

VMware® VMmark™ V1.1.1 Results

Vendor and Hardware Platform: Fujitsu BX922 S2
Virtualization Platform: VMware ESX 4.0 Update 1 (build 244038)

VMmark V1.1.1 Score =
27.99 @ 18 Tiles

Tested By: Fujitsu

Test Date: 04/19/2010

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 | 2063.57 | 2.03 | 18165.50 | 1.09 | 1843.78 | 1.68 | 21.02 | 1.64 | 2416.97 | 1.62 | 1.58 |
| p1 | 2061.53 | 2.02 | 17709.80 | 1.07 | 1890.70 | 1.72 | 20.93 | 1.63 | 2419.70 | 1.62 | 1.58 |
| p2 | 2052.03 | 2.01 | 18174.03 | 1.09 | 1803.53 | 1.64 | 21.00 | 1.64 | 2400.53 | 1.61 | 1.57 |
| TILE_1 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 2060.72 | 2.02 | 18192.28 | 1.10 | 1770.08 | 1.61 | 20.78 | 1.62 | 2339.03 | 1.57 | 1.55 |
| p1 | 2059.43 | 2.02 | 18184.03 | 1.09 | 1837.88 | 1.68 | 20.55 | 1.60 | 2348.88 | 1.57 | 1.56 |
| p2 | 2050.20 | 2.01 | 18159.72 | 1.09 | 1904.28 | 1.74 | 20.52 | 1.60 | 2357.85 | 1.58 | 1.57 |
| TILE_2 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 2059.35 | 2.02 | 18145.80 | 1.09 | 1925.15 | 1.76 | 20.99 | 1.64 | 2400.43 | 1.61 | 1.59 |
| p1 | 2055.95 | 2.02 | 18147.33 | 1.09 | 1835.03 | 1.67 | 20.87 | 1.63 | 2398.12 | 1.61 | 1.57 |
| p2 | 2046.12 | 2.01 | 17699.08 | 1.07 | 1900.25 | 1.73 | 21.05 | 1.64 | 2378.00 | 1.59 | 1.57 |
| TILE_3 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 2064.88 | 2.03 | 18183.92 | 1.09 | 1875.33 | 1.71 | 20.80 | 1.62 | 2416.65 | 1.62 | 1.58 |
| p1 | 2055.07 | 2.02 | 18156.05 | 1.09 | 1890.67 | 1.72 | 20.69 | 1.61 | 2416.97 | 1.62 | 1.58 |
| p2 | 2052.85 | 2.01 | 18159.70 | 1.09 | 1892.72 | 1.73 | 20.46 | 1.59 | 2424.22 | 1.62 | 1.58 |
| TILE_4 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 2063.60 | 2.03 | 18146.97 | 1.09 | 1965.30 | 1.79 | 20.99 | 1.64 | 2418.78 | 1.62 | 1.60 |
| p1 | 2062.32 | 2.02 | 18145.53 | 1.09 | 1781.10 | 1.62 | 20.77 | 1.62 | 2424.28 | 1.62 | 1.57 |
| p2 | 2060.47 | 2.02 | 18140.90 | 1.09 | 1791.60 | 1.63 | 20.89 | 1.63 | 2424.10 | 1.62 | 1.57 |
| TILE_5 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 2062.72 | 2.02 | 18147.67 | 1.09 | 1724.47 | 1.57 | 21.08 | 1.64 | 2392.50 | 1.60 | 1.56 |
| p1 | 2063.18 | 2.02 | 18179.60 | 1.09 | 1822.42 | 1.66 | 20.85 | 1.63 | 2397.60 | 1.61 | 1.57 |
| p2 | 2064.28 | 2.03 | 17729.55 | 1.07 | 1853.08 | 1.69 | 20.78 | 1.62 | 2382.82 | 1.60 | 1.57 |

