

VMware® VMmark™ V1.1.1 Results

Vendor and Hardware Platform: Dell PowerEdge R810
Virtualization Platform: VMware ESX version 4.0 Update 2 Build 258828

VMmark V1.1.1 Score =
37.28 @ 26 Tiles

Tested By: Dell Inc.

Test Date: 07-02-2010

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Performance

	webserver		javaserver		mailserver		fileserver		database		
TILE_0	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1931.83	1.90	18140.53	1.09	1324.25	1.21	17.43	1.36	2319.65	1.55	1.39
p1	1862.12	1.83	18113.47	1.09	1503.60	1.37	16.88	1.32	2330.43	1.56	1.41
p2	1832.60	1.80	18108.58	1.09	1610.50	1.47	16.84	1.31	2333.45	1.56	1.43
TILE_1	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1973.10	1.94	18135.58	1.09	1359.28	1.24	17.54	1.37	2339.32	1.57	1.41
p1	1917.80	1.88	18152.58	1.09	1576.40	1.44	16.78	1.31	2346.78	1.57	1.43
p2	1910.38	1.87	18117.90	1.09	1652.88	1.51	16.78	1.31	2355.05	1.58	1.45
TILE_2	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1936.30	1.90	18153.70	1.09	1293.28	1.18	18.16	1.42	2361.95	1.58	1.41
p1	1895.38	1.86	18131.05	1.09	1541.75	1.41	17.47	1.36	2369.93	1.59	1.44
p2	1876.47	1.84	17693.03	1.06	1642.03	1.50	17.54	1.37	2378.43	1.59	1.45
TILE_3	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1934.45	1.90	18133.65	1.09	1293.65	1.18	17.44	1.36	2351.47	1.58	1.39
p1	1868.42	1.83	18145.08	1.09	1612.17	1.47	17.00	1.32	2359.65	1.58	1.44
p2	1831.22	1.80	17692.20	1.06	1741.15	1.59	16.88	1.32	2373.15	1.59	1.45
TILE_4	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1987.47	1.95	18128.17	1.09	1308.90	1.19	17.26	1.35	2340.95	1.57	1.40
p1	1944.65	1.91	18137.55	1.09	1530.38	1.40	16.89	1.32	2350.57	1.58	1.43
p2	1926.58	1.89	17685.05	1.06	1687.42	1.54	16.58	1.29	2354.45	1.58	1.45
TILE_5	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1943.45	1.91	18141.92	1.09	1371.45	1.25	17.65	1.38	2356.30	1.58	1.41
p1	1882.85	1.85	18117.50	1.09	1488.08	1.36	17.15	1.34	2368.55	1.59	1.42
p2	1846.72	1.81	18106.97	1.09	1712.25	1.56	16.94	1.32	2375.88	1.59	1.45

