

VMmark® 3.0 Results

Vendor and Hardware Platform: Dell EMC PowerEdge R940
 Virtualization Platform: VMware ESXi 6.7 Build 8169922
 VMware vCenter Server: VMware vCenter Server Appliance 6.7 Build 8217866

**VMmark 3.0 Score =
14.71 @ 15 Tiles**

Number of Hosts: 2

Uniform Hosts [yes/no]: yes

Total sockets/cores/threads in test: 8/224/448

Tested By: Dell EMC

Test Date: 05-18-2018

Performance Section
[Performance](#)

Configuration Section
[Configuration](#)

Notes Section
[Notes for Workload](#)

Performance

	weathervane			weathervaneE			dvdstoreA			dvdstoreB			dvdstoreC			
TILE_0	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3599.05	1.00	0.55 0.00	572.74	1.00	0.70 0.22	995.02	1.36	679.32	706.05	1.41	789.89	471.55	1.36	879.78	1.21
p1	3596.15	1.00	0.55 0.00	572.75	1.00	0.57 0.27	975.15	1.33	754.58	718.55	1.44	860.53	526.67	1.52	984.71	1.24
p2	3596.91	1.00	0.53 0.00	573.08	1.00	0.51 0.21	974.02	1.33	789.88	658.65	1.32	951.64	470.05	1.36	1095.67	1.19
TILE_1	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3597.02	1.00	0.58 0.00	573.17	1.00	0.45 0.04	965.00	1.31	780.31	677.52	1.35	919.36	468.62	1.35	1061.82	1.19
p1	3595.07	1.00	0.55 0.00	571.85	1.00	0.35 0.02	963.83	1.31	767.31	700.88	1.40	901.04	517.80	1.49	1004.28	1.22
p2	3604.06	1.00	0.56 0.00	573.30	1.00	0.37 0.12	991.50	1.35	694.38	699.58	1.40	825.76	463.75	1.34	930.49	1.20
TILE_2	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3605.22	1.00	0.47 0.00	571.75	1.00	0.67 0.18	972.45	1.32	750.14	712.65	1.42	865.10	508.27	1.47	950.09	1.23
p1	3592.59	1.00	0.44 0.00	573.20	1.00	0.67 0.50	959.85	1.31	830.91	666.55	1.33	1000.14	485.55	1.40	1143.06	1.20
p2	3596.63	1.00	0.43 0.00	571.97	1.00	0.54 0.26	985.67	1.34	714.67	694.23	1.39	835.37	485.45	1.40	935.02	1.21
TILE_3	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3597.09	1.00	0.45 0.00	572.00	1.00	0.62 0.18	978.48	1.33	738.87	713.30	1.43	868.75	524.70	1.51	974.90	1.23
p1	3603.59	1.00	0.44 0.00	569.94	1.00	0.53 0.21	986.55	1.34	721.65	698.17	1.39	862.73	481.32	1.39	997.02	1.21
p2	3596.72	1.00	0.43 0.00	571.18	1.00	0.54 0.21	1010.23	1.38	646.80	742.35	1.48	738.10	530.33	1.53	825.28	1.26
TILE_4	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3592.18	1.00	0.79 0.01	571.90	1.00	0.75 0.22	923.27	1.26	891.75	636.17	1.27	1075.01	457.43	1.32	1223.59	1.16
p1	3594.20	1.00	0.66 0.00	572.80	1.00	0.52 0.10	856.50	1.17	1178.35	580.10	1.16	1419.28	391.73	1.13	1644.85	1.09
p2	3599.63	1.00	0.75 0.01	572.95	1.00	0.51 0.08	886.73	1.21	1023.05	628.98	1.26	1205.65	454.05	1.31	1378.97	1.15
TILE_5	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3601.93	1.00	0.59 0.00	571.25	1.00	0.64 0.10	1024.88	1.40	607.74	733.85	1.47	711.42	511.88	1.48	796.68	1.25
p1	3599.38	1.00	0.59 0.00	571.50	1.00	0.59 0.13	1020.52	1.39	627.99	754.55	1.51	718.18	538.50	1.55	793.41	1.27
p2	3598.73	1.00	0.61 0.00	571.91	1.00	0.50 0.17	1023.60	1.39	623.55	731.58	1.46	726.73	535.33	1.54	811.11	1.26

