

## VMware® VMmark™ V1.1.1 Results

Vendor and Hardware Platform: SGI C2104-TY3  
 Virtualization Platform: VMware ESX 4.1.0 (build 260247)

**VMmark V1.1.1 Score =  
25.67@ 18 Tiles**

Tested By: SGI

Test Date: 08/23/10

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	1843.88	1.81	18199.60	1.10	1444.08	1.32	15.93	1.24	2267.70	1.52	1.38
p1	1842.80	1.81	18201.40	1.10	1509.33	1.38	16.15	1.26	2311.10	1.55	1.40
p2	1849.03	1.81	18187.78	1.09	1460.72	1.33	15.94	1.24	2307.50	1.55	1.38
TILE_1	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1829.92	1.80	18159.53	1.09	1586.97	1.45	15.44	1.20	2305.35	1.54	1.39
p1	1841.25	1.81	18158.70	1.09	1633.25	1.49	15.78	1.23	2310.80	1.55	1.41
p2	1840.85	1.81	17703.67	1.07	1661.38	1.51	15.68	1.22	2307.43	1.55	1.41
TILE_2	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1841.35	1.81	18160.30	1.09	1589.62	1.45	17.48	1.36	2352.32	1.58	1.44
p1	1847.72	1.81	17699.85	1.07	1547.95	1.41	17.86	1.39	2348.93	1.57	1.43
p2	1854.60	1.82	18159.55	1.09	1563.60	1.43	17.86	1.39	2353.28	1.58	1.44
TILE_3	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1901.50	1.87	18167.12	1.09	1660.97	1.51	15.67	1.22	2275.05	1.52	1.42
p1	1915.75	1.88	17713.28	1.07	1692.92	1.54	15.87	1.24	2310.90	1.55	1.43
p2	1903.25	1.87	18167.15	1.09	1598.40	1.46	15.77	1.23	2295.93	1.54	1.41
TILE_4	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1846.90	1.81	18163.62	1.09	1496.00	1.36	15.56	1.21	2307.25	1.55	1.38
p1	1847.70	1.81	17752.50	1.07	1417.05	1.29	15.68	1.22	2313.85	1.55	1.37
p2	1853.22	1.82	18174.75	1.09	1469.30	1.34	15.76	1.23	2306.05	1.55	1.38
TILE_5	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1836.78	1.80	18174.25	1.09	1557.92	1.42	15.94	1.24	2287.22	1.53	1.40
p1	1840.08	1.81	18172.40	1.09	1538.25	1.40	16.04	1.25	2305.85	1.55	1.40
p2	1845.45	1.81	18176.00	1.09	1468.72	1.34	16.17	1.26	2300.90	1.54	1.39

