VMware® VMmark® V2.5.2 Results

Vendor and Hardware Platform: Fujitsu PRIMEQUEST 2800E (partitioned as 2-way) Virtualization Platform: VMware ESXi 5.5.0 Build 1331820 VMware vCenter Server : VMware vCenter Server 5.5.0 Build 1312298	VMmark V2.5.2 Score = 19.56 @ 16 Tiles

Number of Hosts: 2	Uniform Hosts [yes/no]: yes	Total sockets/cores/threads in test: 4/60/120

Tested By: Fujitsu	Test Date: 03-11-2014

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	325.73	0.99	123.00	4702.32	1.01	139.18	4116.80	1.87	61.53	3047.57	2.01	67.58	2214.55	2.09	70.51	1.51
p1	326.60	0.99	156.00	4706.25	1.01	158.31	4098.45	1.86	62.01	2926.45	1.93	68.63	2210.68	2.09	71.00	1.50
p2	323.10	0.98	177.00	4675.25	1.01	159.79	4047.90	1.84	63.86	2982.93	1.96	70.91	2167.32	2.05	74.08	1.49
TILE_1	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	324.65	0.98	114.75	4698.73	1.01	140.42	4118.05	1.87	61.46	3048.82	2.01	67.09	2317.57	2.19	70.08	1.52
p1	322.50	0.98	137.47	4687.65	1.01	154.02	4159.38	1.89	59.95	3069.35	2.02	66.51	2233.60	2.11	69.40	1.51
p2	326.35	0.99	162.25	4666.85	1.01	172.75	4005.57	1.82	65.43	2866.95	1.89	72.08	2057.12	1.94	75.19	1.46
TILE_2	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.93	0.99	112.75	4698.15	1.01	143.19	4147.40	1.89	59.97	3106.25	2.05	64.62	2288.72	2.16	72.24	1.53
p1	323.65	0.98	145.75	4685.10	1.01	166.50	4138.57	1.88	60.38	2995.85	1.97	65.24	2058.12	1.95	75.29	1.48
p2	327.00	0.99	173.75	4653.60	1.00	174.58	4061.88	1.85	63.34	3053.05	2.01	67.58	2136.47	2.02	76.38	1.49
TILE_3	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.00	0.99	118.25	4705.23	1.01	138.04	4139.75	1.88	60.02	2992.82	1.97	65.29	2179.55	2.06	72.92	1.50
p1	326.88	0.99	138.75	4701.80	1.01	150.61	4159.88	1.89	59.50	3019.38	1.99	64.14	2076.38	1.96	73.83	1.49
p2	328.40	0.99	160.00	4688.02	1.01	171.46	4006.43	1.82	65.32	2990.57	1.97	70.62	2180.05	2.06	79.94	1.49
TILE_4	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	328.35	0.99	119.55	4689.70	1.01	137.57	4156.05	1.89	59.44	3011.40	1.98	63.94	2205.72	2.08	64.08	1.51
p1	328.68	1.00	156.60	4688.45	1.01	155.55	4108.15	1.87	61.00	3089.40	2.03	65.03	2295.30	2.17	65.06	1.53
p2	330.07	1.00	187.50	4687.20	1.01	168.02	4055.60	1.84	63.09	3041.50	2.00	67.86	2358.22	2.23	67.58	1.53
TILE_5	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	330.05	1.00	117.75	4702.68	1.01	135.51	4177.48	1.90	58.71	3040.53	2.00	62.80	2226.22	2.10	63.06	1.52