TILE_6	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1944.90	1.91	18132.80	1.09	1379.15	1.26	17.52	1.37	2360.30	1.58	1.41
p1	1874.20	1.84	18110.58	1.09	1647.22	1.50	17.01	1.33	2368.90	1.59	1.45
p2	1849.65	1.82	18111.08	1.09	1559.50	1.42	16.76	1.31	2379.75	1.59	1.42
TILE_7	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1984.22	1.95	18100.92	1.09	1272.97	1.16	17.96	1.40	2356.85	1.58	1.40
p1	1936.35	1.90	18106.85	1.09	1605.05	1.46	17.49	1.36	2366.12	1.59	1.46
p2	1933.22	1.90	18117.78	1.09	1735.20	1.58	17.48	1.36	2365.10	1.58	1.48
TILE_8	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1951.12	1.91	18141.50	1.09	1260.62	1.15	17.58	1.37	2353.28	1.58	1.39
p1	1883.42	1.85	18131.47	1.09	1539.90	1.40	17.12	1.33	2356.47	1.58	1.43
p2	1845.22	1.81	17691.40	1.06	1602.30	1.46	16.84	1.31	2364.55	1.58	1.42
TILE_9	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1953.85	1.92	18143.22	1.09	1288.58	1.17	18.22	1.42	2365.45	1.59	1.41
p1	1891.80	1.86	18144.42	1.09	1578.15	1.44	17.85	1.39	2373.00	1.59	1.45
p2	1855.17	1.82	18133.40	1.09	1559.92	1.42	17.66	1.38	2383.62	1.60	1.44
TILE_10	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1955.65	1.92	18140.60	1.09	1318.47	1.20	18.15	1.41	2338.62	1.57	1.41
p1	1895.47	1.86	18132.20	1.09	1490.33	1.36	17.73	1.38	2348.12	1.57	1.43
p2	1855.70	1.82	18145.38	1.09	1584.65	1.44	17.53	1.37	2345.25	1.57	1.44
TILE_11	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1960.47	1.92	18108.38	1.09	1240.83	1.13	18.18	1.42	2287.50	1.53	1.39
p1	1894.90	1.86	18101.10	1.09	1477.72	1.35	17.66	1.38	2318.75	1.55	1.42
p2	1866.03	1.83	18105.45	1.09	1626.45	1.48	17.52	1.37	2335.18	1.56	1.45
TILE_12	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1984.30	1.95	18142.97	1.09	1254.20	1.14	18.18	1.42	2349.93	1.57	1.40
p1	1943.60	1.91	18146.28	1.09	1554.25	1.42	17.61	1.37	2361.45	1.58	1.45
p2	1933.53	1.90	17690.92	1.06	1694.60	1.55	17.58	1.37	2364.05	1.58	1.47
TILE_13	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1986.72	1.95	18143.47	1.09	1323.88	1.21	17.45	1.36	2355.70	1.58	1.41
p1	1945.50	1.91	18097.97	1.09	1553.88	1.42	17.06	1.33	2366.10	1.59	1.44
p2	1931.05	1.90	18100.50	1.09	1692.65	1.54	16.91	1.32	2371.95	1.59	1.46
TILE_14	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1992.83	1.96	18156.80	1.09	1316.33	1.20	17.62	1.37	2358.18	1.58	1.41
p1	1950.42	1.91	18114.58	1.09	1556.15	1.42	17.18	1.34	2365.05	1.58	1.44
p2	1933.35	1.90	18112.20	1.09	1684.00	1.54	17.01	1.33	2370.82	1.59	1.46

