

VMware® VMmark™ V1.1.1 Results

Vendor and Hardware Platform: HP ProLiant BL685c G6
Virtualization Platform: VMware ESX 4.0 (build 164009)

VMmark V1.1.1 Score =
29.19 @ 20 Tiles

Tested By: HP

Test Date: 06-26-2009

Performance Section
[Performance](#)

Configuration Section
[Configuration](#)

Notes Section
[Notes for Workload](#)

Performance

	webserver		javaserver		mailserver		fileserver		database		
TILE_0	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1926.17	1.89	17696.12	1.07	1773.78	1.62	17.68	1.38	2405.72	1.61	1.49
p1	1892.70	1.86	18168.25	1.09	1809.97	1.65	17.67	1.38	2405.70	1.61	1.49
p2	1904.55	1.87	18169.38	1.09	1966.25	1.79	17.56	1.37	2400.43	1.61	1.52
TILE_1	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1788.12	1.75	18160.55	1.09	1661.20	1.51	17.93	1.40	2400.68	1.61	1.46
p1	1801.08	1.77	17681.50	1.06	1584.35	1.44	18.16	1.42	2415.18	1.62	1.44
p2	1809.55	1.78	18125.53	1.09	1662.88	1.52	17.94	1.40	2421.28	1.62	1.46
TILE_2	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1784.30	1.75	18114.20	1.09	1777.42	1.62	17.80	1.39	2419.93	1.62	1.47
p1	1793.17	1.76	18117.17	1.09	1706.10	1.56	17.69	1.38	2420.25	1.62	1.46
p2	1798.80	1.77	18118.92	1.09	1678.53	1.53	16.50	1.29	2420.35	1.62	1.44
TILE_3	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1905.67	1.87	18134.45	1.09	1840.80	1.68	16.90	1.32	2422.60	1.62	1.49
p1	1890.95	1.86	17681.95	1.06	1787.80	1.63	16.18	1.26	2423.20	1.62	1.46
p2	1872.33	1.84	18133.17	1.09	1829.53	1.67	16.95	1.32	2422.62	1.62	1.48
TILE_4	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1894.97	1.86	18152.75	1.09	1860.28	1.70	16.39	1.28	2407.15	1.61	1.48
p1	1875.85	1.84	17693.17	1.06	1761.25	1.61	15.62	1.22	2417.60	1.62	1.44
p2	1867.10	1.83	18130.03	1.09	1822.95	1.66	15.92	1.24	2430.80	1.63	1.46
TILE_5	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1959.05	1.92	18147.08	1.09	1820.72	1.66	18.71	1.46	2287.20	1.53	1.51
p1	1940.28	1.90	18118.72	1.09	1889.88	1.72	18.58	1.45	2196.45	1.47	1.50
p2	1939.58	1.90	17691.58	1.06	1799.97	1.64	18.48	1.44	2402.38	1.61	1.50