<b>TILE_6</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1869.22	1.83	18157.35	1.09	1551.17	1.41	15.90	1.24	2329.40	1.56	1.41
<b>p1</b>	1853.80	1.82	17710.72	1.07	1455.78	1.33	15.80	1.23	2348.55	1.57	1.38
<b>p2</b>	1863.15	1.83	18166.72	1.09	1462.62	1.33	16.11	1.26	2354.35	1.58	1.39
<b>TILE_7</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1942.10	1.91	18204.65	1.10	1686.83	1.54	15.64	1.22	2339.47	1.57	1.44
<b>p1</b>	1944.88	1.91	17702.90	1.07	1699.60	1.55	15.61	1.22	2347.93	1.57	1.43
<b>p2</b>	1951.10	1.91	18155.20	1.09	1696.85	1.55	15.76	1.23	2352.15	1.58	1.44
<b>TILE_8</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1853.33	1.82	17742.78	1.07	1592.78	1.45	15.53	1.21	2281.85	1.53	1.39
<b>p1</b>	1842.10	1.81	18182.70	1.09	1513.45	1.38	15.72	1.23	2316.28	1.55	1.39
<b>p2</b>	1856.75	1.82	18164.90	1.09	1518.88	1.38	15.90	1.24	2304.18	1.54	1.39
<b>TILE_9</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1935.25	1.90	18163.90	1.09	1669.00	1.52	17.70	1.38	2336.70	1.57	1.47
<b>p1</b>	1943.40	1.91	18163.25	1.09	1631.15	1.49	17.96	1.40	2353.32	1.58	1.47
<b>p2</b>	1945.90	1.91	18157.47	1.09	1493.40	1.36	17.91	1.40	2349.82	1.57	1.44
<b>TILE_10</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1841.70	1.81	18152.17	1.09	1608.22	1.47	15.67	1.22	2343.00	1.57	1.41
<b>p1</b>	1838.80	1.80	18154.53	1.09	1709.00	1.56	15.96	1.24	2350.78	1.58	1.43
<b>p2</b>	1846.05	1.81	18151.55	1.09	1654.67	1.51	15.92	1.24	2349.93	1.57	1.42
<b>TILE_11</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1940.75	1.90	18165.65	1.09	1590.58	1.45	17.61	1.37	2302.32	1.54	1.45
<b>p1</b>	1948.03	1.91	18186.00	1.09	1612.72	1.47	17.85	1.39	2321.30	1.56	1.46
<b>p2</b>	1949.80	1.91	18195.47	1.10	1589.92	1.45	17.78	1.39	2309.72	1.55	1.45
<b>TILE_12</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1863.78	1.83	17735.90	1.07	1487.75	1.36	17.51	1.36	2333.12	1.56	1.41
<b>p1</b>	1844.05	1.81	18144.20	1.09	1582.42	1.44	17.78	1.39	2359.18	1.58	1.44
<b>p2</b>	1855.97	1.82	18140.45	1.09	1696.30	1.55	17.87	1.39	2356.97	1.58	1.47
<b>TILE_13</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1933.55	1.90	17771.28	1.07	1535.08	1.40	17.29	1.35	2258.22	1.51	1.42
<b>p1</b>	1948.50	1.91	18211.58	1.10	1590.00	1.45	17.77	1.39	2313.07	1.55	1.46
<b>p2</b>	1945.00	1.91	18194.25	1.10	1623.85	1.48	17.79	1.39	2308.43	1.55	1.46
<b>TILE_14</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1851.58	1.82	17731.17	1.07	1444.00	1.32	17.39	1.36	2335.47	1.56	1.40
<b>p1</b>	1857.67	1.82	18165.72	1.09	1602.75	1.46	17.48	1.36	2346.47	1.57	1.44
<b>p2</b>	1851.30	1.82	18164.08	1.09	1628.92	1.49	17.75	1.38	2348.32	1.57	1.45

<b>TILE_15</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1860.38	1.83	18155.03	1.09	1336.92	1.22	17.69	1.38	2269.97	1.52	1.39
<b>p1</b>	1871.60	1.84	17698.00	1.07	1618.45	1.48	18.04	1.41	2320.50	1.55	1.45
<b>p2</b>	1860.42	1.83	18151.17	1.09	1657.92	1.51	17.82	1.39	2310.93	1.55	1.45
<b>TILE_16</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1941.58	1.91	18142.53	1.09	1297.83	1.18	17.69	1.38	2342.60	1.57	1.40
<b>p1</b>	1952.28	1.92	17693.53	1.07	1615.80	1.47	17.96	1.40	2346.70	1.57	1.46
<b>p2</b>	1947.67	1.91	18166.40	1.09	1617.55	1.47	17.93	1.40	2342.85	1.57	1.47
<b>TILE_17</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1856.85	1.82	18079.15	1.09	1318.88	1.20	17.31	1.35	2269.07	1.52	1.37
<b>p1</b>	1869.65	1.83	18131.90	1.09	1548.78	1.41	17.74	1.38	2273.78	1.52	1.43
<b>p2</b>	1868.12	1.83	18145.42	1.09	1679.17	1.53	17.74	1.38	2265.07	1.52	1.45
<b>p0_score:</b>	25.36										
<b>p1_score:</b>	25.67										
<b>p2_score:</b>	25.72										
<b>Unreviewed_VMmark_Score:</b>	25.67										

