

VMmark® 3.1.1 Results		
Server Vendor & Model: Huawei FusionServer Pro 2488H V6 Storage Vendor & Model: VMware vSAN 7.0.0 Hypervisor: VMware ESXi 7.0.0 Build 15843807 Datacenter Management Software: VMware vCenter 7.0.0 Build 15952498		Non-Compliant
Number of Hosts: 4	Uniform Hosts [yes/no]: yes	Total sockets/cores/threads in test: 16/448/896
Tested By: Huawei		Test Date: 12-27-2020
Performance Section Performance	Configuration Section Configuration	Notes Section Notes for Workload

It has been determined that this result was not in compliance with the VMmark Run and Reporting Rules. Specifically, this result used an unsupported configuration and therefore was not in compliance with section 3.2.8 of the Run and Reporting Rules.

Performance -- all data has been removed = NC

	weathervane			weathervaneE			dvdstoreA			dvdstoreB			dvdstoreC			
TILE_0	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_1	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_2	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_3	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_4	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_5	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(nRT MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM

p0																
p1																
p2																
TILE_6	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_7	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_8	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_9	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_10	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_11	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_12	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_13	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_14	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM

p0																
p1																
p2																
TILE_15	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_16	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_17	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_18	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_19	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_20	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_21	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_22	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0																
p1																
p2																
TILE_23	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 7.0.0 Build 15843807 / 04-02-2020
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter 7.0.0 Build 15952498 / 04-02-2020
Supplemental Software	None
Servers	
Number of Servers in System Under Test (all subsequent fields in this section are per server)	4
Server Manufacturer and Model	Huawei FusionServer Pro 2488H V6
Processor Vendor and Model	Intel(R) Xeon(R) Platinum 8380H CPU @ 2.90GHz
Processor Speed (GHz) / Turbo Boost Speed (GHz)	2.9 / 4.3
Total Sockets/Total Cores/Total Threads	4 Sockets / 112 Cores / 224 Threads
Primary CPU Cache	32KB I+32KB D on chip per core
Secondary CPU Cache	1MB I+D on chip per core
Other CPU Cache	38.5MB I+D on chip per chip
BIOS Version	0.39 (U19)
Memory Size (in GB, Number of DIMMs)	1536GB,24*64GB
Memory Type and Speed	64GB,3200 MT/s,2Rank(4G*4bit)
Disk Subsystem Type	VMware vSAN ,NFS
Number of Disk Controllers	1
Disk Controller Vendors and Models	LSI SAS3004
Total Number of Physical Disks for Hypervisor	2
Disk Vendors, Models, Capacities, and Speeds	SSSTC ER2-GD480,480GB,6Gb/S
Number of Host Bus Adapters	0
Host Bus Adapter Vendors and Models	none

Number of Network Controllers	2
Network Controller Vendors and Models	Huawei SC382 2*25GE, Huawei SP382 2*25GE
Other Hardware	none
Other Software	none
Hardware Availability Date (MM-DD-YYYY)	06-19-2020
BIOS Availability Date (MM-DD-YYYY)	11-20-2020
Software Availability Date (MM-DD-YYYY)	04-02-2020
Network	
Network Switch Vendors and Models	Huawei CE6865-48S8CQ-EI*2
Network Speed	3*25GE
Primary Storage	
Storage Category	vSAN
Storage Vendors, Models, and Firmware Versions	4*Huawei FusionServer Pro 2488H V6
Storage Configuration Summary	VMware vSAN(caching tier):HUAWEI ES3610P V5 1.6T (HWE52P431T6M005N) VMware vSAN(capacity tier):HUAWEI ES3510P V5 8T (HWE52P438T0L005N)
Datacenter Management Server	
System Model	Huawei FusionServer 2288H V5
Processor Vendor and Model	Intel(R) Xeon(R) Gold 5118 CPU @ 2.30GHz
Processor Speed (GHz)	2.3
Total Sockets/Total Cores/Total Threads	2 Sockets / 24 Cores / 48 Threads
Memory Size (in GB, Number of DIMMs)	192GB,12*16GB
Network Controller(s) Vendors and Models	Huawei LOM X722 2*10GE+2*GE Huawei SM380 2*25GE SFP+
Operating System, Version, Bitness, and Service Pack	VMware ESXi 7.0.0 Build 15843807
Virtual Center VM Number of vCPUs	8
Virtual Center VM Virtual Memory (in GB)	28