p1	327.30	0.99	134.00	4706.75	1.01	148.23	4165.05	1.89	59.20	3236.25	2.13	63.09	2436.03	2.30	62.82	1.56
p2	328.70	1.00	155.50	4688.35	1.01	164.51	4057.47	1.84	63.24	2942.05	1.94	68.19	2253.57	2.13	68.22	1.50
TILE_6	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.90	0.99	120.20	4700.05	1.01	137.18	4095.95	1.86	62.00	3038.53	2.00	67.92	2204.90	2.08	71.38	1.51
p1	328.00	0.99	152.25	4702.23	1.01	151.07	4081.32	1.86	62.78	3007.80	1.98	69.33	2286.85	2.16	72.14	1.52
p2	326.90	0.99	180.00	4680.38	1.01	160.40	4039.97	1.84	64.53	2862.75	1.89	72.04	2051.20	1.94	75.77	1.46
TILE_7	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	322.75	0.98	117.58	4690.52	1.01	137.30	4096.95	1.86	62.03	3135.22	2.06	67.69	2306.95	2.18	70.90	1.53
p1	325.57	0.99	140.75	4678.18	1.01	152.67	4138.50	1.88	60.92	2944.75	1.94	67.60	2216.22	2.09	70.20	1.50
p2	324.57	0.98	161.00	4673.65	1.01	166.11	3985.85	1.81	66.25	2843.88	1.87	73.07	2045.35	1.93	76.28	1.45
TILE_8	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	324.57	0.98	125.90	4707.15	1.01	139.13	4124.30	1.88	61.24	3077.60	2.03	66.17	2316.47	2.19	70.29	1.53
p1	330.77	1.00	160.25	4684.62	1.01	158.04	4107.88	1.87	61.89	2961.30	1.95	66.97	2103.80	1.99	72.03	1.49
p2	326.57	0.99	185.25	4666.57	1.01	168.07	4053.55	1.84	63.63	3025.03	1.99	69.09	2168.30	2.05	74.09	1.50
TILE_9	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	328.40	0.99	126.75	4718.25	1.02	136.39	4124.05	1.88	61.19	2976.22	1.96	66.43	2207.30	2.09	71.19	1.51
p1	327.07	0.99	145.25	4676.10	1.01	150.95	4144.90	1.88	60.21	2997.38	1.97	65.57	2115.45	2.00	70.64	1.49
p2	327.65	0.99	163.25	4677.95	1.01	162.21	4001.35	1.82	65.73	3084.78	2.03	71.09	2227.05	2.10	76.47	1.51
TILE_10	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	320.82	0.97	134.00	4708.15	1.01	134.45	4156.32	1.89	59.23	3033.95	2.00	63.04	2193.57	2.07	65.11	1.50
p1	325.20	0.98	165.50	4705.40	1.01	152.85	4122.88	1.87	60.60	3116.05	2.05	64.16	2288.07	2.16	65.70	1.53
p2	328.27	0.99	190.00	4680.65	1.01	158.50	4064.03	1.85	63.00	3056.45	2.01	67.00	2341.75	2.21	68.49	1.53
TILE_11	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	324.00	0.98	121.92	4710.90	1.01	133.80	4174.43	1.90	58.82	3140.38	2.07	63.15	2300.00	2.17	64.76	1.53
p1	325.55	0.99	144.75	4701.85	1.01	144.56	4170.50	1.90	58.90	3156.40	2.08	62.24	2315.60	2.19	64.16	1.54
p2	330.70	1.00	166.75	4693.52	1.01	154.51	4057.88	1.85	63.16	2942.22	1.94	68.02	2225.38	2.10	69.74	1.50
TILE_12	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	324.12	0.98	148.35	4702.07	1.01	141.57	4103.70	1.87	61.77	2955.75	1.95	67.21	2110.30	1.99	70.92	1.48
p1	323.68	0.98	170.75	4689.52	1.01	163.63	4069.15	1.85	63.16	3023.45	1.99	68.85	2277.62	2.15	72.54	1.51
p2	324.27	0.98	190.25	4668.52	1.01	167.43	4040.20	1.84	64.38	2888.55	1.90	70.74	2056.35	1.94	75.12	1.46
TILE_13	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	321.07	0.97	127.62	4706.50	1.01	141.97	4104.48	1.87	61.60	3060.72	2.02	66.95	2213.00	2.09	70.46	1.51
p1	327.68	0.99	148.07	4698.62	1.01	154.03	4132.98	1.88	60.72	2964.30	1.95	66.51	2225.78	2.10	69.76	1.51
p2	325.73	0.99	172.75	4670.60	1.01	171.28	4007.12	1.82	65.40	2868.18	1.89	71.77	2049.35	1.94	75.87	1.46
TILE_14	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM

p0	328.62	1.00	148.95	4702.57	1.01	132.83	4103.10	1.87	61.74	3071.03	2.02	66.76	2289.10	2.16	71.90	1.52
p1	327.02	0.99	167.38	4686.45	1.01	146.59	4088.70	1.86	62.64	2947.10	1.94	67.93	2074.00	1.96	73.84	1.48
p2	325.12	0.98	187.75	4701.65	1.01	147.66	4053.82	1.84	63.95	3020.97	1.99	69.80	2143.88	2.03	75.69	1.49
TILE_15	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.40	0.99	129.35	4683.25	1.01	145.83	4097.52	1.86	62.18	2962.43	1.95	67.37	2178.45	2.06	72.91	1.50
p1	326.25	0.99	148.50	4688.23	1.01	158.88	4125.07	1.88	61.33	3063.38	2.02	67.16	2179.70	2.06	72.96	1.51
p2	325.95	0.99	167.25	4677.82	1.01	157.64	3975.70	1.81	66.79	2965.53	1.95	72.26	2104.22	1.99	78.76	1.48