| | | | | | | | | | | | |
|----------------|---------|-------|----------|-------|---------|-------|--------|-------|---------|-------|------|
| TILE_6 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 2061.65 | 2.02 | 18147.83 | 1.09 | 1754.55 | 1.60 | 20.61 | 1.61 | 2416.50 | 1.62 | 1.56 |
| p1 | 2058.57 | 2.02 | 18148.97 | 1.09 | 1926.50 | 1.76 | 20.73 | 1.62 | 2419.15 | 1.62 | 1.59 |
| p2 | 2062.10 | 2.02 | 18149.00 | 1.09 | 1903.35 | 1.74 | 20.29 | 1.58 | 2423.88 | 1.62 | 1.58 |
| TILE_7 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 2062.43 | 2.02 | 17731.90 | 1.07 | 1932.88 | 1.76 | 20.96 | 1.63 | 2394.88 | 1.60 | 1.58 |
| p1 | 2057.47 | 2.02 | 18183.22 | 1.09 | 1769.08 | 1.61 | 20.97 | 1.63 | 2399.38 | 1.61 | 1.56 |
| p2 | 2049.25 | 2.01 | 18187.47 | 1.09 | 1940.92 | 1.77 | 20.86 | 1.63 | 2397.47 | 1.61 | 1.59 |
| TILE_8 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 2063.32 | 2.02 | 18145.08 | 1.09 | 1772.20 | 1.62 | 20.86 | 1.63 | 2422.62 | 1.62 | 1.57 |
| p1 | 2057.75 | 2.02 | 18165.38 | 1.09 | 1715.47 | 1.56 | 20.96 | 1.63 | 2427.30 | 1.63 | 1.56 |
| p2 | 2050.45 | 2.01 | 18172.53 | 1.09 | 1907.95 | 1.74 | 20.92 | 1.63 | 2429.32 | 1.63 | 1.59 |
| TILE_9 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 2065.40 | 2.03 | 18183.90 | 1.09 | 1762.97 | 1.61 | 20.53 | 1.60 | 2399.15 | 1.61 | 1.56 |
| p1 | 2061.62 | 2.02 | 18155.05 | 1.09 | 1810.95 | 1.65 | 19.79 | 1.54 | 2422.65 | 1.62 | 1.56 |
| p2 | 2063.30 | 2.02 | 18153.35 | 1.09 | 1840.08 | 1.68 | 19.84 | 1.55 | 2426.65 | 1.63 | 1.56 |
| TILE_10 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 2063.12 | 2.02 | 18158.10 | 1.09 | 1769.33 | 1.61 | 20.74 | 1.62 | 2349.53 | 1.57 | 1.55 |
| p1 | 2055.07 | 2.02 | 18142.83 | 1.09 | 1785.80 | 1.63 | 20.60 | 1.61 | 2340.05 | 1.57 | 1.55 |
| p2 | 2051.85 | 2.01 | 18143.50 | 1.09 | 1796.33 | 1.64 | 20.49 | 1.60 | 2380.38 | 1.60 | 1.56 |
| TILE_11 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 2064.82 | 2.03 | 18151.72 | 1.09 | 1621.42 | 1.48 | 20.93 | 1.63 | 2415.50 | 1.62 | 1.54 |
| p1 | 2062.68 | 2.02 | 18152.28 | 1.09 | 1717.83 | 1.57 | 20.91 | 1.63 | 2425.82 | 1.63 | 1.56 |
| p2 | 2061.75 | 2.02 | 18153.90 | 1.09 | 1848.53 | 1.69 | 21.00 | 1.64 | 2427.72 | 1.63 | 1.58 |
| TILE_12 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 2069.38 | 2.03 | 18171.30 | 1.09 | 1617.85 | 1.48 | 20.82 | 1.62 | 2365.43 | 1.59 | 1.53 |
| p1 | 2060.18 | 2.02 | 18150.65 | 1.09 | 1724.65 | 1.57 | 20.71 | 1.61 | 2378.55 | 1.59 | 1.55 |
| p2 | 2063.22 | 2.02 | 18149.15 | 1.09 | 1835.70 | 1.67 | 20.46 | 1.59 | 2352.82 | 1.58 | 1.56 |
| TILE_13 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 2063.65 | 2.03 | 18155.92 | 1.09 | 1533.75 | 1.40 | 20.73 | 1.62 | 2375.45 | 1.59 | 1.51 |
| p1 | 2057.50 | 2.02 | 18147.33 | 1.09 | 1656.25 | 1.51 | 20.82 | 1.62 | 2352.25 | 1.58 | 1.53 |
| p2 | 2053.43 | 2.02 | 18148.90 | 1.09 | 1707.78 | 1.56 | 20.46 | 1.60 | 2343.30 | 1.57 | 1.54 |
| TILE_14 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 2072.03 | 2.03 | 18147.25 | 1.09 | 1567.28 | 1.43 | 20.84 | 1.62 | 2420.95 | 1.62 | 1.53 |
| p1 | 2059.05 | 2.02 | 18145.65 | 1.09 | 1728.78 | 1.58 | 20.59 | 1.60 | 2420.60 | 1.62 | 1.55 |
| p2 | 2064.07 | 2.03 | 18141.92 | 1.09 | 1749.05 | 1.59 | 20.34 | 1.59 | 2401.57 | 1.61 | 1.55 |