TILE_6	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1775.95	1.74	18126.22	1.09	1894.20	1.73	17.72	1.38	2381.18	1.60	1.49
p1	1775.65	1.74	18125.85	1.09	1773.65	1.62	17.61	1.37	2399.70	1.61	1.47
p2	1764.95	1.73	18122.05	1.09	1821.95	1.66	17.59	1.37	2399.97	1.61	1.47
TILE_7	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1882.08	1.85	18141.92	1.09	1682.60	1.53	15.78	1.23	2405.60	1.61	1.44
p1	1868.80	1.83	18137.78	1.09	1731.75	1.58	15.36	1.20	2420.30	1.62	1.44
p2	1857.80	1.82	18122.53	1.09	1759.80	1.60	14.95	1.17	2420.35	1.62	1.43
TILE_8	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1953.17	1.92	18156.47	1.09	1636.10	1.49	17.80	1.39	2432.18	1.63	1.48
p1	1933.85	1.90	18144.45	1.09	1758.60	1.60	16.99	1.32	2424.70	1.62	1.48
p2	1941.75	1.91	17691.85	1.06	1660.08	1.51	17.47	1.36	2450.85	1.64	1.47
TILE_9	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1961.72	1.93	18117.17	1.09	1817.67	1.66	18.57	1.45	2414.32	1.62	1.52
p1	1944.80	1.91	18147.53	1.09	1851.15	1.69	18.44	1.44	2429.68	1.63	1.52
p2	1943.33	1.91	18131.35	1.09	1847.55	1.68	18.50	1.44	2428.65	1.63	1.52
TILE_10	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1913.72	1.88	18172.78	1.09	1629.75	1.49	18.28	1.42	2406.30	1.61	1.48
p1	1886.45	1.85	18145.28	1.09	1658.62	1.51	18.16	1.42	2222.50	1.49	1.45
p2	1891.90	1.86	17687.15	1.06	1707.65	1.56	18.17	1.42	2060.00	1.38	1.43
TILE_11	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1580.88	1.55	18159.67	1.09	1599.58	1.46	17.51	1.36	2425.78	1.63	1.41
p1	1484.47	1.46	18138.97	1.09	1826.22	1.67	17.51	1.36	2363.90	1.58	1.42
p2	1488.80	1.46	18129.78	1.09	1821.47	1.66	17.37	1.35	2421.12	1.62	1.42
TILE_12	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1822.62	1.79	18120.55	1.09	1753.17	1.60	18.08	1.41	2351.43	1.58	1.47
p1	1790.35	1.76	18114.47	1.09	1756.08	1.60	17.69	1.38	2388.50	1.60	1.47
p2	1789.62	1.76	18112.97	1.09	1802.42	1.64	17.82	1.39	2325.65	1.56	1.47
TILE_13	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1836.67	1.80	18154.72	1.09	1596.85	1.46	17.13	1.33	2421.65	1.62	1.44
p1	1810.70	1.78	18148.33	1.09	1687.88	1.54	17.14	1.34	2356.50	1.58	1.45
p2	1780.47	1.75	18156.58	1.09	1711.38	1.56	17.09	1.33	2416.85	1.62	1.45
TILE_14	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1911.22	1.88	18121.33	1.09	1514.72	1.38	18.46	1.44	2377.62	1.59	1.45
p1	1889.55	1.85	18123.25	1.09	1727.90	1.58	18.22	1.42	2394.95	1.60	1.49
p2	1877.47	1.84	18120.05	1.09	1750.17	1.60	18.17	1.42	2332.60	1.56	1.48

TILE_15	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1821.40	1.79	18148.60	1.09	1493.58	1.36	17.88	1.39	2414.68	1.62	1.43
p1	1799.10	1.77	18131.53	1.09	1731.62	1.58	17.82	1.39	2419.57	1.62	1.47
p2	1784.22	1.75	18142.45	1.09	1689.40	1.54	17.47	1.36	2371.32	1.59	1.45
TILE_16	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1827.92	1.79	18063.62	1.09	1461.53	1.33	18.34	1.43	2418.05	1.62	1.43
p1	1799.30	1.77	18064.35	1.09	1648.33	1.50	18.11	1.41	2423.93	1.62	1.46
p2	1793.03	1.76	18067.20	1.09	1748.22	1.59	18.06	1.41	2427.28	1.63	1.48
TILE_17	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1858.25	1.82	18090.95	1.09	1325.25	1.21	18.23	1.42	2411.22	1.62	1.41
p1	1815.45	1.78	18072.40	1.09	1632.45	1.49	18.01	1.40	2409.68	1.61	1.46
p2	1827.45	1.79	18073.03	1.09	1615.30	1.47	17.99	1.40	2422.60	1.62	1.46
TILE_18	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1730.17	1.70	18090.97	1.09	1378.25	1.26	17.57	1.37	2399.15	1.61	1.39
p1	1725.65	1.69	18081.55	1.09	1523.00	1.39	17.66	1.38	2411.90	1.62	1.42
p2	1726.30	1.69	18072.92	1.09	1742.83	1.59	17.46	1.36	2414.85	1.62	1.45
TILE_19	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1864.45	1.83	18071.50	1.09	1184.80	1.08	18.44	1.44	1986.40	1.33	1.33
p1	1835.67	1.80	18070.42	1.09	1505.90	1.37	18.21	1.42	2202.07	1.48	1.41
p2	1832.55	1.80	18068.50	1.09	1672.00	1.52	17.95	1.40	2337.75	1.57	1.46
p0_score:	29.05										
p1_score:	29.19										
p2_score:	29.31										
Unreviewed_VMmark_Score:	29.19										

