

## VMware® VMmark™ V1.1.1 Results

Vendor and Hardware Platform: Fujitsu RX300 S5  
 Virtualization Platform: VMware ESX 4.0 (build 164009)

**VMmark V1.1.1 Score =  
25.16 @ 17 Tiles**

Tested By: Fujitsu

Test Date: 10/24/2009

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### Performance

	webserver		javaserver		mailserver		fileserver		database		
TILE_0	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1935.67	1.90	18188.50	1.09	1733.78	1.58	17.38	1.35	2465.53	1.65	1.49
p1	1945.85	1.91	17750.45	1.07	1676.08	1.53	17.24	1.34	2470.68	1.66	1.47
p2	1941.67	1.91	18213.08	1.10	1588.58	1.45	17.27	1.35	2472.43	1.66	1.46
TILE_1	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1912.05	1.88	18208.42	1.10	1760.95	1.61	16.80	1.31	2464.68	1.65	1.48
p1	1918.47	1.88	17744.28	1.07	1767.70	1.61	17.47	1.36	2471.20	1.66	1.49
p2	1913.00	1.88	18220.22	1.10	1707.17	1.56	17.28	1.35	2470.15	1.66	1.48
TILE_2	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1936.75	1.90	17767.95	1.07	1776.88	1.62	17.17	1.34	2470.07	1.66	1.49
p1	1943.17	1.91	18229.08	1.10	1789.35	1.63	17.22	1.34	2475.90	1.66	1.50
p2	1945.72	1.91	18210.62	1.10	1753.53	1.60	17.41	1.36	2475.68	1.66	1.50
TILE_3	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1925.70	1.89	18175.70	1.09	1756.33	1.60	17.50	1.36	2467.20	1.65	1.49
p1	1922.75	1.89	18174.78	1.09	1626.10	1.48	17.73	1.38	2471.82	1.66	1.48
p2	1926.50	1.89	17728.28	1.07	1739.20	1.59	17.61	1.37	2474.10	1.66	1.49
TILE_4	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1951.45	1.92	18177.65	1.09	1685.30	1.54	16.65	1.30	2471.35	1.66	1.47
p1	1945.05	1.91	18178.40	1.09	1678.95	1.53	17.86	1.39	2476.78	1.66	1.49
p2	1948.38	1.91	18172.92	1.09	1698.08	1.55	17.72	1.38	2476.53	1.66	1.49
TILE_5	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1936.08	1.90	18173.97	1.09	1743.35	1.59	17.17	1.34	2468.55	1.65	1.49
p1	1945.00	1.91	18172.00	1.09	1859.40	1.70	17.45	1.36	2474.32	1.66	1.52
p2	1946.25	1.91	18174.92	1.09	1746.75	1.59	17.70	1.38	2473.75	1.66	1.50