| TILE_15 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
|---------------------------------|---------|-------|----------|-------|---------|-------|--------|-------|---------|-------|------|
| p0 | 2065.00 | 2.03 | 17708.50 | 1.07 | 1412.22 | 1.29 | 20.57 | 1.60 | 2403.85 | 1.61 | 1.48 |
| p1 | 2060.35 | 2.02 | 18158.45 | 1.09 | 1595.72 | 1.45 | 20.78 | 1.62 | 2424.72 | 1.62 | 1.53 |
| p2 | 2053.53 | 2.02 | 18147.85 | 1.09 | 1817.33 | 1.66 | 20.51 | 1.60 | 2403.57 | 1.61 | 1.57 |
| TILE_16 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 2061.47 | 2.02 | 18175.03 | 1.09 | 1263.75 | 1.15 | 20.50 | 1.60 | 2401.30 | 1.61 | 1.46 |
| p1 | 2058.85 | 2.02 | 18131.90 | 1.09 | 1439.45 | 1.31 | 20.62 | 1.61 | 2399.12 | 1.61 | 1.50 |
| p2 | 2060.95 | 2.02 | 18138.38 | 1.09 | 1759.80 | 1.60 | 20.35 | 1.59 | 2403.00 | 1.61 | 1.55 |
| TILE_17 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 2059.85 | 2.02 | 18182.78 | 1.09 | 1174.45 | 1.07 | 20.78 | 1.62 | 2372.78 | 1.59 | 1.44 |
| p1 | 2063.93 | 2.03 | 18155.33 | 1.09 | 1472.33 | 1.34 | 21.01 | 1.64 | 2382.65 | 1.60 | 1.51 |
| p2 | 2051.55 | 2.01 | 18176.65 | 1.09 | 1701.90 | 1.55 | 20.81 | 1.62 | 2365.05 | 1.58 | 1.54 |
| p0_score: | 27.78 | | | | | | | | | | |
| p1_score: | 27.99 | | | | | | | | | | |
| p2_score: | 28.21 | | | | | | | | | | |
| Unreviewed_VMmark_Score: | 27.99 | | | | | | | | | | |