## Configuration

<b>Server and Network</b>	
Server Manufacturer and Model	SGI C2104-TY3
Processor Vendor and Model	Intel Xeon W5590
Processor Speed (GHz)	3.33 GHz
Total Sockets/Total Cores/Total Threads	2 Sockets / 8 Cores / 16 Threads
Primary Cache	32KB I + 32KB D on-chip per core
Secondary Cache	256KB I + D on chip per core
Other Cache	8MB I + D on chip per chip L3
BIOS Version	1.30 (12/23/09)
Memory Size (in GB, Number of DIMMs)	96GB (12x8GB)
Memory Type and Speed	Dual rank 1333MHz Registered DDR3
Disk Subsystem Type	Internal RAID for COS, FC SAN for VMs
Number of Disk Controllers	1
Disk Controller Vendors and Models	LSI Logic 1064E Based SAS RAID card
Number of Host Bus Adapters	1

Host Bus Adapter Vendors and Models	1xQLogic Dual-Port 8Gbit fibre channel HBA (qlc2562)
Number of Network Controllers	3
Network Controller Vendors and Models	1x Onboard Intel 82576 Dual-Port Gigabit Ethernet Controller, 2x Single-Port Chelsio N310E 10Gbit Ethernet
Network Switch Vendors and Models	SMC 8848M with 10GigE card
Network Speed	10Gbps for all VMs except webserver VMs. 1Gbps for webserver VMs
Other Hardware	None
Other Software	None
Hardware Availability Date (MM-DD-YYYY)	12/23/09
Software Availability Date (MM-DD-YYYY)	07/13/10
<b>Virtualization Software</b>	
Vendor, Product, Version, and Build	VMware ESX 4.1 (build 260247)
Virtualization Type	Hardware
Supplemental Software	None
Virtualization Software Availability Date (MM-DD-YYYY)	07/13/10
<b>Storage</b>	
Array Vendors, Models, and Firmware Versions	1xSGI InfiniteStorage IS4600, firmware 07.60.31.00
Fibre Channel Switch Vendors and Models	Brocade 4800 Director Switch w/ 16port 8Gbit blade and two 16 port 4Gbit blades
Disk Space Used	1.064TB per LUN for VMs
Array Cache Size	4096MB
Total Number of Physical Disks Used	176
Total Number of Enclosures/Pods/Shelves Used	16
Total Number of Physical Disks per Enclosures/Pods/Shelves Used	16
Total Number of Storage Groups Used	22
Number LUNs Used	22
LUN Size and Number of Disks Per LUN	125GB per LUN, 8 disks per LUN

RAID Type	RAID 0
Number of Members per RAID Set	22 LUNs over 8x146GB 15K drives
Disk Vendors, Models, and Speeds	146 GB Seagate Barracuda 15K6 FC drives (ST3146356FC)
<b>Clients</b>	
Number of Clients	18
System Model(s)	SGI C1001-TY5
Processor Vendor(s) and Model(s)	Intel Xeon L5530
Processor Speed(s) (GHz)	2.4GHz
Total Sockets/Total Cores/Total Threads	2 Sockets / 8 Cores / 16 Threads
Memory per Client	12GB
Network Controller Vendors and Models	1x Intel 82576 Dual-Port Gigabit Ethernet Controller
Operating System, Version, and Service Pack	Microsoft Windows Server 2003 Enterprise Edition 32bit R2, Service Pack 2
Other Hardware	None
Other Software	None

## Notes for Workload

### Server BIOS Settings

- Intel Turbo Boost Technology Enabled up to 3.60GHz (default enabled)
- Adjacent Cache Line Prefetch Enabled (default disabled)

### QLogic HBA BIOS settings

- Execution throttle set to 128 (default 32)
- Fibre Channel tape support disabled (default enabled)

### vSwitch Configuration

- vSwitch0 for Service console on vmnic0 at 1Gbps
- vSwitch1 for all webserver VMs, configured with 24 ports (default 56) on vmnic1 at 1Gbps
- vSwitch2 for even number VMs except webserver VMs, configured with 120 ports (default 56) on vmnic2 at 10Gbps
- vSwitch3 for odd number VMs except webserver VMs, configured with 120 ports (default 56) on vmnic3 at 10Gbps

### Storage Configuration

- 22 RAID 0 LUNs were created over 8x146GB 15K FC drives.
- 18 LUNs holding each tile's Fileserver/Javasever/Mailserver/Standby/Webserver VM
- 2 LUNs each holding 4 Database VMs
- 2 LUNs each holding 5 Database VMs

