

VMware® VMmark™ V1.1.1 Results

Vendor and Hardware Platform: HP ProLiant BL490c G6
Virtualization Platform: VMware ESX 4.0 (build 164009)

**VMmark V1.1.1 Score =
24.54 @ 17 Tiles**

Tested By: HP

Test Date: 08/28/2009

Performance Section

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Performance

	webserver		javaserver		mailserver		fileserver		database		
TILE_0	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1873.42	1.84	18116.10	1.09	1548.08	1.41	16.96	1.32	2440.10	1.64	1.44
p1	1888.45	1.85	18131.38	1.09	1435.97	1.31	17.31	1.35	2438.25	1.63	1.42
p2	1880.10	1.85	18150.40	1.09	1344.12	1.23	17.17	1.34	2440.30	1.64	1.40
TILE_1	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1833.72	1.80	18151.67	1.09	1680.67	1.53	16.61	1.29	2449.82	1.64	1.45
p1	1843.85	1.81	18142.83	1.09	1693.62	1.54	16.83	1.31	2448.18	1.64	1.46
p2	1859.67	1.83	18143.50	1.09	1691.17	1.54	16.81	1.31	2451.40	1.64	1.46
TILE_2	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1876.88	1.84	18164.25	1.09	1352.22	1.23	16.86	1.31	2437.78	1.63	1.40
p1	1893.25	1.86	18118.45	1.09	1443.65	1.32	17.15	1.34	2444.03	1.64	1.42
p2	1881.45	1.85	18139.45	1.09	1463.15	1.33	17.03	1.33	2442.70	1.64	1.42
TILE_3	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1803.55	1.77	18126.97	1.09	1688.80	1.54	16.58	1.29	2439.85	1.63	1.44
p1	1837.65	1.80	18139.08	1.09	1744.03	1.59	16.87	1.31	2452.15	1.64	1.47
p2	1852.17	1.82	18135.28	1.09	1728.83	1.58	16.78	1.31	2450.40	1.64	1.46
TILE_4	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1869.65	1.83	18118.47	1.09	1731.92	1.58	16.89	1.32	2442.53	1.64	1.47
p1	1881.10	1.85	18141.28	1.09	1664.12	1.52	17.25	1.34	2443.53	1.64	1.46
p2	1874.88	1.84	18127.70	1.09	1693.50	1.54	17.20	1.34	2442.10	1.64	1.47
TILE_5	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1838.05	1.80	18135.38	1.09	1734.28	1.58	16.45	1.28	2444.25	1.64	1.46
p1	1858.28	1.82	18121.90	1.09	1763.42	1.61	16.71	1.30	2443.53	1.64	1.47
p2	1865.78	1.83	18117.62	1.09	1660.62	1.51	16.64	1.30	2448.82	1.64	1.45

