

# VMware® VMmark™ V1.1 Results

**Vendor and Hardware Platform: HP ProLiant DL370 G6**  
**Virtualization Platform: VMware ESX 4.0 build 148783**

**VMmark V1.1 Score =**  
**23.96 @ 16 Tiles**

**Tested By: HP**

**Test Date: 03/09/2009**

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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>	1992.97	1.96	18145.38	1.09	1770.20	1.61	18.83	1.47	2470.97	1.66	1.53
<b>p1</b>	1990.12	1.95	18146.00	1.09	1688.00	1.54	18.70	1.46	2473.72	1.66	1.51
<b>p2</b>	1987.62	1.95	17679.70	1.06	1587.78	1.45	18.56	1.45	2472.90	1.66	1.48
<b>TILE_1</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1955.97	1.92	18176.47	1.09	1733.62	1.58	18.70	1.46	2467.38	1.65	1.52
<b>p1</b>	1957.88	1.92	17740.35	1.07	1814.00	1.65	18.71	1.46	2475.93	1.66	1.52
<b>p2</b>	1956.45	1.92	18203.83	1.10	1845.90	1.68	18.71	1.46	2479.62	1.66	1.54
<b>TILE_2</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1994.12	1.96	18146.25	1.09	1767.08	1.61	18.87	1.47	2469.50	1.65	1.53
<b>p1</b>	1994.40	1.96	18145.10	1.09	1774.40	1.62	18.78	1.46	2472.18	1.66	1.53
<b>p2</b>	1993.88	1.96	18138.97	1.09	1768.25	1.61	18.67	1.46	2473.12	1.66	1.53
<b>TILE_3</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1982.58	1.95	18164.53	1.09	1812.67	1.65	18.80	1.47	2465.35	1.65	1.53
<b>p1</b>	1986.72	1.95	17707.20	1.07	1781.40	1.62	18.69	1.46	2469.32	1.65	1.52
<b>p2</b>	1986.92	1.95	18152.67	1.09	1730.45	1.58	18.62	1.45	2473.50	1.66	1.52
<b>TILE_4</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1992.92	1.96	18145.15	1.09	1740.35	1.59	18.69	1.46	2471.05	1.66	1.52
<b>p1</b>	1993.30	1.96	18135.92	1.09	1841.15	1.68	18.66	1.45	2472.47	1.66	1.54
<b>p2</b>	1988.15	1.95	18137.92	1.09	1816.30	1.66	18.57	1.45	2473.90	1.66	1.53
<b>TILE_5</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1940.72	1.90	18140.75	1.09	1699.22	1.55	18.82	1.47	2466.78	1.65	1.51
<b>p1</b>	1957.92	1.92	18137.92	1.09	1622.22	1.48	18.71	1.46	2472.00	1.66	1.50
<b>p2</b>	1958.03	1.92	18135.45	1.09	1540.72	1.40	18.66	1.45	2473.68	1.66	1.48
<b>TILE_6</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1966.53	1.93	18166.10	1.09	1668.47	1.52	18.82	1.47	2472.50	1.66	1.51

