

VMware® VMmark® V2.5.1 Results

Vendor and Hardware Platform: Cisco UCS B260 M4
 Virtualization Platform: VMware ESXi 5.1.0 U2 Build 1483097
 VMware vCenter Server : VMware vCenter Server 5.1.0 Build 799731

**VMmark V2.5.1 Score =
19.18 @ 16 Tiles**

Number of Hosts: 2	Uniform Hosts [yes/no]: yes	Total sockets/cores/threads in test: 4/60/120
Tested By: Cisco Systems		Test Date: 02-10-2014
Performance Section Performance	Configuration Section Configuration	Notes Section 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	328.10	0.99	124.00	4735.38	1.02	127.64	4076.12	1.85	62.41	2959.47	1.95	66.78	2249.15	2.13	67.98	1.51
p1	328.40	0.99	124.75	4712.48	1.02	133.04	4003.62	1.82	64.72	2921.20	1.92	68.77	2115.35	2.00	71.08	1.48
p2	326.07	0.99	134.00	4713.12	1.02	141.01	3948.88	1.80	66.91	3081.20	2.03	70.69	2281.50	2.16	72.68	1.51
TILE_1	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.40	0.99	131.75	4708.85	1.01	127.49	4112.73	1.87	60.72	3075.40	2.03	61.00	2159.25	2.04	67.48	1.51
p1	326.40	0.99	134.00	4692.15	1.01	133.32	3986.60	1.81	65.70	3035.95	2.00	68.06	2181.30	2.06	72.85	1.49
p2	325.98	0.99	134.00	4686.15	1.01	139.80	3901.30	1.77	69.07	2960.75	1.95	72.03	2204.45	2.08	77.88	1.48
TILE_2	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	328.75	1.00	124.00	4705.02	1.01	130.20	4016.22	1.83	64.63	2939.68	1.94	68.46	2090.45	1.98	72.74	1.48
p1	330.30	1.00	127.75	4680.35	1.01	134.77	3919.38	1.78	68.38	2968.20	1.95	71.99	2232.07	2.11	76.12	1.49
p2	326.40	0.99	134.00	4707.40	1.01	145.12	3901.60	1.77	69.09	2996.93	1.97	70.99	2150.70	2.03	75.80	1.48
TILE_3	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	327.73	0.99	113.22	4705.55	1.01	132.22	3913.53	1.78	68.76	2913.97	1.92	74.77	2124.62	2.01	77.62	1.47
p1	327.75	0.99	113.95	4728.32	1.02	133.50	3920.68	1.78	68.48	2855.38	1.88	72.97	2127.70	2.01	77.28	1.47
p2	323.60	0.98	120.00	4698.77	1.01	141.30	3807.85	1.73	73.49	2840.10	1.87	79.30	2033.95	1.92	84.72	1.44
TILE_4	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	323.70	0.98	129.75	4712.25	1.02	128.59	3993.97	1.82	66.07	2936.95	1.93	73.28	2245.62	2.12	75.24	1.49
p1	327.77	0.99	126.25	4708.80	1.01	130.35	3963.00	1.80	68.01	2879.28	1.90	76.98	2110.32	1.99	78.79	1.47
p2	326.45	0.99	134.00	4691.70	1.01	137.71	3738.95	1.70	77.78	2632.05	1.73	86.78	1883.88	1.78	91.39	1.39
TILE_5	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	324.10	0.98	120.25	4706.62	1.01	131.05	3944.00	1.79	67.61	2826.85	1.86	73.88	2153.38	2.04	75.12	1.47