p0_score:	24.21
p1_score:	24.14
p2_score:	23.80

Infrastructure_Operations_Scores:	vmotion	svmotion	deploy
Completed_Ops_PerHour	17.00	11.00	5.50
Avg_Seconds_To_Complete	33.03	23.98	273.24
Failures	0.00	0.00	0.00
Ratio	1.06	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	24.14	
Unreviewed_VMmark2_Infrastructure_Score	1.21	
Unreviewed_VMmark2_Score	19.56	

Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 5.5.0 Build 1331820 / 09-22-2013
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 PRIMEQUEST 2800E
Processor Vendor and Model	Intel Xeon E7-8890 v2
Processor Speed (GHz)	2.8
Total Sockets/Total Cores/Total Threads	2 Sockets / 30 Cores / 60 Threads
Primary Cache	32KB I + 32KB D on chip per core
Secondary Cache	256KB I+D on chip per core
Other Cache	37.5MB I+D on chip per chip L3
BIOS Version	1.32
Memory Size (in GB, Number of DIMMs)	512, 32
Memory Type and Speed	16GB DIMMs 2Rx4 L DDR3-1600 R 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 Emulex OneConnect Dual Port 10GbE Adapter One Intel I350 Dual Port 1GbE Adapter
Other Hardware	One IO unit
Other Software	none
Hardware Availability Date (MM-DD-YYYY)	06-29-2014
Software Availability Date (MM-DD-YYYY)	09-22-2013
Network	
Network Switch Vendors and Models	Cisco Catalyst 4900M
Network Speed	1Gbps for SUT management, Clients and VMotion, 10Gbps for all VMs
Storage	
Array Vendors, Models, and Firmware Versions	Fujitsu PRIMERGY RX300 S8, Firmware V4.6.5.4 R1.1.0 Fujitsu ETERNUS DX80, Firmware version V10L20-0000

Fibre Channel Switch Vendors and Models	Brocade 5100
Disk Space Used	5176GB
Array Cache Size	1GB(PRIMERGY RX300 S8), 2GB(ETERNUS DX80)
Total Number of Physical Disks Used	4 HDDs, 9xSAS-SSDs, 2xPCIe-SSD
Total Number of Enclosures/Pods/Shelves Used	2 (one per storage system)
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	25
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	4xSeagate, ST3450856SS, 15krpm; 9xSSD Toshiba PX02SMF040; 2xFusion-io ioDrive2 1.2TB PCIe SSD

Datacenter Management Server	
System Model	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	17 / 1 / 3

System Model(s)	1xPRIMERGY BX620 S5 (Prime Client) 2xPRIMERGY RX600 S6 (Virtual Client Hosts) 1xPRIMERGY RX500 S7 (Virtual Client Hosts)
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: 512GB
Network Controller(s) Vendors and Models	Prime Client: Three Intel Dual Port 82575EB Virtual Client Hosts: PRIMERGY RX600 S6: Intel Quad Port 82571EB, two Intel Dual Port 82576NS PRIMERGY RX500 S7: Embedded Intel I350 Dual Port, Intel Quad Port 82571EB, Intel Dual Port 82571EB
Operating System, Version, Bitness, and Service Pack	Clients: Windows Server 2008 Enterprise 64-bit SP2 Virtual Client Hosts: PRIMERGY RX600 S6: VMware ESX 4.1 U2 Build 502767 PRIMERGY RX500 S7: VMware ESX 4.1 U3 Build 800380
Number of Virtual Clients	16
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

- Floppy and CDROM removed for all VMs (default enabled)
- Hardware version 7 used for all VMs

- VMware Tools build 9344 used for all VMs (default 9344)
- Logging disabled for all VMs (default enabled)
- Logical CPU layout changed for all VMs (except Standby and Mailserver) to one socket with multiple cores (default: multiple sockets with one core per socket)
- 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)
- 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/SamplePeriod = 0 (default 60)
- /adv/Mem/ShareScanGHz = 0 (default 4)
- /adv/Misc/TimerMaxHardPeriod = 4000 (default 100000)
- /adv/Net/MaxNetifRxQueueLen = 500 (default 100)
- /adv/Net/MaxNetifTxQueueLen = 1000 (default 500)
- /adv/Net/NetTxCompletionWorldlet = 0 (default 1)
- /adv/Net/NetTxWorldlet = 1 (default 2)
- /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

- The PRIMEQUEST 2800E can be split up into 1 to 4 completely independent system partitions with dedicated HW. Each partition is treated as a separate ESXi host.
  For this VMmark result one partition (containing one system board and one IO Unit) was configured on each of two PRIMEQUEST 2800E.

