VMware® VMmark® V2.5 Results

Vendor and Hardware Platform: Fujitsu PRIMERGY BX924 S3 Virtualization Platform: VMware ESX 4.1.0 U3 Build 800380 VMware vCenter Server : VMware vCenter Server 5.1.0b build 947673	VMmark V2.5 Score = 12.05 @ 10 Tiles

Number of Hosts: 2	Uniform Hosts [yes/no]: yes	Total sockets/cores/threads in test: 4/32/64

Tested By: Fujitsu	Test Date: 05-10-2013

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	327.90	0.99	43.00	4680.95	1.01	148.64	4045.82	1.84	63.56	2988.00	1.97	70.33	2121.28	2.00	70.55	1.49
p1	326.00	0.99	43.00	4678.60	1.01	155.79	4014.88	1.83	64.47	2889.60	1.90	70.69	2212.05	2.09	70.98	1.49
p2	331.00	1.00	43.00	4666.45	1.01	168.38	3989.55	1.81	65.66	2964.40	1.95	71.62	2304.32	2.18	71.44	1.51
TILE_1	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	330.55	1.00	43.60	4689.68	1.01	145.00	4053.72	1.84	62.94	2925.75	1.93	68.34	2136.12	2.02	69.33	1.49
p1	326.25	0.99	43.00	4688.75	1.01	157.09	3946.72	1.79	67.23	3042.12	2.00	72.53	2257.78	2.13	74.03	1.50
p2	329.75	1.00	43.00	4683.18	1.01	162.35	3943.72	1.79	67.07	2838.25	1.87	73.58	2176.97	2.06	73.33	1.47
TILE_2	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	322.02	0.98	43.10	4698.60	1.01	143.52	3947.72	1.80	67.91	2965.68	1.95	72.75	2120.72	2.00	78.43	1.47
p1	324.27	0.98	43.23	4682.02	1.01	155.78	3939.12	1.79	67.82	2972.18	1.96	72.40	2227.38	2.11	77.04	1.49
p2	325.15	0.98	43.00	4688.77	1.01	169.47	3932.12	1.79	67.81	2861.57	1.88	72.20	2035.78	1.92	77.20	1.45
TILE_3	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	331.62	1.00	48.75	4705.45	1.01	147.34	4011.38	1.82	64.82	3136.45	2.07	68.37	2278.62	2.15	72.90	1.53
p1	334.57	1.01	44.00	4684.45	1.01	165.92	3980.20	1.81	65.76	2914.90	1.92	69.69	2168.40	2.05	74.09	1.49
p2	324.57	0.98	44.00	4690.12	1.01	168.38	3946.62	1.79	67.10	2899.32	1.91	70.33	2067.18	1.95	74.70	1.46
TILE_4	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	328.80	1.00	54.00	4706.57	1.01	146.45	3993.97	1.82	66.13	2980.55	1.96	71.27	2239.05	2.12	75.85	1.50
p1	328.32	0.99	54.00	4672.55	1.01	159.41	4024.35	1.83	64.37	2924.75	1.93	69.04	2064.70	1.95	74.73	1.47
p2	325.98	0.99	54.00	4662.50	1.00	168.93	3946.10	1.79	67.52	2978.47	1.96	71.35	2132.03	2.02	76.58	1.48
TILE_5	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	333.40	1.01	54.00	4685.65	1.01	151.45	4044.18	1.84	63.25	3050.10	2.01	67.38	2204.68	2.08	71.26	1.51
p1	326.27	0.99	54.00	4679.30	1.01	157.75	3917.20	1.78	68.70	2846.60	1.87	73.36	2017.67	1.91	78.25	1.45

p2	327.10	0.99	54.00	4682.80	1.01	159.91	3936.53	1.79	67.61	2972.15	1.96	71.54	2240.00	2.12	75.32	1.49
TILE_6	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.60	0.99	46.25	4687.25	1.01	161.37	3954.65	1.80	68.22	2918.12	1.92	75.34	2093.43	1.98	80.49	1.47
p1	328.77	1.00	50.25	4645.90	1.00	168.68	3921.15	1.78	69.04	2909.18	1.92	75.13	2086.90	1.97	80.14	1.46
p2	323.90	0.98	45.25	4650.82	1.00	180.85	3948.50	1.80	67.52	2825.70	1.86	74.54	2099.38	1.98	79.07	1.45
TILE_7	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	322.55	0.98	54.00	4648.45	1.00	164.63	3966.05	1.80	67.05	2941.95	1.94	73.31	2121.88	2.01	77.77	1.47
p1	327.27	0.99	54.00	4669.50	1.01	173.97	3972.75	1.81	66.66	2950.10	1.94	72.69	2229.82	2.11	76.17	1.49
p2	323.52	0.98	54.00	4659.00	1.00	186.62	3937.12	1.79	67.87	2823.28	1.86	74.32	2005.97	1.90	79.14	1.44
TILE_8	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	324.60	0.98	54.92	4689.48	1.01	155.34	3996.38	1.82	65.68	3082.12	2.03	70.90	2267.50	2.14	74.13	1.51
p1	325.95	0.99	53.00	4663.82	1.00	163.29	4000.07	1.82	65.56	2872.47	1.89	71.97	2146.18	2.03	75.72	1.47
p2	332.85	1.01	53.00	4660.40	1.00	174.89	3963.80	1.80	66.96	2855.30	1.88	72.61	2033.62	1.92	76.90	1.46
TILE_9	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	322.95	0.98	54.00	4669.77	1.01	153.80	4004.07	1.82	65.46	2973.30	1.96	70.97	2265.05	2.14	73.74	1.50
p1	324.88	0.98	54.00	4674.75	1.01	158.28	3961.97	1.80	67.05	2853.28	1.88	72.72	2036.33	1.92	76.39	1.45
p2	327.57	0.99	54.00	4667.05	1.01	167.23	3931.97	1.79	67.88	2941.15	1.94	72.94	2123.97	2.01	76.97	1.47

