

VMware® VMmark® V2.1.1 Results

Vendor and Hardware Platform: Dell PowerEdge R910
 Virtualization Platform: VMware ESXi 4.1.0 Update 1 Build 348481
 VMware vCenter Server: VMware vCenter Server 4.1.0 Update 1 build 345043

**VMmark V2.1.1 Score =
17.63 @ 18 Tiles**

Number of Hosts: 2	Uniform Hosts [yes/no]: yes	Total sockets/core/threads in test: 8/80/160
Tested By: Dell Inc.		Test Date: 12-30-2011
Performance Section Performance	Configuration Section Configuration	Notes Section Notes for Workload

Performance

	mailserver			olio			dvdstoreA			dvdstoreB			dvdstoreC			
TILE_0	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.18	0.99	69.62	4636.10	1.00	216.17	2911.88	1.32	123.68	2116.25	1.39	129.00	1495.58	1.41	136.13	1.21
p1	325.18	0.98	64.50	4596.10	0.99	255.18	2853.18	1.30	128.53	2197.40	1.45	135.49	1578.08	1.49	143.69	1.22
p2	327.07	0.99	69.50	4602.43	0.99	274.03	2859.43	1.30	127.52	2031.05	1.34	137.91	1506.50	1.42	144.22	1.19
TILE_1	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	329.90	1.00	63.00	4606.00	0.99	236.96	3057.12	1.39	112.21	2229.47	1.47	117.84	1721.33	1.63	116.43	1.27
p1	331.65	1.00	63.00	4603.85	0.99	257.54	2984.82	1.36	116.75	2314.80	1.52	116.62	1765.90	1.67	119.83	1.28
p2	326.12	0.99	63.00	4559.55	0.98	296.61	2848.72	1.30	127.03	2259.53	1.49	122.36	1560.60	1.47	128.06	1.22
TILE_2	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	323.45	0.98	64.00	4638.32	1.00	216.12	2610.25	1.19	150.67	1865.50	1.23	159.99	1265.95	1.20	176.36	1.11
p1	328.00	0.99	64.00	4565.75	0.98	279.69	2538.32	1.15	156.80	1872.62	1.23	166.18	1361.50	1.29	179.85	1.12
p2	322.18	0.98	64.00	4559.85	0.98	280.35	2521.82	1.15	158.22	1855.50	1.22	168.78	1277.95	1.21	184.98	1.10
TILE_3	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.15	0.98	63.00	4646.50	1.00	207.37	3039.97	1.38	114.46	2227.57	1.47	124.76	1653.75	1.56	133.10	1.26
p1	322.68	0.98	63.00	4600.40	0.99	241.77	2979.70	1.35	118.55	2099.72	1.38	129.89	1479.95	1.40	138.40	1.20
p2	323.62	0.98	63.65	4594.27	0.99	254.54	2930.28	1.33	122.59	2142.72	1.41	133.31	1524.90	1.44	141.94	1.21
TILE_4	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.73	0.99	63.65	4633.75	1.00	216.07	3065.03	1.39	112.75	2272.62	1.50	120.44	1611.58	1.52	128.78	1.26
p1	324.68	0.98	63.48	4594.60	0.99	247.19	2955.32	1.34	120.34	2121.78	1.40	127.98	1478.40	1.40	138.54	1.21
p2	329.02	1.00	64.00	4566.77	0.98	269.19	2902.88	1.32	124.87	2135.43	1.41	134.29	1575.75	1.49	143.85	1.22
TILE_5	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.55	0.99	63.98	4634.95	1.00	211.69	2893.00	1.32	124.14	2207.62	1.45	126.72	1534.95	1.45	140.39	1.22
p1	327.23	0.99	64.00	4616.20	0.99	237.51	2859.15	1.30	126.55	2189.90	1.44	127.85	1523.72	1.44	141.28	1.22