<b>TILE_6</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1947.15	1.91	18172.90	1.09	1717.50	1.57	15.82	1.23	2472.25	1.66	1.46
<b>p1</b>	1945.80	1.91	18175.20	1.09	1793.60	1.64	16.15	1.26	2477.07	1.66	1.48
<b>p2</b>	1946.50	1.91	18174.80	1.09	1771.67	1.62	15.85	1.24	2477.25	1.66	1.47
<b>TILE_7</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1929.95	1.89	18171.55	1.09	1743.78	1.59	17.36	1.35	2469.07	1.65	1.49
<b>p1</b>	1936.28	1.90	18173.38	1.09	1827.20	1.67	17.48	1.36	2473.45	1.66	1.51
<b>p2</b>	1940.55	1.90	18175.85	1.09	1887.03	1.72	17.39	1.36	2474.07	1.66	1.52
<b>TILE_8</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1933.65	1.90	18175.55	1.09	1642.97	1.50	17.42	1.36	2470.47	1.66	1.48
<b>p1</b>	1946.60	1.91	18173.03	1.09	1749.45	1.60	17.29	1.35	2475.88	1.66	1.49
<b>p2</b>	1941.75	1.91	18174.03	1.09	1738.17	1.58	17.48	1.36	2477.75	1.66	1.50
<b>TILE_9</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1930.65	1.89	18171.08	1.09	1638.33	1.49	16.17	1.26	2472.90	1.66	1.45
<b>p1</b>	1929.83	1.89	18173.08	1.09	1722.75	1.57	15.93	1.24	2476.43	1.66	1.46
<b>p2</b>	1931.12	1.90	18173.83	1.09	1865.92	1.70	16.19	1.26	2475.43	1.66	1.49
<b>TILE_10</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1576.55	1.55	18166.35	1.09	1681.53	1.53	17.70	1.38	2472.70	1.66	1.43
<b>p1</b>	1577.25	1.55	18168.97	1.09	1754.55	1.60	17.42	1.36	2476.53	1.66	1.44
<b>p2</b>	1580.70	1.55	18175.97	1.09	1843.80	1.68	17.50	1.36	2478.05	1.66	1.45
<b>TILE_11</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1933.35	1.90	18180.60	1.09	1598.38	1.46	18.03	1.41	2474.65	1.66	1.48
<b>p1</b>	1939.00	1.90	18183.88	1.09	1666.45	1.52	17.99	1.40	2479.78	1.66	1.49
<b>p2</b>	1939.80	1.90	18198.72	1.10	1728.03	1.58	18.01	1.40	2478.70	1.66	1.50
<b>TILE_12</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1924.78	1.89	18175.28	1.09	1442.92	1.32	17.49	1.36	2468.07	1.65	1.44
<b>p1</b>	1923.03	1.89	18174.25	1.09	1713.85	1.56	16.81	1.31	2473.38	1.66	1.48
<b>p2</b>	1921.72	1.89	17718.53	1.07	1710.60	1.56	16.90	1.32	2472.10	1.66	1.47
<b>TILE_13</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1917.08	1.88	18176.78	1.09	1389.28	1.27	17.56	1.37	2472.05	1.66	1.43
<b>p1</b>	1915.17	1.88	18181.78	1.09	1676.05	1.53	17.50	1.36	2477.55	1.66	1.48
<b>p2</b>	1918.25	1.88	18168.60	1.09	1613.12	1.47	17.60	1.37	2476.45	1.66	1.47
<b>TILE_14</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1963.95	1.93	18166.72	1.09	1333.05	1.22	17.50	1.36	2473.40	1.66	1.42
<b>p1</b>	1961.85	1.93	18167.25	1.09	1625.70	1.48	17.39	1.36	2475.38	1.66	1.48
<b>p2</b>	1960.30	1.92	17746.33	1.07	1680.08	1.53	17.38	1.35	2478.57	1.66	1.48

<b>TILE_15</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1940.55	1.90	18197.22	1.10	1206.05	1.10	17.62	1.37	2474.65	1.66	1.39
<b>p1</b>	1951.00	1.91	18170.10	1.09	1597.47	1.46	17.42	1.36	2476.55	1.66	1.47
<b>p2</b>	1946.75	1.91	18173.90	1.09	1682.25	1.53	17.43	1.36	2475.78	1.66	1.49
<b>TILE_16</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1908.72	1.87	18216.67	1.10	1118.85	1.02	16.36	1.28	2467.03	1.65	1.35
<b>p1</b>	1918.97	1.88	18186.50	1.09	1523.55	1.39	16.67	1.30	2471.95	1.66	1.44
<b>p2</b>	1914.88	1.88	17718.17	1.07	1524.22	1.39	15.95	1.24	2473.15	1.66	1.42
<b>p0_score:</b>	24.73										
<b>p1_score:</b>	25.16										
<b>p2_score:</b>	25.18										
<b>Unreviewed_VMmark_Score:</b>	25.16										