p0_score:	14.93
p1_score:	14.76
p2_score:	14.69

Infrastructure_Operations_Scores:	vmotion	svmotion	deploy
Completed_Ops_PerHour	17.00	11.00	5.50
Avg_Seconds_To_Complete	32.19	24.03	297.67
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	14.76	
Unreviewed_VMmark2_Infrastructure_Score	1.21	
Unreviewed_VMmark2_Score	12.05	

Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESX 4.1.0 U3 Build 800380 / 08-30-2012
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server 5.1.0b build 947673 / 12-20-2012
Supplemental Software	none
Servers	
Quantity	2
Server Manufacturer and Model	Fujitsu PRIMERGY BX924 S3
Processor Vendor and Model	Eight-core Intel Xeon E5-2690
Processor Speed (GHz)	2.9
Total Sockets/Total Cores/Total Threads	2 Sockets / 16 Cores / 32 Threads
Primary Cache	32KB I + 32KB D on chip per core
Secondary Cache	256KB I+D on chip per core
Other Cache	20MB I+D on chip per chip L3
BIOS Version	V4.6.5.3 R2.4.0
Memory Size (in GB, Number of DIMMs)	256GB, 16
Memory Type and Speed	16GB DIMMs 2Rx4 L DDR3-1600 R ECC
Disk Subsystem Type	FC SAN
Number of Disk Controllers	1 (unused)
Disk Controller Vendors and Models	Intel Patsburg SAS/SATA SCU
Number of Host Bus Adapters	1
Host Bus Adapter Vendors and Models	PY FC Mezz. Card 8Gb 2 Port (MC-FC82E, LPe12000 based)
Number of Network Controllers	2
Network Controller Vendors and Models	Emulex 0Cl11102-LOM 2-p OneConnect 10Gb NIC (be3), PY Eth Mezz Card 1Gb 4 Port (Intel 82575EB)
Other Hardware	PY CB FC Pass Thru 8Gb 18/18
Other Software	vmware-esx-drivers-net-be2net_400.4.4.231.0-1vmw.0.0.260247.1087960

Hardware Availability Date (MM-DD-YYYY)	06-01-2012
Software Availability Date (MM-DD-YYYY)	04-15-2013
Network	
Network Switch Vendors and Models	1xFujitsu PRIMERGY BX600 GbE Switch Blade 30/12 2xFujitsu PRIMERGY BX900 CB Eth Switch/IBP 10Gb 18/8, 1xFujitsu PRIMERGY BX900 CB Eth Switch/IBP 1Gb 36/8+2, 1xCISCO 4900M
Network Speed	1Gbps for SUT management, Clients and VMotion, 10Gbps for all VMs
Storage	
Array Vendors, Models, and Firmware Versions	Fujitsu PRIMERGY RX300 S7, Firmware V4.6.5.1 R1.22.0
Fibre Channel Switch Vendors and Models	2xFujitsu PRIMERGY BX900 CB FC Switch 8Gb 18/18
Disk Space Used	3038GB
Array Cache Size	1GB
Total Number of Physical Disks Used	12xSAS-SSDs, one PCIe-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	2
Number of LUNs Used	16
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 Seagate ST200FM0002, one Fusion-io ioDrive2 1.2TB PCIe SSD
Datacenter Management Server	
System Model	PRIMERGY BX620 S5
Processor Vendor and Model	X5570
Processor Speed (GHz)	2.93

