

VMware® VMmark™ V1.1.1 Results

Vendor and Hardware Platform: Cisco UCS B250 M2
Virtualization Platform: VMware ESX 4.0 U1 Build 218550

**VMmark V1.1.1 Score =
35.83 @ 26 Tiles**

Tested By: Cisco Systems

Test Date: 3-3-2010

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Performance

	webserver		javaserver		mailserver		fileserver		database		
TILE_0	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1768.62	1.74	18038.30	1.09	1484.30	1.35	14.27	1.11	2294.38	1.54	1.34
p1	1781.08	1.75	18047.62	1.09	1437.33	1.31	14.82	1.16	2295.22	1.54	1.35
p2	1761.72	1.73	18093.38	1.09	1416.78	1.29	14.70	1.15	2295.47	1.54	1.34
TILE_1	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1731.62	1.70	18056.75	1.09	1591.85	1.45	15.78	1.23	2254.28	1.51	1.38
p1	1739.67	1.71	18056.72	1.09	1503.90	1.37	15.57	1.21	2254.07	1.51	1.36
p2	1753.85	1.72	18124.40	1.09	1563.58	1.43	15.78	1.23	2265.25	1.52	1.38
TILE_2	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1650.85	1.62	18078.90	1.09	1483.42	1.35	16.11	1.26	2255.35	1.51	1.35
p1	1739.65	1.71	18075.45	1.09	1489.55	1.36	16.16	1.26	2260.72	1.51	1.37
p2	1745.30	1.71	18111.45	1.09	1499.83	1.37	16.02	1.25	2272.95	1.52	1.37
TILE_3	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1635.65	1.61	18136.38	1.09	1468.85	1.34	15.70	1.22	2259.62	1.51	1.34
p1	1714.53	1.68	18161.38	1.09	1440.45	1.31	15.60	1.22	2266.07	1.52	1.35
p2	1738.17	1.71	18158.60	1.09	1458.97	1.33	15.83	1.23	2259.95	1.51	1.36
TILE_4	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1738.58	1.71	18062.15	1.09	1586.17	1.45	15.60	1.22	2297.47	1.54	1.38
p1	1747.15	1.71	18059.38	1.09	1521.47	1.39	15.71	1.22	2292.20	1.54	1.37
p2	1751.55	1.72	18066.25	1.09	1544.00	1.41	15.62	1.22	2296.07	1.54	1.38
TILE_5	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1732.38	1.70	18038.75	1.09	1479.62	1.35	15.65	1.22	2297.35	1.54	1.36
p1	1721.20	1.69	18083.10	1.09	1607.67	1.47	15.79	1.23	2295.57	1.54	1.39
p2	1747.80	1.72	18089.97	1.09	1463.83	1.33	15.71	1.22	2292.10	1.54	1.36

