

## VMware® VMmark® V2.5.2 Results

Vendor and Hardware Platform: Fujitsu Server PRIMERGY RX2540 M1  
 Virtualization Platform: VMware ESXi 6.0.0b Build 2809209  
 VMware vCenter Server : VMware vCenter Server 6.0.0 Build 2559268

**VMmark V2.5.2 Score =  
27.66 @ 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: 08-05-2015
Performance Section <a href="#">Performance</a>	Configuration Section <a href="#">Configuration</a>	Notes Section <a href="#">Notes for Workload</a>

### Performance

	mailserver			olio			dvdstoreA			dvdstoreB			dvdstoreC			
TILE_0	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	326.93	0.99	77.65	4718.45	1.02	126.17	4217.05	1.92	57.55	3187.30	2.10	60.94	2388.62	2.26	65.40	1.56
<b>p1</b>	329.90	1.00	90.25	4693.12	1.01	144.40	4281.95	1.95	55.32	3215.32	2.12	59.45	2303.28	2.18	64.25	1.55
<b>p2</b>	330.00	1.00	95.50	4705.07	1.01	141.74	4113.43	1.87	61.46	3011.72	1.98	64.65	2182.25	2.06	65.70	1.51
TILE_1	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	327.98	0.99	78.25	4724.30	1.02	121.23	4210.38	1.91	58.03	3178.05	2.09	61.43	2385.80	2.25	65.52	1.56
<b>p1</b>	327.27	0.99	97.75	4700.10	1.01	150.01	4323.27	1.97	54.13	3148.45	2.07	57.96	2211.10	2.09	63.75	1.54
<b>p2</b>	324.23	0.98	105.00	4687.65	1.01	150.87	4132.38	1.88	60.47	3126.43	2.06	63.92	2277.07	2.15	65.98	1.53
TILE_2	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	324.70	0.98	74.00	4725.25	1.02	125.70	4376.55	1.99	52.05	3254.55	2.14	53.13	2336.18	2.21	62.27	1.57
<b>p1</b>	328.52	0.99	82.50	4690.25	1.01	152.58	4293.12	1.95	54.80	3303.78	2.18	55.65	2337.75	2.21	62.01	1.57
<b>p2</b>	326.07	0.99	84.00	4695.20	1.01	151.90	4170.23	1.90	58.86	3199.40	2.11	60.26	2334.35	2.21	62.15	1.55
TILE_3	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	332.70	1.01	82.75	4717.18	1.02	131.09	4322.70	1.97	53.92	3214.35	2.12	54.86	2350.90	2.22	61.76	1.57
<b>p1</b>	332.35	1.01	89.75	4604.38	0.99	241.12	4413.07	2.01	50.95	3264.03	2.15	52.93	2256.90	2.13	60.82	1.56
<b>p2</b>	325.85	0.99	94.00	4666.20	1.01	183.62	4263.52	1.94	55.62	3267.97	2.15	57.32	2465.12	2.33	60.71	1.57
TILE_4	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	326.18	0.99	80.00	4712.20	1.02	118.15	4230.88	1.92	56.81	3145.75	2.07	57.81	2202.05	2.08	64.06	1.53
<b>p1</b>	326.98	0.99	93.75	4714.93	1.02	136.12	4264.60	1.94	55.75	3276.80	2.16	56.81	2317.88	2.19	63.07	1.56
<b>p2</b>	326.52	0.99	98.00	4705.02	1.01	133.48	4082.28	1.86	61.80	3148.00	2.07	62.19	2399.70	2.27	64.40	1.54
TILE_5	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	325.25	0.98	77.25	4716.62	1.02	114.65	4228.77	1.92	56.73	3150.22	2.07	57.33	2320.65	2.19	63.40	1.54

