

VMmark 3.0 Results

Vendor and Hardware Platform: Fujitsu Server PRIMERGY RX4770 M4
 Virtualization Platform: VMware ESXi 6.5.0 U1g Build 7967591
 VMware vCenter Server : VMware vCenter Server 6.5.0 U1g Build 8024368

**VMmark 3.0 Score =
14.86 @ 15 Tiles**

Number of Hosts: 2	Uniform Hosts [yes/no]: yes	Total sockets/cores/threads in test: 8/224/448
Tested By: Fujitsu		Test Date: 06-21-2018
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	3594.80	1.00	0.21 0.00	572.78	1.00	0.70 0.42	908.12	1.24	1048.29	615.62	1.23	1297.17	413.98	1.19	1526.73	1.13
p1	3599.02	1.00	0.21 0.00	572.50	1.00	0.84 0.57	876.62	1.19	1111.17	623.48	1.25	1287.53	429.57	1.24	1468.12	1.13
p2	3597.30	1.00	0.21 0.00	572.62	1.00	0.86 0.64	923.42	1.26	940.73	625.85	1.25	1161.30	422.38	1.22	1329.92	1.14
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	3597.51	1.00	0.22 0.00	573.26	1.00	0.53 0.27	1038.60	1.41	610.82	737.60	1.47	718.94	506.25	1.46	847.58	1.25
p1	3598.04	1.00	0.21 0.00	573.69	1.00	0.68 0.40	1029.45	1.40	637.30	748.80	1.50	755.98	550.50	1.59	862.64	1.27
p2	3605.19	1.00	0.21 0.00	569.71	1.00	0.44 0.19	1036.12	1.41	614.94	729.40	1.46	738.07	479.90	1.38	867.14	1.23
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	3599.79	1.00	0.19 0.00	572.96	1.00	0.63 0.28	1039.17	1.42	604.92	769.40	1.54	703.68	548.55	1.58	787.91	1.28
p1	3601.93	1.00	0.19 0.00	572.25	1.00	0.61 0.17	965.33	1.31	804.08	659.02	1.32	985.49	475.77	1.37	1124.71	1.19
p2	3599.09	1.00	0.20 0.00	572.60	1.00	0.59 0.20	965.75	1.32	794.36	676.25	1.35	931.62	467.40	1.35	1055.52	1.19
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	3597.83	1.00	0.20 0.00	571.62	1.00	0.66 0.35	985.98	1.34	737.56	716.62	1.43	864.45	529.23	1.53	967.20	1.24
p1	3595.90	1.00	0.20 0.00	573.00	1.00	0.72 0.45	998.52	1.36	717.69	698.27	1.40	854.79	478.98	1.38	986.92	1.21
p2	3596.56	1.00	0.19 0.00	572.45	1.00	0.65 0.23	976.98	1.33	754.57	717.27	1.43	857.24	502.77	1.45	988.37	1.23
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	3595.37	1.00	0.22 0.00	572.11	1.00	0.68 0.33	958.17	1.30	822.73	658.48	1.32	999.37	471.75	1.36	1136.32	1.18
p1	3596.24	1.00	0.22 0.00	572.17	1.00	0.58 0.17	958.62	1.31	824.03	660.58	1.32	989.34	449.90	1.30	1145.51	1.17
p2	3601.62	1.00	0.23 0.00	573.04	1.00	0.65 0.32	951.42	1.30	837.10	678.17	1.35	1001.94	491.73	1.42	1147.29	1.20
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	3598.17	1.00	0.24 0.00	573.08	1.00	0.58 0.28	1000.08	1.36	695.10	701.10	1.40	830.74	487.40	1.41	950.64	1.22
p1	3599.73	1.00	0.25 0.00	571.65	1.00	0.52 0.25	986.52	1.34	723.68	724.42	1.45	837.33	510.12	1.47	938.46	1.23
p2	3602.03	1.00	0.23 0.00	571.39	1.00	0.60 0.29	994.98	1.35	728.12	692.17	1.38	868.90	503.12	1.45	985.40	1.22
TILE_6	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3597.29	1.00	0.19 0.00	572.87	1.00	0.69 0.35	963.70	1.31	826.21	664.12	1.33	993.92	448.30	1.29	1168.28	1.18