TILE_6	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1760.83	1.73	18100.05	1.09	1554.97	1.42	15.63	1.22	2255.80	1.51	1.38
p1	1772.70	1.74	18062.67	1.09	1567.55	1.43	15.76	1.23	2262.78	1.52	1.38
p2	1761.25	1.73	18070.85	1.09	1443.38	1.32	15.67	1.22	2268.85	1.52	1.36
TILE_7	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1774.40	1.74	18130.80	1.09	1592.85	1.45	16.12	1.26	2258.55	1.51	1.39
p1	1779.22	1.75	18156.50	1.09	1560.72	1.42	15.98	1.25	2260.60	1.51	1.39
p2	1758.85	1.73	18122.15	1.09	1573.70	1.43	16.07	1.25	2260.28	1.51	1.39
TILE_8	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1694.28	1.66	18121.47	1.09	1493.30	1.36	15.62	1.22	2293.07	1.54	1.36
p1	1711.55	1.68	18011.72	1.08	1482.60	1.35	15.71	1.22	2296.95	1.54	1.36
p2	1722.17	1.69	18050.33	1.09	1418.20	1.29	15.62	1.22	2293.18	1.54	1.35
TILE_9	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1770.55	1.74	18139.28	1.09	1538.42	1.40	15.66	1.22	2261.05	1.52	1.38
p1	1784.50	1.75	18155.55	1.09	1554.30	1.42	15.44	1.20	2267.80	1.52	1.38
p2	1766.20	1.73	18124.08	1.09	1583.95	1.44	15.65	1.22	2272.70	1.52	1.38
TILE_10	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1741.35	1.71	18082.62	1.09	1559.72	1.42	16.12	1.26	2306.43	1.55	1.39
p1	1736.95	1.70	18138.58	1.09	1568.35	1.43	16.27	1.27	2300.45	1.54	1.39
p2	1749.35	1.72	18155.72	1.09	1584.80	1.44	16.00	1.25	2297.78	1.54	1.39
TILE_11	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1769.58	1.74	18075.08	1.09	1525.65	1.39	16.04	1.25	2309.05	1.55	1.38
p1	1775.90	1.74	18078.42	1.09	1400.92	1.28	16.13	1.26	2299.38	1.54	1.36
p2	1758.88	1.73	18098.55	1.09	1243.62	1.13	15.87	1.24	2299.28	1.54	1.32
TILE_12	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1765.10	1.73	17630.90	1.06	1554.05	1.42	15.90	1.24	2303.55	1.54	1.38
p1	1781.17	1.75	18109.10	1.09	1666.28	1.52	15.70	1.22	2298.55	1.54	1.40
p2	1767.22	1.73	18104.00	1.09	1556.80	1.42	15.83	1.23	2301.35	1.54	1.39
TILE_13	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1720.70	1.69	18099.10	1.09	1624.60	1.48	15.72	1.23	2261.20	1.52	1.38
p1	1734.53	1.70	18081.58	1.09	1532.22	1.40	15.62	1.22	2262.43	1.52	1.37
p2	1748.62	1.72	18104.85	1.09	1556.75	1.42	15.95	1.24	2271.57	1.52	1.38
TILE_14	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1710.60	1.68	18027.80	1.09	1633.38	1.49	15.65	1.22	2305.53	1.54	1.39
p1	1754.28	1.72	18063.22	1.09	1547.78	1.41	15.72	1.23	2306.45	1.55	1.38
p2	1744.42	1.71	18069.78	1.09	1586.92	1.45	15.65	1.22	2304.47	1.54	1.38

TILE_15	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1772.75	1.74	18021.60	1.08	1535.75	1.40	16.17	1.26	2302.40	1.54	1.39
p1	1765.12	1.73	18035.62	1.09	1516.35	1.38	16.07	1.25	2300.65	1.54	1.38
p2	1776.58	1.74	18042.17	1.09	1535.78	1.40	16.22	1.26	2299.20	1.54	1.39
TILE_16	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1727.97	1.70	18097.85	1.09	1607.28	1.47	16.25	1.27	2306.40	1.55	1.40
p1	1746.22	1.71	18118.65	1.09	1714.17	1.56	16.08	1.25	2303.75	1.54	1.41
p2	1749.25	1.72	18144.62	1.09	1620.25	1.48	16.12	1.26	2293.47	1.54	1.40
TILE_17	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1735.30	1.70	18149.88	1.09	1520.58	1.39	16.02	1.25	2266.20	1.52	1.37
p1	1749.40	1.72	18141.03	1.09	1537.65	1.40	15.74	1.23	2267.20	1.52	1.37
p2	1749.47	1.72	18143.83	1.09	1538.40	1.40	15.92	1.24	2271.05	1.52	1.38
TILE_18	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1757.00	1.72	18079.88	1.09	1536.53	1.40	16.22	1.26	2323.05	1.56	1.39
p1	1765.12	1.73	18109.05	1.09	1378.62	1.26	16.19	1.26	2317.68	1.55	1.36
p2	1753.35	1.72	18123.72	1.09	1196.28	1.09	16.04	1.25	2319.12	1.55	1.32
TILE_19	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1738.30	1.71	18098.33	1.09	1534.12	1.40	16.12	1.26	2307.10	1.55	1.38
p1	1766.45	1.73	18111.20	1.09	1635.95	1.49	16.21	1.26	2307.20	1.55	1.41
p2	1772.15	1.74	18117.35	1.09	1638.95	1.49	15.99	1.25	2309.25	1.55	1.40
TILE_20	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1819.75	1.79	18108.00	1.09	1544.62	1.41	15.78	1.23	2307.15	1.55	1.39
p1	1814.78	1.78	18116.40	1.09	1586.92	1.45	15.80	1.23	2306.55	1.55	1.40
p2	1814.97	1.78	18119.90	1.09	1608.60	1.47	15.73	1.23	2315.97	1.55	1.40
TILE_21	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1656.90	1.63	18138.60	1.09	1493.03	1.36	16.25	1.27	2341.00	1.57	1.37
p1	1738.80	1.71	18124.50	1.09	1601.15	1.46	16.11	1.26	2335.22	1.56	1.40
p2	1751.05	1.72	18147.28	1.09	1648.33	1.50	16.09	1.25	2336.30	1.57	1.41
TILE_22	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1711.92	1.68	18116.47	1.09	1391.45	1.27	15.98	1.25	2313.82	1.55	1.35
p1	1775.10	1.74	18137.10	1.09	1553.62	1.42	15.82	1.23	2306.97	1.55	1.39
p2	1778.65	1.75	18149.53	1.09	1609.55	1.47	15.98	1.25	2313.80	1.55	1.40
TILE_23	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1693.33	1.66	18140.95	1.09	1384.62	1.26	16.10	1.26	2311.43	1.55	1.35
p1	1741.90	1.71	18142.28	1.09	1558.65	1.42	16.27	1.27	2305.25	1.54	1.39
p2	1769.05	1.74	18147.55	1.09	1614.92	1.47	16.13	1.26	2312.97	1.55	1.40

