

VMware® VMmark® V2.5 Results

Vendor and Hardware Platform: **Lenovo ThinkServer RD630**
 Virtualization Platform: **VMware ESXi 5.1.0 Build 1021289**
 VMware vCenter Server : **VMware vCenter Server 5.1.0 Build 947673**

**VMmark V2.5 Score =
11.17 @ 10 Tiles**

Number of Hosts: 2

Uniform Hosts [yes/no]: yes

Total sockets/cores/threads in test: 4/32/64

Tested By: **Principled Technologies, Inc.**

Test Date: **[06-05-2013]**

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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	329.90	1.00	91.50	4749.75	1.02	91.76	3674.90	1.67	79.57	2680.55	1.77	83.52	2020.55	1.91	86.44	1.42
p1	324.73	0.98	94.00	4717.98	1.02	110.50	3559.00	1.62	85.39	2569.53	1.69	91.33	1855.85	1.75	94.05	1.37
p2	323.95	0.98	104.40	4711.85	1.02	136.14	3455.28	1.57	91.23	2560.18	1.69	97.65	1927.70	1.82	102.64	1.37
TILE_1	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.80	0.99	63.73	4739.65	1.02	79.02	3502.70	1.59	90.34	2435.78	1.60	101.16	1712.72	1.62	108.78	1.33
p1	323.30	0.98	64.00	4748.38	1.02	95.18	3429.47	1.56	94.07	2490.15	1.64	103.73	1766.53	1.67	111.58	1.34
p2	326.20	0.99	64.97	4721.25	1.02	116.20	3440.50	1.56	94.43	2378.35	1.57	106.71	1732.47	1.64	115.36	1.32
TILE_2	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	328.15	0.99	74.00	4765.68	1.03	84.22	3637.90	1.65	82.40	2578.80	1.70	90.22	1845.22	1.74	94.66	1.38
p1	328.10	0.99	74.00	4751.88	1.02	100.61	3415.30	1.55	94.86	2489.93	1.64	104.15	1868.67	1.77	110.05	1.36
p2	327.95	0.99	79.00	4717.55	1.02	119.28	3278.03	1.49	105.41	2319.75	1.53	119.61	1650.50	1.56	128.01	1.29
TILE_3	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.27	0.99	77.50	4762.70	1.03	83.32	3494.97	1.59	90.00	2553.68	1.68	98.60	1821.42	1.72	105.10	1.36
p1	319.45	0.97	74.00	4751.50	1.02	102.73	3479.55	1.58	90.96	2431.00	1.60	101.37	1810.40	1.71	106.13	1.34
p2	323.80	0.98	74.00	4726.93	1.02	111.55	3477.62	1.58	91.85	2493.15	1.64	103.75	1781.80	1.68	109.78	1.34
TILE_4	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.85	0.99	74.00	4738.45	1.02	88.41	3789.70	1.72	74.45	2779.57	1.83	82.89	2133.62	2.02	84.49	1.45
p1	325.98	0.99	74.00	4736.90	1.02	103.80	3723.88	1.69	77.93	2628.93	1.73	87.00	1984.38	1.88	89.99	1.41
p2	327.18	0.99	74.00	4716.50	1.02	113.73	3579.28	1.63	84.56	2586.32	1.70	96.03	1793.58	1.70	100.26	1.36
TILE_5	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	323.52	0.98	63.85	4729.23	1.02	104.55	3529.70	1.61	88.86	2440.85	1.61	101.02	1826.50	1.73	105.61	1.35
p1	324.85	0.98	64.00	4708.57	1.01	112.19	3485.25	1.58	90.78	2434.12	1.60	101.49	1722.40	1.63	107.90	1.33

