

VMware® VMmark® V2.5.2 Results

Vendor and Hardware Platform: Fujitsu Server PRIMERGY RX2540 M1
 Virtualization Platform: VMware ESXi 5.5.0 U2 Build 2068190
 VMware vCenter Server : VMware vCenter Server 5.5.0 Build 1312298

**VMmark V2.5.2 Server and Storage PPKW Score =
20.8067 @ 22 Tiles**

Number of Hosts: 2

Uniform Hosts [yes/no]: yes

Total sockets/cores/threads in test: 4/72/144

Tested By: Fujitsu

Test Date: 09-11-2014

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	326.90	0.99	93.50	4687.82	1.01	144.22	3917.57	1.78	69.07	2787.55	1.84	76.15	1847.97	1.75	93.06	1.42
p1	325.05	0.98	94.00	4658.80	1.00	199.59	3860.43	1.76	70.93	2863.40	1.89	77.24	1773.05	1.68	110.36	1.41
p2	320.60	0.97	103.75	4567.88	0.98	261.36	3879.10	1.76	70.39	2859.68	1.88	77.48	1694.00	1.60	128.62	1.38
TILE_1	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	331.75	1.00	92.50	4681.62	1.01	145.40	3913.82	1.78	68.99	2873.88	1.89	76.39	1906.67	1.80	96.07	1.44
p1	322.40	0.98	94.00	4689.35	1.01	165.23	3871.12	1.76	70.61	2851.40	1.88	77.72	1843.42	1.74	102.41	1.42
p2	329.77	1.00	98.75	4664.18	1.00	181.34	3869.68	1.76	70.71	2746.30	1.81	78.84	1769.55	1.67	110.49	1.40
TILE_2	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.10	0.99	94.00	4688.20	1.01	148.60	3896.32	1.77	70.53	2753.00	1.81	78.68	1931.75	1.83	85.39	1.42
p1	325.12	0.98	94.50	4622.95	1.00	202.83	3797.38	1.73	74.72	2774.90	1.83	82.87	2065.22	1.95	88.75	1.43
p2	323.52	0.98	104.00	4593.98	0.99	269.23	3808.90	1.73	74.19	2690.88	1.77	82.83	1881.20	1.78	90.06	1.40
TILE_3	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.32	0.99	92.75	4683.50	1.01	144.00	3861.68	1.76	71.79	2838.30	1.87	79.16	2015.50	1.90	86.23	1.44
p1	325.05	0.98	94.00	4690.75	1.01	163.79	3855.07	1.75	72.43	2799.10	1.84	81.45	2076.95	1.96	87.53	1.45
p2	328.02	0.99	102.50	4653.95	1.00	180.18	3817.47	1.74	74.24	2689.18	1.77	82.87	1873.60	1.77	90.71	1.40
TILE_4	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	332.73	1.01	93.25	4683.43	1.01	144.74	3886.55	1.77	70.11	2993.43	1.97	75.57	2016.53	1.91	93.63	1.47
p1	330.77	1.00	97.00	4640.40	1.00	196.83	3876.03	1.76	70.87	2763.57	1.82	78.26	1733.80	1.64	114.76	1.39
p2	328.73	1.00	104.00	4603.38	0.99	254.83	3861.90	1.76	70.94	2793.72	1.84	76.44	1521.03	1.44	133.05	1.36
TILE_5	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	323.77	0.98	89.25	4692.98	1.01	146.05	3902.75	1.77	69.39	2903.18	1.91	75.22	1996.92	1.89	95.34	1.45