TILE_24	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1721.80	1.69	18167.70	1.09	1285.35	1.17	15.57	1.21	2352.72	1.58	1.33
p1	1771.15	1.74	18154.58	1.09	1504.45	1.37	15.39	1.20	2343.85	1.57	1.37
p2	1777.83	1.74	18170.45	1.09	1627.47	1.48	15.44	1.20	2344.20	1.57	1.40
TILE_25	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1753.90	1.72	18123.53	1.09	1287.40	1.17	16.13	1.26	2308.12	1.55	1.34
p1	1777.95	1.74	18120.22	1.09	1557.30	1.42	16.24	1.27	2301.25	1.54	1.39
p2	1770.33	1.74	18114.00	1.09	1620.03	1.48	16.07	1.25	2311.25	1.55	1.40
p0_score:	35.63										
p1_score:	35.87										
p2_score:	35.83										
Unreviewed_VMmark_Score:	35.83										

Configuration

Server and Network	
Server Manufacturer and Model	Cisco UCS B250 M2
Processor Vendor and Model	Intel Xeon X5680
Processor Speed (GHz)	3.33 GHz
Total Sockets/Total Cores/Total Threads	2 Sockets / 12 Cores / 24 Threads
Primary Cache	32KB I + 32KB D on-chip per core
Secondary Cache	256KB I + D on chip per core
Other Cache	12MB I + D on chip per chip L3
BIOS Version	S5500.1.2.0.6.030220102024
Memory Size (in GB, Number of DIMMs)	192GB, 48x4GB
Memory Type and Speed	Single 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 (one the Converged Network Adapter)
Host Bus Adapter Vendors and Models	Cisco UCS VIC M81KR 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	(2) UCS-2104XP, (2) UCS-6120XP & (1) Cisco 3750
Network Speed	10Gbps
Other Hardware	none
Other Software	none
Hardware Availability Date (MM-DD-YYYY)	06-15-2010
Software Availability Date (MM-DD-YYYY)	01-05-2010

Virtualization Software

Vendor, Product, Version, and Build	VMware ESX 4.0 U1 (build 218550)
Virtualization Type	Hardware
Supplemental Software	VMware vCenter Server 4.0.0 Build 200785
Virtualization Software Availability Date (MM-DD-YYYY)	01/05/2010