  Partition settings:
  - Memory Operation Mode: Performance Mode (default Normal Mode)
  - PCI Address Mode: PCI Bus Mode (default PCI Segment Mode)

- Server/Partition BIOS settings:
  - Adjacent Cache Line Prefetch: Disabled (default enabled)
  - DIMM Speed: Performance Mode (default Normal Mode)
  - Energy Performance: Performance (default Energy Efficient)
  - Hardware Prefetcher: Disabled (default enabled)
  - Turbo Boost Technology: Enabled (Intel Turbo Boost up to 3.4GHz, 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, Olio VMs for tiles 14 and 15
  - vSwitch3 on vmnic3 (10Gb) All Mailserver and remaining Olio VMs

Storage Notes

- 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)
    - 9x400GB 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)

  - SAS-SSD 2:
    - LUN 1: All VMs for Tile 0 except DS2DB, Standby and second Mailserver VHD (186GB)
    - LUN 2: All VMs for Tile 1 except DS2DB, Standby and second Mailserver VHD (186GB)

  - SAS-SSD 3:
    - LUN 1: All VMs for Tile 2 except DS2DB, Standby and second Mailserver VHD (186GB)
    - LUN 2: All VMs for Tile 3 except DS2DB, Standby and second Mailserver VHD (186GB)

  - SAS-SSD 4:
    - LUN 1: All VMs for Tile 4 except DS2DB, Standby and second Mailserver VHD (186GB)
    - LUN 2: All VMs for Tile 5 except DS2DB, Standby and second Mailserver VHD (186GB)

  - SAS-SSD 5:

        - LUN 1: All VMs for Tile 6 except DS2DB, Standby and second Mailserver VHD (186GB)
        - LUN 2: All VMs for Tile 7 except DS2DB, Standby and second Mailserver VHD (186GB)

    - SAS-SSD 6:
        - LUN 1: All VMs for Tile 8 except DS2DB, Standby and second Mailserver VHD (186GB)
        - LUN 2: All VMs for Tile 9 except DS2DB, Standby and second Mailserver VHD (186GB)

    - SAS-SSD 7:
        - LUN 1: All VMs for Tile 10 except DS2DB, Standby and second Mailserver VHD (186GB)
        - LUN 2: All VMs for Tile 11 except DS2DB, Standby and second Mailserver VHD (186GB)

    - SAS-SSD 8:
        - LUN 1: All VMs for Tile 12 except DS2DB, Standby and second Mailserver VHD (186GB)
        - LUN 2: All VMs for Tile 13 except DS2DB, Standby and second Mailserver VHD (186GB)

    - SAS-SSD 9:
        - LUN 1: All VMs for Tile 14 except DS2DB, Standby and second Mailserver VHD (186GB)
        - LUN 2: All VMs for Tile 15 except DS2DB, Standby and second Mailserver VHD (186GB)

    - First PCIe-SSD:
        - LUN 1: DS2DB VMs for tiles 0, 2, 4, 6, 8, 10, 12, 14 (537GB)
        - LUN 2: DS2DB VMs for tiles 1, 3, 5, 7, 9, 11, 13, 15 (537GB)

    - Second PCIe-SSD:
        - LUN 1: Mailserver and Standby for tiles 0, 2, 4, 6, 8, 10, 12, 14 (537GB)
        - LUN 2: Mailserver and Standby for tiles 1, 3, 5, 7, 9, 11, 13, 15 (537GB)

    - All LUNs were configured as block devices; no system memory was used for caching

- ETERNUS DX80 (4 disks)
    - RAID set 0: (4 disks)
        - LUN 0: Boot/Console OS for SUT1 (11GB)
        - LUN 1: Boot/Console OS for SUT2 (11GB)

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 (PRIMERGY RX600 S6): Clients 0, 3, 6, 9, 12, 15
  - System 2 (PRIMERGY RX600 S6): Clients 1, 4, 7, 10, 13
  - System 3 (PRIMERGY RX500 S7): Clients 2, 5, 8, 11, 14

Other Notes

- One client used as a dedicated Benchmark Controller.

- TILEDELAY reduced to 49 seconds (default: 60 seconds)
