

VMware® VMmark™ V1.1.1 Results

Vendor and Hardware Platform: Fujitsu BX922 S2
 Virtualization Platform: VMware ESX 4.0 Update 1 (build 236512)

**VMmark V1.1.1 Score =
32.89 @ 24 Tiles**

Tested By: Fujitsu

Test Date: 03/22/2010

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Performance

	webserver		javaserver		mailserver		fileserver		database		
TILE_0	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1727.40	1.70	18065.78	1.09	1249.53	1.14	15.37	1.20	2260.30	1.51	1.31
p1	1745.85	1.71	18084.20	1.09	1217.97	1.11	15.39	1.20	2262.25	1.52	1.30
p2	1757.00	1.72	18107.55	1.09	1307.20	1.19	15.30	1.19	2265.45	1.52	1.32
TILE_1	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1751.08	1.72	18151.50	1.09	1600.17	1.46	16.10	1.25	2267.75	1.52	1.39
p1	1761.47	1.73	18143.65	1.09	1506.20	1.37	16.21	1.26	2266.72	1.52	1.38
p2	1762.67	1.73	18103.78	1.09	1567.70	1.43	16.01	1.25	2266.82	1.52	1.39
TILE_2	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1681.17	1.65	18099.92	1.09	1400.10	1.28	15.36	1.20	2253.07	1.51	1.33
p1	1681.35	1.65	18126.42	1.09	1436.92	1.31	15.33	1.19	2252.85	1.51	1.34
p2	1706.30	1.67	18108.55	1.09	1511.25	1.38	15.57	1.21	2253.82	1.51	1.36
TILE_3	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1603.20	1.57	18154.80	1.09	1562.15	1.42	16.22	1.26	2237.45	1.50	1.36
p1	1638.38	1.61	18085.50	1.09	1533.95	1.40	16.35	1.27	2245.60	1.50	1.36
p2	1653.00	1.62	18083.22	1.09	1491.53	1.36	16.50	1.29	2244.95	1.50	1.36
TILE_4	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1681.53	1.65	18148.33	1.09	1559.62	1.42	16.43	1.28	2263.88	1.52	1.38
p1	1686.08	1.65	18169.90	1.09	1539.20	1.40	16.27	1.27	2267.15	1.52	1.37
p2	1704.10	1.67	18173.20	1.09	1475.08	1.34	16.43	1.28	2267.20	1.52	1.37
TILE_5	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1680.90	1.65	18119.50	1.09	1390.20	1.27	15.40	1.20	2232.55	1.50	1.33
p1	1692.30	1.66	18057.40	1.09	1323.00	1.21	15.68	1.22	2233.25	1.50	1.32
p2	1706.97	1.68	18109.47	1.09	1474.72	1.34	15.46	1.20	2234.62	1.50	1.35

