VMware® VMmark® V2.5.2 Results

Vendor and Hardware Platform: Dell PowerEdge R720 Virtualization Platform: VMware ESXi 5.5.0 Update 1 Build 1892794 VMware vCenter Server 5.5.0b Build 1476327	VMmark V2.5.2 Score = 12.05 @ 10 Tiles

Number of Hosts: 2	Uniform Hosts [yes/no]: no	Total sockets/cores/threads in test: 4/32/64

Tested By: Principled Technologies, Inc.	Test Date: [09-03-2014]

Performance Section	Configuration Section	Notes Section
Performance	Configuration	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	324.73	0.98	92.75	4754.07	1.02	86.53	3923.47	1.78	68.05	2903.97	1.91	71.20	2111.47	2.00	71.26	1.47
p1	322.93	0.98	92.25	4714.10	1.02	101.79	3790.57	1.72	73.77	2965.60	1.95	72.95	2153.95	2.04	75.46	1.47
p2	329.95	1.00	94.00	4720.48	1.02	122.83	3598.88	1.64	82.00	2883.00	1.90	77.63	2153.07	2.03	82.69	1.45
TILE_1	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	323.60	0.98	106.50	4750.55	1.02	81.25	3909.22	1.78	68.92	2980.25	1.96	66.98	2092.30	1.98	73.26	1.47
p1	321.55	0.97	95.25	4741.48	1.02	95.89	3795.20	1.73	73.25	2977.53	1.96	77.42	2147.05	2.03	83.44	1.47
p2	329.65	1.00	103.75	4730.27	1.02	123.65	3675.62	1.67	78.80	2627.97	1.73	88.14	1924.88	1.82	95.38	1.40
TILE_2	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.48	0.99	60.75	4752.70	1.02	83.42	3890.00	1.77	69.57	2982.32	1.96	71.37	2166.72	2.05	74.25	1.49
p1	327.35	0.99	69.25	4727.00	1.02	101.11	3803.03	1.73	73.32	2894.05	1.91	75.69	2202.05	2.08	78.53	1.47
p2	329.43	1.00	88.75	4701.62	1.01	142.11	3663.25	1.67	79.53	2698.35	1.78	82.23	1931.67	1.83	86.30	1.40
TILE_3	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	328.98	1.00	101.50	4760.90	1.03	73.80	3998.40	1.82	66.38	3092.70	2.04	70.86	2346.53	2.22	68.24	1.53
p1	326.88	0.99	94.00	4740.85	1.02	94.45	4016.62	1.83	65.44	2888.12	1.90	71.44	2193.62	2.07	72.09	1.49
p2	326.27	0.99	98.00	4699.95	1.01	137.84	3909.95	1.78	69.84	2818.10	1.86	75.48	2002.08	1.89	79.77	1.44
TILE_4	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.43	0.99	61.42	4748.05	1.02	81.85	3954.32	1.80	67.24	2927.90	1.93	69.30	2222.40	2.10	70.66	1.49
p1	326.18	0.99	69.20	4745.20	1.02	92.78	3840.22	1.75	71.60	2997.07	1.97	70.78	2169.38	2.05	74.11	1.48
p2	322.35	0.98	87.25	4733.93	1.02	109.40	3653.90	1.66	79.90	2930.12	1.93	74.44	2064.22	1.95	82.41	1.44
TILE_5	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.65	0.99	63.27	4770.50	1.03	74.28	4129.12	1.88	61.56	2943.10	1.94	68.12	2145.85	2.03	69.49	1.50