TILE_15	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1992.75	1.96	18117.03	1.09	1196.25	1.09	17.37	1.35	2353.60	1.58	1.38
p1	1956.47	1.92	18098.97	1.09	1595.40	1.45	17.03	1.33	2363.25	1.58	1.45
p2	1937.58	1.90	18104.12	1.09	1612.15	1.47	16.93	1.32	2371.50	1.59	1.45
TILE_16	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1995.80	1.96	17691.78	1.06	1219.80	1.11	17.95	1.40	2349.60	1.57	1.39
p1	1954.15	1.92	18139.17	1.09	1461.53	1.33	17.58	1.37	2360.62	1.58	1.43
p2	1946.85	1.91	18139.53	1.09	1663.33	1.52	17.58	1.37	2364.55	1.58	1.47
TILE_17	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1964.10	1.93	17700.10	1.07	1214.78	1.11	18.10	1.41	2354.57	1.58	1.38
p1	1911.20	1.88	18114.28	1.09	1515.97	1.38	17.62	1.37	2360.28	1.58	1.44
p2	1877.25	1.84	18139.00	1.09	1570.28	1.43	17.64	1.37	2366.88	1.59	1.44
TILE_18	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1988.00	1.95	17651.00	1.06	1256.88	1.15	18.10	1.41	2351.47	1.58	1.39
p1	1960.95	1.92	18104.22	1.09	1442.62	1.32	17.65	1.38	2365.32	1.58	1.43
p2	1943.00	1.91	18105.92	1.09	1716.53	1.57	17.57	1.37	2369.97	1.59	1.48
TILE_19	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1984.15	1.95	17661.40	1.06	1191.00	1.09	18.22	1.42	2353.68	1.58	1.38
p1	1958.67	1.92	18107.90	1.09	1485.45	1.35	17.72	1.38	2358.47	1.58	1.44
p2	1943.80	1.91	18115.42	1.09	1564.05	1.43	17.77	1.39	2367.35	1.59	1.45
TILE_20	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1977.45	1.94	17694.83	1.07	1230.30	1.12	17.67	1.38	2334.25	1.56	1.38
p1	1962.00	1.93	18141.38	1.09	1449.45	1.32	17.11	1.33	2348.75	1.57	1.42
p2	1944.42	1.91	18138.45	1.09	1659.05	1.51	16.83	1.31	2352.88	1.58	1.45
TILE_21	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1969.88	1.93	18101.90	1.09	1194.15	1.09	18.22	1.42	2353.05	1.58	1.39
p1	1911.22	1.88	17651.25	1.06	1485.75	1.35	17.69	1.38	2368.00	1.59	1.43
p2	1880.55	1.85	18104.45	1.09	1475.20	1.35	17.39	1.36	2373.50	1.59	1.42
TILE_22	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1992.30	1.96	17693.75	1.07	1168.75	1.07	18.09	1.41	2354.05	1.58	1.38
p1	1958.67	1.92	18112.20	1.09	1483.17	1.35	17.58	1.37	2369.25	1.59	1.44
p2	1945.60	1.91	18097.42	1.09	1653.05	1.51	17.46	1.36	2375.18	1.59	1.47
TILE_23	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1966.62	1.93	17683.62	1.06	1171.83	1.07	17.49	1.36	2343.53	1.57	1.36
p1	1913.70	1.88	18136.58	1.09	1460.70	1.33	16.81	1.31	2355.25	1.58	1.41
p2	1873.35	1.84	18136.22	1.09	1611.60	1.47	16.74	1.30	2364.18	1.58	1.44

TILE_24	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1963.17	1.93	17665.83	1.06	1122.72	1.02	17.62	1.37	2344.03	1.57	1.35
p1	1913.05	1.88	18109.53	1.09	1447.58	1.32	16.97	1.32	2353.25	1.58	1.41
p2	1891.03	1.86	18122.50	1.09	1648.80	1.50	16.94	1.32	2358.65	1.58	1.45
TILE_25	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1970.55	1.93	17718.20	1.07	1216.38	1.11	17.86	1.39	2355.12	1.58	1.38
p1	1914.28	1.88	18149.42	1.09	1453.78	1.33	17.38	1.35	2367.50	1.59	1.42
p2	1892.03	1.86	18118.45	1.09	1680.42	1.53	17.13	1.34	2371.88	1.59	1.46
p0_score:	36.21										
p1_score:	37.28										
p2_score:	37.70										
Unreviewed_VMmark_Score:	37.28										

Configuration

Server and Network	
Server Manufacturer and Model	Dell PowerEdge R810
Processor Vendor and Model	Intel Xeon X7560
Processor Speed (GHz)	2.27 GHz
Total Sockets/Total Cores/Total Threads	2 Sockets / 16 Cores / 32 Threads
Primary Cache	32KB I+32KB D on chip per core
Secondary Cache	256KB I+D on chip per core
Other Cache	24MB I+D on chip per chip L3
BIOS Version	1.0.3
Memory Size (in GB, Number of DIMMs)	256GB, 32x8GB
Memory Type and Speed	Quad rank 1066MHz Registered DDR3
Disk Subsystem Type	SAS DAS
Number of Disk Controllers	3
Disk Controller Vendors and Models	1x Dell PERC H700 integrated 2x Dell PERC H800 Adapter
Number of Host Bus Adapters	0
Host Bus Adapter Vendors and Models	N/A
Number of Network Controllers	14
Network Controller Vendors and Models	2x Dual-port Broadcom BCM5709C (onboard) 2x Quad-port Intel 82575 Gb Network Connection (add-in)(not used) 2x Single-port Intel 82598EB 10GbE SR