- IS4600-01 configured with 22 LUNs.
- IS4600-01\_LUN0 configured with Fileserver/Javaserver/Mailserver/Standby/Webserver VM for tile 0
- IS4600-01\_LUN1 configured with Fileserver/Javaserver/Mailserver/Standby/Webserver VM for tile 1
- IS4600-01\_LUN2 configured with Fileserver/Javaserver/Mailserver/Standby/Webserver VM for tile 2
- IS4600-01\_LUN3 configured with Fileserver/Javaserver/Mailserver/Standby/Webserver VM for tile 3
- IS4600-01\_LUN4 configured with Fileserver/Javaserver/Mailserver/Standby/Webserver VM for tile 4
- IS4600-01\_LUN5 configured with Fileserver/Javaserver/Mailserver/Standby/Webserver VM for tile 5
- IS4600-01\_LUN6 configured with Fileserver/Javaserver/Mailserver/Standby/Webserver VM for tile 6
- IS4600-01\_LUN7 configured with Fileserver/Javaserver/Mailserver/Standby/Webserver VM for tile 7
- IS4600-01\_LUN8 configured with Fileserver/Javaserver/Mailserver/Standby/Webserver VM for tile 8
- IS4600-01\_LUN9 configured with Fileserver/Javaserver/Mailserver/Standby/Webserver VM for tile 9
- IS4600-01\_LUN10 configured with Fileserver/Javaserver/Mailserver/Standby/Webserver VM for tile 10
- IS4600-01\_LUN11 configured with Fileserver/Javaserver/Mailserver/Standby/Webserver VM for tile 11
- IS4600-01\_LUN12 configured with Fileserver/Javaserver/Mailserver/Standby/Webserver VM for tile 12
- IS4600-01\_LUN13 configured with Fileserver/Javaserver/Mailserver/Standby/Webserver VM for tile 13
- IS4600-01\_LUN14 configured with Fileserver/Javaserver/Mailserver/Standby/Webserver VM for tile 14
- IS4600-01\_LUN15 configured with Fileserver/Javaserver/Mailserver/Standby/Webserver VM for tile 15
- IS4600-01\_LUN16 configured with Fileserver/Javaserver/Mailserver/Standby/Webserver VM for tile 16
- IS4600-01\_LUN17 configured with Fileserver/Javaserver/Mailserver/Standby/Webserver VM for tile 17
- IS4600-01\_LUN18 configured with Database VM for tile 0,1,2,3,
- IS4600-01\_LUN19 configured with Database VM for tile 4,5,6,7
- IS4600-01\_LUN20 configured with Database VM for tile 8,9,10,11,12
- IS4600-01\_LUN21 configured with Database VM for tile 13,14,15,16,17

## Virtualization Software Notes

- Virtual hardware running V7
- Virtual MMU was enabled for all VMs
- Ethernet adapter type set to vmxnet3 for all VMs
- Logging was disabled for all VMs
- Storage multipathing was set to "Fixed" (default MRU)
- IDE & Floppy removed for all Linux VMs (default enabled)
- IDE removed for all Windows VMs (default enabled)
- BufferCache.SoftMaxDirty=85 (default 15)
- Disk.SchedNumReqOutstanding = 128 (default 32)
- IRQ.RoutingPolicy = 0 (default 2)
- Net.MaxNetifRxQueueLen=300 (default 100)
- Net.MaxNetifTxQueueLen=1000 (default 500)
- Net.TcpipHeapMax=120 (default 64)
- Net.vmxnetThroughputWeight=255 (default 0)
- Net.MaxPortRxQueueLen=160 (default 80)
- Net.EtherswitchHashSize=4 (default 1)
- VMFS3.MaxHeapSizeMB=64 (default 80)
- /vmkernel/module/qla2xxx.o/options = "ql2xmaxqdepth=128" 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 and KB933360
- Database, 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 and KB933360
- TCP TOE chimney was disabled on all clients (default enabled)

## Other Notes

- Memory speed with 2 DIMMs per channel is 1066 MT/s

---

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](http://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).