p1	326.50	0.99	94.00	4666.05	1.01	166.09	3901.47	1.77	69.65	2810.53	1.85	75.49	1767.17	1.67	101.97	1.40
p2	325.85	0.99	104.00	4659.73	1.00	187.98	3848.68	1.75	71.68	2872.43	1.89	77.36	1756.10	1.66	111.93	1.40
TILE_6	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	323.70	0.98	94.00	4703.20	1.01	137.79	3930.15	1.79	68.10	2931.38	1.93	73.44	2047.55	1.94	91.21	1.46
p1	323.48	0.98	100.00	4670.62	1.01	181.35	3893.20	1.77	69.34	2823.12	1.86	74.31	1677.45	1.59	112.77	1.39
p2	325.32	0.99	108.25	4614.07	0.99	232.32	3886.70	1.77	69.68	2917.38	1.92	74.12	1615.75	1.53	129.26	1.38
TILE_7	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	319.77	0.97	87.12	4683.90	1.01	149.91	3941.47	1.79	67.60	2843.70	1.87	73.21	1935.80	1.83	93.23	1.43
p1	328.05	0.99	96.25	4663.30	1.00	171.62	3894.55	1.77	69.14	2834.65	1.87	73.66	1777.30	1.68	100.95	1.41
p2	327.65	0.99	104.00	4641.55	1.00	194.03	3869.68	1.76	70.54	2890.62	1.90	75.79	1849.75	1.75	109.96	1.42
TILE_8	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.60	0.99	93.70	4686.45	1.01	145.69	3918.78	1.78	68.96	2783.55	1.83	76.65	1850.12	1.75	93.37	1.42
p1	326.52	0.99	97.92	4662.38	1.00	196.68	3852.72	1.75	71.34	2838.47	1.87	78.63	1762.78	1.67	111.36	1.40
p2	326.52	0.99	107.00	4583.90	0.99	262.21	3862.93	1.76	70.75	2851.53	1.88	77.82	1696.47	1.60	128.20	1.39
TILE_9	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.05	0.99	92.50	4703.43	1.01	143.63	3919.82	1.78	68.66	2786.55	1.84	76.20	1833.88	1.73	94.92	1.42
p1	327.68	0.99	94.00	4661.10	1.00	162.17	3860.65	1.76	71.32	2938.57	1.94	78.05	1906.05	1.80	103.87	1.44
p2	329.65	1.00	101.00	4660.62	1.00	180.78	3847.88	1.75	71.91	2729.85	1.80	79.72	1757.75	1.66	111.78	1.39
TILE_10	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	322.80	0.98	94.00	4694.07	1.01	145.56	3876.45	1.76	71.16	2760.25	1.82	78.37	1933.28	1.83	85.49	1.42
p1	328.55	0.99	99.25	4646.73	1.00	194.11	3815.03	1.73	74.03	2784.07	1.83	82.66	2066.30	1.95	88.80	1.44
p2	326.95	0.99	111.25	4592.10	0.99	246.10	3824.53	1.74	73.85	2685.82	1.77	82.89	1878.95	1.78	90.06	1.40
TILE_11	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	329.65	1.00	94.00	4693.95	1.01	147.08	3873.32	1.76	71.48	2840.93	1.87	78.98	2014.58	1.90	85.60	1.45
p1	332.68	1.01	94.00	4681.20	1.01	167.97	3834.57	1.74	73.33	2704.80	1.78	81.98	1986.72	1.88	88.22	1.43
p2	326.12	0.99	101.25	4650.15	1.00	186.80	3815.05	1.73	74.26	2770.10	1.82	83.56	1957.38	1.85	90.91	1.42
TILE_12	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	328.40	0.99	94.00	4702.90	1.01	140.52	3893.70	1.77	70.03	3006.15	1.98	74.95	2016.15	1.91	93.73	1.46
p1	323.62	0.98	101.75	4665.43	1.01	182.69	3867.55	1.76	71.03	2766.57	1.82	77.97	1732.58	1.64	115.01	1.39
p2	326.27	0.99	104.00	4623.70	1.00	232.83	3885.12	1.77	70.33	2801.15	1.84	75.95	1522.03	1.44	132.61	1.36
TILE_13	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	329.62	1.00	94.00	4672.12	1.01	144.20	3913.12	1.78	69.02	2905.03	1.91	75.23	1991.17	1.88	95.97	1.45
p1	325.65	0.99	94.00	4683.85	1.01	165.34	3896.75	1.77	70.12	2791.95	1.84	76.30	1752.30	1.66	103.49	1.40
p2	326.62	0.99	95.75	4693.27	1.01	184.49	3838.88	1.75	72.13	2865.30	1.89	77.56	1754.95	1.66	112.04	1.40
TILE_14	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM

Infrastructure_Operations_Scores:	vmotion	svmotion	deploy
Completed_Ops_PerHour	17.00	11.00	5.50
Avg_Seconds_To_Complete	31.63	22.57	307.19
Failures	0.00	0.00	0.00
Ratio	1.06	1.22	1.38
Number_Of_Threads	1	1	1

PTD_Summary:	
Number_of_PTD_Daemons	2
Number_of_PTD_Phases	3
PTD_Phase_Timing	2400secs
PtdTiming:	ptd0 ptd1
p0	0 0
p1	0 0
p2	0 0
PTD_Results:	
p0	Target Avg_Watts Avg_Volts Avg_Amps Avg_PF Samples UnCert%
ptd0	SERVER 994.81 230.34 4.37 0.99 2400.00 0.00
ptd1	EXT_STOR 212.24 230.74 0.95 0.97 2400.00 0.00
p1	Target Avg_Watts Avg_Volts Avg_Amps Avg_PF Samples UnCert%
ptd0	SERVER 996.67 230.48 4.38 0.99 2400.00 0.00
ptd1	EXT_STOR 211.91 230.89 0.94 0.97 2400.00 0.00
p2	Target Avg_Watts Avg_Volts Avg_Amps Avg_PF Samples UnCert%
ptd0	SERVER 997.71 230.36 4.39 0.99 2400.00 0.00
ptd1	EXT_STOR 211.89 230.77 0.95 0.97 2400.00 0.00

Summary	Run_Is_Compliant	Turbo_Setting:0
	Number_Of_Compliance_Issues(0)*	Median_Phase(p1)
Unreviewed_VMmark2_Avg_Watts	1208.58	
Unreviewed_VMmark2_Applications_Score	31.13	
Unreviewed_VMmark2_Infrastructure_Score	1.21	
Unreviewed_VMmark2_Score	25.15	
Unreviewed_VMmark2_PPKW	20.8067	

Configuration

PTD Configuration	
Number of Power Meters	2
Power Meter Vendors and Models	Hioki 3334
Power Meter PTD Target(s) (SERVER/EXT_STOR)	SERVER, EXT_STOR
Power Meter Connection Type(s) (Eth/GPIB/Serial/USB)	Serial
Power Meter Calibration Date(s) (MM-DD-YYYY)	07-17-2014
Power Meter Calibration Info (Calibrated By/Duration/Calibration certificate(s))	Atlas Copco / one year / W14072231, W14072229
Power Meter(s) Volt/Amp Range	300 / 10, 300 / 3
PTD Client Configuration	
Number of Power Meter Clients	1
System Model(s)	Prime Client, details in client configuration section
Processor Vendor(s) and Model(s)	Prime Client, details in client configuration section
Processor Speed(s) (GHz)	Prime Client, details in client configuration section
Total Sockets/Total Cores/Total Threads	Prime Client, details in client configuration section
Memory Per Power Meter Client	Prime Client, details in client configuration section
Network Controller(s) Vendors and Models	Prime Client, details in client configuration section
Operating System, Version, and Service Pack	Prime Client, details in client configuration section
Other Hardware	2x Delock Adapter USB 2.0 > 1 x Seriell
Other Software	none

Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 5.5.0 U2 Build 2068190 / 09-09-2014
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server 5.5.0 Build 1312298 / 09-22-2013
Supplemental Software	none
Servers	
Quantity	2
Server Manufacturer and Model	Fujitsu Server PRIMERGY RX2540 M1
Processor Vendor and Model	Intel Xeon E5-2699 v3
Processor Speed (GHz)	2.3