TILE_6	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1773.80	1.74	18163.88	1.09	1580.33	1.44	15.01	1.17	2229.88	1.49	1.37
p1	1792.80	1.76	18147.60	1.09	1550.10	1.41	15.31	1.19	2235.88	1.50	1.37
p2	1781.30	1.75	17687.45	1.06	1503.12	1.37	15.17	1.18	2232.88	1.50	1.35
TILE_7	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1780.53	1.75	18089.38	1.09	1553.95	1.42	15.40	1.20	2268.55	1.52	1.38
p1	1794.97	1.76	18113.80	1.09	1591.70	1.45	15.51	1.21	2266.47	1.52	1.39
p2	1780.33	1.75	18103.35	1.09	1598.30	1.46	15.38	1.20	2268.95	1.52	1.38
TILE_8	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1770.20	1.74	18128.60	1.09	1665.42	1.52	15.48	1.21	2229.97	1.49	1.39
p1	1792.12	1.76	18131.97	1.09	1610.70	1.47	15.22	1.19	2236.78	1.50	1.38
p2	1777.05	1.74	18135.78	1.09	1616.25	1.47	15.40	1.20	2231.47	1.50	1.38
TILE_9	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1688.15	1.66	18098.22	1.09	1478.78	1.35	16.32	1.27	2264.95	1.52	1.36
p1	1696.22	1.66	18097.50	1.09	1477.38	1.35	16.54	1.29	2265.18	1.52	1.37
p2	1730.20	1.70	18115.12	1.09	1518.80	1.38	16.32	1.27	2267.60	1.52	1.38
TILE_10	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1682.25	1.65	18146.17	1.09	1472.53	1.34	15.30	1.19	2268.22	1.52	1.34
p1	1695.65	1.66	18116.97	1.09	1442.22	1.31	15.48	1.21	2266.60	1.52	1.34
p2	1713.80	1.68	18092.70	1.09	1463.03	1.33	15.51	1.21	2267.35	1.52	1.35
TILE_11	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1771.00	1.74	17676.45	1.06	1736.20	1.58	16.33	1.27	2238.45	1.50	1.41
p1	1789.90	1.76	18132.67	1.09	1665.50	1.52	16.42	1.28	2239.88	1.50	1.41
p2	1769.88	1.74	18131.78	1.09	1547.20	1.41	16.38	1.28	2242.15	1.50	1.39
TILE_12	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1773.97	1.74	18062.67	1.09	1561.53	1.42	15.29	1.19	2234.80	1.50	1.37
p1	1799.88	1.77	18074.92	1.09	1524.78	1.39	15.46	1.20	2237.32	1.50	1.37
p2	1784.72	1.75	18046.47	1.09	1595.12	1.45	15.34	1.20	2231.82	1.50	1.38
TILE_13	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1772.70	1.74	18165.20	1.09	1458.10	1.33	15.31	1.19	2271.60	1.52	1.36
p1	1791.72	1.76	18192.35	1.10	1472.25	1.34	15.63	1.22	2276.22	1.53	1.37
p2	1784.03	1.75	18168.65	1.09	1379.58	1.26	15.29	1.19	2275.88	1.52	1.34
TILE_14	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1774.42	1.74	18134.65	1.09	1554.17	1.42	16.50	1.29	2277.90	1.53	1.40
p1	1789.85	1.76	18133.58	1.09	1561.28	1.42	16.30	1.27	2276.82	1.53	1.40
p2	1785.75	1.75	18104.08	1.09	1582.75	1.44	16.54	1.29	2274.28	1.52	1.40

