

VMware® VMmark™ V1.1.1 Results

Vendor and Hardware Platform: Cisco UCS B200 M1
Virtualization Platform: VMware ESX 4.0 Build 164009

**VMmark V1.1.1 Score =
25.06 @ 17 Tiles**

Tested By: Cisco Systems

Test Date: 12-27-2009

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Performance

| | webserver | | javaserver | | mailserver | | fileserver | | database | | |
|--------|-----------|-------|------------|-------|------------|-------|------------|-------|----------|-------|------|
| TILE_0 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1925.85 | 1.89 | 18131.30 | 1.09 | 1520.53 | 1.39 | 17.20 | 1.34 | 2347.00 | 1.57 | 1.43 |
| p1 | 1931.42 | 1.90 | 18136.38 | 1.09 | 1598.33 | 1.46 | 17.74 | 1.38 | 2388.47 | 1.60 | 1.46 |
| p2 | 1931.70 | 1.90 | 18130.10 | 1.09 | 1317.42 | 1.20 | 17.78 | 1.39 | 2385.90 | 1.60 | 1.41 |
| TILE_1 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1965.50 | 1.93 | 18133.17 | 1.09 | 1712.28 | 1.56 | 17.55 | 1.37 | 2385.38 | 1.60 | 1.48 |
| p1 | 1963.83 | 1.93 | 18123.20 | 1.09 | 1595.70 | 1.45 | 17.53 | 1.37 | 2384.93 | 1.60 | 1.46 |
| p2 | 1962.55 | 1.93 | 18099.58 | 1.09 | 1642.78 | 1.50 | 17.72 | 1.38 | 2404.38 | 1.61 | 1.48 |
| TILE_2 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1971.80 | 1.94 | 18128.15 | 1.09 | 1644.47 | 1.50 | 18.18 | 1.42 | 2390.15 | 1.60 | 1.48 |
| p1 | 1958.72 | 1.92 | 18139.50 | 1.09 | 1696.15 | 1.55 | 18.27 | 1.42 | 2374.30 | 1.59 | 1.49 |
| p2 | 1960.67 | 1.92 | 18125.97 | 1.09 | 1611.90 | 1.47 | 18.29 | 1.43 | 2389.90 | 1.60 | 1.48 |
| TILE_3 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1962.88 | 1.93 | 18156.97 | 1.09 | 1731.58 | 1.58 | 17.42 | 1.36 | 2414.45 | 1.62 | 1.49 |
| p1 | 1954.62 | 1.92 | 18148.35 | 1.09 | 1543.20 | 1.41 | 17.69 | 1.38 | 2414.05 | 1.62 | 1.46 |
| p2 | 1962.58 | 1.93 | 18164.62 | 1.09 | 1641.65 | 1.50 | 17.75 | 1.38 | 2413.32 | 1.62 | 1.48 |
| TILE_4 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1964.25 | 1.93 | 18154.42 | 1.09 | 1764.35 | 1.61 | 17.90 | 1.40 | 2339.57 | 1.57 | 1.49 |
| p1 | 1957.30 | 1.92 | 18168.85 | 1.09 | 1737.62 | 1.58 | 18.10 | 1.41 | 2399.88 | 1.61 | 1.50 |
| p2 | 1957.70 | 1.92 | 18176.90 | 1.09 | 1745.95 | 1.59 | 17.71 | 1.38 | 2375.65 | 1.59 | 1.49 |
| TILE_5 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1947.53 | 1.91 | 18142.62 | 1.09 | 1766.55 | 1.61 | 17.49 | 1.36 | 2400.30 | 1.61 | 1.49 |
| p1 | 1949.00 | 1.91 | 18149.25 | 1.09 | 1628.30 | 1.48 | 17.75 | 1.38 | 2402.90 | 1.61 | 1.47 |
| p2 | 1948.85 | 1.91 | 18150.30 | 1.09 | 1628.00 | 1.48 | 17.42 | 1.36 | 2399.90 | 1.61 | 1.47 |