p2	325.05	0.98	64.00	4592.60	0.99	252.94	2860.78	1.30	126.64	2090.03	1.38	131.36	1513.72	1.43	142.95	1.20
TILE_6	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.70	0.99	64.00	4642.65	1.00	215.73	2868.07	1.30	126.50	2204.38	1.45	127.30	1539.65	1.46	139.60	1.22
p1	325.30	0.99	64.00	4598.52	0.99	259.69	2753.95	1.25	136.45	2083.80	1.37	140.65	1482.10	1.40	158.53	1.19
p2	329.02	1.00	64.00	4579.02	0.99	264.54	2755.28	1.25	135.08	2020.72	1.33	138.79	1372.65	1.30	155.77	1.16
TILE_7	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	324.60	0.98	63.40	4641.43	1.00	209.57	2987.28	1.36	118.12	2274.20	1.50	127.22	1634.28	1.54	135.46	1.25
p1	328.85	1.00	63.50	4582.62	0.99	252.01	3018.18	1.37	115.07	2113.15	1.39	125.47	1557.42	1.47	133.07	1.23
p2	330.38	1.00	63.40	4602.27	0.99	244.50	2901.35	1.32	124.32	2038.58	1.34	137.28	1429.50	1.35	146.41	1.19
TILE_8	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	323.70	0.98	73.25	4620.43	1.00	207.49	2910.07	1.32	123.43	2130.70	1.40	134.02	1597.47	1.51	140.81	1.22
p1	322.62	0.98	67.92	4635.70	1.00	232.20	2836.50	1.29	128.09	2016.10	1.33	138.47	1447.60	1.37	142.93	1.18
p2	328.48	0.99	73.15	4606.68	0.99	246.96	2776.75	1.26	133.62	2035.80	1.34	144.37	1462.15	1.38	151.52	1.18
TILE_9	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.15	0.98	65.25	4627.88	1.00	210.75	3043.70	1.38	114.03	2144.20	1.41	125.88	1603.85	1.52	130.49	1.24
p1	322.88	0.98	64.00	4618.25	1.00	243.31	2979.25	1.35	118.54	2087.05	1.37	131.36	1513.10	1.43	133.62	1.21
p2	324.18	0.98	64.00	4613.30	0.99	224.62	2915.12	1.33	122.90	2055.35	1.35	141.96	1610.45	1.52	138.59	1.22
TILE_10	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	324.02	0.98	64.00	4633.73	1.00	205.47	3050.85	1.39	113.63	2136.85	1.41	126.70	1521.70	1.44	131.89	1.22
p1	326.05	0.99	64.00	4630.80	1.00	229.04	2971.25	1.35	119.40	2123.62	1.40	135.25	1550.22	1.47	137.41	1.22
p2	327.12	0.99	64.00	4626.02	1.00	228.89	2884.25	1.31	126.16	1967.92	1.30	145.08	1479.53	1.40	148.76	1.19
TILE_11	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	324.12	0.98	76.25	4622.52	1.00	239.23	3076.53	1.40	111.34	2218.05	1.46	118.20	1554.45	1.47	126.98	1.24
p1	326.38	0.99	74.00	4594.52	0.99	268.60	3004.53	1.37	116.49	2214.97	1.46	125.68	1635.05	1.55	134.97	1.25
p2	323.68	0.98	73.50	4570.07	0.98	282.51	2985.62	1.36	117.53	2137.78	1.41	126.28	1481.12	1.40	137.45	1.21
TILE_12	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.57	0.99	75.50	4640.82	1.00	212.34	2895.82	1.32	124.81	2217.40	1.46	132.98	1541.28	1.46	139.75	1.23
p1	330.75	1.00	74.00	4637.43	1.00	221.63	2863.28	1.30	125.52	2114.20	1.39	128.21	1577.20	1.49	133.93	1.22
p2	327.80	0.99	74.00	4596.90	0.99	244.92	2781.35	1.26	132.27	2079.03	1.37	131.90	1480.25	1.40	137.89	1.19
TILE_13	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.93	0.99	76.45	4645.38	1.00	205.63	2972.93	1.35	118.84	2109.35	1.39	136.29	1637.72	1.55	134.86	1.24
p1	324.70	0.98	74.00	4633.65	1.00	218.36	2906.97	1.32	123.85	1973.65	1.30	143.88	1464.22	1.38	140.77	1.18
p2	326.77	0.99	74.00	4595.38	0.99	250.75	2841.62	1.29	128.40	2010.08	1.32	147.49	1503.42	1.42	145.08	1.19
TILE_14	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.23	0.99	64.50	4629.77	1.00	216.88	2766.22	1.26	112.75	2146.88	1.41	125.63	1625.88	1.54	127.79	1.22
p1	329.18	1.00	63.58	4619.98	1.00	244.07	2689.07	1.22	118.80	2086.78	1.37	132.49	1493.12	1.41	137.24	1.19