Configuration

| Server and Network | |
|---|---|
| Server Manufacturer and Model | Fujitsu BX922 S2 |
| Processor Vendor and Model | Quad-core Intel Xeon X5677 |
| Processor Speed (GHz) | 3.46 |
| 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 | 12MB I+D on chip per chip L3 |
| BIOS Version | Rev 3C20.2861 |
| Memory Size (in GB, Number of DIMMs) | 96GB, 12 |
| Memory Type and Speed | 8GB per DIMM, 1333MHz registered ECC DDR3 |
| Disk Subsystem Type | FC SAN |
| Number of Disk Controllers | 1 (unused) |
| Number of Host Bus Adapters | 1 |
| Host Bus Adapter Vendors and Models | 1 dual-channel MC-FC82E (Emulex LPe12002 based) |
| 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 244038) |
| Virtualization Type | Hardware |
| Supplemental Software | igb-Driver Version 1.3.19.12.1 Patch Release ESX400-201002001 Patch Release ESX400-201003001 |
| Virtualization Software Availability Date (MM-DD-YYYY) | 04/01/2010 |

Storage

| | |
|---|--|
| Array Vendors, Models, and Firmware Versions | 9xFujitsu ETERNUS DX80, Firmware version V10L20-0000 |
| Fibre Channel Switch Vendors and Models | Brocade 5100 |
| Disk Space Used | Total 2211GB: 1176GB for VMs, 11GB for Host-OS, 1TB for VM-config and swap |
| Array Cache Size | 2GB |
| Total Number of Physical Disks Used | 196 |
| Total Number of Enclosures/Pods/Shelves Used | 17 |
| 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 | 9 |
| Number LUNs Used | Total 44: 42 LUNs for VMs, 1 LUN for Host-OS, 1 LUN for VM-config and swap |
| LUN Size and Number of Disks Per LUN | 18x9GB/8 Disks, 18x46GB/8 Disks, 6x31GB/8 Disks, 1x11GB/4 Disks, 1x1TB/4 Disks |
| RAID Type | 0 |

| | |
|---|--|
| Number of Members per RAID Set | Two members for ETERNUS DX80 1 to 6, one member for ETERNUS DX80 7 and 8, two members for ETERNUS DX80 0 |
| Disk Vendors, Models, and Speeds | 192xSeagate, ST3300656SS, 15krpm 4xSeagate, ST3450856SS, 15krpm |
| Clients | |
| Number of Clients | 18 |
| 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 3.733GHz, default enabled)
 - Adjacent Cache Line Prefetch: Disabled (default enabled)
 - Hardware Prefetch: Disabled (default enabled)
 - DCU Streamer Prefetch: Disabled (default enabled)
 - Data Reuse Optimization: Disabled (default enabled)
 - Performance/Power Setting: Traditional (default optimized)
 - Serial: Disabled (default enabled)
 - SATA RAID Enable: Disabled (default enabled)
- MC-FC82E(Emulex) HBA BIOS settings:
 - defaults
- vSwitch Configuration:
 - vSwitch0 for Service Console on vmnic0
 - vSwitch1 for all Java/Standby VMs on vmnic3
 - vSwitch1 configured for 56 Ports (default 56)
 - vSwitch2 for all Database/File/Mail VMs on vmnic2
 - vSwitch2 configured for 56 Ports (default 56)
 - vSwitch3 for all Web VMs on vmnic1
 - vSwitch3 configured for 24 Ports (default 56)

- Storage Configuration:
 - ETERNUS DX80[0]
 - RAID set 0, LUN 0: Boot/Console OS
 - RAID set 0, LUN 1: VM-config and swap

 - ETERNUS DX80[1]
 - RAID set 0, LUN 1: Fileserver for tile 0
 - RAID set 0, LUN 2: Javaser/Mailserver/Standby/Webserver for tile 0
 - RAID set 1, LUN 3: Fileserver for tile 1
 - RAID set 1, LUN 4: Javaser/Mailserver/Standby/Webserver for tile 1
 - RAID set 2, LUN 5: Fileserver for tile 2
 - RAID set 2, LUN 6: Javaser/Mailserver/Standby/Webserver for tile 2

 - ETERNUS DX80[2]
 - RAID set 0, LUN 1: Fileserver for tile 3
 - RAID set 0, LUN 2: Javaser/Mailserver/Standby/Webserver for tile 3
 - RAID set 1, LUN 3: Fileserver for tile 4
 - RAID set 1, LUN 4: Javaser/Mailserver/Standby/Webserver for tile 4
 - RAID set 2, LUN 5: Fileserver for tile 5
 - RAID set 2, LUN 6: Javaser/Mailserver/Standby/Webserver for tile 5