p1	330.45	1.00	124.00	4706.40	1.01	131.99	3944.18	1.79	67.34	2842.10	1.87	73.08	2057.88	1.94	74.92	1.46
p2	324.00	0.98	124.00	4692.40	1.01	140.95	3799.18	1.73	73.27	2921.70	1.92	79.32	2164.20	2.05	80.91	1.46
TILE_6	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	331.32	1.00	134.00	4703.20	1.01	129.76	4044.53	1.84	63.22	2974.88	1.96	65.97	2150.20	2.03	68.51	1.49
p1	324.12	0.98	134.00	4709.68	1.01	130.23	3975.28	1.81	65.98	3024.72	1.99	68.53	2203.05	2.08	71.17	1.49
p2	326.75	0.99	134.00	4698.25	1.01	137.57	3938.93	1.79	67.48	3024.53	1.99	68.58	2276.20	2.15	73.10	1.50
TILE_7	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.62	0.99	134.00	4710.27	1.01	131.28	4109.85	1.87	60.76	3003.18	1.98	64.72	2168.85	2.05	66.77	1.50
p1	325.90	0.99	139.00	4709.38	1.01	134.88	3984.22	1.81	65.95	3083.43	2.03	70.22	2284.95	2.16	72.07	1.51
p2	326.95	0.99	144.00	4699.35	1.01	140.40	3909.60	1.78	68.40	2836.62	1.87	73.52	2136.03	2.02	76.01	1.46
TILE_8	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	324.62	0.98	124.00	4703.68	1.01	132.63	3972.00	1.81	66.55	2969.68	1.96	71.33	2189.15	2.07	72.43	1.49
p1	326.32	0.99	124.00	4703.48	1.01	137.19	3936.03	1.79	68.10	2826.60	1.86	74.39	2158.28	2.04	74.86	1.47
p2	326.43	0.99	124.00	4698.10	1.01	148.97	3782.12	1.72	75.31	2675.12	1.76	83.51	1944.22	1.84	84.81	1.41
TILE_9	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	328.57	0.99	124.50	4687.30	1.01	135.45	3913.88	1.78	68.50	3026.72	1.99	73.27	2225.80	2.10	76.54	1.50
p1	323.93	0.98	124.00	4696.30	1.01	135.17	3954.45	1.80	67.00	2848.57	1.88	72.74	2139.78	2.02	75.70	1.47
p2	329.45	1.00	124.00	4691.25	1.01	144.84	3835.60	1.74	72.12	2761.68	1.82	77.90	1975.75	1.87	81.99	1.43
TILE_10	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	326.30	0.99	140.75	4725.88	1.02	126.30	4076.25	1.85	62.40	3073.12	2.02	66.13	2329.47	2.20	68.96	1.53
p1	324.68	0.98	134.00	4704.00	1.01	129.37	4023.28	1.83	64.19	2938.28	1.93	68.20	2102.90	1.99	71.64	1.48
p2	323.68	0.98	135.25	4708.90	1.01	134.66	3956.68	1.80	66.60	3004.05	1.98	69.78	2169.72	2.05	73.62	1.49
TILE_11	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	329.93	1.00	134.00	4719.40	1.02	126.45	4094.50	1.86	61.35	3086.43	2.03	65.58	2241.35	2.12	68.62	1.52
p1	325.73	0.99	134.00	4716.12	1.02	131.86	3988.72	1.81	65.45	2902.35	1.91	69.92	2068.10	1.95	74.14	1.47
p2	325.82	0.99	134.00	4708.52	1.01	138.63	3894.80	1.77	69.07	2922.05	1.92	74.06	2205.95	2.08	77.65	1.48
TILE_12	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	331.10	1.00	124.00	4704.07	1.01	129.57	4006.88	1.82	65.09	2989.28	1.97	70.63	2181.50	2.06	73.38	1.50
p1	326.55	0.99	124.00	4704.27	1.01	137.57	3933.10	1.79	67.92	2957.20	1.95	72.57	2152.72	2.03	75.31	1.48
p2	331.62	1.00	124.00	4692.80	1.01	146.12	3805.03	1.73	73.84	2724.60	1.79	81.19	2042.88	1.93	84.62	1.44
TILE_13	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.60	0.99	143.93	4713.57	1.02	132.50	4198.93	1.91	57.91	3087.28	2.03	65.32	2317.25	2.19	63.77	1.53
p1	326.48	0.99	144.00	4710.55	1.01	134.07	4031.75	1.83	64.01	2986.07	1.97	70.44	2298.20	2.17	71.44	1.51
p2	323.85	0.98	142.25	4694.12	1.01	138.22	3977.38	1.81	66.08	2848.75	1.88	72.83	2073.72	1.96	74.03	1.46
TILE_14	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	323.43	0.98	149.12	4711.15	1.02	132.09	4007.70	1.82	65.10	3148.90	2.07	67.72	2294.05	2.17	71.97	1.52