Total Sockets/Total Cores/Total Threads	2 Sockets / 36 Cores / 72 Threads
Primary Cache	32KB I + 32KB D on chip per core
Secondary Cache	256KB I+D on chip per core
Other Cache	45MB I+D on chip per chip L3
BIOS Version	V5.0.0.9 R1.3.0
Memory Size (in GB, Number of DIMMs)	384, 12
Memory Type and Speed	32GB DIMMs 4Rx4 PC4-2133P-L ECC
Disk Subsystem Type	FC SAN
Number of Disk Controllers	0
Disk Controller Vendors and Models	none
Number of Host Bus Adapters	1
Host Bus Adapter Vendors and Models	Dual port Emulex LPe12002
Number of Network Controllers	2
Network Controller Vendors and Models	Emulex OneConnect OCe14000 Dual Port Adapter with 1Gb D3245 Mezzanine Fujitsu D2755 Dual Port 10GbE Adapter
Other Hardware	none
Other Software	none
Hardware Availability Date (MM-DD-YYYY)	12-06-2014
Software Availability Date (MM-DD-YYYY)	09-09-2014
Network	
Network Switch Vendors and Models	Fujitsu PRIMERGY BX600 GbE Switch Blade 30/12, Cisco Catalyst 4900M
Network Speed	1Gbps for SUT management, Clients and VMotion, 10Gbps for all VMs
Storage	
Array Vendors, Models, and Firmware Versions	Fujitsu Server PRIMERGY RX300 S8, Firmware V4.6.5.4 R1.1.0
Fibre Channel Switch Vendors and Models	none
Disk Space Used	6292GB
Array Cache Size	1GB

Total Number of Physical Disks Used	12xSAS-SSDs, 2xPCIe-SSD
Total Number of Enclosures/Pods/Shelves Used	1
Number of Physical Disks Used per Enclosure/Pod/Shelf	Details in section Storage Notes
Total Number of Storage Groups Used	0
Number of LUNs Used	31
LUN Size and Number of Disks Per LUN	Details in section Storage Notes
RAID Type	0
Number of Members per RAID Set	Details in section Storage Notes
Disk Vendors, Models, and Speeds	12xSSD Toshiba PX02SMF040; 2xFusion-io ioDrive2 1.2TB PCIe SSD

Datacenter Management Server

System Model	Fujitsu Server PRIMERGY BX620 S5
Processor Vendor and Model	Intel Xeon X5570
Processor Speed (GHz)	2.93
Total Sockets/Total Cores/Total Threads	2 Sockets / 8 Cores / 16 Threads
Memory	Hypervisor: 24GB Virtual Center VM: 10GB
Network Controller(s) Vendors and Models	3 Intel Dual port 82575EB
Operating System, Version, Bitness, and Service Pack	Hypervisor: VMware ESXi 5.1.0 Build 799733 Virtual Center VM: 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	23 / 1 / 2
System Model(s)	1xFujitsu Server PRIMERGY BX620 S5 (Prime Client) 2xFujitsu Server PRIMERGY RX600 S6 (Virtual Client Hosts)
Processor Vendor(s) and Model(s)	Prime Client: Intel Xeon Intel Xeon X5570 Virtual Client Hosts: Intel Xeon E7-4870

Processor Speed(s) (GHz)	Prime Client: 2.93 Virtual Client Hosts: 2.4
Total Sockets/Total Cores/Total Threads	Prime Client: 2 Sockets / 8 Cores / 16 Threads Virtual Client Hosts: 4 Sockets / 40 Cores / 80 Threads
Memory per Physical Client	Prime Client: 12GB Virtual Client Hosts: 512GB
Network Controller(s) Vendors and Models	Prime Client: Three Intel Dual Port 82575EB Virtual Client Hosts: Intel Quad Port 82571EB, two Intel Dual Port 82576NS
Operating System, Version, Bitness, and Service Pack	Clients: Windows Server 2008 Enterprise 64-bit SP2 Virtual Client Hosts: VMware ESX 4.1 U2 Build 502767
Number of Virtual Clients	22
Number of vCPUs Per Virtual Client	4
Number of vMem (GB) Per Virtual Client	4
Virtual Client Networking Notes	All virtual clients were distributed evenly over 6 vSwitches per Virtual Client Host
Virtual Client Storage Notes	none
Other Hardware	One Dual Port Emulex LPe12002 for each virtual client host, one shared Fujitsu ETERNUS DX80 with 24x300GB disks
Other Software	none