p1	3600.98	1.00	0.20 0.00	571.74	1.00	0.78 0.49	1009.30	1.37	681.37	735.55	1.47	802.43	539.33	1.56	914.84	1.26
p2	3608.36	1.00	0.20 0.00	572.12	1.00	0.79 0.50	1027.67	1.40	639.81	724.73	1.45	766.03	501.25	1.45	885.45	1.24
TILE_7	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3602.89	1.00	0.20 0.00	571.94	1.00	0.55 0.09	1061.60	1.45	554.00	793.62	1.59	631.13	561.70	1.62	720.52	1.30
p1	3601.38	1.00	0.20 0.00	572.61	1.00	0.55 0.14	1065.20	1.45	551.99	764.48	1.53	635.59	562.35	1.62	714.36	1.29
p2	3623.88	1.01	0.20 0.00	569.24	0.99	0.51 0.09	1066.00	1.45	546.75	767.67	1.53	632.25	534.75	1.54	716.50	1.28
TILE_8	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3599.79	1.00	0.24 0.00	573.10	1.00	0.69 0.32	953.83	1.30	821.20	686.92	1.37	975.35	497.35	1.43	1124.00	1.21
p1	3599.01	1.00	0.22 0.00	570.79	1.00	0.76 0.43	965.52	1.31	811.71	666.90	1.33	972.94	450.20	1.30	1144.02	1.18
p2	3686.79	1.02	0.23 0.00	549.97	0.96	0.64 0.28	949.73	1.29	846.53	684.58	1.37	986.70	471.60	1.36	1161.14	1.19
TILE_9	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3599.97	1.00	0.20 0.00	572.13	1.00	0.73 0.41	1059.00	1.44	567.62	756.38	1.51	662.24	555.17	1.60	756.22	1.28
p1	3610.22	1.00	0.20 0.00	572.01	1.00	0.86 0.54	1063.30	1.45	551.52	765.30	1.53	634.31	532.85	1.54	733.11	1.28
p2	3478.73	0.97	0.53 0.67	574.59	1.00	0.49 0.16	1052.30	1.43	579.57	782.08	1.56	660.83	582.30	1.68	742.26	1.30
TILE_10	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3597.55	1.00	0.22 0.00	571.23	1.00	0.84 0.93	974.23	1.33	783.81	674.02	1.35	945.84	454.18	1.31	1126.70	1.18
p1	3599.84	1.00	0.20 0.00	571.24	1.00	0.70 0.44	956.52	1.30	821.81	686.67	1.37	966.22	471.73	1.36	1153.83	1.19
p2	3608.99	1.00	0.20 0.00	565.63	0.99	0.64 0.28	961.00	1.31	816.20	662.95	1.32	982.58	471.32	1.36	1152.59	1.18
TILE_11	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3602.75	1.00	0.19 0.00	571.46	1.00	0.76 0.51	1056.03	1.44	572.55	751.15	1.50	678.35	522.83	1.51	772.96	1.27
p1	3596.04	1.00	0.19 0.00	571.98	1.00	0.85 0.65	1044.03	1.42	606.21	765.17	1.53	706.41	540.20	1.56	806.44	1.28
p2	3619.59	1.01	0.19 0.00	570.65	1.00	0.76 0.44	1042.45	1.42	602.73	738.08	1.47	717.84	538.52	1.55	815.37	1.27
TILE_12	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3593.72	1.00	0.19 0.00	571.98	1.00	0.79 0.50	974.12	1.33	779.83	672.90	1.34	946.90	459.40	1.32	1101.73	1.19
p1	3597.51	1.00	0.22 0.00	572.45	1.00	0.73 0.39	960.77	1.31	808.95	690.17	1.38	949.81	504.30	1.45	1072.19	1.21
p2	3634.79	1.01	0.22 0.00	571.64	1.00	0.64 0.18	966.98	1.32	805.62	665.12	1.33	975.55	456.65	1.32	1127.83	1.18
TILE_13	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3599.38	1.00	0.17 0.00	571.70	1.00	0.63 0.52	977.77	1.33	767.99	731.02	1.46	909.59	511.75	1.48	1041.10	1.23
p1	3594.94	1.00	0.17 0.00	573.20	1.00	0.57 0.44	992.77	1.35	733.67	661.92	1.32	891.02	473.98	1.37	1012.38	1.20