p2	325.70	0.99	63.77	4609.45	0.99	247.35	2615.65	1.19	124.25	2165.62	1.43	137.61	1600.85	1.51	140.49	1.20
TILE_15	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	328.95	1.00	68.58	4620.55	1.00	224.53	2821.45	1.28	129.65	2088.60	1.38	131.96	1471.22	1.39	139.89	1.19
p1	328.50	0.99	64.00	4618.45	1.00	240.03	2802.68	1.27	130.56	2165.20	1.43	130.87	1537.47	1.45	139.14	1.21
p2	327.18	0.99	64.00	4575.05	0.99	274.59	2786.90	1.27	131.52	2126.53	1.40	134.11	1604.95	1.52	139.26	1.21
TILE_16	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.52	0.99	67.75	4652.30	1.00	215.50	3014.07	1.37	116.21	2162.43	1.42	124.31	1514.50	1.43	132.95	1.23
p1	325.00	0.98	63.62	4587.32	0.99	269.74	2936.53	1.34	122.49	2172.62	1.43	130.77	1595.03	1.51	141.18	1.23
p2	325.25	0.98	64.00	4572.60	0.99	292.24	2927.68	1.33	122.47	2158.78	1.42	131.60	1520.47	1.44	141.62	1.21
TILE_17	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	324.70	0.98	81.75	4622.12	1.00	217.77	2944.97	1.34	121.53	2177.82	1.43	130.06	1539.78	1.46	139.82	1.22
p1	329.50	1.00	74.00	4597.00	0.99	229.64	2902.75	1.32	124.89	2038.12	1.34	137.13	1504.25	1.42	144.86	1.20
p2	325.55	0.99	74.00	4616.02	0.99	242.22	2797.70	1.27	133.57	2017.92	1.33	147.20	1431.72	1.35	156.85	1.18
p0_score:	22.05															
p1_score:	21.76															
p2_score:	21.48															

Infrastructure_Operations_Scores:	vmotion	svmotion	deploy
Completed_Ops_PerHour	15.50	10.00	5.00
Avg_Seconds_To_Complete	34.90	29.91	323.46
Failures	0.00	0.00	0.00
Ratio	0.97	1.11	1.25
Number_Of_Threads	1	1	1

Summary	Run_Is_Compliant	Number_Of_Compliance_Issues(0)*	Median_Phase(p1)
Unreviewed_VMmark2_Applications_Score	21.76		
Unreviewed_VMmark2_Infrastructure_Score	1.10		
Unreviewed_VMmark2_Score	17.63		

Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 4.1.0 Update 1 Build 348481 / 02-10-2011
Datacenter Management Software Vendor, Product, Version, and Build /	VMware vCenter Server 4.1.0 Update 1 build 345043 / 02-10-2011

Availability Date (MM-DD-YYYY)	
Supplemental Software	mpt2sas 10.10.10.00 driver update
Servers	
Quantity	2
Server Manufacturer and Model	Dell PowerEdge R910
Processor Vendor and Model	Intel Xeon E7-4870
Processor Speed (GHz)	2.4
Total Sockets/Total Cores/Total Threads	4 Sockets / 40 Cores / 80 Threads
Primary Cache	32 KB I + 32 KB D on chip per core
Secondary Cache	256 KB I + D on chip per core
Other Cache	30 MB I + D on chip per chip L3
BIOS Version	2.5.0
Memory Size (in GB, Number of DIMMs)	512 GB, 64 x 8 GB
Memory Type and Speed	Dual rank PC3-8500 Registered ECC
Disk Subsystem Type	Direct-Attach SAS
Number of Disk Controllers	1
Disk Controller Vendors and Models	Dell PERC H700
Number of Host Bus Adapters	3
Host Bus Adapter Vendors and Models	Dell 6 Gbps SAS HBA Adapter
Number of Network Controllers	2
Network Controller Vendors and Models	Integrated Broadcom 1GbE BASE-T MC Server Adapter, 2 x Intel 82599EB 10-Gigabit SFI/SFP+ Network Adapter
Other Hardware	None
Other Software	None
Hardware Availability Date (MM-DD-YYYY)	04-04-2011
Software Availability Date (MM-DD-YYYY)	12-07-2011
Network	
Network Switch Vendors and Models	2 x Dell PowerConnect 6248, 1 x PowerConnect 8024F
Network Speed	1Gbps for SUT management and all VMs except OlioWeb and OlioDB; 10Gbps for OlioWeb, OlioDB and VMotion
Storage	