Virtual Center VM Operating System, Version, Bitness, and Service Pack	VMware vCenter 7.0.0 Build 15952498					
Other Hardware	none					
Other Software	none					
Clients						
Total Number of Virtual Clients / Virtual Client Hosts	29 / 3					
System Model(s)	Huawei FusionServer 2288H V5					
Processor Vendor(s) and Model(s)	Intel(R) Xeon(R) Platinum 8280 CPU @ 2.70GHz					
Processor Speed(s) (GHz)	2.7					
Total Sockets/Total Cores/Total Threads	2 Sockets / 56Cores /112 Threads					
Memory per Virtual Client Host	384GB,12*32GB					
Network Controller(s) Vendors and Models	Huawei LOM X722 2*10GE+2*GE, Huawei SM380 2*25GE SFP+					
Virtual Client Networking Notes	All management traffic and workload traffic running on one vmnic5 and vSAN traffic running on vmnic4.					
Virtual Client Storage Notes	All clients stored on vSAN datastore.					
Other Hardware	none					
Other Software	VMware ESXi 7.0.0 Build 15843807					
Security Mitigations						
Vulnerability	CVE	Exploit Name	Public Vulnerability Name	Mitigated		
				Server Firmware	ESXi	Guest OS
Spectre	2017-5753	Variant 1	Bounds Check Bypass	N/A	Yes	Yes
Spectre	2017-5715	Variant 2	Branch Target Injection	Yes	Yes	Yes
Meltdown	2017-5754	Variant 3	Rogue Data Cache Load	N/A	Yes	Yes
Spectre-NG	2018-3640	Variant 3a	Rogue System Register Read	Yes	N/A	N/A
Spectre-NG	2018-3639	Variant 4	Speculative Store Bypass	N/A	Yes	Yes
Foreshadow	2018-3615	Variant 5	L1 Terminal Fault - SGX	N/A	N/A	N/A
Foreshadow-NG	2018-3620	Variant 5	L1 Terminal Fault - OS	N/A	N/A	Yes
Foreshadow-NG	2018-3646	Variant 5	L1 Terminal Fault - VMM	N/A	Yes	N/A

Notes for Workload

Template deployed with disk type: Thick

Virtualization Software Notes

- PrimeClient VM configured with a 500GB sized second disk and a 500GB sized third disk for scratch.
- Cluster DRS Automation level set to Fully Automated.
- DRS Migration threshold set to level 2.
- CPU shares of AuctionDB*, ElasticDB*, DS3DB* and PrimeClient were set to "high" (default: normal).
- Logging was disabled for all VMs (default : enabled).
- Logical CPU configuration changed for all multi-cpu VMs to 1 socket with multiple cores (default: Single core per socket).
- VMkernel.Boot.hyperthreadingMitigation = true set on SUT ESXi hosts (default: false).

Server Notes

- NUMA enabled(default).
- Intel Hyper Threading enabled(default).
- Power Management Setting:Performance.
- VMX enabled(default).
- SATA Controller disable.
- MONITOR/MWAIT enabled.

• ESXi settings of SUT hosts:

- o CPU performance policy = High Performance (default: balanced)
- o /adv/Irq/BestVcpuRouting = 1 (default : 0)
- o /adv/Irq/IRQRebalancePeriod = 20000 (default : 50)
- o /adv/Misc/TimerMaxHardPeriod = 4000 (default : 500000)
- o /adv/Net/MaxNetifTxQueueLen = 1000 (default : 2000)
- o /adv/Mem/ShareScanGHz = 0 (default : 4)
- o /adv/Mem/CtlMaxPercent = 0 (default : 65)
- o /adv/Cpu/CreditAgePeriod = 1000 (default : 3000)
- o /adv/Cpu/HTWholeCoreThreshold = 0 (default : 800)
- o /adv/Cpu/CoschedCrossCall = 0 (default : 1)
- o /adv/Numa/RebalancePeriod = 60000 (default : 2000)
- o /adv/Numa/SwapInterval = 1 (default : 3)
- o /adv/Numa/MigImbalanceThreshold = 57 (default : 10)
- o /adv/Numa/SwapLoadEnable = 0 (default : 1)
- o /adv/Numa/SwapLocalityEnable = 0 (default : 1)
- o /adv/Numa/MonMigEnable = 0 (default : 1)
- o /adv/Numa/PageMigEnable = 0 (default : 1)
- o /adv/Numa/LTermFairnessInterval = 0 (default : 5)
- o /adv/Numa/LargeInterleave = 0 (default : 1)
- o /adv/Numa/PreferHT = 1 (default : 0)
- o /adv/VMFS3/HardwareAcceleratedLocking = 0 (default : 1)
- o /adv/Virsto/DedupSpaceReclaim = 2 (default : 0)
- o /adv/DataMover/HardwareAcceleratedMove = 0 (default : 1)
- o /adv/DataMover/HardwareAcceleratedInit = 0 (default : 1)
- o /adv/UserVars/HostClientSessionTimeout = 7200 (default : 900)
- o /adv/UserVars/HostClientCEIPOptIn = 1 (default : 0)