p1_score:	18.05			
p2_score:	18.06			
Infrastructure_Operations_Scores:	vMotion	SVMotion	XVMotion	Deploy
Completed_Ops_PerHour	28.50	28.00	21.00	12.00
Avg_Seconds_To_Complete	6.02	76.60	102.70	268.27
Failures	0.00	0.00	0.00	0.00
Ratio	1.10	1.56	1.17	1.50
Number_Of_Threads	1	1	1	1
Summary	Run_Is_Compliant			Turbo_Setting:0
	Number_Of_Compliance_Issues(0)*			Median_Phase(p2)
Unreviewed_VMmark3_Applications_Score	18.06			
Unreviewed_VMmark3_Infrastructure_Score	1.31			
Unreviewed_VMmark3_Score	14.71			

Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 6.7, Build 8169922 / 04-17-2018
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server Appliance 6.7 Build 8217866 / 04-17-2018
Supplemental Software	None
Servers	
Number of Servers in System Under Test (all subsequent fields in this section are per server)	2
Server Manufacturer and Model	Dell EMC PowerEdge R940
Processor Vendor and Model	Intel Xeon Platinum 8180
Processor Speed (GHz)	2.50
Total Sockets/Total Cores/Total Threads	4 Sockets / 112 Cores / 224 Threads
Primary CPU Cache	32 KB I + 32 KB D on chip per core
Secondary CPU Cache	1MB I+D on chip per core
Other CPU Cache	38.5 MB I+D on chip per chip
BIOS Version	1.3.7
Memory Size (in GB, Number of DIMMs)	1536 GB, 48
Memory Type and Speed	32GB 2Rx4 DDR4 2666MHz RDIMM
Disk Subsystem Type	FC SAN

Number of Disk Controllers	1
Disk Controller Vendors and Models	Dell EMC PERC H730P Adapter
Total Number of Physical Disks for Hypervisor	2
Disk Vendors, Models, Capacities, and Speeds	Seagate,ST1000NX0453, 1TB,12Gbps SAS,7200 RPM, 2.5" form factor
Number of Host Bus Adapters	1
Host Bus Adapter Vendors and Models	Qlogic QLE2692 dual port 16Gb FC Adapter
Number of Network Controllers	3
Network Controller Vendors and Models	1xQlogic 577xx/578xx 1Gb Ethernet BCM57800, 2xIntel Converged Network Adapter X710
Other Hardware	None
Other Software	None
Hardware Availability Date (MM-DD-YYYY)	07-07-2017
BIOS Availability Date (MM-DD-YYYY)	04-17-2018
Software Availability Date (MM-DD-YYYY)	04-17-2018
Network	
Network Switch Vendors and Models	2xDell PowerConnect 6248, 1xDell Force10 S4810
Network Speed	1Gbps for SUT Management, 10Gbps for VMotion, Clients and VMs
Storage	
Array Vendors, Models, and Firmware Versions	SanDisk ION Data Accelerator,2.5.0
Fibre Channel Switch Vendors and Models	Brocade 6510
Disk Space Used	32 TB
Array Cache Size	N/A
Total Number of Physical Disks Used	14 (2 per SUT OS, 2 per storage host OS), 10xPCI-e Flash
Total Number of Enclosures/Pods/Shelves Used	5
Number of Physical Disks Used per Enclosure/Pod/Shelf	Refer to Storage Notes section
Total Number of Storage Groups Used	0
Number of LUNs Used	5
LUN Size and Number of Disks Per LUN	Refer to Storage Notes section
RAID Type	Refer to Storage Notes section
Number of Members per RAID Set	Refer to Storage Notes section
Disk Vendors, Models, and Speeds	SanDisk Fusion ioMemory SX350 3200 solid state drive 3.2 TB; Toshiba MBE2147RC (6Gbps SAS , 146GB, 15K RPM HDDs in RAID 1 for ION software)
Datacenter Management Server	
System Model	Dell EMC PowerEdge M830
Processor Vendor and Model	Intel Xeon E5-4669 v4
Processor Speed (GHz)	2.2 GHz
Total Sockets/Total Cores/Total Threads	4 Sockets / 88 Cores / 176 Threads
Memory Size (in GB, Number of DIMMs)	512 GB, 16
Network Controller(s) Vendors and Models	Qlogic BCM 57800 Gigabit Ethernet
Operating System, Version, Bitness, and Service Pack	N/A