p1	326.82	0.99	73.72	4727.48	1.02	91.21	3866.57	1.76	71.69	2953.35	1.94	72.50	2098.97	1.98	80.49	1.47
p2	327.95	0.99	83.00	4694.68	1.01	128.13	3660.88	1.66	81.06	2853.70	1.88	78.10	2074.60	1.96	90.08	1.44
TILE_6	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.40	0.99	78.00	4779.35	1.03	80.79	4016.82	1.83	65.44	2866.75	1.89	72.09	2083.45	1.97	73.64	1.47
p1	325.70	0.99	89.25	4737.00	1.02	100.45	3952.75	1.80	68.14	2968.97	1.96	76.86	2219.22	2.10	77.41	1.49
p2	328.77	1.00	106.25	4703.25	1.01	137.43	3885.32	1.77	71.21	2648.15	1.74	85.31	2028.40	1.92	85.49	1.43
TILE_7	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.25	0.98	73.25	4764.07	1.03	77.41	4038.50	1.84	64.18	3076.90	2.03	66.31	2233.53	2.11	70.12	1.51
p1	323.50	0.98	74.50	4739.80	1.02	86.99	3858.93	1.75	71.02	2957.75	1.95	72.45	2334.15	2.21	70.01	1.50
p2	327.95	0.99	86.00	4738.55	1.02	114.55	3698.90	1.68	78.33	2741.05	1.81	80.14	2086.50	1.97	74.22	1.43
TILE_8	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.45	0.99	131.50	4752.00	1.02	81.28	3891.62	1.77	69.28	2967.60	1.95	72.24	2237.18	2.11	76.42	1.49
p1	329.73	1.00	118.75	4755.52	1.02	89.51	3796.00	1.73	73.15	2868.20	1.89	78.54	2043.58	1.93	84.28	1.45
p2	327.38	0.99	119.75	4727.07	1.02	105.23	3655.80	1.66	79.39	2598.65	1.71	89.21	1830.60	1.73	95.80	1.38
TILE_9	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	324.30	0.98	137.90	4755.93	1.02	78.25	3964.15	1.80	66.79	2922.93	1.92	69.52	2191.38	2.07	72.43	1.49
p1	323.05	0.98	114.67	4759.00	1.03	87.59	3878.75	1.76	70.35	2939.62	1.94	73.54	2127.22	2.01	77.32	1.47
p2	327.62	0.99	114.00	4700.60	1.01	112.53	3752.05	1.71	75.77	2841.65	1.87	79.16	2045.08	1.93	83.74	1.44
p0_score:	14.91															
p1_score:	14.76															
p2_score:	14.26															

Infrastructure_Operations_Scores:	vmotion	svmotion	deploy
Completed_Ops_PerHour	17.50	11.00	5.50
Avg_Seconds_To_Complete	19.95	14.20	289.84
Failures	0.00	0.00	0.00
Ratio	1.09	1.22	1.38
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	14.76	
Unreviewed_VMmark2_Infrastructure_Score	1.22	
Unreviewed_VMmark2_Score	12.05	

Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 5.5.0 Update 1 Build 1892794 / 07-01-2014
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server 5.5.0b Build 1476327 / 12-22-2013
Supplemental Software	None
Servers	
Quantity	2
Server Manufacturer and Model	Dell PowerEdge R720
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	32 KB I + 32 KB D on chip per core
Secondary Cache	256KB I+D on chip per core
Other Cache	20MB I+D on chip per core L3
BIOS Version	2.2.3
Memory Size (in GB, Number of DIMMs)	256GB, 16
Memory Type and Speed	16GB DIMMs 2Rx4 DDR3-1600MHz Registered ECC
Disk Subsystem Type	iSER SAN
Number of Disk Controllers	1
Disk Controller Vendors and Models	Dell PERC H710P Mini controller
Number of Host Bus Adapters	None
Host Bus Adapter Vendors and Models	None
Number of Network Controllers	4
Network Controller Vendors and Models	Mellanox Technologies MT27500 Family [ConnectX-3] dual-port 40Gbps adapter, Intel X540-AT2 dual-port 10Gbps adapter, (2 x Intel 82599EB dual-port 10Gbps adapter in Host 1), (Host 2 had 1 x Intel 82599EB dual-port 10Gbps adapter and 1 x QLogic Corp HP NC523SFP 10GbE 2-port Ethernet Server Adapter)
Other Hardware	None
Other Software	VMware ESXi 5.5 driver for Mellanox dual-port adapter version 1.9.10.0