- o /vmkernel/hyperthreadingMitigation = true (default : false)

Networking Notes

- MTU was set to 9000 for vmnic2,vmnic3 and vmnic5, and MTU was set to 9000 for VM Network,vSAN and vMotion vSwitches.
- Three Standard vSwitches were set up: vSwitch0, vSAN and vMotion.
- These three switches were backed by vmnic3,vmnic2 and vmnic5 respectively.
- vSwitch0 contains the following portgroups: VM Network,Management Network.
- vSAN contains the following portgroups: vSAN.
- vMotion contains the following portgroups: vMotion.
- All virtual machines used VM Network for traffic.
- All vSAN traffic is only run on vSAN on its only dedicated vSwitch.

Storage Notes

- All client server OS installed on a RAID1 of 2 m.2 drives via SSSTC ER2-GD480.
- All SUT hosts OS installed on a RAID1 of 2 m.2 drives via SSSTC ER2-GD480.

- **NFS Folder configuration**

- o All folders are backed by the same NFS server on a single striped zfs array, mounted storage device detailed in the "Secondary Storage section."
- o deploy1 datastore -> /data/deploy1
- o deploy2 datastore -> /data/deploy2
- o vmotion1 datastore -> /data/vmotion1
- o vmotion2 datastore -> /data/vmotion2

- **System under Test configuration**

- o 4 x Intel(R) Xeon(R) Platinum 8380H CPU @ 2.90GHz
- o 24 x 64GB,3200 MT/s,2Rank(4G*4bit)
- o 2 x HUAWEI ES3610P V5 1.6T (HWE52P431T6M005N) NVMe
- o 6 x HUAWEI ES3510P V5 8T (HWE52P438T0L005N) NVMe
- o Huawei SC382 2*25GE
- o Huawei SP382 2*25GE
- o 2x SSSTC ER2-GD480
- o LSI SAS3004

- **Software configuration**

- o All Flash vSAN.
- o Two diskgroups per host.
- o Each disk group contains 1 x HUAWEI ES3610P V5 1.6T (HWE52P431T6M005N) for caching and 3 x HUAWEI ES3510P V5 8T (HWE52P438T0L005N) for capacity.
- o vSAN Default Storage Policy used.

- **Virtual Machine LUN Distribution:**

- o vsanDatastore contains the following workloads:

- ♦ AuctionAppA*

- ◆ AuctionAppB*
- ◆ AuctionDB*
- ◆ AuctionLB*
- ◆ AuctionMSQ*
- ◆ AuctionNoSQL*
- ◆ AuctionWebA*
- ◆ AuctionWebB*
- ◆ DS3DB*
- ◆ DS3WebA*
- ◆ DS3WebB*
- ◆ DS3WebC*
- ◆ ElasticAppA*
- ◆ ElasticAppB*
- ◆ ElasticDB*
- ◆ ElasticLB*
- ◆ ElasticWebA*
- ◆ ElasticWebB*
- ◆ Standby*

• **Secondary Shared Storage Device:**

o Hardware: Huawei FusionServer 2288H V5

- ◆ 2 x Intel(R) Xeon(R) Platinum 8176 CPU @ 2.10GHz
- ◆ 12 x Hynix 32GB 2666 DIMM
- ◆ Huawei LOM X722 2*10GE+2*GE
- ◆ Huawei SM380 2*25GE SFP+
- ◆ 12 x HUAWEI ES3610P 1.6T V5 (HWE52P431T6M005N) NVMe SSD's
- ◆ 2 x SSSTC ER2-GD480
- ◆ LSI SAS3004

o Firmware:

- ◆ BIOS - 7.79 (U47)
- ◆ BMC - 5.12 (U4282)
- ◆ X722 - 3.33
- ◆ SM380 - 14.22.1002
- ◆ HUAWEI ES3610P V5 1.6T (HWE52P431T6M005N) - 3248
- ◆ SSSTC ER2-GD480 - E4N6404

o Software:

- ◆ CentOS-7-x86_64-DVD-1810/ Updates as of 06/20/2019

o Configuration:

- ◆ Disks installed into Bays 0,1,2,3,4,5,6,7,8,9,10,11
- ◆ All 12 disks mount to /data
- ◆ Huawei SM380(eno4 and eno5) set to MTU 9000
- ◆ ufw disabled

o Virtual Machine LUN Distribution:

- ◆ vmotion1 contains the following workload: vmotion1
- ◆ vmotion2 contains the following workload: vmotion2
- ◆ deploy1 contains the following workload: deploy1
- ◆ deploy2 contains the following workload: deploy2

Datacenter Management Server Notes

The datacenter management server was hosted on a seperate vCenter Server Appliance from the Clients and SUT.

Operating System Notes

- none

Software Notes

- none

Client Notes

- MTU was set to 9000 for vmnic4 and vmnic5, and MTU was set to 9000 for VM Network,vSAN vSwitches.
- Cluster DRS Automation level set to Fully Automated.
- DRS Migration threshold set to level 2.

• ESXi settings of Client hosts:

- o CPU performance policy = High Performance (default: balanced)
- o /adv/Irq/BestVcpuRouting = 1 (default : 0)
- o /adv/Irq/IRQRebalancePeriod = 20000 (default : 50)
- o /adv/Misc/TimerMaxHardPeriod = 4000 (default : 500000)
- o /adv/Net/MaxNetifTxQueueLen = 1000 (default : 2000)
- o /adv/Mem/ShareScanGHz = 0 (default : 4)
- o /adv/Mem/CtlMaxPercent = 0 (default : 65)
- o /adv/Cpu/CreditAgePeriod = 1000 (default : 3000)
- o /adv/Cpu/HTWholeCoreThreshold = 0 (default : 800)
- o /adv/Cpu/CoschedCrossCall = 0 (default : 1)
- o /adv/Numa/RebalancePeriod = 60000 (default : 2000)
- o /adv/Numa/SwapInterval = 1 (default : 3)
- o /adv/Numa/MigImbalanceThreshold = 57 (default : 10)
- o /adv/Numa/SwapLoadEnable = 0 (default : 1)
- o /adv/Numa/SwapLocalityEnable = 0 (default : 1)
- o /adv/Numa/MonMigEnable = 0 (default : 1)
- o /adv/Numa/PageMigEnable = 0 (default : 1)
- o /adv/Numa/LTermFairnessInterval = 0 (default : 5)
- o /adv/Numa/LargeInterleave = 0 (default : 1)
- o /adv/Numa/PreferHT = 1 (default : 0)
- o /adv/VMFS3/HardwareAcceleratedLocking = 0 (default : 1)
- o /adv/Virsto/DedupSpaceReclaim = 2 (default : 0)
- o /adv/DataMover/HardwareAcceleratedMove = 0 (default : 1)
- o /adv/DataMover/HardwareAcceleratedInit = 0 (default : 1)

- o /adv/UserVars/HostClientSessionTimeout = 7200 (default : 900)
- o /adv/UserVars/HostClientCEIPOptIn = 1 (default : 0)

• **vSAN configuration**

- o All Flash vSAN.
- o One diskgroup per host.
- o Each disk group contains 1 x ES3600P V3 3.2T (HWE32P43032M000N) for caching and 3 x ES3600P V3 3.2T (HWE32P43032M000N) for capacity.
- o vSAN Default Storage Policy used.

o **vsanDatastore contains the following Client VMs:**

- ◆ Client0
- ◆ Client1
- ◆ Client2
- ◆ Client3
- ◆ Client4
- ◆ Client5
- ◆ Client6
- ◆ Client7
- ◆ Client8
- ◆ Client9
- ◆ Client10
- ◆ Client11
- ◆ Client12
- ◆ Client13
- ◆ Client14
- ◆ Client15
- ◆ Client16
- ◆ Client17
- ◆ Client18
- ◆ Client19
- ◆ Client20
- ◆ Client21
- ◆ Client22
- ◆ Client23
- ◆ Client24
- ◆ Client25
- ◆ Client26
- ◆ Client27
- ◆ PrimeClient

Other Notes

- VMmark3.properties - DebugLevel = 3
 - VMmark3.properties - VCscratchDir = /root/VMmark3/results/scratch
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