

## VMware® VMmark® V2.1.1 Results

Vendor and Hardware Platform: Cisco UCS B200 M3  
 Virtualization Platform: VMware ESXi 5.1.0 Build 774985  
 VMware VCenter Server: VMware VCenter Server 5.1.0 Build 775229

**VMmark V2.1.1 Score =  
11.32 @ 10 Tiles**

Number of Hosts: 2	Uniform Hosts [yes/no]: yes	Total sockets/core/threads in test: 4/32/64
Tested By: Cisco Systems		Test Date: 09-13-2012
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
p0	325.77	0.99	67.00	4722.93	1.02	123.41	3585.80	1.63	83.19	2709.95	1.78	81.34	1850.72	1.75	93.16	1.39
p1	328.45	0.99	66.50	4721.02	1.02	132.33	3474.62	1.58	88.83	2723.12	1.79	86.14	1887.53	1.78	97.88	1.39
p2	332.40	1.01	71.50	4680.18	1.01	150.01	3386.12	1.54	94.08	2526.47	1.66	93.72	1810.08	1.71	105.64	1.35
TILE_1	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	328.20	0.99	89.78	4673.55	1.01	152.47	4039.28	1.84	63.77	2950.53	1.94	67.63	2157.50	2.04	68.33	1.49
p1	324.02	0.98	100.25	4613.18	0.99	271.42	3888.90	1.77	70.07	2936.43	1.93	74.03	2264.07	2.14	74.80	1.48
p2	323.20	0.98	104.00	4524.73	0.97	351.65	3879.07	1.76	70.76	2819.47	1.86	75.07	2058.45	1.95	76.55	1.43
TILE_2	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	331.30	1.00	53.48	4685.52	1.01	158.69	3876.45	1.76	70.45	2859.72	1.88	77.82	2087.88	1.97	80.63	1.46
p1	331.68	1.00	53.00	4656.90	1.00	213.16	3818.72	1.74	73.71	2700.18	1.78	82.28	2017.53	1.91	86.48	1.43
p2	327.45	0.99	53.00	4631.10	1.00	251.80	3675.97	1.67	79.68	2630.35	1.73	87.17	1870.42	1.77	92.11	1.38
TILE_3	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.73	0.99	51.62	4702.98	1.01	139.72	3975.22	1.81	66.37	3093.43	2.04	65.77	2311.10	2.18	71.00	1.52
p1	323.75	0.98	53.15	4658.98	1.00	190.94	3826.97	1.74	72.59	2856.22	1.88	73.32	1999.30	1.89	80.42	1.44
p2	327.35	0.99	53.90	4686.82	1.01	170.44	3791.07	1.72	74.29	2954.30	1.95	73.33	2093.00	1.98	80.11	1.46
TILE_4	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.27	0.99	74.00	4677.05	1.01	150.40	3792.32	1.72	73.87	2764.93	1.82	78.07	2048.90	1.94	82.88	1.43
p1	328.32	0.99	74.00	4667.20	1.01	172.27	3700.90	1.68	77.73	2718.40	1.79	81.02	1904.17	1.80	88.30	1.40
p2	323.30	0.98	74.00	4618.93	1.00	222.25	3578.93	1.63	83.50	2696.53	1.78	88.13	1993.92	1.88	95.27	1.40
TILE_5	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.07	0.99	54.00	4733.85	1.02	114.98	3515.07	1.60	90.25	2431.38	1.60	102.67	1664.25	1.57	115.30	1.32
p1	325.55	0.99	54.00	4716.12	1.02	122.69	3378.53	1.54	97.66	2435.40	1.60	108.89	1670.95	1.58	122.81	1.31