Array Vendors, Models, and Firmware Versions	3 x Dell PowerVault MD3220 (Firmware 07.80.41.60), 8 x Dell PowerVault MD1220
Fibre Channel Switch Vendors and Models	None
Disk Space Used	26,479 GB
Array Cache Size	2 GB
Total Number of Physical Disks Used	229 (180 HDDs, 49 SSDs)
Total Number of Enclosures/Pods/Shelves Used	11
Number of Physical Disks Used per Enclosure/Pod/Shelf	<ul style="list-style-type: none"> • Two enclosures with 24 (146GB 15K HDDs) • Two enclosures with 12 (146GB 15K HDDs) • Two enclosures with 24 (4x150GB SSDs + 20x146GB 15K HDDs) • Two enclosure with 24 (12x150GB SSDs + 12x146GB 15K HDDs) • One enclosure with 24 (8x150GB SSDs + 16x146GB 15K HDDs) • One enclosure with 24 (9x150GB SSDs + 15x146GB 15K HDDs) • One enclosure with 13 (146GB 15K HDDs)
Total Number of Storage Groups Used	30
Number of LUNs Used	42
LUN Size and Number of Disks Per LUN	Details in section Storage Notes
RAID Type	RAID 0
Number of Members per RAID Set	<ul style="list-style-type: none"> • 12 RAID 0 sets, each across 4x150GB SSDs • 6 RAID 0 sets, each across 10x146GB HDDs • 6 RAID 0 sets, each across 12x146GB HDDs • 5 RAID 0 sets, each across 6x146GB HDDs • 1 RAID 0 set across 1x150GB SSD
Disk Vendors, Models, and Speeds	SEAGATE ST9146852SS, 15K RPM HITACHI HUC151414CSS600, 15K RPM FUJITSU MBE2147RC, 15K RPM Pliant LB150S

Datacenter Management Server

System Model	Dell PowerEdge 1950
Processor Vendor and Model	Intel Xeon E5450
Processor Speed (GHz)	3.00
Total Sockets/Total Cores/Total Threads	2 Sockets / 4 Cores / 4 Threads
Memory	16 GB
Network Controller(s) Vendors and Models	Integrated Broadcom BCM5708C NetXtreme II GigE

Operating System, Version, and Service Pack	Microsoft Windows Server 2008 R2 Enterprise (64-bit)
Other Hardware	None
Other Software	None
Clients	
Number of Clients	7 (1 Dedicated Prime client, 6 Physical ESX servers)
System Model(s)	Dell PowerEdge R410
Processor Vendor(s) and Model(s)	Intel Xeon E5620
Processor Speed(s) (GHz)	2.40
Total Sockets/Total Cores/Total Threads	2 Sockets / 8 Cores / 16 Threads
Memory per Client	Prime Client: 4 GB Clients 0-3: 24 GB
Network Controller(s) Vendors and Models	Prime Client: Intel PRO/1000 PT Dual Port Server Adapter Clients 0-5: 1 x Integrated Broadcom BCM5716 NetXtreme II GbE
Operating System, Version, and Service Pack	Prime Client: Microsoft Windows Server 2003 Enterprise 32-bit, Service Pack 2 Physical Clients: VMware ESX 4.1.0 (Build 260247) Virtual Clients: Microsoft Windows Server 2008 R2 Enterprise 64-bit
Other Hardware	None
Other Software	None

Notes for Workload

Virtualization Software Notes

- All VMs used virtual hardware V7
- Ethernet adapter type set to VMXNET3 for all VMs (default VMXNET2)
- Logging was disabled for all VMs (default enabled)
- Floppy was removed for all VMs (default enabled)
- CDROM was removed for all VMs (default enabled)
- /adv/Cpu/CoschedCrossCall = 0 (default 1)
- /adv/Cpu/HaltingIdleMsecPenalty = 0 (default 100)
- /adv/Disk/SchedNumReqOutstanding = 256 (default 32)
- /adv/Mem/BalancePeriod = 0 (default 15)
- /adv/Mem/SamplePeriod = 0 (default 60)
- /adv/Mem/ShareScanGHz = 0 (default 4)
- /adv/Misc/TimerMinHardPeriod = 2000 (default 100)
- /adv/Misc/TimerMaxHardPeriod = 4000 (default 100000)
- /adv/Net/MaxNetifRxQueueLen = 500 (default 100)
- /adv/Net/MaxNetifTxQueueLen = 1000 (default 500)
- /adv/Net/NetTxWorldlet = 0 (default 2)
- /adv/Net/NetTxCompletionWorldlet = 0 (default 1)
- /adv/Numa/AutoSplitVM = 0 (default 1)
- /adv/Numa/LTermFairnessInterval = 0 (default 5)