p1	329.40	1.00	144.00	4698.57	1.01	136.00	3965.05	1.80	66.75	2904.57	1.91	70.44	2157.38	2.04	74.80	1.48
p2	327.80	0.99	144.00	4704.32	1.01	143.67	3925.22	1.78	68.33	2907.45	1.91	70.02	2065.32	1.95	74.82	1.46
TILE_15	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	324.02	0.98	144.00	4700.70	1.01	132.00	4046.97	1.84	63.27	3105.47	2.05	64.80	2351.82	2.22	67.79	1.53
p1	328.25	0.99	144.00	4708.27	1.01	135.19	3973.35	1.81	66.28	2889.05	1.90	70.79	2061.88	1.95	74.58	1.47
p2	324.50	0.98	144.00	4687.43	1.01	140.19	3878.12	1.76	69.86	2936.20	1.93	73.28	2122.68	2.01	76.83	1.47
p0_score:	24.03															
p1_score:	23.68															
p2_score:	23.37															

Infrastructure_Operations_Scores:	vmotion	svmotion	deploy
Completed_Ops_PerHour	18.50	11.00	4.50
Avg_Seconds_To_Complete	15.20	24.49	318.51
Failures	0.00	0.00	1.00
Ratio	1.16	1.22	1.12
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	23.68	
Unreviewed_VMmark2_Infrastructure_Score	1.17	
Unreviewed_VMmark2_Score	19.18	

Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 5.1.0 U2 Build 1483097/ 01-16-2014
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server 5.1.0 Build 799731 / 9-10-2012
Supplemental Software	None
Servers	

Quantity	2
Server Manufacturer and Model	Cisco UCS B260 M4
Processor Vendor and Model	Intel Xeon E7-4890 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	EXM4-1.2.2.1.12.012920142034
Memory Size (in GB, Number of DIMMs)	256GB, 32
Memory Type and Speed	8GB DIMMs 2Rx4 DDR3-1600MHz Registered ECC
Disk Subsystem Type	FC SAN
Number of Disk Controllers	1
Disk Controller Vendors and Models	LSI RAID SAS-3 3008M-8i
Number of Host Bus Adapters	1 dual-port (on the Virtual Interface Card)
Host Bus Adapter Vendors and Models	Cisco UCS VIC 1280 Virtual Interface Card
Number of Network Controllers	1 4-port (on the Virtual Interface Card)
Network Controller Vendors and Models	Cisco UCS VIC 1280 Virtual Interface Card
Other Hardware	None
Other Software	None
Hardware Availability Date (MM-DD-YYYY)	05/19/2014
Software Availability Date (MM-DD-YYYY)	01/16/2014
Network	
Network Switch Vendors and Models	(2) Cisco UCS 6248 UP, (1) Cisco Nexus 5548 UP
Network Speed	40Gbps, 10Gbps
Storage	
Array Vendors, Models, and Firmware Versions	4 x Cisco UCS Invicta C3124SA 6TB, RR5.0
Fibre Channel Switch Vendors and Models	Cisco Nexus 5548 UP

Disk Space Used	4384GB
Array Cache Size	N/A
Total Number of Physical Disks Used	98 SSDs (1 per SUT OS, 24 per Invicta)
Total Number of Enclosures/Pods/Shelves Used	4
Number of Physical Disks Used per Enclosure/Pod/Shelf	24
Total Number of Storage Groups Used	1
Number of LUNs Used	8
LUN Size and Number of Disks Per LUN	<p>All LUNs spread across 24 SSDs within each Invicta</p> <ul style="list-style-type: none"> • 1 LUN at 150GB on first Invicta (Source) • 1 LUN at 50GB on first Invicta (Target) • 1 LUN at 800GB on first Invicta (DS2Web) • 1 LUN at 400GB on first Invicta (OlioDB) • 1 LUN at 1800GB on first Invicta (OlioWeb) • 1 LUN at 1800GB on second Invicta (Mailserver) • 1 LUN at 600GB on third Invicta (DS2DBA) • 1 LUN at 600GB on fourth Invicta (DS2DBB)
RAID Type	RAID6
Number of Members per RAID Set	<p>Invicta 1: 5 Invicta 2: 1 Invicta 3: 1 Invicta 4: 1</p>
Disk Vendors, Models, and Speeds	2 x STEC 100GB SSDs, 96 x 256GB SSDs