<b>p1</b>	325.95	0.99	91.25	4696.52	1.01	136.65	4304.05	1.96	54.37	3325.68	2.19	54.35	2349.55	2.22	61.47	1.57
<b>p2</b>	327.55	0.99	104.00	4705.15	1.01	137.72	4132.80	1.88	60.20	3087.93	2.03	60.69	2322.60	2.20	63.51	1.53
<b>TILE_6</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	325.88	0.99	79.25	4704.95	1.01	140.67	4382.90	1.99	51.95	3226.38	2.12	54.12	2338.88	2.21	55.67	1.56
<b>p1</b>	329.12	1.00	89.25	4669.27	1.01	183.42	4281.80	1.95	55.05	3394.78	2.24	55.97	2512.43	2.37	58.10	1.60
<b>p2</b>	327.62	0.99	92.75	4645.10	1.00	180.80	4187.82	1.90	58.57	3087.05	2.03	60.63	2358.35	2.23	61.12	1.54
<b>TILE_7</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	324.65	0.98	77.25	4728.65	1.02	119.14	4321.12	1.96	54.23	3301.25	2.17	55.62	2409.90	2.28	57.75	1.58
<b>p1</b>	328.38	0.99	87.50	4652.75	1.00	213.75	4403.40	2.00	51.49	3366.90	2.22	52.86	2570.45	2.43	54.82	1.61
<b>p2</b>	323.20	0.98	88.00	4665.05	1.01	175.61	4277.82	1.95	55.56	3157.20	2.08	57.20	2273.88	2.15	60.01	1.54
<b>TILE_8</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	326.02	0.99	75.75	4730.85	1.02	119.80	4211.93	1.92	57.42	3185.22	2.10	60.43	2298.07	2.17	64.49	1.54
<b>p1</b>	326.12	0.99	89.00	4707.35	1.01	140.44	4257.15	1.94	56.00	3116.95	2.05	58.88	2329.03	2.20	62.62	1.54
<b>p2</b>	326.52	0.99	97.75	4712.50	1.02	135.28	4097.82	1.86	61.53	3067.30	2.02	64.20	2302.88	2.18	64.28	1.52
<b>TILE_9</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	326.50	0.99	75.50	4696.75	1.01	125.40	4192.05	1.91	58.14	3289.82	2.17	60.93	2392.30	2.26	65.24	1.56
<b>p1</b>	326.82	0.99	98.50	4706.32	1.01	149.50	4325.45	1.97	53.76	3162.32	2.08	56.56	2340.28	2.21	62.05	1.55
<b>p2</b>	327.10	0.99	113.50	4701.80	1.01	145.65	4136.65	1.88	59.93	3020.47	1.99	63.76	2210.40	2.09	63.72	1.51
<b>TILE_10</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	326.80	0.99	75.58	4715.45	1.02	123.43	4362.30	1.98	52.40	3345.03	2.20	53.77	2425.20	2.29	63.23	1.59
<b>p1</b>	323.82	0.98	83.65	4679.52	1.01	166.87	4305.12	1.96	54.41	3169.43	2.09	56.82	2226.90	2.10	62.73	1.53
<b>p2</b>	327.52	0.99	89.75	4677.88	1.01	163.15	4175.38	1.90	58.44	3189.38	2.10	60.44	2337.88	2.21	62.36	1.55
<b>TILE_11</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	328.65	1.00	76.25	4727.65	1.02	111.62	4329.68	1.97	53.57	3317.68	2.18	55.09	2433.75	2.30	62.56	1.59
<b>p1</b>	329.93	1.00	84.00	4658.55	1.00	163.80	4394.77	2.00	51.31	3256.20	2.14	52.71	2232.25	2.11	62.55	1.55
<b>p2</b>	325.95	0.99	84.00	4698.30	1.01	150.12	4263.23	1.94	55.63	3253.50	2.14	57.66	2339.05	2.21	62.23	1.56
<b>TILE_12</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	323.38	0.98	83.75	4708.10	1.01	120.18	4196.80	1.91	58.02	3103.85	2.04	60.28	2295.18	2.17	64.96	1.53
<b>p1</b>	322.95	0.98	84.00	4699.52	1.01	134.01	4280.80	1.95	55.29	3155.68	2.08	57.76	2218.57	2.10	63.42	1.53
<b>p2</b>	326.23	0.99	84.90	4699.02	1.01	133.31	4082.95	1.86	62.20	3230.28	2.13	63.34	2402.68	2.27	64.38	1.55
<b>TILE_13</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	323.45	0.98	84.00	4716.85	1.02	119.40	4221.35	1.92	57.36	3211.68	2.11	59.83	2294.57	2.17	65.25	1.54
<b>p1</b>	326.40	0.99	94.00	4688.88	1.01	134.63	4318.98	1.96	54.01	3188.22	2.10	55.93	2236.32	2.11	62.14	1.54
<b>p2</b>	325.32	0.99	104.00	4693.70	1.01	137.02	4131.30	1.88	60.10	3148.15	2.07	62.52	2412.88	2.28	64.10	1.55
<b>TILE_14</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM



<b>Infrastructure_Operations_Scores:</b>	vmotion	svmotion	deploy
<b>Completed_Ops_PerHour</b>	17.50	11.00	5.50
<b>Avg_Seconds_To_Complete</b>	25.24	19.20	328.01
<b>Failures</b>	0.00	0.00	0.00
<b>Ratio</b>	1.09	1.22	1.38
<b>Number_Of_Threads</b>	1	1	1
<b>Summary</b>	Run_Is_Compliant		Turbo_Setting:0
	Number_Of_Compliance_Issues(0)*		Median_Phase(p0)
<b>Unreviewed_VMmark2_Applications_Score</b>	34.27		
<b>Unreviewed_VMmark2_Infrastructure_Score</b>	1.22		
<b>Unreviewed_VMmark2_Score</b>	27.66		

## Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 6.0.0b Build 2809209 / 07-07-2015
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server 6.0.0 Build 2559268 / 03-12-2015
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 R1.24.0 for D3289-A1x

Memory Size (in GB, Number of DIMMs)	512, 16
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	
Number of Host Bus Adapters	1
Host Bus Adapter Vendors and Models	Dual port Emulex LPe16002
Number of Network Controllers	2
Network Controller Vendors and Models	One Intel I350-T2 Dual Port 1GbE Adapter One Emulex OneConnect OCe14000 Dual Port Adapter with 10Gb SFP+ DynamicLoM interface module
Other Hardware	none
Other Software	none
Hardware Availability Date (MM-DD-YYYY)	12-06-2014
Software Availability Date (MM-DD-YYYY)	07-07-2015
<b>Network</b>	
Network Switch Vendors and Models	Fujitsu PRIMERGY BX600 GbE Switch Blade 30/12, Brocade VDX 6740
Network Speed	1Gbps for SUT management and VMotion, 10Gbps for Clients and VMs
<b>Storage</b>	
Array Vendors, Models, and Firmware Versions	One Fujitsu Server PRIMERGY RX300 S8, Firmware V4.6.5.4 R1.1.0
Fibre Channel Switch Vendors and Models	Brocade 6510
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	Hypervisor: 2 Sockets / 8 Cores / 16 Threads Virtual Center VM: Details in section Datacenter Management Server Notes
Memory	Hypervisor: 24GB Virtual Center VM: Details in section Datacenter Management Server Notes
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: Details in section Datacenter Management Server Notes
Other Hardware	none
Other Software	none

**Clients**

Total Number of Clients / Total Physical Clients / Total Virtual Client Hosts	23 / 1 / 4
System Model(s)	1xFujitsu Server PRIMERGY BX620 S5 (Prime Client) 3xFujitsu Server PRIMERGY RX600 S6 (Virtual Client Hosts) 1xFujitsu Server PRIMERGY RX500 S7 (Virtual Client Host)
Processor Vendor(s) and Model(s)	Prime Client: Intel Xeon Intel Xeon X5570 Virtual Client Hosts: PRIMERGY RX600 S6: Intel Xeon E7-4870 PRIMERGY RX500 S7: Intel Xeon E5-4650
Processor Speed(s) (GHz)	Prime Client: 2.93 Virtual Client Hosts: PRIMERGY RX600 S6: 2.4 PRIMERGY RX500 S7: 2.7
Total Sockets/Total Cores/Total Threads	Prime Client: 2 Sockets / 8 Cores / 16 Threads Virtual Client Hosts: PRIMERGY RX600 S6: 4 Sockets / 40 Cores / 80 Threads