Hardware Availability Date (MM-DD-YYYY)	05-20-2014
Software Availability Date (MM-DD-YYYY)	07-01-2014
Network	
Network Switch Vendors and Models	1 x Dell Force10 S4810P
Network Speed	10/40GbE
Storage	
Array Vendors, Models, and Firmware Versions	Micron Enterprise PCIe SSD-based SAN
Fibre Channel Switch Vendors and Models	None (hosts were directly cabled to the iSER storage)
Disk Space Used	7824
Array Cache Size	N/A
Total Number of Physical Disks Used	5 (2 per system under test for OS, 1 for CentOS storage host), 8 PCI-e Flash
Total Number of Enclosures/Pods/Shelves Used	1
Number of Physical Disks Used per Enclosure/Pod/Shelf	1 disk for storage host OS, 8 PCI-e SSD
Total Number of Storage Groups Used	0
Number of LUNs Used	24
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	• 4 x Seagate ST9300653SS, 300GB 15k RPM SAS (ESXi Host OS) • 1 x Seagate ST1000DM003, 1TB 7.2k RPM SATA (Storage Server OS) • 4 x Micron P320h, 700GB Enterprise PCIe SSD • 4 x Micron P420m, 1.4TB Enterprise PCIe SSD

Datacenter Management Server	
System Model	PowerEdge C8220 Compute GPU Node
Processor Vendor and Model	Intel Xeon E5-2650
Processor Speed (GHz)	2.0

Total Sockets/Total Cores/Total Threads	2 Sockets / 16 Cores / 32 Threads
Memory	128GB
Network Controller(s) Vendors and Models	Intel I350 Gigabit Network Adapter
Operating System, Version, Bitness, and Service Pack	Microsoft Windows Server 2008 R2 Enterprise 64-bit
Other Hardware	None
Other Software	None

Clients	
Total Number of Clients / Total Physical Clients / Total Virtual Client Hosts	11/1/5
System Model(s)	PowerEdge C8220 Compute GPU Node
Processor Vendor(s) and Model(s)	Intel Xeon E5-2650
Processor Speed(s) (GHz)	2.0
Total Sockets/Total Cores/Total Threads	2 Sockets / 16 Cores / 32 Threads
Memory per Physical Client	128GB
Network Controller(s) Vendors and Models	10Gbps dual-port Intel I350 Gigabit Network Adapter
Operating System, Version, Bitness, and Service Pack	• Microsoft Windows Server 2008 R2 Enterprise 64-bit (prime client) • VMware ESXi 5.5.0 Update 1 Build 1892794 (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	4
Virtual Client Networking Notes	None
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 V10
- 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 VMs (except for Deploy Template) had VMware tools version 9344 installed and running
- All 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)
- Multiqueue was disabled in the vmxnet3 driver on all Linux VMs
- MTU size 9000 set for the iSCSI vSwitches
- Driver qlcnic installed on host2, not installed on host1
- Cluster DRS Automation Level was set to "Fully Automated", Level 2
- CPU shares set to high for all DS2DB VMs

  Advanced Settings:

- Cpu.CoschedCrossCall = 0 (default 1)
- Cpu.CreditAgePeriod = 1000 (default 3000)
- Cpu.HTWholeCoreThreshold =0 (default 200)
- DataMover.HardwareAcceleratedInit = 0 (default 1)
- DataMover.HardwareAcceleratedMove = 0 (default 1)
- Irq.BestVcpuRouting = 1 (default 0)
- Mem.BalancePeriod = 0 (default 15)
- Mem.SamplePeriod = 0 (default 60)
- Mem.ShareScanGHz = 0 (default 4)
- Misc.TimerMaxHardPeriod = 4000 (default 100000)
- Net.MaxNetifRxQueueLen =500 (default 100)
- Net.MaxNetifTxQueueLen =1000 (default 500)
- Net.NetTxCompletionWorldlet = 0 (default 1)
- Net.NetTxWorldlet = 1 (default 2)
- Numa.LargeInterleave = 0 (default 1)
- Numa.LTermFairnessInterval = 0 (default 5)
- Numa.MigImbalanceThreshold = 57 (default 10)
- Numa.MonMigEnable = 0 (default 1)
- Numa.PageMigEnable = 0 (default 1)
- Numa.PreferHT = 1 (default 0)
- Numa.RebalancePeriod = 60000 (default 2000)
- Numa.SwapInterval = 1 (default 3)
- Numa.SwapLoadEnable =0 (default 1)
- Numa.SwapLocalityEnable =0 (default 1)
- Power.CpuPolicy = static (default balanced)
- VMFS3.HardwareAcceleratedLocking =0 (default 1)