| | | | | | | | | | | | |
|----------------|---------|-------|----------|-------|---------|-------|--------|-------|---------|-------|------|
| TILE_6 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1968.35 | 1.93 | 17675.45 | 1.06 | 1691.72 | 1.54 | 18.24 | 1.42 | 2349.43 | 1.57 | 1.48 |
| p1 | 1959.92 | 1.92 | 18130.03 | 1.09 | 1676.20 | 1.53 | 18.45 | 1.44 | 2367.55 | 1.59 | 1.49 |
| p2 | 1966.35 | 1.93 | 18121.12 | 1.09 | 1608.42 | 1.47 | 18.38 | 1.43 | 2388.03 | 1.60 | 1.48 |
| TILE_7 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1961.35 | 1.92 | 18174.85 | 1.09 | 1678.92 | 1.53 | 17.63 | 1.37 | 2410.47 | 1.62 | 1.48 |
| p1 | 1956.55 | 1.92 | 18207.55 | 1.10 | 1684.47 | 1.54 | 17.66 | 1.38 | 2417.53 | 1.62 | 1.48 |
| p2 | 1959.22 | 1.92 | 18168.03 | 1.09 | 1662.83 | 1.52 | 17.76 | 1.38 | 2401.38 | 1.61 | 1.48 |
| TILE_8 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1944.25 | 1.91 | 18157.92 | 1.09 | 1645.90 | 1.50 | 18.70 | 1.46 | 2396.70 | 1.61 | 1.49 |
| p1 | 1949.20 | 1.91 | 18173.58 | 1.09 | 1665.30 | 1.52 | 18.42 | 1.44 | 2397.15 | 1.61 | 1.49 |
| p2 | 1948.08 | 1.91 | 18158.40 | 1.09 | 1675.50 | 1.53 | 18.68 | 1.46 | 2400.82 | 1.61 | 1.50 |
| TILE_9 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1965.88 | 1.93 | 17669.38 | 1.06 | 1615.65 | 1.47 | 17.67 | 1.38 | 2395.28 | 1.61 | 1.46 |
| p1 | 1965.28 | 1.93 | 18141.12 | 1.09 | 1676.80 | 1.53 | 18.10 | 1.41 | 2398.35 | 1.61 | 1.49 |
| p2 | 1964.20 | 1.93 | 18146.08 | 1.09 | 1654.70 | 1.51 | 17.98 | 1.40 | 2391.38 | 1.60 | 1.48 |
| TILE_10 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1943.30 | 1.91 | 18124.97 | 1.09 | 1606.53 | 1.46 | 17.96 | 1.40 | 2357.62 | 1.58 | 1.46 |
| p1 | 1933.55 | 1.90 | 17634.00 | 1.06 | 1710.85 | 1.56 | 17.96 | 1.40 | 2373.00 | 1.59 | 1.48 |
| p2 | 1948.65 | 1.91 | 18077.72 | 1.09 | 1828.38 | 1.67 | 18.27 | 1.42 | 2367.47 | 1.59 | 1.51 |
| TILE_11 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1942.97 | 1.91 | 17704.45 | 1.07 | 1546.95 | 1.41 | 18.06 | 1.41 | 2401.50 | 1.61 | 1.45 |
| p1 | 1947.00 | 1.91 | 18179.90 | 1.09 | 1648.55 | 1.50 | 18.19 | 1.42 | 2400.40 | 1.61 | 1.48 |
| p2 | 1950.20 | 1.91 | 18169.38 | 1.09 | 1598.45 | 1.46 | 18.09 | 1.41 | 2399.55 | 1.61 | 1.47 |
| TILE_12 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1952.67 | 1.92 | 18129.10 | 1.09 | 1575.95 | 1.44 | 17.93 | 1.40 | 2386.80 | 1.60 | 1.46 |
| p1 | 1953.92 | 1.92 | 18107.17 | 1.09 | 1696.55 | 1.55 | 17.90 | 1.40 | 2388.20 | 1.60 | 1.48 |
| p2 | 1951.08 | 1.91 | 18102.92 | 1.09 | 1730.05 | 1.58 | 17.89 | 1.39 | 2385.07 | 1.60 | 1.49 |
| TILE_13 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1937.95 | 1.90 | 18172.25 | 1.09 | 1519.10 | 1.39 | 17.61 | 1.37 | 2407.38 | 1.61 | 1.45 |
| p1 | 1930.53 | 1.89 | 18168.00 | 1.09 | 1508.83 | 1.38 | 17.96 | 1.40 | 2408.88 | 1.61 | 1.45 |
| p2 | 1936.38 | 1.90 | 18151.95 | 1.09 | 1710.75 | 1.56 | 17.94 | 1.40 | 2408.85 | 1.61 | 1.49 |
| TILE_14 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1950.30 | 1.91 | 18131.50 | 1.09 | 1312.03 | 1.20 | 17.90 | 1.39 | 2400.25 | 1.61 | 1.41 |
| p1 | 1951.12 | 1.91 | 18113.28 | 1.09 | 1550.53 | 1.41 | 17.89 | 1.39 | 2385.07 | 1.60 | 1.46 |
| p2 | 1945.47 | 1.91 | 18094.58 | 1.09 | 1686.58 | 1.54 | 18.11 | 1.41 | 2399.75 | 1.61 | 1.49 |