Datacenter Management Server

System Model	Cisco UCS C220 M3
Processor Vendor and Model	Intel Xeon E5-2643
Processor Speed (GHz)	3.30
Total Sockets/Total Cores/Total Threads	2 Sockets / 8 Cores / 16 Threads
Memory	128GB
Network Controller(s) Vendors and Models	Intel 82599EB 10Gigabit 2-port
Operating System, Version, Bitness, and Service Pack	VMware ESXi 5.1.0 Build 799733 (Windows 2008 R2 Enterprise 64-bit for VM)
Other Hardware	None

Other Software	None
Clients	
Total Number of Clients / Total Physical Clients / Total Virtual Client Hosts	17 / 1 / 3
System Model(s)	<ul style="list-style-type: none"> • ESXi Virtual Client Hosts: UCS B200 M3 • Prime Client: Cisco UCS C220 M3
Processor Vendor(s) and Model(s)	<ul style="list-style-type: none"> • Intel Xeon E5-2697v2 (virtual client hosts) • Intel Xeon E5-2650v2 (prime client)
Processor Speed(s) (GHz)	<ul style="list-style-type: none"> • 2.70GHz (virtual client hosts) • 2.60GHz (prime client)
Total Sockets/Total Cores/Total Threads	<ul style="list-style-type: none"> • 2 Sockets / 24 Cores / 48 Threads (virtual client hosts) • 2 Sockets / 16 Cores / 16 Threads (prime client)
Memory per Physical Client	<ul style="list-style-type: none"> • 256GB (virtual client hosts) • 128GB (prime client)
Network Controller(s) Vendors and Models	<ul style="list-style-type: none"> • Cisco UCS VIC 1240 Virtual Interface Card (virtual client hosts) • Intel 82598EB 10Gigabit 2-port (prime client)
Operating System, Version, Bitness, and Service Pack	<ul style="list-style-type: none"> • Microsoft Windows Server 2008 R2 Enterprise 64-bit (prime client) • VMware ESXi 5.1 U1 Build 1065491 (virtual client hosts) • Microsoft Windows Server 2008 R2 Enterprise 64-bit (virtual clients)
Number of Virtual Clients	16
Number of vCPUs Per Virtual Client	4
Number of vMem (GB) Per Virtual Client	4GB
Virtual Client Networking Notes	All Client VMs connected to default vSwitch
Virtual Client Storage Notes	All Client VMs stored on Cisco UCS Invicta C3124SA 3TB
Other Hardware	None
Other Software	None

Notes for Workload

Virtualization Software Notes

- Virtual hardware for all VMs was set to V7
- All VMs running VMware tools version 8305
- 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 except Standby14 and Standby15 (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
- Installed drivers: scsi-megaraid-sas-6.602.53.00, net-enic-2.1.2.42, scsi-fnic-1.6.0.5
- /adv/Power/CpuPolicy = "static" (default balanced)
- /adv/Irq/IRQRebalancePeriod = "20000" (default 50)
- /adv/Irq/BestVcpuRouting = "1" (default 0)
- /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/Mem/VMOverheadGrowthLimit = "0" (default 4294967295)
- /adv/Misc/TimerMaxHardPeriod = "4000" (default 100000)
- /adv/Misc/TimerMinHardPeriod = "2000" (default 30)
- /adv/Cpu/CoschedCrossCall = "0" (default 1)
- /adv/Cpu/HTWholeCoreThreshold = "0" (default 200)
- /adv/Cpu/CreditAgePeriod = "533" (default 3000)
- /adv/Disk/SchedNumReqOutstanding = "256" (default 32)
- /adv/Numa/SwapLocalityEnable = "0" (default 1)
- /adv/Numa/LTermFairnessInterval = "0" (default 5)
- /adv/Numa/SwapLoadEnable = "0" (default 1)
- /adv/Numa/LargeInterleave = "0" (default 1)
- /adv/Numa/SwapInterval = "1" (default 3)
- /adv/Numa/MonMigEnable = "0" (default 1)
- /adv/Numa/MigImbalanceThreshold = "57" (default 10)
- /adv/Numa/PreferHT = "1" (default 0)
- /adv/Numa/RebalancePeriod = "60000" (default 2000)
- /adv/Mem/SamplePeriod = "0" (default 60)
- /adv/Mem/BalancePeriod = "0" (default 15)
- /adv/Mem/ShareScanGHz = "0" (default 4)

