  
For all VMs, each tile was stored on its own LUN

## 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)
- 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)
- ip6tables and firewall services disabled 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

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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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