TILE_15	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1679.33	1.65	17629.50	1.06	1548.90	1.41	16.50	1.29	2275.50	1.52	1.37
p1	1674.97	1.64	18108.60	1.09	1532.62	1.40	16.27	1.27	2277.22	1.53	1.37
p2	1691.25	1.66	18146.08	1.09	1512.20	1.38	16.46	1.28	2277.12	1.53	1.37
TILE_16	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1686.80	1.66	18114.45	1.09	1458.03	1.33	16.46	1.28	2250.38	1.51	1.36
p1	1710.62	1.68	18109.12	1.09	1453.40	1.33	16.46	1.28	2255.22	1.51	1.36
p2	1686.45	1.66	18116.83	1.09	1499.20	1.37	16.40	1.28	2255.90	1.51	1.37
TILE_17	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1663.25	1.63	18061.03	1.09	1661.92	1.52	16.29	1.27	2244.82	1.50	1.39
p1	1673.42	1.64	18098.47	1.09	1710.67	1.56	16.26	1.27	2248.12	1.51	1.40
p2	1688.47	1.66	18103.47	1.09	1633.75	1.49	16.26	1.27	2247.40	1.51	1.39
TILE_18	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1787.55	1.75	18087.70	1.09	1572.15	1.43	16.47	1.28	2275.20	1.52	1.40
p1	1777.75	1.74	18097.12	1.09	1646.92	1.50	16.23	1.26	2281.65	1.53	1.41
p2	1782.25	1.75	18147.95	1.09	1560.75	1.42	16.39	1.28	2281.97	1.53	1.40
TILE_19	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1765.10	1.73	18082.88	1.09	1567.97	1.43	15.40	1.20	2245.30	1.50	1.37
p1	1766.35	1.73	18124.20	1.09	1611.45	1.47	15.54	1.21	2252.65	1.51	1.38
p2	1778.75	1.75	18143.78	1.09	1586.90	1.45	15.73	1.23	2247.85	1.51	1.38
TILE_20	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1672.47	1.64	18091.92	1.09	1488.85	1.36	16.16	1.26	2252.00	1.51	1.36
p1	1674.58	1.64	18126.65	1.09	1587.88	1.45	16.42	1.28	2255.95	1.51	1.38
p2	1704.12	1.67	18117.90	1.09	1555.80	1.42	16.28	1.27	2252.07	1.51	1.38
TILE_21	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1686.60	1.66	18098.30	1.09	1391.85	1.27	15.27	1.19	2286.90	1.53	1.33
p1	1700.55	1.67	18094.45	1.09	1619.72	1.48	15.39	1.20	2288.35	1.53	1.38
p2	1695.25	1.66	18103.78	1.09	1685.28	1.54	15.56	1.21	2286.78	1.53	1.39
TILE_22	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1777.15	1.74	18078.47	1.09	1347.03	1.23	16.48	1.28	2289.38	1.53	1.36
p1	1764.88	1.73	18100.28	1.09	1503.65	1.37	16.26	1.27	2286.03	1.53	1.38
p2	1769.33	1.74	18097.30	1.09	1555.70	1.42	16.50	1.29	2295.07	1.54	1.40
TILE_23	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1783.75	1.75	18107.65	1.09	1245.83	1.14	14.86	1.16	2256.00	1.51	1.31
p1	1767.08	1.73	18110.62	1.09	1468.40	1.34	15.52	1.21	2255.53	1.51	1.36
p2	1777.72	1.74	18102.12	1.09	1576.05	1.44	15.68	1.22	2250.10	1.51	1.38

p0_score:	32.70
p1_score:	32.89
p2_score:	32.95
Unreviewed_VMmark_Score:	32.89

Configuration

Server and Network	
Server Manufacturer and Model	Fujitsu BX922 S2
Processor Vendor and Model	Six-core Intel Xeon X5680
Processor Speed (GHz)	3.33
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	Rev 3C20.2861
Memory Size (in GB, Number of DIMMs)	192GB, 12
Memory Type and Speed	16GB per DIMM, 1066MHz registered ECC DDR3
Disk Subsystem Type	FC SAN
Number of Disk Controllers	0
Number of Host Bus Adapters	1
Host Bus Adapter Vendors and Models	1 dual-channel Emulex LPe12002
Number of Network Controllers	2
Network Controller Vendors and Models	Two integrated Intel 82576EB dual port 1GbE Adapter
Network Switch Vendors and Models	3xBX600 GbE Switch Blade 30/12, 1xBX900 GbE Connection Blade 36/8+2, 1xBX900 GbE Connection Blade 36/12
Network Speed	1Gb
Other Hardware	none
Other Software	none
Hardware Availability Date (MM-DD-YYYY)	03/29/2010
Software Availability Date (MM-DD-YYYY)	03/25/2010
Virtualization Software	
Vendor, Product, Version, and Build	VMware ESX 4.0 Update 1 (build 236512)

Virtualization Type	Hardware
Supplemental Software	igb-Driver Version 1.3.19.12.1 Patch ESX400-201002001
Virtualization Software Availability Date (MM-DD-YYYY)	03/03/2010