| TILE_15 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
|---------------------------------|---------|-------|----------|-------|---------|-------|--------|-------|---------|-------|------|
| p0 | 1953.20 | 1.92 | 17644.05 | 1.06 | 1209.78 | 1.10 | 17.72 | 1.38 | 2369.32 | 1.59 | 1.38 |
| p1 | 1958.08 | 1.92 | 18098.58 | 1.09 | 1560.00 | 1.42 | 17.91 | 1.40 | 2380.57 | 1.60 | 1.46 |
| p2 | 1949.20 | 1.91 | 18112.62 | 1.09 | 1674.00 | 1.53 | 17.90 | 1.40 | 2375.22 | 1.59 | 1.48 |
| TILE_16 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1916.50 | 1.88 | 18110.58 | 1.09 | 1242.83 | 1.13 | 17.79 | 1.39 | 2339.65 | 1.57 | 1.38 |
| p1 | 1931.90 | 1.90 | 18080.20 | 1.09 | 1566.20 | 1.43 | 17.79 | 1.39 | 2346.45 | 1.57 | 1.45 |
| p2 | 1930.20 | 1.89 | 18096.85 | 1.09 | 1636.15 | 1.49 | 18.19 | 1.42 | 2363.90 | 1.58 | 1.47 |
| p0_score: | 24.79 | | | | | | | | | | |
| p1_score: | 25.06 | | | | | | | | | | |
| p2_score: | 25.13 | | | | | | | | | | |
| Unreviewed_VMmark_Score: | 25.06 | | | | | | | | | | |

Configuration

| Server and Network | |
|---|--|
| Server Manufacturer and Model | Cisco UCS B200-M1 |
| Processor Vendor and Model | Intel Xeon X5570 |
| Processor Speed (GHz) | 2.93 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 | S5500.0042.1.0.03.121020091404 |
| Memory Size (in GB, Number of DIMMs) | 96GB, 12x8GB |
| Memory Type and Speed | Dual rank 1333MHz Registered DDR3 |
| Disk Subsystem Type | FC SAN |
| Number of Disk Controllers | 1 (unused) |
| Disk Controller Vendors and Models | LSI Logic embedded |
| Number of Host Bus Adapters | 1 dual-port (on the Converged Network Adapter) |
| Host Bus Adapter Vendors and Models | Cisco UCS M71KR-Q Converged Network Adapter |
| Number of Network Controllers | 1 dual-port (on the Converged Network Adapter) |
| Network Controller Vendors and Models | (see above) |