	PRIMERGY RX500 S7: 4 Sockets / 32 Cores / 64 Threads
Memory per Physical Client	Prime Client: 12GB Virtual Client Hosts: PRIMERGY RX600 S6: 512GB PRIMERGY RX500 S7: 256GB
Network Controller(s) Vendors and Models	Prime Client: Three Intel Dual Port 82575EB Virtual Client Hosts: PRIMERGY RX600 S6: Two Intel Dual Port 82576NS, Intel Dual Port 82599 PRIMERGY RX500 S7: Intel Dual Port I350, Intel Dual Port 82599
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 2 vSwitches per Virtual Client Host
Virtual Client Storage Notes	none
Other Hardware	One Dual Port Emulex LPe12002 for each virtual client host, three shared Fujitsu ETERNUS DX80 with 24x300GB disks, one Brocade 5100 Fibre Channel Switch
Other Software	none

## Notes for Workload

### Virtualization Software Notes

- CDROM removed for all VMs except Deploy Template (default enabled)
- Config.HostAgent.log.level set to warning (default info)
- CPU shares set to high for all DS2DB VMs (default normal)
- Floppy 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)
- sched.mem.maxmemctl = 0 set for all VMs (default defined through global parameter Mem.CtlMaxPercent)
- sched.mem.min and sched.mem.minsize set to the configured VM memory size (default 0)
- sched.mem.minsize set to the configured Deploy Template memory size (default 0)
- sched.mem.pin = TRUE set for all VMs (default FALSE)
- 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)
- Syslog.global.defaultSize set to 112 (default 1024)
- VMware Tools build 9537 used for all VMs (default 9537)
- VMXNET3 enabled for all VMs (default VMXNET2)
- Vpx.Vpxa.config.log.level set to warning (default verbose)

- vSphere DRS Migration Threshold set to Fully Automated level 2

Changes in esx.conf:

- /adv/Cpu/HTWholeCoreThreshold = 0 (default 200)
- /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/Net/MaxNetifRxQueueLen = 1000 (default 100)
- /adv/Net/MaxNetifTxQueueLen = 2000 (default 500)
- /adv/Net/MaxPortRxQueueLen = 160 (default 80)
- /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)

## Server Notes

- Server BIOS settings:
  - COD Enable: Enable (default Auto)
  - 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 vmnic2 for Service Console (1Gb)
  - vSwitch1 on vmnic3 for VMotion (1Gb)
  - vSwitch2 on vmnic0 (10Gb) All VMs except Olio VMs
  - vSwitch3 on vmnic1 (10Gb) 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)
    - One QLogic QLE2562 8Gb FC HBA used as FC target controller



- 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 - 3.0.101-0.46 (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 DS2 VMs for tiles 0, 4, 8, 12, 16, 20 (537GB)
  - LUN 2: Mailserver configuration files and DS2 VMs for tiles 2, 6, 10, 14, 18 (537GB)
- Second PCIe-SSD:
  - LUN 1: Mailserver configuration files and DS2 VMs for tiles 1, 5, 9, 13, 17, 21 (537GB)
  - LUN 2: Mailserver configuration files and DS2 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 realized as a VM running on a dedicated Hypervisor system:
  - Number of vCPUs: 4 (one vCPU per vSocket)
  - Size of vRAM: 10GB
  - Operating System: Windows Server 2008 R2 Enterprise 64-bit

## **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 (PRIMERGY RX600 S6): Clients 0, 4, 8, 12, 16, 20
  - System 2 (PRIMERGY RX600 S6): Clients 1, 5, 9, 13, 17, 21
  - System 3 (PRIMERGY RX600 S6): Clients 2, 6, 10, 14, 18
  - System 4 (PRIMERGY RX500 S7): Clients 3, 7, 11, 15, 19

## Other Notes

- One client used as a dedicated Benchmark Controller.
- TILEDELAY reduced to 33 seconds (default: 60 seconds)

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