p2	3667.50	1.02	0.17 0.00	567.78	0.99	0.53 0.38	970.10	1.32	785.73	700.92	1.40	929.55	487.32	1.41	1069.86	1.21
TILE_14	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3596.83	1.00	0.21 0.00	571.00	1.00	0.64 0.25	949.98	1.29	855.07	672.02	1.34	1043.10	480.50	1.39	1205.54	1.19
p1	3603.78	1.00	0.20 0.00	573.95	1.00	0.63 0.28	959.48	1.31	825.43	634.67	1.27	1005.06	423.55	1.22	1199.63	1.15
p2	3683.37	1.02	0.21 0.00	565.63	0.99	0.55 0.17	932.50	1.27	898.27	665.45	1.33	1073.96	475.57	1.37	1250.53	1.19
p0_score:	18.33															
p1_score:	18.25															
p2_score:	18.25															

Infrastructure_Operations_Scores:	vMotion	SVMotion	XVMotion	Deploy
Completed_Ops_PerHour	28.50	27.00	21.00	11.50
Avg_Seconds_To_Complete	6.21	76.60	101.56	274.22
Failures	0.00	0.00	0.00	0.00
Ratio	1.10	1.50	1.17	1.44
Number_Of_Threads	1	1	1	1

Summary	Run_Is_Compliant	Turbo_Setting:0
	Number_Of_Compliance_Issues(0)*	Median_Phase(p1)
Unreviewed_VMmark3_Applications_Score	18.25	
Unreviewed_VMmark3_Infrastructure_Score	1.29	
Unreviewed_VMmark3_Score	14.86	

Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 6.5.0 U1g, Build 7967591 / 03-20-2018
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server 6.5.0 U1g, Build 8024368 / 03-20-2018
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	Fujitsu Server PRIMERGY RX4770 M4
Processor Vendor and Model	Intel Xeon Platinum 8180
Processor Speed (GHz)	2.5
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	1 MB I+D on chip per core
Other CPU Cache	38.5 MB I+D on chip per chip
BIOS Version	V5.0.0.12 R1.7.0 for D3753-A1x
Memory Size (in GB, Number of DIMMs)	1536, 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	Fujitsu PRAID EP400i
Total Number of Physical Disks for Hypervisor	1
Disk Vendors, Models, Capacities, and Speeds	INTEL, DC S3520, 480GB, SATA 3.0 6Gb/S
Number of Host Bus Adapters	2
Host Bus Adapter Vendors and Models	Emulex LightPulse LPe31002-M6 2-Port 16Gb
Number of Network Controllers	3
Network Controller Vendors and Models	Emulex OneConnect Oce14000 Dual Port 10GbE Adapter
Other Hardware	None
Other Software	None
Hardware Availability Date (MM-DD-YYYY)	09-05-2017
BIOS Availability Date (MM-DD-YYYY)	02-09-2018
Software Availability Date (MM-DD-YYYY)	03-20-2018

Network	
Network Switch Vendors and Models	1 x Fujitsu SR-X340TR1 1 x Fujitsu ET-7648BFERA-FOS
Network Speed	10Gbps for SUT management, VMotion, Clients and VMs
Storage	
Array Vendors, Models, and Firmware Versions	3 x Fujitsu Server PRIMERGY RX2540 M2, Firmware V5.0.0.11 R1.13.0 for D3289-B1x 1 x Fujitsu Server PRIMERGY TX2560 M2, Firmware V5.0.0.11 R1.7.0 for D3289-B1x 1 x Fujitsu Server PRIMEQUEST 2800E3, Firmware 1.36
Fibre Channel Switch Vendors and Models	Brocade 6510
Disk Space Used	26.9TB
Array Cache Size	1GB for storage server OS; no cache used for SUT datastores
Total Number of Physical Disks Used	2 x SAS-HDD(PRIMERGY TX2560 M2 and PRIMEQUEST 2800E3 OS), 3 x SAS-SSD(1 per PRIMERGY RX2540M2 OS), 3 x SAS-SSD(for Template), 17 x PCIe-SSD
Total Number of Enclosures/Pods/Shelves Used	5
Number of Physical Disks Used per Enclosure/Pod/Shelf	3 x Enclosure(PRIMERGY RX2540 M2): 1 x SAS-SSD and 4 x PCIe-SSD 1 x Enclosure(PRIMERGY TX2560 M2): 1 x SAS-HDD, 3 x SAS-SSD and 2 x PCIe-SSD 1 x Enclosure(PRIMEQUEST 2800E3): 1 x SAS-HDD and 3 x PCIe-SSD
Total Number of Storage Groups Used	0
Number of LUNs Used	63
LUN Size and Number of Disks Per LUN	Details in section Storage Notes
RAID Type	RAID 0 for OS drives and Template drives
Number of Members per RAID Set	1
Disk Vendors, Models, and Speeds	6 x Toshiba PX02SMF040 400GB SAS SSD 1 x Seagate ST9500620SS 500GB 7.2K SAS HDD 1 x HGST HUC156060CSS204 600GB 15K SAS HDD 3 x Fusion ioMemory PX600 1.3TB PCIe SSD 11 x Fusion ioMemory PX600 2.6TB PCIe SSD 3 x Intel P3700 800GB PCIe SSD
Datacenter Management Server	
System Model	Fujitsu Server PRIMERGY RX2530 M2
Processor Vendor and Model	Intel Xeon E5-2698 v4
Processor Speed (GHz)	2.2
Total Sockets/Total Cores/Total Threads	1 Sockets / 20 Cores / 40 Threads