- /adv/Numa/MonMigEnable = 0 (default 1)
- /adv/Numa/PageMigEnable = 0 (default 1)
- /adv/Numa/SwapLoadEnable = 0 (default 1)
- /adv/Numa/SwapLocalityEnable = 0 (default 1)
- /vmkernel/module/mpt2sas.o/options = "mpt2sas_sas_queue_depth=254" (default)
- Firewall disabled for Console OS (default enabled)
- Cluster DRS Automation Level set to "Fully Automated", Level 1 ("Aggressive")

Server Notes

- Intel Turbo Boost Technology up to 2.80 GHz
- Virtualization Technology: Enabled (default: Disabled)
- Power Management: Maximum Performance (default: Active Power Controller)

Networking Notes

vSwitch Configuration:

- vSwitch0 for Service Console on vmnic0 at 1Gb/s
- vSwitch1 for all Olio VMs on vmnic6 at 10Gb/s
- vSwitch2 for all Standby VMs on vmnic1 at 1Gb/s
- vSwitch3 for all DS2 VMs on vmnic7 at 10Gb/s
- vSwitch4 for Even MailServer VMs on vmnic2 at 1Gb/s
- vSwitch5 for Odd MailServer VMs on vmnic3 at 1Gb/s
- vSwitch6 for VMotion on vmnic5 at 10Gb/s

Storage Notes

- 1 disk group, across 6x146GB HDDs, containing 1 LUN: SVMotion (400GB)
- 1 disk group, across 6x146GB HDDs, containing 1 LUN: DeployLUN (80GB)
- 1 disk group, across 1x150GB SSD, containing 1 LUN: DeployTemplate (80GB)
- 3 disk groups, each across 4x150GB SSDs, containing 2 LUNs: Even DS2DB (380GB), Even OlioDB (173GB)
- 3 disk groups, each across 4x150GB SSDs, containing 2 LUNs: Odd DS2DB (380GB), Odd OlioDB (173GB)
- 3 disk groups, each across 10x146GB HDDs, containing 1 LUN: Even DS2Web (150GB)
- 3 disk groups, each across 10x146GB HDDs, containing 1 LUN: Odd DS2Web (150GB)
- 3 disk groups, each across 12x146GB HDDs, containing 1 LUN: Even MailServer (300GB)
- 3 disk groups, each across 12x146GB HDDs, containing 1 LUN: Odd MailServer (300GB)
- 3 disk groups, each across 4x150GB SSDs, containing 2 LUNs: Even OlioWeb (400GB)
- 3 disk groups, each across 4x150GB SSDs, containing 2 LUNs: Odd OlioWeb (400GB)
- 3 disk groups, each across 6x146GB HDDs, containing 1 LUN: All Standby (200GB)

Datacenter Management Server Notes

None

Operating System Notes

- All MailServer VMs running Microsoft Windows Server 2008 R2 Enterprise (64-bit) and updated through Windows Update
- Mailserver6 had these additional updates: KB2207559 KB2385596 KB2476490 KB2503665 KB2525694 KB2530548 KB2534366 KB2535512 KB2536276 KB2541014 KB2544521 KB2544893 KB980360 KB981550
- All Standby VMs running Microsoft Windows Server 2003 R2 Enterprise SP2 (32-bit)

- Storage Controller for all Exchange Database Virtual Disks set to Paravirtual.

Software Notes

None

Client Notes

- Prime Client split from Client0 and run on a non-virtualized copy of Microsoft Windows Server 2003 Enterprise SP2 (32-bit)
- Prime Client was running VMware vSphere PowerCLI-4.1.1-332441
- All clients were run on virtual machines that were each defined with 4 vCPUs, 4GB memory, 1 VMXNET3 network and 32GB disk space.
- Each client virtual machine was running Microsoft Windows Server 2008 R2 Enterprise (64-bit)
- Each physical client ran 3 virtual clients
- All physical clients were installed with VMware ESX 4.1.0 (Build 260247)

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.

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.](http://www.vmware.com)