<b>p2</b>	323.70	0.98	54.00	4703.07	1.01	128.17	3359.60	1.53	98.73	2320.60	1.53	111.83	1668.15	1.58	123.09	1.30
<b>TILE_6</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	331.38	1.00	90.95	4712.27	1.02	123.60	3870.12	1.76	70.44	2791.53	1.84	76.08	1993.55	1.88	80.43	1.44
<b>p1</b>	322.90	0.98	84.00	4707.57	1.01	131.50	3768.25	1.71	74.49	2810.88	1.85	80.10	2121.25	2.00	84.72	1.45
<b>p2</b>	324.32	0.98	84.00	4702.55	1.01	137.39	3667.38	1.67	79.45	2628.18	1.73	86.42	1877.15	1.77	90.70	1.38
<b>TILE_7</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	330.10	1.00	84.75	4718.57	1.02	110.74	3535.57	1.61	89.14	2536.57	1.67	100.60	1781.95	1.68	110.70	1.36
<b>p1</b>	326.40	0.99	74.00	4724.65	1.02	117.73	3443.32	1.57	93.97	2363.57	1.56	107.55	1718.58	1.62	116.83	1.32
<b>p2</b>	331.40	1.00	74.00	4707.38	1.01	122.07	3431.70	1.56	94.42	2353.57	1.55	108.56	1617.08	1.53	119.83	1.30
<b>TILE_8</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	325.93	0.99	128.38	4686.50	1.01	147.53	3586.35	1.63	86.43	2616.95	1.72	95.73	1965.75	1.86	101.47	1.39
<b>p1</b>	320.68	0.97	93.00	4670.43	1.01	184.67	3549.72	1.61	88.47	2484.53	1.64	99.32	1744.90	1.65	107.41	1.34
<b>p2</b>	324.68	0.98	84.00	4612.18	0.99	224.42	3456.95	1.57	92.75	2510.15	1.65	102.98	1780.50	1.68	111.25	1.34
<b>TILE_9</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	331.15	1.00	54.00	4707.93	1.01	139.65	3536.78	1.61	87.38	2448.38	1.61	99.11	1837.60	1.74	102.86	1.36
<b>p1</b>	328.65	1.00	54.00	4646.57	1.00	201.15	3455.85	1.57	91.94	2386.78	1.57	104.23	1692.28	1.60	110.20	1.32
<b>p2</b>	324.07	0.98	54.00	4590.23	0.99	276.68	3367.62	1.53	96.51	2419.28	1.59	107.87	1818.97	1.72	113.00	1.32
<b>p0_score:</b>	14.15															
<b>p1_score:</b>	13.86															
<b>p2_score:</b>	13.67															

<b>Infrastructure_Operations_Scores:</b>	vmotion	svmotion	deploy
<b>Completed_Ops_PerHour</b>	17.00	11.00	5.00
<b>Avg_Seconds_To_Complete</b>	21.56	14.28	327.19
<b>Failures</b>	0.00	0.00	0.00
<b>Ratio</b>	1.06	1.22	1.25
<b>Number_Of_Threads</b>	1	1	1

<b>Summary</b>	Run_Is_Compliant	Number_Of_Compliance_Issues(0)*	Median_Phase(p1)
<b>Unreviewed_VMmark2_Applications_Score</b>	13.86		
<b>Unreviewed_VMmark2_Infrastructure_Score</b>	1.18		
<b>Unreviewed_VMmark2_Score</b>	11.32		

## Configuration

<b>Virtualization Software</b>
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Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 5.1.0 Build 774985 / 11-19-2012
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server 5.1.0 Build 775229 / 11-19-2012
Supplemental Software	None
<b>Servers</b>	
Quantity	2
Server Manufacturer and Model	Cisco UCS B200 M3
Processor Vendor and Model	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	B200M3.2.0.3.2
Memory Size (in GB, Number of DIMMs)	128GB, 16
Memory Type and Speed	8GB DIMMs 2Rx4 DDR3-1600MHz Registered ECC
Disk Subsystem Type	FC SAN
Number of Disk Controllers	1 (unused)
Disk Controller Vendors and Models	MegaRAID SAS SKINNY Controller
Number of Host Bus Adapters	1 dual-port (on the Virtual Interface Card)
Host Bus Adapter Vendors and Models	Cisco UCS VIC M82-4P Virtual Interface Card
Number of Network Controllers	1 4-port (on the Virtual Interface Card)
Network Controller Vendors and Models	Cisco UCS VIC M82-4P Virtual Interface Card
Other Hardware	None
Other Software	None
Hardware Availability Date (MM-DD-YYYY)	06/05/2012
Software Availability Date (MM-DD-YYYY)	11/19/2012