Memory Size (in GB, Number of DIMMs)	Hypervisor: 64GB, 8
Network Controller(s) Vendors and Models	Emulex OneConnect Oce14000 1GbE Dual Port Adapter
Operating System, Version, Bitness, and Service Pack	Hypervisor: VMware ESXi 6.0.0 U2 Build 3620759
Virtual Center VM Number of vCPUs	8
Virtual Center VM Virtual Memory (in GB)	32
Virtual Center VM Operating System, Version, Bitness, and Service Pack	Microsoft Windows Server 2008 R2 Enterprise sp1 (64-bit)
Other Hardware	None
Other Software	Microsoft SQL Server 2012 Enterprise sp1 (64-bit)

Clients

Total Number of Virtual Clients / Virtual Client Hosts	16 / 6
System Model(s)	Fujitsu PRIMERGY RX2530 M2
Processor Vendor(s) and Model(s)	ClientHost1-3,6: Intel Xeon E5-2699 v4 ClientHost4-5: Intel Xeon E5-2699A v4
Processor Speed(s) (GHz)	ClientHost1-3,6: 2.2 ClientHost4-5: 2.4
Total Sockets/Total Cores/Total Threads	2 Sockets / 44 Cores / 88 Threads
Memory per Virtual Client Host	256 GB
Network Controller(s) Vendors and Models	Emulex OneConnect Oce14000 1GbE Dual Port Adapter Emulex OneConnect Oce14000 10GbE Dual Port Adapter
Virtual Client Networking Notes	1 virtual adapter for management, 2 virtual adapter for workload traffic
Virtual Client Storage Notes	1 x 300GB SAS 10K TOSHIBA AL14SEB03EN HDD with RAID 0 for Client Host OS 2 x 400GB SAS 12G TOSHIBA PX02SMF040 SSD with RAID 0 for Client VMs
Other Hardware	None
Other Software	VMware ESXi 6.5.0 U1 Build 5969303

Notes for Workload

Virtualization Software Notes

- CDROM removed for all VMs (default enabled)
- Config.HostAgent.log.level set to warning (default info)
- Vpx.Vpxa.config.log.level set to warning (default verbose)
- CPU and Memory shares set to high for all DS3DB VMs (default normal)
- Floppy removed for all VMs (default enabled)
- Logging disabled for all VMs (default enabled)
- Logical CPU configuration changed for multi-cpu VMs to 1 socket with multiple cores (default: Single core per socket)
- All memory reserved for DS3DB VMs (default non-reserved)
- Syslog.global.defaultSize set to 112 (default 1024)
- CPU shares set to low for all Standby VMs (default normal)
- vSphere DRS Migration Threshold set to Fully Automated level 2

Changes in esx.conf:

- /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/Mem/CtlMaxPercent = 0 (default 65)
- /adv/Mem/ShareScanGHz = 0 (default 4)
- /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/Disk/ReqCallThreshold = 1 (default 8)
- /adv/Disk/IdleCredit = 64 (default 32)
- /adv/Power/CpuPolicy = static (default balanced)
- /adv/VMFS3/HardwareAcceleratedLocking = 0 (default 1)
- /adv/Mem/VMOverheadGrowthLimit = 0 (default 4294967295)

