

## VMware® VMmark® V2.1 Results

**Vendor and Hardware Platform: Cisco UCS B200 M2**  
**Virtualization Platform: VMware ESX 4.1.0 Build 260247**

**VMmark V2.1 Score =**  
**7.17 @ 7 Tiles**

**Number of Hosts: 2**

**Uniform Hosts [yes/no]: yes**

**Total sockets/core/threads in test: 4/24/48**

**Tested By: Cisco Systems**

**Test Date: 03-07-2011**

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### Performance

	mailserver			olio			dvdstoreA			dvdstoreB			dvdstoreC			
<b>TILE_0</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	326.32	0.99	113.00	4686.15	1.01	153.00	2780.38	1.26	138.32	1985.85	1.31	154.97	1495.70	1.41	159.77	1.18
<b>p1</b>	329.68	1.00	108.25	4688.82	1.01	163.91	2904.88	1.32	129.35	2052.70	1.35	148.09	1479.30	1.40	154.07	1.20
<b>p2</b>	325.18	0.98	109.50	4672.65	1.01	181.51	2873.30	1.31	130.54	1966.88	1.30	149.41	1381.60	1.31	158.71	1.17
<b>TILE_1</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	330.07	1.00	109.00	4675.52	1.01	155.42	2940.97	1.34	125.50	2109.28	1.39	134.97	1546.10	1.46	144.28	1.22
<b>p1</b>	324.30	0.98	112.00	4651.55	1.00	180.53	3072.22	1.40	117.17	2271.40	1.50	126.47	1587.33	1.50	138.97	1.25
<b>p2</b>	329.95	1.00	113.50	4644.07	1.00	194.04	3019.82	1.37	117.92	2252.30	1.48	125.20	1582.72	1.50	136.81	1.25
<b>TILE_2</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	325.25	0.98	112.25	4683.68	1.01	158.45	3020.85	1.37	118.61	2244.38	1.48	127.51	1545.72	1.46	135.22	1.24
<b>p1</b>	324.18	0.98	113.25	4654.62	1.00	183.78	3089.65	1.40	116.13	2201.68	1.45	124.88	1616.97	1.53	134.53	1.25
<b>p2</b>	328.38	0.99	114.00	4658.57	1.00	189.20	3045.40	1.38	116.33	2327.70	1.53	124.49	1686.90	1.59	131.71	1.28
<b>TILE_3</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	324.62	0.98	113.50	4689.32	1.01	153.44	3143.80	1.43	110.56	2273.72	1.50	123.26	1570.33	1.48	129.77	1.26
<b>p1</b>	328.32	0.99	114.00	4684.80	1.01	176.36	3078.47	1.40	114.49	2270.70	1.50	123.27	1703.97	1.61	129.15	1.28
<b>p2</b>	322.95	0.98	120.00	4652.02	1.00	176.41	3006.00	1.37	117.95	2203.60	1.45	127.90	1589.88	1.50	133.51	1.24
<b>TILE_4</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	324.85	0.98	114.50	4691.12	1.01	151.04	3095.32	1.41	112.20	2274.75	1.50	121.62	1639.42	1.55	127.81	1.27
<b>p1</b>	324.23	0.98	114.00	4668.30	1.01	169.52	3044.00	1.38	115.00	2271.20	1.50	121.02	1731.22	1.64	123.81	1.27
<b>p2</b>	326.62	0.99	114.00	4639.80	1.00	181.42	3013.97	1.37	117.55	2224.70	1.47	126.58	1544.17	1.46	130.42	1.24
<b>TILE_5</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	328.18	0.99	114.50	4664.45	1.00	168.34	3073.25	1.40	116.77	2298.78	1.51	128.94	1650.38	1.56	137.26	1.27
<b>p1</b>	325.68	0.99	114.00	4659.25	1.00	181.25	3123.53	1.42	112.09	2198.72	1.45	123.70	1631.88	1.54	128.44	1.26