<b>Network</b>	
Network Switch Vendors and Models	(2) Cisco UCS 6248 UP, (1) Cisco Nexus 5548 UP
Network Speed	20Gbps, 10Gbps
<b>Storage</b>	
Array Vendors, Models, and Firmware Versions	2 x Violin V6000 16TB with formatted capacity of 8TB (50%) Firmware A5.1.3
Fibre Channel Switch Vendors and Models	Cisco Nexus 5548 UP (see Network Switch)
Disk Space Used	2722GB
Array Cache Size	N/A
Total Number of Physical Disks Used	128
Total Number of Enclosures/Pods/Shelves Used	2
Number of Physical Disks Used per Enclosure/Pod/Shelf	Violin VMA: 64 Flash VIMMs
Total Number of Storage Groups Used	2
Number of LUNs Used	16
LUN Size and Number of Disks Per LUN	<ul style="list-style-type: none"> <li>• All LUNs spread across 64 Flash VIMMs <ul style="list-style-type: none"> <li>○ 2 LUNs at 30GB (VMware ESX Boot)</li> <li>○ 1 LUN at 20GB (Deploy Source)</li> <li>○ 1 LUN at 40GB (Deploy Target)</li> <li>○ 2 LUNs at 1031GB (DS2DB)</li> <li>○ 2 LUNs at 783GB (DS2Web)</li> <li>○ 2 LUNs at 1652GB (Mailserver)</li> <li>○ 2 LUNs at 374GB (OlioDB)</li> <li>○ 2 LUNs at 1771GB (OlioWeb)</li> <li>○ 1 LUN at 200GB (Standby Source)</li> <li>○ 1 LUN at 100GB (Standby Target)</li> </ul> </li> </ul>
RAID Type	Violin Memory vRAID
Number of Members per RAID Set	9 on Violin Memory Array A, 7 on Violin Memory Array B
Disk Vendors, Models, and Speeds	128 x Violin 256 GB Flash VIMMs
<b>Datacenter Management Server</b>	
System Model	Cisco UCS C200 M2
Processor Vendor and Model	Intel Xeon E5620
Processor Speed (GHz)	2.40

Total Sockets/Total Cores/Total Threads	2 Sockets / 8 Cores / 16 Threads
Memory	96GB
Network Controller(s) Vendors and Models	Intel 82599EB 10Gigabit 2-port
Operating System, Version, and Service Pack	VMware ESXi 5.0.0 Build 469512 (Windows 2008 R2 Enterprise 64-bit for VM)
Other Hardware	None
Other Software	None

### Clients

Number of Clients	5
System Model(s)	<ul style="list-style-type: none"> <li>• ESX client servers: UCS B230 M2</li> <li>• Prime Client: Cisco UCS C200 M2</li> </ul>
Processor Vendor(s) and Model(s)	<ul style="list-style-type: none"> <li>• Intel Xeon E7-4870 (clients)</li> <li>• Intel Xeon E5540 (prime client)</li> </ul>
Processor Speed(s) (GHz)	<ul style="list-style-type: none"> <li>• 2.40GHz (E7-4870)</li> <li>• 2.53GHz (E5540)</li> </ul>
Total Sockets/Total Cores/Total Threads	<ul style="list-style-type: none"> <li>• 2 Sockets / 20 Cores / 40 Threads (clients)</li> <li>• 2 Sockets / 8 Cores / 8 Threads (prime client)</li> </ul>
Memory per Client	<ul style="list-style-type: none"> <li>• 256GB (clients)</li> <li>• 24GB (prime client)</li> </ul>
Network Controller(s) Vendors and Models	<ul style="list-style-type: none"> <li>• Cisco UCS M81KR Virtual Interface Card 10Gigabit 2-port (clients)</li> <li>• Intel 82599EB 10Gigabit 2-port (prime client)</li> </ul>
Operating System, Version, and Service Pack	<ul style="list-style-type: none"> <li>• Microsoft Windows 2003 Enterprise SP2 32-bit (prime client)</li> <li>• VMware ESX 4.1 Build 348481 (physical clients)</li> <li>• Microsoft Windows 2008 R2 Enterprise 64-bit (virtual clients)</li> </ul>
Other Hardware	None
Other Software	None

## Notes for Workload

### Virtualization Software Notes

- Virtual hardware for all VMs was set to V9
- Ethernet adapter type set to vmxnet3 for all VMs (default vmxnet2)
- IDE and floppy were removed from all VMs (default attached)
- Logging was disabled for all VMs (default enabled)
- All Linux VMs configured to have a single virtual socket with multiple cores (default one core per multiple virtual sockets)
- vSphere DRS Migration Threshold set to Fully Automated level 2