Server Notes

- Server BIOS settings:
 - Onboard Serial COM1 disabled (default enabled)
 - Turbo Boost Technology: enabled (Intel Turbo Boost up to 3.8GHz, default enabled)
 - IMC Interleaving: 1-way (default auto)

Networking Notes

- vSwitch Configuration:
 - vSwitch0 for Service Console on vmnic0 at 10Gb/s
 - vSwitch1 for DS3 and standby workload on vmnic3 at 10Gb/s
 - vSwitch2 for Auction Workload on vmnic4 at 10Gb/s
 - vSwitch3 for Elastic Workload on vmnic5 at 10Gb/s
 - vSwitch4 for vMotion connection on vmnic2 at 10Gb/s
 - 9000 MTU (default 1500)

Storage Notes

- First Fujitsu Server PRIMERGY RX2540 M2 configured as a Fibre Channel Target:
 - Hardware details:
 - 2 x Intel Xeon E5-2667 v4@3.2GHz processors
 - 128GB RAM (8 x 16 GB dual rank PC4-19200 Registered DDR4 / 2400 MHz DIMMs)
 - 1 x QLogic QLE2672 Dual Port 16Gb FC HBA used as FC target controller
 - 1 x Fujitsu RAID SAS Controller with 1GB Cache (D3108)
 - 1 x 400GB SAS-SSD Toshiba PX02SMF040
 - 1 x Fusion ioMemory PX600 1.3TB PCIe SSD
 - 3 x Fusion ioMemory PX600 2.6TB PCIe SSD
 - Software details:
 - Operating System: SUSE Linux Enterprise Server 12 SP2 - 4.4.74-92.29-default (64-bit)
 - Fibre Channel Target SW: LIO (part of SUSE Linux Enterprise Server 12 SP2)

RAID configuration:

- SAS-SSD 1:
 - LUN 1: Storage system OS (400GB, this LUN is not counted in the Storage section)
- First PCIe-SSD:
 - LUN 1: DS3DB, DS3WebA, DS3WebB, DS3WebC for tiles 0 (600GB)
 - LUN 2: DS3DB, DS3WebA, DS3WebB, DS3WebC for tiles 11 (600GB)
 - LUN 3: AuctionNoSQL, ElasticDB for tiles 0 (400GB)
 - LUN 4: AuctionDB, ElasticLB for tiles 0 (400GB)
- Second PCIe-SSD:
 - LUN 1: AuctionDB, ElasticLB for tiles 14 (300GB)
 - LUN 2: AuctionWebA, AuctionWebB, AuctionAppA, AuctionAppB, AuctionLB, AuctionMSQ, Standby, ElasticWebA, ElasticWebB, ElasticAppA, ElasticAppB for tiles 5 (300GB)
 - LUN 3: AuctionWebA, AuctionWebB, AuctionAppA, AuctionAppB, AuctionLB, AuctionMSQ, Standby, ElasticWebA, ElasticWebB, ElasticAppA, ElasticAppB for tiles 11 (300GB)
 - LUN 4: Deploy Lun (100GB)
- Third PCIe-SSD:
 - LUN 1: DS3DB, DS3WebA, DS3WebB, DS3WebC for tiles 4, AuctionWebA, AuctionWebB, Standby for tiles 14 (600GB)
 - LUN 2: AuctionDB, ElasticLB for tiles 4 (600GB)
 - LUN 3: AuctionNoSQL, ElasticDB for tiles 4 (400GB)
 - LUN 4: AuctionNoSQL, ElasticDB for tiles 11 (400GB)
- Fourth PCIe-SSD:
 - LUN 1: DS3DB, DS3WebA, DS3WebB, DS3WebC for tiles 8, AuctionAppA, AuctionAppB for tiles 14 (600GB)
 - LUN 2: AuctionDB, ElasticLB for tiles 8 (600GB)
 - LUN 3: AuctionNoSQL, ElasticDB for tiles 8 (400GB)
 - LUN 4: AuctionDB, ElasticLB for tiles 11 (400GB)
- Second Fujitsu Server PRIMERGY RX2540 M2 configured as a Fibre Channel Target:
 - Hardware details:
 - 2 x Intel Xeon E5-2667 v4@3.2GHz processors
 - 128GB RAM (8 x 16 GB dual rank PC4-19200 Registered DDR4 / 2400 MHz DIMMs)
 - 1 x QLogic QLE2672 Dual Port 16Gb FC HBA used as FC target controller
 - 1 x Fujitsu RAID SAS Controller with 1GB Cache (D3108)