<b>p2</b>	327.90	0.99	114.00	4656.18	1.00	192.99	3077.68	1.40	115.12	2233.30	1.47	127.20	1508.95	1.43	138.37	1.24
<b>TILE_6</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	326.98	0.99	132.97	4689.77	1.01	156.04	3092.07	1.41	114.52	2220.18	1.46	130.31	1626.83	1.54	141.17	1.26
<b>p1</b>	324.77	0.98	120.50	4689.43	1.01	162.03	3086.20	1.40	114.19	2141.30	1.41	128.96	1497.25	1.42	137.53	1.23
<b>p2</b>	318.05	0.96	111.15	4636.70	1.00	188.52	3072.07	1.40	115.40	2190.53	1.44	130.66	1559.55	1.47	142.01	1.23
<b>p0_score:</b>	8.70															
<b>p1_score:</b>	8.74															
<b>p2_score:</b>	8.64															
<b>Infrastructure_Operations_Scores:</b>										vmotion		svmotion		deploy		
<b>Completed_Ops_PerHour</b>										16.50		9.00		4.50		
<b>Avg_Seconds_To_Complete</b>										32.31		43.84		376.45		
<b>Failures</b>										0.00		0.00		0.00		
<b>Ratio</b>										1.03		1.00		1.12		
<b>Number_Of_Threads</b>										1		1		1		
<b>Summary</b>						Run_Is_Compliant		Number_Of_Compliance_Issues(0)*				Median_Phase(p0)				
<b>Unreviewed_VMmark2_Applications_Score</b>						8.70										
<b>Unreviewed_VMmark2_Infrastructure_Score</b>						1.05										
<b>Unreviewed_VMmark2_Score</b>						7.17										

## Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESX 4.1.0 Build 260247 / 07-13-2010
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server 4.1.0 build 258902 / 07-13-2010
Supplemental Software	Cisco Virtual Ethernet Module cross_cisco-vem-v121-4.0.4.1.3.1.0-2.0.3.vib
Servers	
Quantity	2
Server Manufacturer and Model	Cisco UCS B200 M2
Processor Vendor and Model	Intel Xeon X5690
Processor Speed (GHz)	3.46 GHz

Total Sockets/Total Cores/Total Threads	2 Sockets / 12 Cores / 24 Threads
Primary Cache	32KB I + 32KB D on-chip per core
Secondary Cache	256KB I + D on chip per core
Other Cache	12MB I + D on chip per chip L3
BIOS Version	S5500.1.3.1g.0.120720100638
Memory Size (in GB, Number of DIMMs)	96GB, 12x8GB
Memory Type and Speed	Dual rank 1333MHz Registered DDR3
Disk Subsystem Type	FC SAN
Number of Disk Controllers	1 (unused)
Disk Controller Vendors and Models	LSI Logic embedded
Number of Host Bus Adapters	1 dual-port (on the Virtual Interface Card)
Host Bus Adapter Vendors and Models	Cisco UCS M81KR Virtual Interface Card
Number of Network Controllers	1 dual-port (on the Virtual Interface Card)
Network Controller Vendors and Models	Cisco UCS M81KR Virtual Interface Card
Other Hardware	None
Other Software	None
Hardware Availability Date (MM-DD-YYYY)	02-15-2011
Software Availability Date (MM-DD-YYYY)	07-13-2010
<b>Network</b>	
Network Switch Vendors and Models	(2) Cisco UCS-6120XP, (1) Cisco Nexus 5010
Network Speed	10Gbps
<b>Storage</b>	
Array Vendors, Models, and Firmware Versions	EMC CX4-240 (version 04.29.000.5.003)
Fibre Channel Switch Vendors and Models	Cisco MDS 9134
Disk Space Used	1904GB
Array Cache Size	2522MB
Total Number of Physical Disks Used	65
Total Number of Enclosures/Pods/Shelves Used	6