Configuration

Server and Network	
Server Manufacturer and Model	HP ProLiant BL685c G6
Processor Vendor and Model	Six-core AMD Opteron 8435
Processor Speed (GHz)	2.6GHz
Total Sockets/Total Cores/Total Threads	4 Sockets / 24 Cores / 24 Threads
Primary Cache	64KB I + 64KB D on chip per core
Secondary Cache	512K I+D on chip per core
Other Cache	6MB I+D L3 on chip
BIOS Version	5/7/2009

Memory Size (in GB, Number of DIMMs)	128GB (16x8GB)
Memory Type and Speed	PC2-5300 667MHz Registered ECC DDR2
Disk Subsystem Type	Direct attach SAS for operating system, FC SAN for VMs
Number of Disk Controllers	1
Disk Controller Vendors and Models	Integrated HP Smart Array P400i
Number of Host Bus Adapters	1
Host Bus Adapter Vendors and Models	1 QLogic QMH2462 dual port 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 3400c1-48G
Network Speed	10Gb/s for VM's & COS, 1Gb/s for alternate COS
Other Hardware	HP ProCurve Switch c1 10GbE Media Flex Module
Other Software	None.
Hardware Availability Date	06/02/2009
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	1.34TB for VM's
Array Cache Size	1GB
Total Number of Physical Disks Used	146
Total Number of Enclosures/Pods/Shelves Used	12
Total Number of Physical Disks per Enclosures/Pods/Shelves Used	12

Total Number of Storage Groups Used	12
Number LUNs Used	12
LUN Size and Number of Disks Per LUN	1.6TB per LUN, 12 disks per LUN
RAID Type	RAID 0 for VMs, RAID 1 for O/S
Number of Members per RAID Set	12
Disk Vendors, Models, and Speeds	144 HP 146GB 15K RPM SAS drive for VMs, 2 HP 36GB 15K RPM SFF for O/S

Clients

Number of Clients	20
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:
 - Power Regulator: Static High Performance (default Dynamic Power Savings Mode)
 - Ultra Low Power State: disabled (default enabled)
 - Memory Channel Mode: Independent Mode (default Combined Mode)
 - AMD Virtualization Technology enabled (default disabled)
 - Drive Write Cache enabled (default disabled)
 - DRAM Prefetch disabled (default enabled)
 - Software Training on Hardware Prefetch disabled (default 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 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
 - vSwitch1 for all VM tiles 0, 2, 4, 6, 8, 12, 14, 16, 18 configured with 120 ports (default 56) on vmnic1 at 10Gb/s
 - vSwitch2 for an alternate Service Console on vmnic11 at 1Gb/s
- Storage Configuration:
 - database00_bl685g6 configured to store database VMs 0, 2, 4, 6, 8, 11, 13, 15, 17, 19
 - database01_bl685g6 configured to store database VMs 1, 3, 5, 7, 9, 12, 14, 16, 18, 21
 - 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 & 17
 - storage9_bl685g6 configured to store all VMs other than database for tiles 18 & 19

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)
- BufferCache.SoftMaxDirty=85 (default 15)
- Disk.SchedNumReqOutstanding = 128 (default 32)
- Net.EtherswitchHashSize = 4 (default 1)
- IRQ.RoutingPolicy = 0 (default 2)
- /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

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.

For information about VMmark and the rules regarding its usage visit www.vmware.com/products/vmmark.

VMware and VMmark are trademarks or registered trademarks of VMware, Inc. VMware® VMmark™ is a product of [VMware, Inc.](http://www.vmware.com). VMmark utilizes SPECjbb®2005 and SPECweb®2005, which are available from the [Standard Performance Evaluation Corporation \(SPEC®\)](http://www.spec.org).