Virtual Center Appliance VM Number of vCPUs	4
Virtual Center VM Virtual Memory (in GB)	16
Virtual Center VM Operating System, Version, Bitness, and Service Pack	N/A
Other Hardware	None
Other Software	None
Clients	
Total Number of Virtual Clients / Virtual Client Hosts	16/ 5
System Model(s)	Client-Host1,3,4,5 Dell EMC PowerEdge M630 Client-Host2 Dell EMC PowerEdge M830
Processor Vendor(s) and Model(s)	Client-Host1: 2xIntel Xeon E5-2697 v4 Client-Host2: 4xIntel Xeon E5-4669 v4 Client-Host3: 2xIntel Xeon E5-2660 v4 Client-Host4: 2xIntel Xeon E5-2697 v4 Client-Host5: 2xIntel Xeon E5-2699 v4
Processor Speed(s) (GHz)	Client-Host1: 2.3GHz Client-Host2: 2.2GHz Client-Host3: 2.0GHz Client-Host4: 2.3GHz Client-Host5: 2.2GHz
Total Sockets/Total Cores/Total Threads	Client-Host1: 2 Sockets / 36 Cores / 72 Threads Client-Host2: 4 Sockets / 88 Cores / 176 Threads Client-Host3: 2 Sockets / 28 Cores / 56 Threads Client-Host4: 2 Sockets / 36 Cores / 72 Threads Client-Host5: 2 Sockets / 44 Cores / 88 Threads Total: 12 Sockets / 232 Cores / 464 Threads
Memory per Virtual Client Host	Client-Host1: 320GB Client-Host2: 512GB Client-Host3: 160GB Client-Host4: 384GB Client-Host5: 160GB
Network Controller(s) Vendors and Models	Client-Host1: Qlogic Corporation NetXtreme II BCM57810 10 Gigabit Ethernet Client-Host2: Broadcom Corporation Qlogic 57810 10 GbE Adapter Client-Host3: Intel Corporation Ethernet Controller X710 for 10 GbE backplane Client-Host4: Qlogic Corporation NetXtreme II BCM57810 10 Gigabit Ethernet Client-Host5: Intel Corporation Ethernet Controller X710 for 10 GbE backplane
Virtual Client Networking Notes	1 virtual adapter for management and workload traffic, 1 virtual adapter for vMotion
Virtual Client Storage Notes	All clients on LUN04 (Refer to section: Storage Notes)
Other Hardware	Client-Host1,3,4,5: Qlogic QME2662-DEL dual port 16Gb Adapter Client-Host2: 2 x Qlogic QME2572 single port 8Gb FC Adapter
Other Software	Client-Host1,3,4,5: VMware ESXi 6.5.0 a Build 4887370 Client-Host2: VMware ESXi 6.5 U1 Build 5969303

Notes for Workload

Virtualization Software Notes

Cluster DRS Automation Level set to "Fully Automated": Level 2
SUT Hardware Power Management Active Policy set to "High Performance"
Logging was disabled for all VMs except for PrimeClient
CD-ROM and floppy devices for all DS3* VMs were removed
/adv/userVars/HostClientCEIPOptin set to 2 (default 0)
All Elastic VMs and PrimeClient CPU Shares set to high(default Normal)
All Standby VMs had CPU shares set to low(default normal)

Server Notes

Intel Turbo Boost Enabled (Frequency boost up to 3.8 GHz) (default Enabled)