p2	328.23	0.99	68.75	4702.93	1.01	124.40	3397.57	1.54	95.02	2594.53	1.71	101.97	1862.90	1.76	109.68	1.36		
TILE_6	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM		
p0	331.12	1.00	74.00	4747.18	1.02	92.30	3757.47	1.71	77.35	2641.82	1.74	86.16	1866.38	1.76	92.44	1.40		
p1	325.73	0.99	74.00	4765.50	1.03	100.03	3612.20	1.64	84.63	2621.88	1.73	94.25	1866.15	1.76	101.01	1.38		
p2	327.57	0.99	74.00	4738.00	1.02	105.51	3485.50	1.58	91.72	2508.72	1.65	102.18	1873.85	1.77	108.94	1.36		
TILE_7	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM		
p0	328.88	1.00	403.10	4754.15	1.02	82.48	3529.85	1.61	89.19	2419.93	1.59	102.48	1704.08	1.61	109.43	1.33		
p1	327.70	0.99	244.93	4737.15	1.02	93.70	3443.82	1.57	93.67	2557.15	1.68	104.51	1834.15	1.73	112.44	1.36		
p2	323.48	0.98	159.62	4731.25	1.02	116.18	3369.12	1.53	98.13	2327.43	1.53	110.81	1701.08	1.61	119.51	1.30		
TILE_8	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM		
p0	320.20	0.97	85.45	4736.32	1.02	97.11	3776.35	1.72	75.83	2836.68	1.87	84.79	2111.80	2.00	86.44	1.45		
p1	323.10	0.98	84.00	4734.50	1.02	101.73	3681.30	1.67	81.13	2561.55	1.69	91.99	1938.50	1.83	94.44	1.39		
p2	327.57	0.99	84.00	4711.18	1.02	125.54	3595.75	1.64	85.58	2472.90	1.63	98.48	1773.67	1.68	102.11	1.35		
TILE_9	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM		
p0	329.27	1.00	88.12	4748.60	1.02	82.62	3865.10	1.76	71.82	2910.68	1.92	75.79	2199.80	2.08	79.56	1.48		
p1	323.88	0.98	83.75	4747.12	1.02	93.15	3664.15	1.67	80.94	2616.30	1.72	87.96	1871.15	1.77	92.53	1.38		
p2	327.45	0.99	84.00	4726.70	1.02	121.83	3298.62	1.50	104.88	2366.80	1.56	118.03	1680.97	1.59	127.53	1.30		
p0_score:	13.95																	
p1_score:	13.65																	
p2_score:	13.37																	
Infrastructure_Operations_Scores:										vmotion			svmotion			deploy		
Completed_Ops_PerHour										18.50			12.00			5.00		
Avg_Seconds_To_Complete										14.84			15.87			309.95		
Failures										0.00			1.00			0.00		
Ratio										1.16			1.33			1.25		
Number_Of_Threads										1			1			1		
Summary								Run_Is_Compliant					Turbo_Setting:0					
								Number_Of_Compliance_Issues(0)*					Median_Phase(p1)					
Unreviewed_VMmark2_Applications_Score								13.65										
Unreviewed_VMmark2_Infrastructure_Score								1.24										
Unreviewed_VMmark2_Score								11.17										

Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 5.1.0 Build 1021289 / 03-07-2013
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server 5.1.0 Build 947673/ 12-20-2012
Supplemental Software	None
Servers	
Quantity	2
Server Manufacturer and Model	Lenovo ThinkServer RD630
Processor Vendor and Model	Intel Xeon E5-2690
Processor Speed (GHz)	2.9
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	20MB I+D on chip per chip L3
BIOS Version	2.10
Memory Size (in GB, Number of DIMMs)	256GB, 16
Memory Type and Speed	16GB DIMMs 2Rx4 DDR3-1600MHz Registered ECC
Disk Subsystem Type	FC SAN
Number of Disk Controllers	1
Disk Controller Vendors and Models	LSI MegaRAID SAS 9260-8i
Number of Host Bus Adapters	1 dual-port
Host Bus Adapter Vendors and Models	Emulex LPe12002 8Gbps FC HBA
Number of Network Controllers	4
Network Controller Vendors and Models	Intel 1Gbps dual-port I350 adapter (embedded), Intel 1Gbps single-port 82574L adapter (embedded, shared management), 2 x Intel 10Gbps dual-port X540-T2 adapter
Other Hardware	None
Other Software	VMware ESXi 5.1 Driver for Emulex Fibre Channel HBAs and FCoE UCNAs version 8.2.4.146.59, ESXi 5.x driver package version 3.14.3 for Intel ixgbe

Hardware Availability Date (MM-DD-YYYY)	06-05-2012
Software Availability Date (MM-DD-YYYY)	03-07-2013
Network	
Network Switch Vendors and Models	1 x Extreme Networks Summit X670V-48t 48 Port 10 GbE Copper Switch
Network Speed	1Gbps for SUT management and clients, 10Gbps for all VMs, VMotion and vCenter Server
Storage	
Array Vendors, Models, and Firmware Versions	1 x Dot Hill AssuredSAN Pro 5720, Firmware version CS100P002-02
Fibre Channel Switch Vendors and Models	None
Disk Space Used	3193GB
Array Cache Size	8GB (4GB per controller)
Total Number of Physical Disks Used	20
Total Number of Enclosures/Pods/Shelves Used	3
Number of Physical Disks Used per Enclosure/Pod/Shelf	Two enclosures with 4 (400GB SSDs), One enclosure with 8 (400GB SSDs)
Total Number of Storage Groups Used	2
Number of LUNs Used	14
LUN Size and Number of Disks Per LUN	Details in section Storage Notes
RAID Type	Details in section Storage Notes
Number of Members per RAID Set	Details in section Storage Notes
Disk Vendors, Models, and Speeds	<ul style="list-style-type: none"> • 16 x Hitachi HUSML4040ASS600, SSD • 4 x Seagate ST9300653SS, 300GB 15k RPM SAS
Datacenter Management Server	
System Model	Lenovo ThinkServer RD530
Processor Vendor and Model	Intel Xeon E5-2640
Processor Speed (GHz)	2.50
Total Sockets/Total Cores/Total Threads	2 Sockets / 6 Cores / 12 Threads