Storage

Array Vendors, Models, and Firmware Versions	15xFujitsu ETERNUS DX80, Firmware version V10L20-0000
Fibre Channel Switch Vendors and Models	Brocade 5100
Disk Space Used	1704 GB for VMs, 11GB for Host-OS, 1TB for VM-config and swap
Array Cache Size	2GB
Total Number of Physical Disks Used	340
Total Number of Enclosures/Pods/Shelves Used	29
Total Number of Physical Disks per Enclosures/Pods/Shelves Used	12 except first ETERNUS DX80 with only 4 disks
Total Number of Storage Groups Used	15
Number LUNs Used	Total 56: 54 LUNs for VMs, 1 LUN for Host-OS, 1 LUN for VM-config and swap
LUN Size and Number of Disks Per LUN	24x9GB/12 Disks, 24x46GB/12 Disks, 6x64GB/8 Disks, 1x11GB/4 Disks, 1x1TB/4 Disks
RAID Type	0
Number of Members per RAID Set	Two members for the 12 disks LUNs, one member for the 8 disks LUNs, 1x11GB and 1x1TB on the same RAID Set
Disk Vendors, Models, and Speeds	336xSeagate, ST3300656SS, 15krpm 4xSeagate, ST3450856SS, 15krpm

Clients

Number of Clients	24
System Model(s)	BX620 S4
Processor Vendor(s) and Model(s)	Intel Xeon 5130
Processor Speed(s) (GHz)	2
Total Sockets/Total Cores/Total Threads	2 Sockets / 4 Cores / 4 Threads
Memory per Client	3GB
Network Controller Vendors and Models	Broadcom NetXtreme

Operating System, Version, and Service Pack	Microsoft(R) Windows(R) Server 2003 R2 Enterprise Edition, Service Pack 2
Other Hardware	none
Other Software	none

Notes for Workload

Server and Network Notes

- Server BIOS settings:
 - Turbo Boost Technology: Enabled (Intel Turbo Boost up to 3.6GHz, default enabled)
 - Adjacent Cache Line Prefetch: Disabled (default enabled)
 - Hardware Prefetch: Disabled (default enabled)
 - DCU Streamer Disabled (default enabled)
 - Data Reuse Optimizations: Disabled (default enabled)
 - Serial: Disabled (default enabled)
 - SATA RAID Enable: Disabled (default enabled)
- Emulex HBA BIOS settings:
 - defaults
- vSwitch Configuration:
 - vSwitch0 for Service Console on vmnic0
 - vSwitch1 for all Java/Standby VMs on vmnic2
 - vSwitch1 configured for 120 Ports (default 56)
 - vSwitch2 for all Web VMs on vmnic1
 - vSwitch2 configured for 56 Ports (default 56)
 - vSwitch3 for all Database/File/Mail VMs on vmnic3
 - vSwitch2 configured for 120 Ports (default 56)
- Storage Configuration:
 - ETERNUS DX80[1]/LUN 0: Boot/Console OS
 - ETERNUS DX80[1]/LUN 1: VM-config and swap
 - ETERNUS DX80[2]/LUN 1: Fileservers/Javaservert/Mailserver/Standby/Webserver for tile 0
 - ETERNUS DX80[2]/LUN 2: Fileservers/Javaservert/Mailserver/Standby/Webserver for tile 1
 - ETERNUS DX80[3]/LUN 1: Fileservers/Javaservert/Mailserver/Standby/Webserver for tile 2
 - ETERNUS DX80[3]/LUN 2: Fileservers/Javaservert/Mailserver/Standby/Webserver for tile 3
 - ETERNUS DX80[4]/LUN 1: Fileservers/Javaservert/Mailserver/Standby/Webserver for tile 4
 - ETERNUS DX80[4]/LUN 2: Fileservers/Javaservert/Mailserver/Standby/Webserver for tile 5
 - ETERNUS DX80[5]/LUN 1: Fileservers/Javaservert/Mailserver/Standby/Webserver for tile 6
 - ETERNUS DX80[5]/LUN 2: Fileservers/Javaservert/Mailserver/Standby/Webserver for tile 7
 - ETERNUS DX80[6]/LUN 1: Fileservers/Javaservert/Mailserver/Standby/Webserver for tile 8
 - ETERNUS DX80[6]/LUN 2: Fileservers/Javaservert/Mailserver/Standby/Webserver for tile 9
 - ETERNUS DX80[7]/LUN 1: Fileservers/Javaservert/Mailserver/Standby/Webserver for tile 10
 - ETERNUS DX80[7]/LUN 2: Fileservers/Javaservert/Mailserver/Standby/Webserver for tile 11
 - ETERNUS DX80[8]/LUN 1: Fileservers/Javaservert/Mailserver/Standby/Webserver for tile 12
 - ETERNUS DX80[8]/LUN 2: Fileservers/Javaservert/Mailserver/Standby/Webserver for tile 13
 - ETERNUS DX80[9]/LUN 1: Fileservers/Javaservert/Mailserver/Standby/Webserver for tile 14
 - ETERNUS DX80[9]/LUN 2: Fileservers/Javaservert/Mailserver/Standby/Webserver for tile 15