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	1773.48GB
Array Cache Size	1024MB
Total Number of Physical Disks Used	50
Total Number of Enclosures/Pods/Shelves Used	5
Total Number of Physical Disks per Enclosures/Pods/Shelves Used	1 @ 14 disks, 4 @ 9 disks
Total Number of Storage Groups Used	2
Number LUNs Used	55
LUN Size and Number of Disks Per LUN	21 LUNs at 38GB (Fileserver + Mailserver) over 20x73GB SSDs 5 LUNs at 38GB (Fileserver + Mailserver) over 5x73GB SSDs 21 LUNs at 15GB (Database) + 2 LUNs at 400GB (Standby, Webserver, Javasever) over 16x450GB 15K disks 5 LUNs at 15GB (Database) over 4x450GB 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	21 LUNs over 20x73GB SSDs 23 LUNs over 16x450GB 15K disks 5 LUNs over 5x73GB SSDs 5 LUNs over 4x450GB 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	26
System Model(s)	clients 0-17: Dell PowerEdge 2950 client18: Cisco UCS C200 M1 client19: Cisco UCS B200 M1 client20: Cisco UCS B200 M1 client21: Cisco UCS B200 M1 client22: Cisco UCS B200 M1 client23: Cisco UCS B200 M1 client24: Cisco UCS B200 M1 client25: Cisco UCS C200 M1
Processor Vendor(s) and Model(s)	client0-17: Intel Xeon E5430 client18: Intel Xeon E5540 client19: Intel Xeon E5540 client20: Intel Xeon X5670 client21: Intel Xeon E5520 client22: Intel Xeon X5570 client23: Intel Xeon E5540 client24: Intel Xeon E5520 client25: Intel Xeon X5570
Processor Speed(s) (GHz)	client0-17: 2.66GHz client18: 2.53GHz client19: 2.53GHz client20: 2.93GHz client21: 2.26GHz client22: 2.93GHz client23: 2.53GHz client24: 2.26GHz client25: 2.93GHz
Total Sockets/Total Cores/Total Threads	client0-17: 2 Sockets / 8 Cores / 8 Threads client18-19: 2 Sockets / 8 Cores / 16 Threads client20: 2 Sockets / 12 Cores / 24 Threads client21-25: 2 Sockets / 8 Cores / 16 Threads
Memory per Client	client0-17: 16GB client18-25: 24GB
Network Controller Vendors and Models	client0-17: Broadcom BMC5708C (1Gb/s) client18 & 25: Intel 82576 (1Gb/s) client19-24: Intel 82598EB (10Gb/s)
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 3.6GHz
- Hardware Prefetcher Disabled (default enabled)
- Adjacent Sector Prefetcher Disabled (default enabled)
- DCU Streamer Disabled (default enabled)
- Data Reuse Disabled (default enabled)
- Intel DirectPath Enabled (default disabled)

Virtual Switch Configuration

- 1 vSwitch defined, one attached to a physical NIC (vnic1) for all virtual machines with the exception of the webservers
- 27 virtual NICs were configured on the other physical NIC of the Cisco UCS VIC M81KR CNA
- These 27 virtual NICs were configured as a Distributed Virtual Switch in VMware vCenter PTS_vSwitch1
- The 26 webservers were assigned to this Distributed Virtual Switch along with the COS interface
- Both of the virtual switches were configured with 248 ports (default 24)

Storage Configuration

- 21x38GB RAID 0 LUNs were created over 20x73GB SSDs. 5x38GB RAID 0 LUNs were created over an additional 5x73GB SSDs. Each LUN held both a Mailserver and a Fileserver (each tile's MailServer and FileServer were contained on the same LUN).
- 21x15GB RAID 0 LUNs and 2x400GB RAID 0 LUNs were created over 16x450GB 15K drives.
 - Each of the 15GB LUNs held a Database VM
 - One of the 400GB LUNs held Standby, Webserver and Javaservert VM's from even numbered tiles, the other 400GB LUN held Standby, Webserver and Javaservert VM's from odd numbered tiles.
- 5x15GB RAID 0 LUNs were created over 4 additional 450GB 15K drives for Database VM's.
- 1x16GB 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)

- CPU.Quantum=75 (default 50)
- vmfs2 was disabled
- usb was disabled
- firewall for the COS was stopped
- Used the VMmark AutoPart utility to expand all mailserver data partitions

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

- Used a delay in parallel setup for KillLockMem in benchmark setup

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
- Clients19-24 were Cisco UCS B200 M1 blade servers housed in the same chassis as the SUT.
- Network traffic between these (6) clients and the SUT leaves the blade chassis and is switched at the UCS 6120 fabric interconnects.
- Network traffic between the other clients and the SUT is via the Cisco 3750 switch, which is connected to the SUT via the UCS 6120 fabric interconnects.

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.

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