Networking Notes

vSwitch0 on vmnic0,vmnic1,vmnic2,vmnic3 for Service Console(1Gbps)
vSwitch1 on vmnic4, for all Auction VMs
vSwitch2 on vmnic7, with MTU size of 9000 for VMotion
vSwitch3 on vmnic5, for all DS3* VMs and Deploy VM
vSwitch4 on vmnic6, for all Elastic and Standby VMs

Storage Notes

Storage Host OS installed on(RAID1) container for each host

All LUNs configured as block devices and no system memory used for write caching
5xDell PowerEdge R730 configured with 2xSanDisk Fusion ioMemory SX350 3200 solid state drive 3.2 TB with ION Accelerator software.
Cofiguration for ION Accelerator:
Dell PowerEdge R730
2xToshiba MBE2147RC (6Gbps SAS , 146GB, 15K RPM HDDs in RAID 1 for ION software)
2xIntel Xeon E5-2690 2.0 GHz
256 GB(16x16 GB, 2Rx4 PC3-12899R-11)
1xQlogic QLE2692 16Gbps Dual-Port Fiber Channel HBA
LUNS span both Fusion ioMemory SX350 3200 cards in each storage system

LUN Layout:

- LUN00: 5960GB
AuctionAppA 0,1,2,3; AuctionAppB 0,1,2,3; AuctionDB 0,1,2,3; AuctionLB 0,1,2,3; AuctionMSQ 0,1,2,3; AuctionNoSQL 0,1,2,3; AuctionWebA 0,1,2,3; AuctionWebB 0,1,2,3;
DS3DB 0,1,2,3,4; DS2WebA 0; DS3WebB 0, DS3WebC 0; ElasticAppA 0,1,2,3; ElasticAppB 0,1,2,3; ElasticDB 0,1,2,3; ElasticLB 0,1,2,3; ElasticWebA 0,1,2,3; ElasticWebB 0,1,2,3; Standby 0,1,2,3
- LUN01: 5960GB
AuctionappA 4,5,6,7; AuctionappB 4,5,6,7; AuctionDB 4,5,6,7; AuctionLB 4,5,6,7; AuctionMSQ 4,5,6,7; AuctionNoSQL 4,5,6,7; AucionWebA 4,5,6,7; AuctionWebB 4,5,6,7; DS3DB 5,6,7,8,9; ElasticAppA 4,5,6,7; ElasticAppB 4,5,6,7;
ElasticDB 4,5,6,7; ElasticLB 4,5,6,7; Elastic WebA 4,5,6,7; ElasticWebB 4,5,6,7; Standby 4,5,6,7;
- LUN02: 5960GB
AuctionAppA 8,9,10,11; AuctionAppB 8,9,10,11; AuctionDB 8,9,10,11; AuctionLB 8,9,10,11; AuctionMSQ 8,9,10,11; AuctionNoSQL 8,9,10,11; AuctionWebA 8,9,10,11; AuctionwebB 8,9,10,11; DS3DB 10,11,12,13; DS3WebA
11,12,13; DS3WebB 11,12,13; Ds3WebC 11,12,13; ElasticAppA 8,9,10,11; ElasticAppB 8,9,10,11; ElasticDB 8,9,10,11; ElasticWebA 8,9,10,11; ElasticWebB 8,9,10,11; Standby 8,9,10,11
- LUN03: 5960GB
AuctionAppA 12,13,14; AuctionappB 12,13,14; AuctionDB 12,13,14; AuctionLB 12,13,14; AuctionMSQ 12,13,14; AuctionNoSQL 12,13,14; AuctionDS3DB 12,13,14; DS3DB 14; DS3WebA 1,2,3,4,5,6,7,8,9,10,14; DS3WebB
1,2,3,4,5,6,7,8,9,10,14; DS3WebC 1,2,3,4,5,6,7,8,9,10,11,14; ElasticappA 12,13,14; ElasticAppB 12,13,14; ElasticDB 12,13,14; ElasticLB 12,13,14; ElasticWebA 12,13,14; ElasticWebB 12,13,14; Standby 12,13,14; vmmark3-template-05-