- ETERNUS DX80[10]/LUN 1: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 16
- ETERNUS DX80[10]/LUN 2: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 17
- ETERNUS DX80[11]/LUN 1: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 18
- ETERNUS DX80[11]/LUN 2: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 19
- ETERNUS DX80[12]/LUN 1: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 20
- ETERNUS DX80[12]/LUN 2: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 21
- ETERNUS DX80[13]/LUN 1: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 22
- ETERNUS DX80[13]/LUN 2: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 23
- ETERNUS DX80[14]/LUN 1: Database tiles 0 - 3
- ETERNUS DX80[14]/LUN 2: Database tiles 4 - 7
- ETERNUS DX80[14]/LUN 3: Database tiles 8 - 11
- ETERNUS DX80[15]/LUN 1: Database tiles 12 - 15
- ETERNUS DX80[15]/LUN 2: Database tiles 16 - 19
- ETERNUS DX80[15]/LUN 3: Database tiles 20 - 23

Virtualization Software Notes

- All VMs were upgraded to hardware version 7
- Virtualized MMU was set to full hardware support for all VMs (default automatic)
- Ethernet adapter type set to vmxnet3 for all VMs
- Logging disabled for all VMs (default enabled)
- Floppy and CDROM removed for all VMs (default enabled)
- Firewall disabled for the Console OS (default enabled)
- Disk.SchedNumReqOutstanding = 64 (default 32)
- BufferCache.SoftMaxDirty=30 (default 15)
- IRQ.RoutingPolicy = 0 (default 2)
- Net.MaxNetifRxQueueLen=300 (default 100)
- Net.MaxNetifTxQueueLen=1000 (default 500)
- Net.VmxnetTxCopySize=1500 (default 256)
- Net.vmxnetThroughputWeight=255 (default 0)
- Emulex driver: lpfc_lun_queue_depth=64, lpfc_cr_count=5, lpfc_cr_delay=1 (defaults 32,1,0)
- VGA buffer for all Windows VMs was set to 1310720 Bytes
- VGA buffer for all Linux VMs was set to 1572864 Bytes
- One dedicated LUN(ETERNUS DX80[1]/LUN 1) for the VM configuration/swap files
- Used the VMmark AutoPart utility to expand all mailserver data partitions
- /vmkernel/module/vmfs2/enabled = "false"
- Installed Patch ESX400-201002001

Operating System Notes

- Microsoft Windows Server 2003 R2 VMs were updated with Service Pack 2
- Standby server and mail server were updated with KB955839
- File server and web server were updated to SLES10 SP2

Software Notes

- none

Client Notes

- Microsoft Windows Server 2003 R2 Clients were updated with Service Pack 2 and KB955839

Other Notes

- Memory speed with 2 quad rank DIMMs per channel is 800 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.

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