Network Switch Vendors and Models	2x Dell PowerConnect 6248
Network Speed	10Gbps for all Webserver VMs, 1Gbps for all remaining VMs and clients
Other Hardware	None
Other Software	None
Hardware Availability Date (MM-DD-YYYY)	07-07-2010
Software Availability Date (MM-DD-YYYY)	07-07-2010
Virtualization Software	
Vendor, Product, Version, and Build	VMware ESX 4.0 Update 2 Build 258828
Virtualization Type	Hardware
Supplemental Software	None
Virtualization Software Availability Date (MM-DD-YYYY)	06-10-2010
Storage	
Array Vendors, Models, and Firmware Versions	3x Dell PowerVault MD1220 version A.00
Fibre Channel Switch Vendors and Models	None
Disk Space Used	1612GB
Array Cache Size	N/A
Total Number of Physical Disks Used	59
Total Number of Enclosures/Pods/Shelves Used	3
Total Number of Physical Disks per Enclosures/Pods/Shelves Used	2(17x 146GB SSDs), 1(24x 146GB SAS 15k disks)
Total Number of Storage Groups Used	N/A
Number LUNs Used	39
LUN Size and Number of Disks Per LUN	34 LUNs at 138GB (MailServer + FileServer) each on 1x146GB SSD 4 LUNs at 816.5GB ((Misc) over 6x146GB 15k disks 1 LUN at 66.5GB (boot) over 1 local 73GB 15k disk
RAID Type	RAID0
Number of Members per RAID Set	34 RAID sets each over 1x 146GB SSD 4 RAID sets over 6x146GB 15k disks 1 RAID set over 1x 73GB 15k disk

Disk Vendors, Models, and Speeds	Pliant LB 150S, Hitachi GST HUC151414CSS600
Clients	
Number of Clients	26
System Model(s)	PowerEdge 1750: Clients 0-3 PowerEdge 1850: Clients 4,10-25 PowerEdge 1950: Clients 5-9
Processor Vendor(s) and Model(s)	Intel Xeon, P4, E5205
Processor Speed(s) (GHz)	3.06GHz: Clients 0,1 3.20GHz: Clients 2,3 2.80GHz: Clients 4 1.86GHz: Clients 5-9, 3.40GHz: Client 10 3.60GHz: Clients 11-25
Total Sockets/Total Cores/Total Threads	2 Sockets / 1 Core per Socket / 4 Threads: Clients 0-4, 10-25 2 Sockets / 4 Cores per Socket / 4 Threads: Clients 5-9
Memory per Client	2GB: Clients 0-4, 11-25 4GB: Clients 5-10
Network Controller Vendors and Models	Broadcom NetXtreme 5704 Gigabit Ethernet (PE1750) Intel PRO/1000 MT Network Controller (PE1850) Broadcom 5708 Gigabit Network Controller (PE1950)
Operating System, Version, and Service Pack	Windows Server 2003 Enterprise Edition SP2
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 2.93GHz, default enabled)
 - Virtualization Technology=Enabled (default Disabled)
 - Embedded SATA=Off (default On)
 - Internal USB port=Off (default On)
 - User Accessible USB ports=Only back ports on (default All ports on)
 - Power Management: Maximum Performance (default Active Power Controller)
- PERC BIOS settings:
 - SSD virtual disks set to Write-Through, No Read Ahead (default Write-Back, Adaptive Read Ahead)”
 - SAS virtual disks set to Write-Back, Read Ahead (default Write-Back/Adaptive Read Ahead)
- Network Settings:
 - Broadcom NICs (vmnic0,1,2,3) bound to vSwitch0,1,2,3 respectively
 - Intel 10GbE NICs (vmnic12,13) bound to vSwitch4,5 respectively

Service Console, Standby and FileServer VMs attached to vSwitch0

MailServer VMs attached to vSwitch1

JavaServer VMs attached to vSwitch2

Database VMs attached to vSwitch3

WebServer 0,2,4,6,8,10,12,14,16,20,22,24 VMs attached to vSwitch 4

WebServer 1,3,5,7,9,11,13,15,17,18,19,21,23,25 VMs attached to vSwitch 5

vSwitch0,1,2,3 configured with 128 ports (default 56)

vmnics 4-11 not used

- Storage Configuration:

17 LUNs of 138GB were created (One LUN per hard drive) for FileServer VMs

LUN1 for FileServer 0 and 17

LUN2 for FileServer 1 and 18

LUN3 for FileServer 2 and 19

LUN4 for FileServer 3 and 20

LUN5 for FileServer 4 and 21

LUN6 for FileServer 5 and 22

LUN7 for FileServer 6 and 23

LUN8 for FileServer 7 and 24

LUN9 for FileServer 8 and 25

LUN10 for FileServer 9

LUN11 for FileServer 10

LUN12 for FileServer 11

LUN13 for FileServer 12

LUN14 for FileServer 13

LUN15 for FileServer 14

LUN16 for FileServer 15

LUN17 for FileServer 16

17 LUNs of 138GB were created (One LUN per hard drive) for MailServer VMs

LUN1 for MailServer 0 and 17

LUN2 for MailServer 1 and 18

LUN3 for MailServer 2 and 19

LUN4 for MailServer 3 and 20

LUN5 for MailServer 4 and 21

LUN6 for MailServer 5 and 22

LUN7 for MailServer 6 and 23

LUN8 for MailServer 7 and 24

LUN9 for MailServer 8 and 25

LUN10 for MailServer 9

LUN11 for MailServer 10

LUN12 for MailServer 11

LUN13 for MailServer 12

LUN14 for MailServer 13

LUN15 for MailServer 14

LUN16 for MailServer 15

LUN17 for MailServer 16

4 LUNs of 817GB were created across 6 SSD for Standby, Database, WebServer and JavaServer VMs

LUN0 for Tiles 0,4,8,12,16,20,24

LUN1 for Tiles 1,5,9,13,17,21,25

LUN2 for Tiles 2,6,10,14,18,22

LUN3 for Tiles 3,7,11,15,19,23

Virtualization Software Notes

- Hardware support for both CPU and MMU virtualization enabled on all VMs (default automatic)
- All VM's hardware upgraded to version 7
- Ethernet adapter type upgraded to VMXNET3 for all VM's
- Logging was disabled for all VMs
- IDE and Floppy devices were removed on all VMs, except for MailServer04 (default enabled)
- iptables and firewall services were disabled at boot
- Disk.SchedNumReqOutstanding set to 128 (default 32)
- BufferCache.SoftMaxDirty=85 (default 15)
- IRQ.RoutingPolicy=0 (default 2)
- Net.EtherswitchHashSize=4 (default 1)
- Net.MaxNetifRxQueueLen=300 (default 100)
- Net.MaxNetifTxQueueLen=1000 (default 500)
- Net.TcpipHeapMax=120 (default 64)
- Net.vmxnetThroughputWeight=255 (default 0)
- CPU.Quantum=75 (default 50)
- CPU.HaltingIdleMsecPenalty=0 (default 100)
- JavaServer VMs use jrockit-R27.5.0-jdk1.5.0_15
- All mailserver data partitions have been expanded

Operating System Notes

- Microsoft Windows Server 2003 virtual machines were updated to Service Pack 2, and KB951072-v2 was applied
- SUSE Linux Enterprise Server 10 virtual machines were updated to Service Pack 2

Software Notes

- None

Client Notes

- KB951072-v2 was applied to all clients and overwrites KB933360

Other Notes

- VMmark Config
 - TILEDELAY=60 (Default="600")
 - MailServer/DELAYTIME="0" (Default="5")
 - JavaServer/DELAYTIME="25" (Default="540")
 - Standby/DELAYTIME="35" (Default="170")
 - WebServer/DELAYTIME="50" (Default="180")
 - Database/DELAYTIME="75" (Default="360")
 - FileServer/DELAYTIME="100" (Default="450")

For information about VMmark and the rules regarding its usage visit www.vmware.com/products/vmmark.

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