31-17

- LUN04: 5960GB

VMware vCenter Server Appliance 6.7, PrimeClient, Client 0,1,2,3,4,5,6,7,8,9,10,11,12,13,14

Datacenter Management Server Notes

VMware vCenter Server Appliance 6.7 hosted by Client-Host2

Operating System Notes

None

Software Notes

None

Client Notes

Client Host1: Client2, Client3, Client14

Client-Host2: Client0, Client1, Client4, PrimeClient

Client-Host3: Client8, Client9, Client10

Client-Host4: Client11, Client12, Client13

Client-Host5: Client5, Client6, Client7

For Client-Host4 the following Advanced System Setting were different from Client-Host1, Client-Host2, Client-Host3 and Client-Host5.

/adv/Cpu/CreditAgePeriod = "1000" (default 3000)
/adv/Cpu/HTWholeCoreThreshold = "0" (default 800)
/adv/DataMover/HardwareAcceleratedInit = "0" (default 1)
/adv/DataMover/HardwareAcceleratedMove = "0" (default 1)
/adv/Disk/IdleCredit = "64" (default 32)
/adv/Disk/UseIOWorlds = "1" (default 0)
/adv/Mem/CtlMaxPercent = "0" (default 65)
/adv/Mem/ShareScanGHz = "0" (default 4)
/adv/Net/MaxNetifRxQueueLen = "500" (default 80)
/adv/Net/MaxNetifTxQueueLen = "1000" (default 2000)
/adv/Net/MaxTxCompDelay = "61" (default 50)
/adv/Net/NetSchedCoalesceTxUsecs = "61" (default 33)
/adv/Numa/LTermFairnessInterval = "0" (default 5)
/adv/Numa/MigImbalanceThreshold = "57" (default 10)
/adv/Numa/PageMigEnable = "0" (default 1)
/adv/Numa/RebalancePeriod = "60000" (default 2000)
/adv/Numa/SwapLoadEnable = "0" (default 1)
/adv/Numa/SwapLocalityEnable = "0" (default 1)
/adv/Power/CpuPolicy = "static" (default balanced)
/adv/VMFS3/HardwareAcceleratedLocking = "0" (default 1)

Client-Host1, ClientHost3, ClientHost4, ClientHost5 had the following Advanced System Settings changed from default:

/adv/UserVars/HostClient.CEIPOptIn=2 (default 0)

Client-Host2 had the following Advanced System Settings changed from default:

/adv/UserVars/HostClientCEIPOptIn=2 (default 0)

Client-Host4 had the following additional modules installed as compared to Client-Host1, Client-Host3, Client-Host5:
lsu-lsi-mptsas-plugin 1.0.0-1vmw.600.0.0.2494585 VMware VMwareCertified 2017-05-17
vmware-fdm 6.0.0-2503373 VMware VMwareCertified 2017-05-17

Client-Host4 had the following driver option set:
/vmkernel/module/qlnativefc/options = "ql2xmaxqdepth=64"

Other Notes

None

Meltdown/Spectre Mitigations

CVE-2017-5754 (aka "Meltdown")

- ESXi: mitigation present (ESXi 6.7 Build 8169922)
- Guest OS: no mitigation present

CVE-2017-5753 (aka "Spectre variant 1")

- ESXi: mitigation present (ESXi 6.7 Build 8169922)
- Guest OS: no mitigation present

CVE-2017-5715 (aka "Spectre variant 2")

- Server Firmware: mitigation present (BIOS version 1.3.7)
- ESXi: mitigation present (ESXi 6.7 Build 8169922)
- Guest OS: no mitigation present

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. VMmark is a product of [VMware, Inc.](http://www.vmware.com) VMmark utilizes the SPEC Power and Temperature Daemon (SPEC PTDaemon), which is available from the Standard Performance Evaluation Corporation (SPEC®). VMmark results are not SPEC metrics and cannot be compared to SPEC metrics in any way.