Number of Physical Disks Used per Enclosure/Pod/Shelf	<ul style="list-style-type: none"> <li>• Three enclosures with 12 each (10x73GB SSDs + 2x450GB 15K disks)</li> <li>• One enclosure with 15 (15x450GB 15K disks)</li> <li>• One enclosure with 4 (4x450GB 15K disks)</li> <li>• One enclosure with 10 (6x73GB SSDs + 4x450GB 15K disks)</li> </ul>
Total Number of Storage Groups Used	2
Number of LUNs Used	20
LUN Size and Number of Disks Per LUN	<ul style="list-style-type: none"> <li>• 1 LUN at 55GB (Deploy Source), set over 1x73GB SSD</li> <li>• 1 LUN at 55GB (Deploy Target), set over 6x450GB 15K disk</li> <li>• 1 LUN at 45GB (Standby Source), set over 6x450GB 15K disk</li> <li>• 1 LUN at 45GB (Standby Target), set over 6x450GB 15K disk</li> <li>• 7 LUNs at 150GB (DS2 Webserver), set over 1x450GB 15K disk</li> <li>• 7 LUNs at 278GB (DS2 DB, Olio DB, Olio Web, Mailserver), set over 5x73GB SSDs</li> <li>• 2 LUNs at 139GB (boot), set over 2x450GB 15K disks</li> </ul>
RAID Type	RAID 0 for LUNs on 5x73GB disks and 6x450GB disks, RAID 1 for VMware ESX 4.1 O/S, JBOD for DS2Webserver and Deploy Source LUNs
Number of Members per RAID Set	<ul style="list-style-type: none"> <li>• 7 RAID 0 RAID sets each over 5x73GB SSDs</li> <li>• 2 RAID 1 RAID sets each over 2x450GB 15K disks</li> <li>• 3 RAID 0 RAID sets each over 6x450GB 15K disks</li> </ul>
Disk Vendors, Models, and Speeds	STEC ZIV2A074 CLAR72, SEAGATE ST345085 CLAR450

**Datacenter Management Server**

System Model	Cisco UCS C200 M2
Processor Vendor and Model	Intel Xeon X5670
Processor Speed (GHz)	2.93GHz
Total Sockets/Total Cores/Total Threads	2 Sockets / 12 Cores / 24 Threads (4 vCPU for VM)
Memory	48GB (24 GB for VM)
Network Controller(s) Vendors and Models	Intel X520-DA2 Dual Port 10 Gigabit Server Adapter (VMXNET 3 for VM)
Operating System, Version, and Service Pack	VMware ESX 4.1.0 build 260247 (Microsoft Windows Server 2008 Enterprise for VM)
Other Hardware	None
Other Software	None

**Clients**

Number of Clients	7
System Model(s)	client0-5: Cisco UCS B200 M1 client6: Cisco UCS C200 M1 controller: Dell 2950
Processor Vendor(s) and Model(s)	client0: Intel Xeon X5570 client1: Intel Xeon E5540 client2: Intel Xeon E5520

	client3: Intel Xeon X5570 client4: Intel Xeon E5520 client5: Intel Xeon X5570 client6: Intel Xeon X5550 controller: Intel Xeon E5520
Processor Speed(s) (GHz)	client0: 2.93GHz client1: 2.53GHz client2: 2.27GHz client3: 2.93GHz client4: 2.27GHz client5: 2.93GHz client6: 2.66GHz controller: 2.27GHz
Total Sockets/Total Cores/Total Threads	2 Sockets / 8 Cores / 8 Threads
Memory per Client	client0: 24GB client1: 24GB client2: 24GB client3: 48GB client4: 48GB client5: 24GB client6: 24GB controller: 48GB
Network Controller(s) Vendors and Models	client0-5: Intel 82598EB 10 Gigabit Ethernet Controller client6: Broadcom BMC5708C Gigabit Ethernet Controller controller: Intel 82576NS Gigabit Ethernet Controller
Operating System, Version, and Service Pack	Microsoft Windows Server 2003 Enterprise, Service Pack 2
Other Hardware	None
Other Software	None