Notes for Workload

Virtualization Software Notes

- All Guest Memory reserved (Locked into physical memory)
- Floppy and CDROM removed for all VMs (default enabled)
- Hardware version 8 used for all VMs
- Logging disabled for all VMs (default enabled)
- Logical CPU configuration changed for all Linux VMs to one socket with multiple cores (default: multiple sockets with one core per socket)
- Mailserver CPU shares set to high (default normal)
- sched.mem.maxmemctl = 0 set for all VMs (disables Ballooning, default enabled)
- 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)
- VMware Tools build 9354 used for all VMs (default 9354)
- VMXNET3 enabled for all VMs (default VMXNET2)
- 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 200)

- /adv/DataMover/HardwareAcceleratedInit = 0 (default 1)
- /adv/DataMover/HardwareAcceleratedMove = 0 (default 1)
- /adv/Mem/BalancePeriod = 0 (default 15)
- /adv/Mem/CtlMaxPercent = 0 (default 65)
- /adv/Mem/SamplePeriod = 0 (default 60)
- /adv/Mem/ShareScanGHz = 0 (default 4)
- /adv/Net/MaxNetifRxQueueLen = 500 (default 100)
- /adv/Net/MaxNetifTxQueueLen = 1000 (default 500)
- /adv/Numa/LTermFairnessInterval = 0 (default 5)
- /adv/Numa/MigImbalanceThreshold = 57 (default 10)
- /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)
- /adv/Power/CpuPolicy = static (default balanced)
- /adv/VMFS3/HardwareAcceleratedLocking = 0 (default 1)

Server Notes

- Server BIOS settings:
 - Energy Performance: Performance (default Energy Efficient)
 - Onboard SAS/SATA controller disabled (default enabled)
 - Onboard Serial COM1 disabled (default enabled)
 - Turbo Boost Technology: Enabled (Intel Turbo Boost up to 3.6GHz, default enabled)

Networking Notes

- One dedicated VLAN for the systems under test, vCenter Server and Benchmark Controller (SUT-VLAN)
- One dedicated VLAN for the VMs and Clients (Load-VLAN)
- vSwitch Configuration:
 - vSwitch0 on vmnic0 for Service Console (1Gb)
 - vSwitch1 on vmnic1 for VMotion (1Gb)
 - vSwitch2 on vmnic2 (10Gb) All DS2 and Standby VMs
 - vSwitch3 on vmnic3 (10Gb) All Mailserver and Olio VMs

Storage Notes

- Fujitsu Server PRIMERGY RX300 S8 configured as a Fibre Channel Target:
 - Hardware details:
 - Two Intel Xeon E5-2667@3.3GHz processors
 - 128GB RAM (8x16 GB dual rank PC3-12800 Registered DDR3 / 1600 MHz DIMMs)
 - Two QLogic QLE2562 8Gb FC HBA used as FC target controllers
 - One Fujitsu RAID SAS 6G Controller with 1GB Cache and BBU (D3116)
 - 12x400GB SAS-SSDs Toshiba PX02SMF040
 - 2xFusion-io ioDrive2 1.2TB PCIe-SSD

- Software details:
 - Operating System: SUSE Linux Enterprise Server 11 SP3 - 3.0.101-0.8 (64-bit)
 - Fibre Channel Target SW: LIO (part of SUSE Linux Enterprise Server 11 SP3)

RAID configuration:

- SAS-SSD 1:
 - LUN 1: Storage system OS (12GB, this LUN is not counted in the Storage section)
 - LUN 2: Target LUN for Storage VMotion (10GB)
 - LUN 3: Source LUN for Deploy (10GB)
 - LUN 4: Target LUN for Deploy (10GB)
 - LUN 5: Boot/Console OS for SUT1 (11GB)
 - LUN 6: Boot/Console OS for SUT2 (11GB)

- SAS-SSD 2:
 - LUN 1: For Tile 0 Olio/Standby VMs and Mailserver VHDs (186GB)
 - LUN 2: For Tile 2 Olio/Standby VMs and Mailserver VHDs (186GB)