Server Notes

- System Profile set to Performance in BIOS (default Performance Per Watt Optimized (DAPC))

Networking Notes

vSwitch Configuration for Host 1:

- vSwitch0 on vmnic7 (10Gb) for Service Console and VMotion
- vSwitch1 on vmnic6 (10Gb) for all Olio, DS2, Standby and Deploy VMs
- vSwitch2 on vmnic8 (40Gb) for one of two paths for iSER traffic
- vSwitch3 on vmnic10000802 (40Gb) for one of two paths for iSER traffic
- vSwitch4 on vmnic5 (10Gb) for all Mail VMs
- vmnic0 connection is up on host2, down on host1

vSwitch Configuration for Host 2:

- vSwitch0 on vmnic5 (10Gb) for Service Console and VMotion
- vSwitch1 on vmnic4 (10Gb) for all Olio, DS2, Standby and Deploy VMs
- vSwitch2 on vmnic10000602 (40Gb) for one of two paths for iSER traffic
- vSwitch3 on vmnic6 (40Gb) for one of two paths for iSER traffic
- vSwitch4 on vmnic7 (10Gb) for all Mail VMs

Storage Notes

- ESX was installed on two internal 300GB SAS hard drives configured as RAID 1 in each system under test.
- The servers were connected to the storage over iSCSI.
- The systems under test were directly connected to the storage host using 40Gbps connections.
- All LUNs were spread across eight Micron Technology Inc RealSSD PCI-e Flash cards within a single SuperMicro X9DRX+-F.
- Physical Configuration for Micron Enterprise PCIe SSD based SAN:
  - SuperMicro SuperServer 6037R-TXRF
  - 2 x Intel Xeon E5-2690 2.90 GHz processors
  - 64 GB Memory (8 x 8 GB DIMMs dual rank PC3-12800 Registered DDR3)
  - 4 x Micron Technology Inc RealSSD P320h (rev 03)
  - 4 x Micron Technology Inc RealSSD P420m (rev 03)
  - 2 x Mellanox Technologies ConnectX-3 NICs (firmware 2.31.5050)
    - Driver version 1.9.10.0 (Feb-16-2014)
  - Linux-IO Target (LIOT) based storage controller
  - 1 x 1 TB SAS drive for OS installation
  - Based on CentOS release 6.4 (Final)
- Virtual Configuration for 24x 326GB LUNs on Micron Enterprise PCIe SSD based SAN:
  1. The Standby source targets and the Deploy template VMs
  2. The Standby VMs and the Deploy cloning target location
  3. The DS2DB VMs for tiles 0,2,4
  4. The OlioWeb VMs for tiles 1,3
  5. The DS2Web VMs for tiles 0
  6. The DS2Web VMs for tiles 1
  7. The Mail VMs for tiles 0,2,4
  8. The DS2Web VMs for tiles 2,3
  9. The DS2DB VMs for tiles 1,3
  10. The OlioWeb VMs for tiles 0,2,4
  11. The DS2Web VMs for tiles 4

12. The DS2DB VMs for tiles 5,7,9
13. The DS2Web VMs for tiles 5
14. The DS2Web VMs for tiles 6
15. The Mail VMs for tiles 6,8
16. The OlioWeb VMs for tiles 5,7,9
17. The DS2Web VMs for tiles 9
18. The OlioWeb VMs for tiles 6,8
19. The Mail VMs for tiles 5,7,9
20. The DS2Web VMs for tiles 7,8
21. The OlioDB VMs for tiles 5,6,7,8,9
22. The DS2DB VMs for tiles 6,8
23. The OlioDB VMs for tiles 0,1,2,3,4
24. The Mail VMs for tiles 1,3

- All LUNs were distributed across 8 Micron Technology Inc RealSSDs.
- All LUNs were configured as block devices and no system memory was used for write caching.

Datacenter Management Server Notes

- None

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 5.5 Release 2 build 1671586
- All clients ran as virtual machines that were each defined with 4 virtual CPUs, 4GB of memory, 1 vmxnet3 network, and 36GB 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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