## Notes for Workload

### Virtualization Software Notes

- Virtual hardware for all VMs was set to V7
- Ethernet adapter type set to vmxnet3 for all VMs
- IDE and floppy were removed from all VMs
- Logging was disabled for all VMs
- CPU.HaltingIdleMsecPenalty=0 (default 100)
- /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 100000 )
- /adv/Misc/TimerMinHardPeriod = 2000 (default 100 )
- /adv/Net/MaxNetifRxQueueLen = 500 (default 100 )

- /adv/Net/MaxNetifTxQueueLen = 1000 (default 500 )
- /adv/Net/NetTxWorldlet = 1 (default 2)
- /adv/Numa/LTermFairnessInterval = 0 (default 5)
- /adv/Numa/PageMigEnable = 0 (default 1 )
- /vmkernel/module/lpfc820.o/options = "lpfc\_lun\_queue\_depth=64 lpfc\_cr\_count=5 lpfc\_cr\_delay=1" (defaults 31,1,0)
- /vmkernel/pageSharing = FALSE (default TRUE)
- /vmkernel/iovDisableIR = TRUE (default FALSE)
- Firewall was disabled for the COS
- Cluster DRS Automation Level was set to "Fully Automated", Level 1 ("Aggressive")

## Server Notes

- Intel Turbo Boost enabled up to 3.73GHz
- Hardware Prefetcher Disabled (default enabled)
- Adjacent Sector Prefetcher Disabled (default enabled)

## Networking Notes

- Virtual Machine Port Groups and Service Console Ports were all connected to vSwitch0.
- VMkernel ports were all connected to vSwitch1. Jumbo Frames was enabled for the VMkernel vSwitch.
- For SUT1, vmnic38 was on vSwitch0 with 120 ports and vmnic37 was on vSwitch1 with 120 ports; for SUT2, vmnic0 was on vSwitch0 with 64 ports and vmnic37 was on vSwitch1 with 120 ports.
- 35 virtual NICs were configured on the other two physical NICs of the Cisco UCS M81KR VIC. These 35 virtual NICs were configured as a Distributed Virtual Switch in VMware vCenter PTS.
- Workloads OlioWeb and Mailserver were assigned to this Distributed Virtual Switch.

## Storage Notes

- There was 1x55GB JBOD LUN, created over a single 73GB SSD. This LUN contained the VM used for source deployment operations.
- There was 1x55GB JBOD LUN, created over 6x450GB 15K disks. This LUN contained the VM used for target deployment operations.
- There was 2x45GB JBOD LUNs, each created over 6x450GB 15K disks. These LUNs contained the standby VMs used for Storage VMotion operations of the Standby VMs.
- There were 7x150GB JBOD LUNs, each created over a single 450GB 15K disk. These LUNs contained the DS2 Webserver VMs.
- There were 7x278GB RAID 0 LUNs, each created over five 73GB SSDs. These LUNs contained the DS2DB, OlioDB, OlioWeb, and Mailserver VMs. Each LUN contains VMs from the same tile.
- There were 2x139GB RAID 1 LUNs, each created over two 450GB 15K disks. These LUNs were used for booting ESX over SAN.

## Datacenter Management Server Notes

- VMware vSphere Center was run as a virtual machine on ESX 4.1.
- The vSphere was running on a Windows 2008 Server Enterprise Edition, 64-bit with SP1

## Operating System Notes

- All Mailservers running Microsoft Windows Server 2008 R2 Enterprise.
- Storage Controller for all Exchange Database Virtual Disks set to Paravirtual.

## Software Notes

- Cisco Nexus 1000V VEM version VEM410-201007311-BG was installed on both SUT systems
- ServerEngines BladeEngine NIC driver version SVE-be2net-2.102.440.0 was installed on both SUT systems
- lpfc820 scsi driver for VMware ESX version 8.2.1.79.25 was installed on both SUT systems

## Client Notes

- Microsoft Windows Server 2003 clients updated through Windows Update.
- Prime client was running VMware vSphere PowerCLI 4.1.1.2816 build 332441

## Other Notes

Prime controller run on a dedicated, non-client machine.

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