| | |
|---|---|
| Network Switch Vendors and Models | UCS-2104XP, UCS-6120XP & Cisco 3750 |
| Network Speed | 10Gbps |
| Other Hardware | none |
| Other Software | none |
| Hardware Availability Date (MM-DD-YYYY) | 04-01-2010 |
| Software Availability Date (MM-DD-YYYY) | 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 (MM-DD-YYYY) | 05/21/2009 |
| Storage | |
| Array Vendors, Models, and Firmware Versions | EMC CX4-240, version 04.29.000.5.003 |
| Fibre Channel Switch Vendors and Models | Cisco MDS 9134 |
| Disk Space Used | 1154.27GB |
| Array Cache Size | 1024MB |
| Total Number of Physical Disks Used | 41 |
| Total Number of Enclosures/Pods/Shelves Used | 4 |
| Total Number of Physical Disks per Enclosures/Pods/Shelves Used | 1 @ 14 disks, 3 @ 9 disks |
| Total Number of Storage Groups Used | 1 |
| Number LUNs Used | 37 |
| LUN Size and Number of Disks Per LUN | 17 LUNs at 38GB (Fileserver + Mailserver) over 20x73GB SSDs 17 LUNs at 15GB (Database) + 2 LUNs at 400GB (Misc) over 16x450GB 15K disks 1 LUN at 20GB (boot) over 5x300GB 15K disks |
| RAID Type | RAID 0 for VMs, RAID 5 for VMware ESX 4.0 O/S |
| Number of Members per RAID Set | 17 LUNs over 20x73GB SSDs 19 LUNs over 16x450GB 15K disks 1 LUN over 5x300GB 15K disks |

| | |
|---|--|
| Disk Vendors, Models, and Speeds | STEC ZIV2A074 CLAR72, SEAGATE ST345085 CLAR450, SEAGATE ST330065 CLAR300 |
| Clients | |
| Number of Clients | 17 |
| System Model(s) | Dell PowerEdge 2950 |
| Processor Vendor(s) and Model(s) | Intel Xeon |
| Processor Speed(s) (GHz) | 2.66GHz |
| Total Sockets/Total Cores/Total Threads | 2 Sockets / 8 Cores / 8 Threads |
| Memory per Client | 16GB |
| Network Controller Vendors and Models | Broadcom BMC5708C |
| Operating System, Version, and Service Pack | Windows Server 2003 Enterprise Edition SP2 |
| Other Hardware | None |
| Other Software | None |

Notes for Workload

Server BIOS Settings

- Intel Turbo Boost enabled up to 3.33GHz
- External USB ports disabled

QLogic HBA BIOS settings

- Execution throttle set to 128

vSwitch Configuration

- 2 vSwitches defined, one attached to each physical NIC.
- Both vSwitches were configured with 120 ports (default 56).
- Odd numbered tiles attached to one vSwitch, Even numbered tiles attached to the other.

Storage Configuration

- 17 RAID 0 LUNs were created over 20x73GB SSDs. Each LUN held both a Mailserver and a Fileserver.
- 17 RAID 0 LUNs were created for Database VM's, and 2 RAID 0 LUNs were created for all other VM's over 16x450GB 15K drives.
- 1 RAID 5 LUN was created for the OS over 5x300GB 15K drives.

Virtualization Software Notes

- Virtual hardware upgraded from V4 to 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 VMs (default enabled)
- BufferCache.SoftMaxDirty=85 (default 15)
- Disk.SchedNumReqOutstanding = 120 (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.netQueueEnabled = false (default true)
- VMFS2.Enabled = false (default true)
- Usb.storageEnabled = false (default true)
- /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 KB955839
- 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 KB943545 & KB955839

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.

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