 - ETERNUS DX80[3]
 - RAID set 0, LUN 1: Fileserver for tile 6
 - RAID set 0, LUN 2: Javaser/Mailserver/Standby/Webserver for tile 6
 - RAID set 1, LUN 3: Fileserver for tile 7
 - RAID set 1, LUN 4: Javaser/Mailserver/Standby/Webserver for tile 7
 - RAID set 2, LUN 5: Fileserver for tile 8
 - RAID set 2, LUN 6: Javaser/Mailserver/Standby/Webserver for tile 8

 - ETERNUS DX80[4]
 - RAID set 0, LUN 1: Fileserver for tile 9
 - RAID set 0, LUN 2: Javaser/Mailserver/Standby/Webserver for tile 9
 - RAID set 1, LUN 3: Fileserver for tile 10
 - RAID set 1, LUN 4: Javaser/Mailserver/Standby/Webserver for tile 10
 - RAID set 2, LUN 5: Fileserver for tile 11
 - RAID set 2, LUN 6: Javaser/Mailserver/Standby/Webserver for tile 11

 - ETERNUS DX80[5]
 - RAID set 0, LUN 1: Fileserver for tile 12
 - RAID set 0, LUN 2: Javaser/Mailserver/Standby/Webserver for tile 12
 - RAID set 1, LUN 3: Fileserver for tile 13
 - RAID set 1, LUN 4: Javaser/Mailserver/Standby/Webserver for tile 13
 - RAID set 2, LUN 5: Fileserver for tile 14
 - RAID set 2, LUN 6: Javaser/Mailserver/Standby/Webserver for tile 14

 - ETERNUS DX80[6]
 - RAID set 0, LUN 1: Fileserver for tile 15
 - RAID set 0, LUN 2: Javaser/Mailserver/Standby/Webserver for tile 15
 - RAID set 1, LUN 3: Fileserver for tile 16
 - RAID set 1, LUN 4: Javaser/Mailserver/Standby/Webserver for tile 16
 - RAID set 2, LUN 5: Fileserver for tile 17

RAID set 2, LUN 6: Javaser/Mailserver/Standby/Webserver for tile 17

- ETERNUS DX80[7]
 - RAID set 0, LUN 1: Database tiles 0 - 2
 - RAID set 1, LUN 2: Database tiles 3 - 5
 - RAID set 2, LUN 3: Database tiles 6 - 8
- ETERNUS DX80[8]
 - RAID set 0, LUN 1: Database tiles 9 - 11
 - RAID set 1, LUN 2: Database tiles 12 - 14
 - RAID set 2, LUN 3: Database tiles 15 - 17

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)
- CPU.HaltingIdleMsecPenalty = 929 (default 50)
- IRQ.RoutingPolicy = 0 (default 2)
- Mem.BalancePeriod was set to 0 (default 15)
- Mem.SwapDecayPct was set to 10 (default 5)
- Net.MaxNetifRxQueueLen=300 (default 100)
- Net.MaxNetifTxQueueLen=1000 (default 500)
- 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[0]/LUN 1) for the VM configuration/swap files
- /vmkernel/module/vmfs2/enabled = "false" (default "true")
- Installed Patch Release ESX400-201002001 and Patch Release ESX400-201003001

Operating System Notes

- Microsoft Windows Server 2003 R2 VMs were updated with Service Pack 2
- Standby server and mail server were updated with KB955839

Software Notes

- none

Client Notes

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

Other Notes

- The following parameters were altered from their default values in VMMARK.CONFIG
TILEDELAY=750 (default 600)
-

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.](#) VMmark utilizes SPECjbb®2005 and SPECweb®2005, which are available from the [Standard Performance Evaluation Corporation \(SPEC®\)](#).