<b>p1</b>	1984.20	1.95	18154.60	1.09	1674.40	1.53	18.79	1.46	2473.57	1.66	1.51
<b>p2</b>	1981.58	1.94	18137.95	1.09	1616.30	1.47	18.71	1.46	2476.00	1.66	1.50
<b>TILE_7</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1901.42	1.87	18140.35	1.09	1662.95	1.52	18.58	1.45	2467.38	1.65	1.49
<b>p1</b>	1956.38	1.92	18162.58	1.09	1716.95	1.57	18.43	1.44	2473.12	1.66	1.51
<b>p2</b>	1963.78	1.93	18157.12	1.09	1804.50	1.65	18.55	1.45	2474.75	1.66	1.53
<b>TILE_8</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1990.28	1.95	18148.45	1.09	1596.30	1.46	18.69	1.46	2474.57	1.66	1.50
<b>p1</b>	1991.00	1.95	18171.45	1.09	1711.35	1.56	18.74	1.46	2473.35	1.66	1.52
<b>p2</b>	1990.17	1.95	18172.15	1.09	1720.10	1.57	18.66	1.45	2472.62	1.66	1.52
<b>TILE_9</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1939.78	1.90	18178.85	1.09	1669.62	1.52	18.69	1.46	2467.22	1.65	1.50
<b>p1</b>	1830.33	1.80	18162.10	1.09	1737.03	1.58	18.59	1.45	2473.10	1.66	1.49
<b>p2</b>	1907.45	1.87	18157.92	1.09	1728.25	1.58	18.69	1.46	2475.60	1.66	1.51
<b>TILE_10</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1821.88	1.79	18095.50	1.09	1538.15	1.40	18.27	1.42	2454.22	1.64	1.45
<b>p1</b>	1822.40	1.79	18102.67	1.09	1720.03	1.57	18.31	1.43	2460.82	1.65	1.48
<b>p2</b>	1838.00	1.80	18092.33	1.09	1735.90	1.58	18.10	1.41	2459.30	1.65	1.49
<b>TILE_11</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1773.38	1.74	18112.53	1.09	1536.38	1.40	17.65	1.38	2451.00	1.64	1.43
<b>p1</b>	1891.88	1.86	18096.80	1.09	1775.70	1.62	17.37	1.35	2459.62	1.65	1.49
<b>p2</b>	1897.75	1.86	18096.05	1.09	1772.15	1.62	17.51	1.36	2458.93	1.65	1.49
<b>TILE_12</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1956.85	1.92	18117.78	1.09	1505.08	1.37	18.34	1.43	2461.12	1.65	1.47
<b>p1</b>	1954.05	1.92	18108.75	1.09	1633.33	1.49	18.33	1.43	2460.75	1.65	1.49
<b>p2</b>	1795.03	1.76	18103.47	1.09	1751.08	1.60	18.11	1.41	2463.18	1.65	1.48
<b>TILE_13</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1870.33	1.84	18119.28	1.09	1281.47	1.17	18.18	1.42	2462.15	1.65	1.40
<b>p1</b>	1864.80	1.83	18103.17	1.09	1575.25	1.44	18.10	1.41	2464.35	1.65	1.46
<b>p2</b>	1875.15	1.84	18093.70	1.09	1737.45	1.58	18.01	1.40	2464.88	1.65	1.49
<b>TILE_14</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1878.38	1.84	18096.85	1.09	1260.20	1.15	18.19	1.42	2459.57	1.65	1.40
<b>p1</b>	1827.22	1.79	18092.22	1.09	1516.70	1.38	18.13	1.41	2467.15	1.65	1.45
<b>p2</b>	1792.65	1.76	18097.33	1.09	1686.75	1.54	18.09	1.41	2463.97	1.65	1.47
<b>TILE_15</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1775.53	1.74	18136.53	1.09	1222.08	1.11	18.06	1.41	2434.57	1.63	1.37
<b>p1</b>	1822.15	1.79	18105.38	1.09	1511.05	1.38	17.82	1.39	2439.07	1.63	1.44
<b>p2</b>	1843.35	1.81	18093.35	1.09	1582.33	1.44	17.97	1.40	2439.75	1.63	1.45

<b>p0_score:</b>	23.66
<b>p1_score:</b>	23.96
<b>p2_score:</b>	24.01
<b>Unreviewed_VMmark_Score:</b>	23.96

## Configuration

<b>Server and Network</b>	
Server Manufacturer and Model	HP ProLiant DL370 G6
Processor Vendor and Model	Quad-core Intel Xeon W5580
Processor Speed (GHz)	3.2GHz
Number of Sockets/Cores per Socket	2 Sockets / 4 Cores per Socket (8 Cores Total) / 2 Threads per Core (16 Threads Total with Intel Hyper-Threading Capability)
Primary Cache	32KB I + 32KB D on chip per core
Secondary Cache	256K per core
Other Cache	8MB L3
Memory	96GB (12x8GB 1066MHz Registered ECC DDR3)
Disk Subsystem Type	Direct attach SAS for operating system, FC SAN for VMs
Number of Disk Controllers	1
Number of Host Bus Adapters	1
Host Bus Adapter Vendors and Models	2 QLogic QLE2460 fibre channel HBAs
Number of Network Controllers	7
Network Controller Vendors and Models	6xSingle-port Broadcom NetXtreme II 5708 Gigabit Ethernet, 1xDual-port Broadcom BCM571S Gigabit Ethernet (not used)
Network Switch Vendors and Models	HP ProCurve 3400
Network Speed	1GB/s
Other Hardware	None.
Other Software	None.
Hardware Availability Date	04/27/2009
Software Availability Date	06/30/2009