- Patch cisco-vem-v144-esx 4.2.1.1.5.2.0-3.1.2 installed on each SUT
- /adv/Power/CpuPolicy = "static" (default balanced)
- /adv/VMFS3/HardwareAcceleratedLocking = "0" (default 1)
- /adv/Mem/SamplePeriod = "0" (default 60)
- /adv/Mem/BalancePeriod = "0" (default 15)
- /adv/Mem/ShareScanGHz = "0" (default 4)
- /adv/Cpu/CoschedCrossCall = "0" (default 1)
- /adv/Cpu/HTWholeCoreThreshold = "0" (default 200)
- /adv/Net/MaxNetifTxQueueLen = "1000" (default 500)
- /adv/Net/MaxNetifRxQueueLen = "500" (default 100)
- /adv/Net/NetTxWorldlet = "1" (default 2)
- /adv/Net/NetTxCompletionWorldlet = "0" (default 1)
- /adv/DataMover/HardwareAcceleratedInit = "0" (default 1)
- /adv/DataMover/HardwareAcceleratedMove = "0" (default 1)
- /adv/Numa/SwapLocalityEnable = "0" (default 1)
- /adv/Numa/LTermFairnessInterval = "0" (default 5)
- /adv/Numa/SwapLoadEnable = "0" (default 1)
- /adv/Numa/MonMigEnable = "0" (default 1)
- /adv/Numa/PageMigEnable = "0" (default 1)
- /adv/Misc/TimerMaxHardPeriod = "4000" (default 100000)
- /adv/Misc/TimerMinHardPeriod = "2000" (default 30)

## Server Notes

- Intel Turbo Boost enabled up to 3.8GHz
- Memory Performance set to Maximum Performance (default Power Saving)
- Hardware Prefetcher set to Disabled (default Enabled)
- Adjacent Cache Line Prefetcher set to Disabled (default Enabled)

## Networking Notes

There were 2 vSwitches and 1 vSphere Distributed Switch configured, all at 20Gbps

- vSwitch0 on vmnic0 for Service Console, DS2DB, DS2web, Standby, and deploy VMs
- vSwitch1 on vmnic1 for VMkernel traffic (MTU set to 9000)
- Distributed Switch vm-fex configured with two uplinks per host, vmnic46 and vmnic47
- Distributed Switch vm-fex contained Mailserver, OlioWeb, and OlioDB VMs

## Storage Notes

- All LUNs were spread across two Violin Memory Arrays each consisting of 64 256GB VIMM Flash modules in vRAID.
- On Violin Memory Array A:
  - There were 2 LUNs at 30GB, each acting as the VMware ESX Boot LUN for each server.
  - There was 1 LUN at 40GB used to act as the Deploy Target LUN.
  - There was 1 LUN at 100GB used to act as the Standby Target LUN.
  - There was 1 LUN at 1031GB, containing the even DS2DB VMs.
  - There was 1 LUN at 783GB, containing the even DS2Web VMs.
  - There was 1 LUN at 1652GB, containing the even Mailserver VMs.
  - There was 1 LUN at 374GB, containing the even OlioDB VMs.
  - There was 1 LUN at 1771GB, containing the even OlioWeb VMs.
- On Violin Memory Array B:

- There was 1 LUN at 100GB used to act as the Deploy Source LUN.
- There was 1 LUN at 200GB used to act as the Standby Source LUN.
- There was 1 LUN at 1031GB, containing the odd DS2DB VMs.
- There was 1 LUN at 783GB, containing the odd DS2Web VMs.
- There was 1 LUN at 1652GB, containing the odd Mailserver VMs.
- There was 1 LUN at 374GB, containing the odd OlioDB VMs.
- There was 1 LUN at 1771GB, containing the odd OlioWeb VMs.
- All LUNs were using a Round Robin (VMware) Path Selection Policy and given an I/O Operation Limit of 8.

## **Datacenter Management Server Notes**

The Datacenter Management Server was a virtual machine configured with 4 vCPUs and 16GB RAM.

## **Operating System Notes**

- All Mailservers running Microsoft Windows Server 2008 R2 Enterprise 64-bit.
- All storage controllers for the virtual machines were set to Paravirtual. (default LSI Logic SAS)
- All SLES 11 VMs were updated to SP1
- All Linux and Standby VMs aligned to match underlying 4K block size using storage vendor provided tool

## **Software Notes**

None.

## **Client Notes**

- Microsoft Windows Server 2008 R2 64-bit installed on client virtual machines and updated through Windows Update.
- Prime client was running Microsoft Windows Server 2003 Enterprise SP2 32-bit and VMware vSphere PowerCLI 4.1.1.2816 build 332441.
- All clients were run on virtual machines that were each defined with 4 virtual CPUs, 4GB of memory, 1 vmxnet3 network, and 40GB of disk space.
- Virtual clients 0, 4, and 8 were hosted on physical client1.
- Virtual clients 1, 5, and 9 were hosted on physical client2.
- Virtual clients 2 and 6 were hosted on physical client3.
- Virtual clients 3 and 7 were hosted on physical client4.
- ESX clients run with hyperthreading and turbo boost enabled. ESX configuration settings unchanged from default.

## **Other Notes**

Prime client run on a dedicated, non-client machine. Hyperthreading was disabled for the Prime Client.

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