- SAS-SSD 3:
 - LUN 1: For Tile 1 Olio/Standby VMs and Mailserver VHDs (186GB)
 - LUN 2: For Tile 3 Olio/Standby VMs and Mailserver VHDs (186GB)

- SAS-SSD 4:
 - LUN 1: For Tile 4 Olio/Standby VMs and Mailserver VHDs (186GB)
 - LUN 2: For Tile 6 Olio/Standby VMs and Mailserver VHDs (186GB)

- SAS-SSD 5:
 - LUN 1: For Tile 5 Olio/Standby VMs and Mailserver VHDs (186GB)
 - LUN 2: For Tile 7 Olio/Standby VMs and Mailserver VHDs (186GB)

- SAS-SSD 6:
 - LUN 1: For Tile 8 Olio/Standby VMs and Mailserver VHDs (186GB)
 - LUN 2: For Tile 10 Olio/Standby VMs and Mailserver VHDs (186GB)

- SAS-SSD 7:
 - LUN 1: For Tile 9 Olio/Standby VMs and Mailserver VHDs (186GB)
 - LUN 2: For Tile 11 Olio/Standby VMs and Mailserver VHDs (186GB)

- SAS-SSD 8:
 - LUN 1: For Tile 12 Olio/Standby VMs and Mailserver VHDs (186GB)
 - LUN 2: For Tile 14 Olio/Standby VMs and Mailserver VHDs (186GB)

- SAS-SSD 9:
 - LUN 1: For Tile 13 Olio/Standby VMs and Mailserver VHDs (186GB)
 - LUN 2: For Tile 15 Olio/Standby VMs and Mailserver VHDs (186GB)

- SAS-SSD 10:

- LUN 1: For Tile 16 Olio/Standby VMs and Mailserver VHDs (186GB)
 - LUN 2: For Tile 18 Olio/Standby VMs and Mailserver VHDs (186GB)
- SAS-SSD 11:
 - LUN 1: For Tile 17 Olio/Standby VMs and Mailserver VHDs (186GB)
 - LUN 2: For Tile 19 Olio/Standby VMs and Mailserver VHDs (186GB)
- SAS-SSD 12:
 - LUN 1: For Tile 20 Olio/Standby VMs and Mailserver VHDs (186GB)
 - LUN 2: For Tile 21 Olio/Standby VMs and Mailserver VHDs (186GB)
- First PCIe-SSD:
 - LUN 1: Mailserver configuration files and DS2DB VMs for tiles 0, 4, 8, 12, 16, 20 (537GB)
 - LUN 2: Mailserver configuration files and DS2DB VMs for tiles 2, 6, 10, 14, 18 (537GB)
- Second PCIe-SSD:
 - LUN 1: Mailserver configuration files and DS2DB VMs for tiles 1, 5, 9, 13, 17, 21 (537GB)
 - LUN 2: Mailserver configuration files and DS2DB VMs for tiles 3, 7, 11, 15, 19 (537GB)
- All LUNs were configured as block devices; no system memory was used for caching

Datacenter Management Server Notes

- Virtual Center VM configured with four vCPUs and 10GB vMEM

Operating System Notes

- Mailserver VMs: Microsoft Windows 2008 R2 Enterprise 64-bit.
- Linux VMs:
 - All SLES11 VMs were updated with SP2
 - VMXNET3 driver configured to use one receive and one request queue (default: number of queues matches the number of vCPUs)
 - Paravirtualized drivers (VMXNET3, PVSCSI, VMMEMCTL) compiled with gcc 4.3.4
- The file systems of all Linux and Standby VMs were aligned to a 4KB boundary

Software Notes

- Mailserver VMs: Microsoft Exchange 2007 Enterprise x64 Edition updated with SP3.

Client Notes

- Prime Client was running VMware vSphere PowerCLI 5.1 Release 1 Build 793510.
- Prime Client was updated via Windows Update.
- Virtual Client Hosts:
 - System 1: Even numbered clients

- System 2: Odd numbered clients

Other Notes

- One client used as a dedicated Benchmark Controller.
- TILEDELAY reduced to 40 seconds (default: 60 seconds)

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) 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.