Memory	64GB
Network Controller(s) Vendors and Models	Intel 1Gbps dual port I350 adapter (embedded), Intel 1Gbps single port 82574L adapter (embedded, shared management), Intel 10Gbps dual port X540-T2 adapter
Operating System, Version, Bitness, and Service Pack	VMware ESXi 5.1.0 Build 1021289 (Windows Server 2008 R2 Enterprise 64-bit for VM)
Other Hardware	None
Other Software	None

Clients

Total Number of Clients / Total Physical Clients / Total Virtual Client Hosts	11 / 1 / 5
System Model(s)	Lenovo ThinkServer RD530
Processor Vendor(s) and Model(s)	Intel Xeon E5-2640
Processor Speed(s) (GHz)	2.50
Total Sockets/Total Cores/Total Threads	2 Sockets / 6 Cores / 2 Threads
Memory per Physical Client	64GB
Network Controller(s) Vendors and Models	Intel 1Gbps dual port I350 adapter (embedded), Intel 1Gbps single port 82574L adapter (embedded, shared management), Intel 10Gbps dual port X540-T2 adapter (installed in only one client)
Operating System, Version, Bitness, and Service Pack	<ul style="list-style-type: none"> • Microsoft Windows Server 2008 R2 Enterprise 64-bit (prime client) • VMware ESXi 5.1.0 Build 1021289 (virtual client hosts) • Microsoft Windows Server 2008 R2 Enterprise 64-bit (virtual client)
Number of Virtual Clients	10
Number of vCPUs Per Virtual Client	4
Number of vMem (GB) Per Virtual Client	4GB
Virtual Client Networking Notes	All clients had a dedicated 1Gbps vSwitch
Virtual Client Storage Notes	All clients stored on virtual client hosts' two disk RAID 1 volume
Other Hardware	None
Other Software	None

Notes for Workload

Virtualization Software Notes

- Virtual hardware for all VMs was set to V9
- Ethernet adapter type set to vmxnet3 for all VMs (default vmxnet2)
- CD and floppy were removed from all VMs (default attached)
- Logging was disabled for all VMs (default enabled)
- All Linux and Mailserver VMs configured as single virtual socket with multiple cores (default one core per multiple virtual sockets)
- SCSI adapter type PVSCSI used for all Standby VMs (default LSI Logic parallel)
- SCSI adapter type PVSCSI used for all MailServer and Linux VMs (default LSI Logic SAS)
- Power management set to High performance in OS on Standby and Mailserver VMs (default balanced)
- Firewall was disabled in all console OS (default enabled)
- Old VMware tools installed on all OlioWeb-VMs (Build 9216 instead of 9217)
- /adv/Cpu/CoschedCrossCall = 0 (default 1)
- /adv/Cpu/HTWholeCoreThreshold = 0 (default 200)
- /adv/DataMover/HardwareAcceleratedInit = 0 (default 1)
- /adv/DataMover/HardwareAcceleratedMove = 0 (default 1)
- /adv/Mem/BalancePeriod = 0 (default 15)
- /adv/Mem/SamplePeriod = 0 (default 60)
- /adv/Mem/ShareScanGHz = 0 (default 4)
- /adv/Misc/TimerMaxHardPeriod = 4000 (default 100000)
- /adv/Misc/TimerMinHardPeriod = 2000 (default 30)
- /adv/Net/MaxNetifRxQueueLen = 500 (default 100)
- /adv/Net/MaxNetifTxQueueLen = 1000 (default 500)
- /adv/Net/NetTxCompletionWorldlet = 0 (default 1)
- /adv/Irq/IRQRebalancePeriod = 20000 (default 50)
- /adv/Irq/BestVcpuRouting = 1 (default 0)
- /adv/Numa/LTermFairnessInterval = 0 (default 5)
- /adv/Numa/PreferHT = 1 (default 0)
- /adv/Numa/MonMigEnable = 0 (default 1)
- /adv/Numa/PageMigEnable = 0 (default 1)
- /adv/Numa/RebalancePeriod = 60000 (default 2000)
- /adv/Numa/SwapLoadEnable = 0 (default 1)
- /adv/Numa/SwapLocalityEnable = 0 (default 1)
- /vmkernel/module/lpfc820.o/options = "lpfc_lun_queue_depth=64 lpfc_cr_count=3 lpfc_cr_delay=1" (default 30,1,0)
- /vmkernel/module/ixgbe/options = 'VMDQ=16,16,16,16 InterruptThrottleRate=2000,2000,2000,2000 InterruptType=2,2,2,2' (default 8,16000,2)