Server Notes

- Intel Turbo Boost enabled up to 3.4GHz (default Enabled)
- 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 3 vSwitches configured, two at 40Gbps and one with two 10 Gbps adapters

- vSwitch0 on vmnic0 (40Gbps) for Service Console, Mailserver, Standby, deploy VMs, and for all Olio VMs
- vSwitch1 on vmnic1 (40Gbps) for all DS2 VMs
- vSwitch2 on vmnic2 & vmnic3 (2 x 10Gbps) for VMkernel traffic (MTU set to 9000)
 - vSwitch2 had two VMkernel ports configured
 - VMkernel A had vmnic2 as an active adapter and vmnic3 as a standby adapter

- VMkernel B had vmnic3 as an active adapter and vmnic2 as a standby adapter

Storage Notes

- VMware ESXi was installed on a single SSD as locally attached storage using LSI RAID SAS-3 3008M-8i controller.
- There were four Cisco UCS Invicta C3124SA 6TB Arrays
- On the first Invicta, there were 5 LUNs spread across the entire 6TB of storage:
 - There was 1 LUN at 150GB used as the Standby and Deploy Source LUN.
 - There was 1 LUN at 50GB used as the Standby and Deploy Target LUN.
 - There was 1 LUN at 800GB, containing the DS2Web VMs.
 - There was 1 LUN at 400GB, containing the OlioDB VMs.
 - There was 1 LUN at 1800GB, containing the OlioWeb VMs.
- On the second Invicta, there was 1 LUN spread across the entire 6TB of storage:
 - There was 1 LUN at 1800GB, containing the Mailserver VMs.
- On the third Invicta, there was 1 LUN spread across the entire 6TB of storage:
 - There was 1 LUN at 600GB, containing the even DS2DB VMs.
- On the fourth Invicta, there was 1 LUN spread across the entire 6TB of storage:
 - There was 1 LUN at 600GB, containing the odd DS2DB 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 Mailserver had hotfix rollup 2775511 applied
- All storage controllers for the virtual machines were set to Paravirtual (default LSI Logic SAS)
- All SLES 11 VMs were updated to SP2
- The filesystems of all Linux and Standby VMs were aligned to a 4K boundary

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 2008 R2 Enterprise 64-bit and VMware vSphere PowerCLI 5.1.0.4977 build 793510.
- 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, 3, 6, 9, 12, and 15 were hosted on physical client1.
- Virtual clients 1, 4, 7, 10, and 13 were hosted on physical client2.
- Virtual clients 2, 5, 8, 11, and 14 were hosted on physical client3.
- ESXi clients run with Hyper-Threading and Turbo Boost enabled. ESXi configuration settings unchanged from default.
- The SPP Notification Service and Software Protection Service were only running on clients 13, 14, and 15.

Other Notes

- Prime client run on a dedicated, non-client machine. Hyper-Threading was disabled for the Prime Client.
 - STAF Communication over SSL was disabled on all VMs and clients. (default enabled)
 - RMQ_MinInitDelay = 120 in VMMARK2.CONFIG
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This is a full disclosure report for a VMmark benchmark result. All published VMmark results must be from fully-compliant tests for which a full disclosure report is publicly available.

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