## Configuration

<b>Server and Network</b>	
Server Manufacturer and Model	Fujitsu RX300 S5
Processor Vendor and Model	Quad-core Intel Xeon W5590
Processor Speed (GHz)	3.33
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 per core
Other Cache	8MB L3
BIOS Version	6.00 R1.09.2619
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	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	Integrated Intel 82575EB dual port 1GbE Adapter, 1xIntel 82571EB quad port adapter
Network Switch Vendors and Models	3xBX600 GbE Switch Blade 30/12
Network Speed	1Gb

Other Hardware	none
Other Software	none
Hardware Availability Date (MM-DD-YYYY)	10/02/2009
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	8xFujitsu ETERNUS DX80, Firmware version V10L11-0000
Fibre Channel Switch Vendors and Models	Brocade 5100
Disk Space Used	1088 GB for VMs, 11GB for Host-OS, 1TB for VM-config and swap
Array Cache Size	2GB
Total Number of Physical Disks Used	172
Total Number of Enclosures/Pods/Shelves Used	15
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	22
Number LUNs Used	Total 23: 21 LUNs for VMs, 1 LUN for Host-OS, 1 LUN for VM-config and swap
LUN Size and Number of Disks Per LUN	21x64GB/8 Disks, 1x11GB/4 Disks, 1x1TB/4 Disks
RAID Type	0
Number of Members per RAID Set	21x64GB: 1, 1x11GB and 1x1TB on the same RAID Set
Disk Vendors, Models, and Speeds	168xSeagate, ST3300656SS, 15krpm 4xSeagate, ST3450856SS, 15krpm

**Clients**

Number of Clients	17
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)
  - Memory Mode: Max Performance (default=Automatic)
- Emulex HBA BIOS settings:
  - defaults
- vSwitch Configuration:
  - vSwitch0 for Service Console on vmnic0
  - vSwitch1 for all VMs except web servers on vmnic4
  - vSwitch1 configured for 120 Ports (default 56)
  - vSwitch2 for all web servers on vmnic5
  - vSwitch2 configured for 24 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 10: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 0
  - ETERNUS DX80[2]/LUN 20: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 1
  - ETERNUS DX80[2]/LUN 30: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 2
  - ETERNUS DX80[3]/LUN 10: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 3
  - ETERNUS DX80[3]/LUN 20: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 4
  - ETERNUS DX80[3]/LUN 30: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 5
  - ETERNUS DX80[4]/LUN 10: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 6
  - ETERNUS DX80[4]/LUN 20: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 7
  - ETERNUS DX80[4]/LUN 30: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 8
  - ETERNUS DX80[5]/LUN 10: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 9
  - ETERNUS DX80[5]/LUN 20: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 10
  - ETERNUS DX80[5]/LUN 30: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 11
  - ETERNUS DX80[6]/LUN 10: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 12
  - ETERNUS DX80[6]/LUN 20: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 13

- ETERNUS DX80[6]/LUN 30: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 14
- ETERNUS DX80[7]/LUN 10: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 15
- ETERNUS DX80[7]/LUN 20: Fileserver/Javaserver/Mailserver/Standby/Webserver for tile 16
- ETERNUS DX80[7]/LUN 30: Database tiles 15 - 16
- ETERNUS DX80[8]/LUN 10: Database tiles 0 - 4
- ETERNUS DX80[8]/LUN 20: Database tiles 5 - 9
- ETERNUS DX80[8]/LUN 30: Database tiles 10 - 14

## 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
- Floppy and CDROM removed for all VMs
- Firewall disabled for the Console OS
- Mem.BalancePeriod was set to 0 (default 15)
- Mem.IdleTax was set to 85 (default 75)
- vmnic4/5: rx/tx-queue size changed to 512/1024 (defaults 256/256) with ethtool
- VGA buffer for all Windows VMs was set to 1310720 Bytes
- VGA buffer for all Linux VMs was set to 1572864 Bytes
- Ballooning disabled for all File server VMs (sched.mem.maxmemctrl=0)
- One dedicated LUN(ETERNUS DX80[1]/LUN 1) for the VM configuration/swap files

## 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

- none

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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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