<b>Virtualization Software</b>	
Vendor, Product, Version, and Build	VMware ESX 4.0 build 148783
Virtualization Type	Hardware
Supplemental Software	None.
Virtualization Software Availability Date	06/30/2009

<b>Storage</b>	
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Array Vendor, Model, and Firmware Version	HP StorageWorks MSA 2000, firmware version J200P16
Fibre Channel Switch Vendors and Models	HP StorageWorks SAN Switch 4/32
Disk Space Used	1.08TB for VM's
Array Cache Size	1GB
Number and Size of LUNs	10 LUNs, 1.6TB per LUN
RAID Type	RAID 0
Number of Members per RAID Set	12 drives per RAID set
Disk Vendor, Model, and Speed	HP 146GB 15K RPM SAS drive

### Clients

Number of Clients	16
System Model(s)	HP ProLiant DL360G5
Processor Vendor(s) and Model(s)	Intel Xeon
Processor Speed(s) (GHz)	2.83GHz
Number of Sockets/Cores per Socket	1 Sockets / 4 Cores per Socket (4 Cores Total)
Memory	2GB
Network Controller Vendor and Model	HP NC373i Gigabit adapter
Operating System, Version, and Service Pack	Microsoft Windows Server 2003 Enterprise Edition, Service Pack 2
Other Hardware	None.
Other Software	None.

## Notes for Workload

### Server and Network Notes

- Server BIOS settings:
  - Processor Speed: Intel Turbo Boost up to 3.3GHz
  - Intel Hyper-threading enabled
  
- QLogic HBA BIOS settings:
  - Fibre Channel tape support disabled (default enabled)
  - Data rate option set to 3 (default 2)
  - Execution Throttle set to 64 (default 16)
  
- vSwitch Configuration:
  - vSwitch0 for the Service Console configured on vmnic0
  - vSwitch2 for all webserver VMs configured with 128 ports (default 56) on vmnic3, vmnic4, and vmnic5
  - vSwitch1 for all other VMs configured with 128 ports (default 56) on vmnic1, vmnic2

- Storage Configuration:
  - database\_storage00 configured to store even-numbered database VMs
  - database\_storage01 configured to store odd-numbered database VMs
  - storage1\_ml370g6 configured to store all VMs other than database for tiles 0 & 1
  - storage2\_ml370g6 configured to store all VMs other than database for tiles 2 & 3
  - storage3\_ml370g6 configured to store all VMs other than database for tiles 4 & 5
  - storage4\_ml370g6 configured to store all VMs other than database for tiles 6 & 7
  - storage5\_ml370g6 configured to store all VMs other than database for tiles 8 & 9
  - storage6\_ml370g6 configured to store all VMs other than database for tiles 10 & 11
  - storage7\_ml370g6 configured to store all VMs other than database for tiles 12 & 13
  - storage8\_5 configured to store all VMs other than database for tiles 14 & 15

## Virtualization Software Notes

- virtualized MMU was enabled for all Linux VMs (default Automatic)
- ethernet adapter type set to vmxnet3 for all VMs
- logging was disabled for all VMs
- IDE & floppy devices were removed on all VMs (default enabled)

## Operating System Notes

- Microsoft Windows Server 2003 virtual machines were updated to Service Pack 2
- Microsoft Windows Server 2003 virtual machines updated with KB933360
- Fileserver and Webserver VMs were updated to SLES 10 SP2

## Software Notes

None.

## Client Notes

- Microsoft Windows Server 2003 client machines were updated to Service Pack 2
- TCP TOE chimney was disabled on all clients (default enabled)
- Microsoft Windows Server 2003 clients updated with KB933360

## Other Notes

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