- 1 x 400GB SAS-SSD Toshiba PX02SMF040
- 1 x Fusion ioMemory PX600 1.3TB PCIe SSD
- 3 x Fusion ioMemory PX600 2.6TB PCIe SSD

- Software details:

- Operating System: SUSE Linux Enterprise Server 12 SP2 - 4.4.74-92.29-default (64-bit)
- Fibre Channel Target SW: LIO (part of SUSE Linux Enterprise Server 12 SP2)

RAID configuration:

- SAS-SSD 1:

- LUN 1: Storage system OS (400GB, this LUN is not counted in the Storage section)

- First PCIe-SSD:

- LUN 1: DS3DB, DS3WebA, DS3WebB, DS3WebC for tiles 1 (600GB)
- LUN 2: DS3DB, DS3WebA, DS3WebB, DS3WebC for tiles 12 (600GB)
- LUN 3: AuctionNoSQL, ElasticDB for tiles 1 (400GB)
- LUN 4: AuctionDB, ElasticLB for tiles 1 (400GB)

- Second PCIe-SSD:

- LUN 1: AuctionWebA, AuctionWebB, AuctionAppA, AuctionAppB, AuctionLB, AuctionMSQ, Standby, ElasticWebA, ElasticWebB, ElasticAppA, ElasticAppB for tiles 0 (300GB)
- LUN 2: AuctionWebA, AuctionWebB, AuctionAppA, AuctionAppB, AuctionLB, AuctionMSQ, Standby, ElasticWebA, ElasticWebB, ElasticAppA, ElasticAppB for tiles 6 (300GB)
- LUN 3: AuctionWebA, AuctionWebB, AuctionAppA, AuctionAppB, AuctionLB, AuctionMSQ, Standby, ElasticWebA, ElasticWebB, ElasticAppA, ElasticAppB for tiles 12 (300GB)
- LUN 4: SVMotion Target Lun (100GB)

- Third PCIe-SSD:

- LUN 1: DS3DB, DS3WebA, DS3WebB, DS3WebC for tiles 5, ElasticAppA, ElasticAppB for tiles 14 (600GB)
- LUN 2: AuctionDB, ElasticLB for tiles 5 (600GB)
- LUN 3: AuctionNoSQL, ElasticDB for tiles 5 (400GB)
- LUN 4: AuctionDB, ElasticLB for tiles 12 (400GB)

- Fourth PCIe-SSD:

- LUN 1: DS3DB, DS3WebA, DS3WebB, DS3WebC for tiles 9 (600GB)
- LUN 2: AuctionDB, ElasticLB for tiles 9 (600GB)
- LUN 3: AuctionNoSQL, ElasticDB for tiles 9 (400GB)
- LUN 4: AuctionNoSQL, ElasticDB for tiles 12 (400GB)

- Third Fujitsu Server PRIMERGY RX2540 M2 configured as a Fibre Channel Target:

- Hardware details:

- 2 x Intel Xeon E5-2667 v4@3.2GHz processors
- 128GB RAM (8 x 16 GB dual rank PC4-19200 Registered DDR4 / 2400 MHz DIMMs)
- 1 x QLogic QLE2672 Dual Port 16Gb FC HBA used as FC target controller
- 1 x Fujitsu RAID SAS Controller with 1GB Cache (D3108)
- 1 x 400GB SAS-SSD Toshiba PX02SMF040
- 1 x Fusion ioMemory PX600 1.3TB PCIe SSD
- 3 x Fusion ioMemory PX600 2.6TB PCIe SSD

- Software details:

- Operating System: SUSE Linux Enterprise Server 12 SP2 - 4.4.74-92.29-default (64-bit)
- Fibre Channel Target SW: LIO (part of SUSE Linux Enterprise Server 12 SP2)

RAID configuration:

- SAS-SSD 1:
 - LUN 1: Storage system OS (400GB, this LUN is not counted in the Storage section)
- First PCIe-SSD:
 - LUN 1: DS3DB, DS3WebA, DS3WebB, DS3WebC for tiles 2 (600GB)
 - LUN 2: DS3DB, DS3WebA, DS3WebB, DS3WebC for tiles 13 (600GB)
 - LUN 3: AuctionNoSQL, ElasticDB for tiles 2 (400GB)
 - LUN 4: AuctionDB, ElasticLB for tiles 2 (400GB)
- Second PCIe-SSD:
 - LUN 1: AuctionWebA, AuctionWebB, AuctionAppA, AuctionAppB, AuctionLB, AuctionMSQ, Standby, ElasticWebA, ElasticWebB, ElasticAppA, ElasticAppB for tiles 1 (300GB)
 - LUN 2: AuctionWebA, AuctionWebB, AuctionAppA, AuctionAppB, AuctionLB, AuctionMSQ, Standby, ElasticWebA, ElasticWebB, ElasticAppA, ElasticAppB for tiles 7 (300GB)
 - LUN 3: AuctionWebA, AuctionWebB, AuctionAppA, AuctionAppB, AuctionLB, AuctionMSQ, Standby, ElasticWebA, ElasticWebB, ElasticAppA, ElasticAppB for tiles 13 (300GB)
 - LUN 4: XVmotion Target Lun (100GB)
- Third PCIe-SSD:
 - LUN 1: DS3DB, DS3WebA, DS3WebB, DS3WebC for tiles 6, ElasticWebA, ElasticWebB for tiles 14 (600GB)
 - LUN 2: AuctionDB, ElasticLB for tiles 6 (600GB)
 - LUN 3: AuctionNoSQL, ElasticDB for tiles 6 (400GB)
 - LUN 4: AuctionNoSQL, ElasticDB for tiles 13 (400GB)
- Fourth PCIe-SSD:
 - LUN 1: DS3DB, DS3WebA, DS3WebB, DS3WebC for tiles 10 (600GB)
 - LUN 2: AuctionDB, ElasticLB for tiles 10 (600GB)
 - LUN 3: AuctionNoSQL, ElasticDB for tiles 10 (400GB)
 - LUN 4: AuctionDB, ElasticLB for tiles 13 (400GB)
- Fourth Fujitsu Server PRIMERGY TX2560 M2 configured as a Fibre Channel Target:
 - Hardware details:
 - 2 x Intel Xeon E5-2699A v4@2.4GHz processors
 - 256GB RAM (16 x 16 GB dual rank PC4-19200 Registered DDR4 / 2400 MHz DIMMs)
 - 1 x QLogic QLE2672 Dual Port 16Gb FC HBA used as FC target controller
 - 1 x Fujitsu RAID SAS Controller with 1GB Cache (D3108)
 - 1 x Seagate ST9500620SS 500GB 7.2K SAS HDD
 - 3 x 400GB SAS-SSD Toshiba PX02SMF040
 - 2 x Fusion ioMemory PX600 2.6TB PCIe SSD
 - Software details:
 - Operating System: SUSE Linux Enterprise Server 12 SP2 - 4.4.103-92.56-default (64-bit)
 - Fibre Channel Target SW: LIO (part of SUSE Linux Enterprise Server 12 SP2)

RAID configuration:

- SAS-HDD 1:
 - LUN 1: Storage system OS (400GB, this LUN is not counted in the Storage section)
- First PCIe-SSD:
 - LUN 1: DS3DB, DS3WebA, DS3WebB, DS3WebC for tiles 3 (600GB)

- LUN 2: DS3DB, DS3WebA, DS3WebB, DS3WebC for tiles 14 (600GB)
 - LUN 3: AuctionDB, ElasticLB for tiles 3 (400GB)
 - LUN 4: AuctionNoSQL, ElasticDB for tiles 3 (400GB)
- Second PCIe-SSD:
 - LUN 1: DS3DB, DS3WebA, DS3WebB, DS3WebC for tiles 7, AuctionMSQ, AuctionLB for tiles 14 (600GB)
 - LUN 2: AuctionDB, ElasticLB for tiles 7 (600GB)
 - LUN 3: AuctionNoSQL, ElasticDB for tiles 7 (400GB)
 - LUN 4: AuctionNoSQL, ElasticDB for tiles 14 (400GB)
- SAS-SSD 1~3(RAID 0):
 - LUN 1: vmmark3-template-053117 (100GB)
- Fifth Fujitsu Server PRIMEQUEST 2800E3 configured as a Fibre Channel Target:
 - Hardware details:
 - 2 x Intel Xeon E7-8890 v4@2.2GHz processors
 - 128GB RAM (4 x 32 GB dual rank PC4-19200 Registered DDR4 / 2400 MHz DIMMs)
 - 1 x QLogic QLE2672 Dual Port 16Gb FC HBA used as FC target controller
 - 1 x Fujitsu RAID SAS Controller with 1GB Cache (D3108)
 - 1 x HGST HUC156060CSS204 600GB 15K SAS HDD
 - 3 x Intel P3700 800GB PCIe SSD
 - Software details:
 - Operating System: SUSE Linux Enterprise Server 12 SP2 - 4.4.103-92.56-default (64-bit)
 - Fibre Channel Target SW: LIO (part of SUSE Linux Enterprise Server 12 SP2)