TILE_6	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1877.75	1.84	18136.33	1.09	1707.28	1.56	16.90	1.32	2437.97	1.63	1.46
p1	1886.67	1.85	18134.72	1.09	1788.72	1.63	17.00	1.33	2443.03	1.64	1.48
p2	1873.75	1.84	18132.15	1.09	1794.80	1.64	17.20	1.34	2439.75	1.63	1.48
TILE_7	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1830.53	1.80	18132.97	1.09	1675.53	1.53	16.61	1.29	2445.70	1.64	1.45
p1	1844.70	1.81	17687.35	1.06	1745.05	1.59	16.82	1.31	2447.50	1.64	1.46
p2	1859.45	1.82	18140.15	1.09	1810.75	1.65	17.02	1.33	2445.25	1.64	1.48
TILE_8	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1854.85	1.82	18168.15	1.09	1678.38	1.53	16.96	1.32	2446.12	1.64	1.46
p1	1868.28	1.83	18145.15	1.09	1653.08	1.51	17.10	1.33	2444.43	1.64	1.46
p2	1864.08	1.83	18141.03	1.09	1595.45	1.45	17.38	1.35	2442.38	1.64	1.45
TILE_9	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1847.45	1.81	18122.35	1.09	1597.60	1.46	16.68	1.30	2444.55	1.64	1.44
p1	1856.92	1.82	18155.80	1.09	1674.83	1.53	16.69	1.30	2443.72	1.64	1.45
p2	1865.72	1.83	18162.05	1.09	1604.25	1.46	16.96	1.32	2451.38	1.64	1.45
TILE_10	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1793.75	1.76	18067.22	1.09	1591.35	1.45	16.39	1.28	2422.55	1.62	1.42
p1	1804.33	1.77	18066.33	1.09	1679.58	1.53	16.56	1.29	2427.65	1.63	1.44
p2	1801.17	1.77	18067.92	1.09	1692.33	1.54	16.82	1.31	2419.90	1.62	1.45
TILE_11	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1780.05	1.75	17643.47	1.06	1571.97	1.43	16.14	1.26	2412.75	1.62	1.40
p1	1765.65	1.73	18068.53	1.09	1711.85	1.56	16.15	1.26	2416.78	1.62	1.43
p2	1773.78	1.74	18060.42	1.09	1702.17	1.55	16.45	1.28	2419.68	1.62	1.44
TILE_12	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1810.08	1.78	18073.88	1.09	1492.97	1.36	16.35	1.27	2433.85	1.63	1.40
p1	1825.70	1.79	18062.05	1.09	1633.50	1.49	16.69	1.30	2431.68	1.63	1.44
p2	1816.30	1.78	18049.80	1.09	1689.80	1.54	16.62	1.30	2434.03	1.63	1.45
TILE_13	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1762.95	1.73	18047.80	1.09	1482.10	1.35	16.05	1.25	2442.60	1.64	1.39
p1	1772.17	1.74	18046.65	1.09	1609.83	1.47	16.43	1.28	2439.15	1.63	1.42
p2	1783.42	1.75	18055.90	1.09	1640.80	1.50	16.35	1.27	2445.85	1.64	1.43
TILE_14	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1805.88	1.77	18082.95	1.09	1337.58	1.22	16.58	1.29	2429.90	1.63	1.38
p1	1819.22	1.79	18096.62	1.09	1582.75	1.44	16.80	1.31	2426.68	1.63	1.43
p2	1811.62	1.78	18085.62	1.09	1688.55	1.54	17.04	1.33	2428.55	1.63	1.45

TILE_15	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1720.33	1.69	18065.97	1.09	1291.17	1.18	16.20	1.26	2411.03	1.62	1.35
p1	1775.22	1.74	18058.97	1.09	1554.58	1.42	16.15	1.26	2416.07	1.62	1.40
p2	1788.85	1.76	18071.78	1.09	1592.20	1.45	16.34	1.27	2412.40	1.62	1.42
TILE_16	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1749.15	1.72	18023.72	1.08	1208.47	1.10	16.58	1.29	2408.45	1.61	1.34
p1	1768.80	1.74	18049.97	1.09	1588.30	1.45	16.80	1.31	2399.60	1.61	1.42
p2	1745.10	1.71	18061.92	1.09	1683.72	1.54	16.72	1.30	2409.05	1.61	1.43
p0_score:	24.14										
p1_score:	24.54										
p2_score:	24.59										
Unreviewed_VMmark_Score:	24.54										

Configuration

Server and Network	
Server Manufacturer and Model	HP ProLiant BL490 G6
Processor Vendor and Model	Quad-core Intel Xeon X5570
Processor Speed (GHz)	2.93GHz
Total Sockets/Total Cores/Total Threads	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
BIOS Version	06/20/2009 (Prerelease)
Memory Size (in GB, Number of DIMMs)	96GB (12x8GB)
Memory Type and Speed	1333MHz Registered ECC DDR3
Disk Subsystem Type	Direct attach SATA for operating system, FC SAN for VMs
Number of Disk Controllers	1
Disk Controller Vendors and Models	HP Embedded SATA Controller
Number of Host Bus Adapters	1
Host Bus Adapter Vendors and Models	1 dual-channel QLogic QMH2462 fibre channel HBA
Number of Network Controllers	3
Network Controller Vendors and Models	2xIntegrated Dual-port HP NC532i Flex-10 10Gb Ethernet, 1xDual-port HP NC360m Gigabit Ethernet