Server Notes

- CPU C6 Report disabled (default enabled)
- Package C state limit set to C0 (default no limit)

Networking Notes

- vSwitch Configuration:
- vSwitch0 on vmnic2 for Service Console (1Gb)
- vSwitch1 on vmnic3 (10Gb) for all Standby, Mail and Deploy VMs
- vSwitch2 on vmnic4 (10Gb) for all Olio VMs
- vSwitch3 on vmnic6 (10Gb) for all DS2 VMs
- vSwitch4 on vmnic5 (10Gb) for VMotion

Storage Notes

- ESX was installed on a two-disk RAID 1 volume from the internal 300GB SAS hard drives in each system under test
- The 16 SSDs were configured into eight two-disk RAID 1 vdisks
- The eight vdisks were configured into two storage pools (four vdisks per storage pool, with two SSDs per vdisk, for a total of 8 SSDs per storage pool)
- One storage pool was mapped to each controller (Storage pool 1 mapped to controller 1 and storage pool 2 mapped to controller 2)
- Storage pool 1 on controller 1:
 - 1 LUN at 10GB, for Deploy Template
 - 1 LUN at 55GB, containing all Standby VMs
 - 1 LUN at 90GB, containing OlioDB0, OlioDB1, OlioDB2, OlioDB3, OlioDB4 VMs
 - 1 LUN at 470GB, containing OlioWeb0 OlioWeb1 OlioWeb2 OlioWeb3 OlioWeb4 VMs
 - 1 LUN at 270GB, containing DS2DB0, DS2DB1, DS2DB2, DS2DB3, DS2DB4 VMs
 - 1 LUN at 270GB, containing DS2WebA,B,C0, DS2WebA,B,C1, DS2WebA,B,C2, DS2WebA,B,C3, DS2WebA,B,C4 VMs
 - 1 LUN at 445GB, containing Mailserver0, Mailserver1, Mailserver2, Mailserver3, Mailserver4 VMs
- Storage pool 2 on controller 2:
 - 1 LUN at 10GB, for Deploy Target
 - 1 LUN at 55GB, for Standby Source
 - 1 LUN at 90GB, containing OlioDB5, OlioDB6, OlioDB7, OlioDB8, OlioDB9 VMs
 - 1 LUN at 470GB, containing OlioWeb5 OlioWeb6 OlioWeb7 OlioWeb8 OlioWeb9 VMs
 - 1 LUN at 270GB, containing DS2DB5, DS2DB6, DS2DB7, DS2DB8, DS2DB9 VMs
 - 1 LUN at 270GB, containing DS2WebA,B,C5, DS2WebA,B,C6, DS2WebA,B,C7, DS2WebA,B,C8, DS2WebA,B,C9 VMs
 - 1 LUN at 445GB, containing Mailserver5, Mailserver6, Mailserver7, Mailserver8, Mailserver9 VMs

Datacenter Management Server Notes

The Datacenter Management Server was a virtual machine configured with 4 vCPU and 16GB RAM on physical client 6.

Operating System Notes

All Mailservers ran Microsoft Windows Server 2008 R2 Enterprise 64-bit

Software Notes

None

Client Notes

- Microsoft Windows Server 2008 R2 Enterprise 64-bit installed on client virtual machines and updated through Windows Update
- Prime client was running Microsoft Windows Server 2008 R2 Enterprise 64-bit and VMware vSphere PowerCLI 5.1.0 R2 build 1012425
- All clients ran as virtual machines that were each defined with 4 virtual CPUs, 4GB of memory, 1 vmxnet3 network, and 60GB of disk space
- Prime client ran on physical client 1
- Virtual clients 0, and 1 were hosted on physical client 2
- Virtual clients 2 and 3 were hosted on physical client 3
- Virtual clients 4 and 5 were hosted on physical client 4
- Virtual clients 6 and 7 were hosted on physical client 5
- Virtual clients 8 and 9 were hosted on physical client 6
- Clients ran with default ESX settings

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.

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