RAID configuration:

- SAS-HDD 1:
 - LUN 1: Storage system OS (500GB, this LUN is not counted in the Storage section)
- First PCIe-SSD:
 - LUN 1: AuctionWebA, AuctionWebB, AuctionAppA, AuctionAppB, AuctionLB, AuctionMSQ, Standby, ElasticWebA, ElasticWebB, ElasticAppA, ElasticAppB for tiles 2 (300GB)
 - LUN 2: AuctionWebA, AuctionWebB, AuctionAppA, AuctionAppB, AuctionLB, AuctionMSQ, Standby, ElasticWebA, ElasticWebB, ElasticAppA, ElasticAppB for tiles 8 (300GB)
- Second PCIe-SSD:
 - LUN 1: AuctionWebA, AuctionWebB, AuctionAppA, AuctionAppB, AuctionLB, AuctionMSQ, Standby, ElasticWebA, ElasticWebB, ElasticAppA, ElasticAppB for tiles 3 (300GB)
 - LUN 2: AuctionWebA, AuctionWebB, AuctionAppA, AuctionAppB, AuctionLB, AuctionMSQ, Standby, ElasticWebA, ElasticWebB, ElasticAppA, ElasticAppB for tiles 9 (300GB)
- Third PCIe-SSD:
 - LUN 1: AuctionWebA, AuctionWebB, AuctionAppA, AuctionAppB, AuctionLB, AuctionMSQ, Standby, ElasticWebA, ElasticWebB, ElasticAppA, ElasticAppB for tiles 4 (300GB)
 - LUN 2: AuctionWebA, AuctionWebB, AuctionAppA, AuctionAppB, AuctionLB, AuctionMSQ, Standby, ElasticWebA, ElasticWebB, ElasticAppA, ElasticAppB for tiles 10 (300GB)
- All LUNs were configured as block devices; no system memory was used for caching

Datcenter Management Server Notes

- Virtual Center realized as a VM running on a dedicated Hypervisor system:
 - Number of vCPUs: 8 (One vSocket)
 - Size of vRAM: 32GB

- Operating System: Windows Server 2008 R2 Enterprise sp1 64-bit

Operating System Notes

VMware ESXi 6.5 U1g Build 7967591 was installed using 'Fujitsu Custom Image for VMware ESXi 6.5b' named VMware-ESXi-6.5.0-5146846-Fujitsu-v402-1.iso and updated with VMware patch named ESXi650-201803001.zip

Software Notes

None

Client Notes

Client Host1: Client0,Client4,Client8
Client Host2: Client1,Client5,Client9
Client Host3: Client2,Client6,PrimeClient
Client Host4: Client3,Client7,Client10
Client Host5: Client13,Client14
Client Host6: Client11,Client12

Changes in esx.conf:

- /adv/Power/CpuPolicy = "static" (default balanced)
- /adv/UserVars/SuppressShellWarning = 1 (default 0)

Changes in Client VM:

- vcpu = 20 (default 12)
- vmem = 32GB (default 20GB)

Other Notes

None

Meltdown/Spectre Mitigations

CVE-2017-5754 (aka "Meltdown")

- ESXi: mitigation present (ESXi 6.5.0 U1g Build 7967591)
- Guest OS: no mitigation present

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

- ESXi: mitigation present (ESXi 6.5.0 U1g Build 7967591)
- Guest OS: no mitigation present

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

- Server Firmware: mitigation present (BIOS version: V5.0.0.12 R1.7.0 for D3753-A1x)
 - ESXi: mitigation present (ESXi 6.5.0 U1g Build 7967591)
 - Guest OS: no mitigation present
-

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