Network Switch Vendors and Models	HP ProCurve 3400cl-48G
Network Speed	10Gb/s for VM's & COS, 1Gb/s for alternate COS
Other Hardware	HP ProCurve Switch cl 10GbE Media Flex Module
Other Software	None.
Hardware Availability Date	10/31/2009
Software Availability Date	05/21/2009

Virtualization Software

Vendor, Product, Version, and Build	VMware ESX 4.0 (build 164009)
Virtualization Type	Hardware
Supplemental Software	None.
Virtualization Software Availability Date	05/21/2009

Storage

Array Vendors, Models, and Firmware Versions	HP StorageWorks MSA 2000, firmware version J200P16
Fibre Channel Switch Vendors and Models	HP StorageWorks SAN Switch 4/32
Disk Space Used	1.12TB for VM's
Array Cache Size	1GB
Total Number of Physical Disks Used	133
Total Number of Enclosures/Pods/Shelves Used	11
Total Number of Physical Disks per Enclosures/Pods/Shelves Used	12
Total Number of Storage Groups Used	11
Number LUNs Used	11
LUN Size and Number of Disks Per LUN	1.6TB per LUN, 12 disks per LUN
RAID Type	RAID 0 for VMs, none for O/S
Number of Members per RAID Set	12
Disk Vendors, Models, and Speeds	132 HP 146GB 15K SAS drives for data, 1 HP 32GB 1.5G SATA SSD for O/S

Clients

Number of Clients	17
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System Model(s)	HP ProLiant DL360G5
Processor Vendor(s) and Model(s)	Intel Xeon
Processor Speed(s) (GHz)	2.83GHz
Total Sockets/Total Cores/Total Threads	1 Sockets / 4 Cores / 4 Threads
Memory per Client	2GB
Network Controller Vendors and Models	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 3.33GHz
 - HP Power Profile: Maximum Performance (default Balanced Power and Performance)
 - HP Power Regulator: HP Static High Performance Mode (default HP Dynamic Power Savings Mode)
 - Thermal Configuration: Increased Cooling (default Optimal Cooling)
 - Drive Write Cache: Enabled (default Disabled)
 - Memory Speed with 2 DIMMs per Channel: 1333 MHz Maximum (default 1066 MHz Maximum)
- 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 on vmnic3 at 1Gb/s
 - vSwitch1 for an alternate Service Console and all VM tiles 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21 configured with 120 ports (default 56) on vmnic0 at 10Gb/s
 - vSwitch2 for all VM tiles 0, 2, 4, 6, 8, 12, 14, 16, 18 configured with 120 ports (default 56) on vmnic1 at 10Gb/s
- Storage Configuration:
 - database00_bl685g6 configured to store database VMs 0, 2, 4, 6, 8, 11, 13, 15, 17
 - database01_bl685g6 configured to store database VMs 1, 3, 5, 7, 9, 12, 14, 16
 - storage0_bl685g6 configured to store all VMs other than database for tiles 0 & 1
 - storage1_bl685g6 configured to store all VMs other than database for tiles 2 & 3
 - storage2_bl685g6 configured to store all VMs other than database for tiles 4 & 5
 - storage3_bl685g6 configured to store all VMs other than database for tiles 6 & 7
 - storage4_bl685g6 configured to store all VMs other than database for tiles 8 & 9
 - storage5_bl685g6 configured to store all VMs other than database for tiles 10 & 11
 - storage6_bl685g6 configured to store all VMs other than database for tiles 12 & 13
 - storage7_bl685g6 configured to store all VMs other than database for tiles 14 & 15

- storage8_bl685g6 configured to store all VMs other than database for tiles 16

Virtualization Software Notes

- virtual hardware upgraded from V4 to V7
- virtualized MMU was enabled for all 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)
- VMFS3.MaxHeapSizeMB was set to 64 (default 80)
- BufferCache.SoftMaxDirty=85 (default 15)
- Disk.SchedNumReqOutstanding = 128 (default 32)
- Net.EtherswitchHashSize = 4 (default 1)
- /vmkernel/module/qla2xxx.o/options = "ql2xmaxqdepth=64" set in /etc/vmware/esx.conf (default 32)
- firewall was disabled for the COS

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

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.

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