Total Sockets/Total Cores/Total Threads	2 Sockets / 8 Cores / 16 Threads
Memory	Hypervisor: 24GB Virtual Center VM: 8GB
Network Controller(s) Vendors and Models	3 Intel Dual port 82575EB
Operating System, Version, Bitness, and Service Pack	Hypervisor: VMware ESX 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	11 / 1 / 2
System Model(s)	PRIMERGY BX620 S5 (Prime Client) PRIMERGY RX600 S6 (Virtual Client Hosts)
Processor Vendor(s) and Model(s)	Prime Client: 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: One 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	10
Number of vCPUs Per Virtual Client	4
Number of vMem (GB) Per Virtual Client	4
Virtual Client Networking Notes	One vSwitch per virtual client
Virtual Client Storage Notes	none
Other Hardware	One Dual-channel 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)
- Firewall disabled for the Console OS (default enabled)
- Hardware version 7 used for all VMs (default 7)
- 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)

Changes in esx.conf:

- /adv/Cpu/CreditAgePeriod = 500 (default 1)
- /adv/Cpu/HaltingIdleMsecPenalty = 0 (default 1)
- /adv/DataMover/HardwareAcceleratedInit = 0 (default 1)
- /adv/DataMover/HardwareAcceleratedMove = 0 (default 1)
- /adv/Irq/RoutingPolicy = 0 (default 2)
- /adv/Mem/BalancePeriod = 0 (default 15)
- /adv/Mem/SamplePeriod = 0 (default 60)
- /adv/Mem/ShareScanGHz = 0 (default 4)
- /adv/Misc/TimerMaxHardPeriod = 4000 (default 100)
- /adv/Misc/TimerMinHardPeriod = 2000 (default 100)
- /adv/Net/MaxNetifRxQueueLen = 500 (default 100)
- /adv/Net/MaxNetifTxQueueLen = 1000 (default 500)
- /adv/Net/NetTxCompletionWorldlet = 0 (default 2)
- /adv/Net/NetTxWorldlet = 0 (default 2)
- /adv/Numa/LTermFairnessInterval = 0 (default 5)
- /adv/Numa/MonMigEnable = 0 (default 1)
- /adv/Numa/PageMigEnable = 0 (default 1)
- /adv/Numa/PreferHT = 1 (default 0)
- /adv/Numa/RebalancePeriod = 60000 (default 2000)
- /adv/Numa/SwapLoadEnable = 0 (default 1)
- /adv/Numa/SwapLocalityEnable = 0 (default 1)
- /adv/VMFS3/HardwareAcceleratedLocking = 0 (default 1)
- /vmkernel/module/lpfc820.o/options = "lpfc_lun_queue_depth=64 (defaults 31)

Server Notes

- Server BIOS settings:
  - Adjacent Cache Line Prefetch: Disabled (default enabled)
  - Energy Performance: Performance (default Energy Efficient)
  - Hardware Prefetcher: Disabled (default enabled)
  - Onboard CNA Oprom: Disabled (default enabled)

    - Onboard SAS/SATA SCU: Disabled (default enabled)
    - Serial 1: Disabled (default enabled)
    - Turbo Boost Technology: Enabled (Intel Turbo Boost up to 3.8GHz, default enabled)

- PY FC Mezz. Card 8Gb 2 Port (MC-FC82E) BIOS settings:
    - defaults

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 vmnic2 for VMotion (1Gb)
    - vSwitch2 on vmnic4 (10Gb) for all DS2, Deploy and Standby VMs and for Olio VMs 2,3,6,7
    - vSwitch3 on vmnic5 (10Gb) for all Mailservers and Olio VMs 0,1,4,5,8,9

Storage Notes

One PRIMERGY RX300 S7 configured as a Fibre Channel Target:

- Hardware details:
    - Two Intel Xeon E5-2690@2.9GHz processors
    - 64GB RAM (8x8 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 (D3116)
    - 12x200GB SAS-SSDs Seagate ST200FM0002
    - One Fusion-io ioDrive2 1.2TB PCIe-SSD

- Software details:
    - Operating System: SUSE Linux Enterprise Server 11 SP2 (64-bit)
    - Fibre Channel Target SW: Open Source Software SCST (Generic SCSI Target Subsystem for Linux) version 2.2.1

RAID configuration:

- SAS-SSD 1..10: For each Tile one SSD (186GB) with all VMs except the second VHDs for the OlioWeb and DS2DB VMs
- SAS-SSD 11:
    - LUN 1: Boot/Console OS for SUT1 (11GB)
    - LUN 2: Boot/Console OS for SUT2 (11GB)
    - LUN 3: Target LUN for Storage VMotion (10GB)
    - LUN 4: Source LUN for Deploy (10GB)
    - LUN 5: Target LUN for Deploy (10GB)
- SAS-SSD 12: Boot OS for the storage system
- PCIe-SSD: The second VHDs for all OlioWeb and DS2DB VMs
- 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 8GB vMEM

Operating System Notes

Mailserver VMs: Microsoft Windows 2008 R2 Enterprise 64-bit.
Linux VMs : All SLES11 VMs were updated with SP2

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.

Other Notes

One client used as a dedicated Benchmark Controller.
