

# VMmark<sup>®</sup> 4.0.1 Disclosure

**Server Vendor & Model:** Supermicro AS -2126HS-TN  
**Storage Vendor & Model:** PureStorage FlashArray FA-X90R2  
**Hypervisor:** VMware ESXi 8.0 Update 3, Build 24022510  
**Server Management Software:** VMware vCenter Server 8.0 Update 3, Build 24022515

**VMmark 4.0.1 Score =  
1.74 @ 2 Tiles**

Number of Hosts: 2	Uniform Hosts: yes	Total sockets/cores/threads in test: 4/128/256
Tested By: Supermicro	Test Date: 09-26-2024	SUT Availability Date: 01-10-2025
<b>Performance Section</b> <a href="#">Performance</a>	<b>Configuration Section</b> <a href="#">Configuration</a>	<b>Notes Section</b> <a href="#">Notes for Workload</a>
<b>Virtual Machines Section</b> <a href="#">Virtual Machines</a>		

## Performance

TILE_0_Scores	WVAuctionVM	WVAuctionK8S	DVDStoreA	DVDStoreB	DVDStoreC	NoSQLBenchA	NoSQLBenchB	NoSQLBenchC	SocialNetwork	Standby	
p0	14089.41	9249.53	2805.47	2017.95	1506.55	52737.82	52776.08	52772.59	71.42	1.00	
p1	14083.81	9321.80	2759.50	2038.25	1409.85	51307.15	51307.47	51306.33	71.54	1.00	
p2	14049.82	9226.22	2813.53	1934.50	1413.55	50012.85	50013.51	50013.22	71.29	1.00	
TILE_0_Ratios	WVAuctionVM	WVAuctionK8S	DVDStoreA	DVDStoreB	DVDStoreC	NoSQLBenchA	NoSQLBenchB	NoSQLBenchC	SocialNetwork	Standby	Geo.Mean
p0	1.01	1.01	0.97	0.94	0.98	0.93	0.93	0.93	0.99	1.00	0.97
p1	1.01	1.01	0.95	0.95	0.92	0.91	0.91	0.91	0.99	1.00	0.95
p2	1.00	1.00	0.97	0.90	0.92	0.89	0.89	0.89	0.99	1.00	0.94
TILE_0_QoS	WVAuctionVM%	WVAuctionK8S%	DVDStoreA	DVDStoreB	DVDStoreC	NoSQLBenchA	NoSQLBenchB	NoSQLBenchC			
p0	0.71   0.14	0.38   0.00	497.01	570.35	615.92	0.64	0.64	0.64			
p1	0.76   0.13	0.40   0.01	530.01	561.42	660.46	0.66	0.67	0.67			
p2	0.83   0.15	0.40   0.00	496.43	584.57	657.79	0.70	0.70	0.71			
TILE_1_Scores	WVAuctionVM	WVAuctionK8S	DVDStoreA	DVDStoreB	DVDStoreC	NoSQLBenchA	NoSQLBenchB	NoSQLBenchC	SocialNetwork	Standby	
p0	14118.65	9236.18	2579.90	1790.40	1287.55	51259.99	51265.77	51265.82	72.05	1.00	
p1	14071.72	9228.38	2616.28	1908.28	1342.40	50011.21	50010.88	50011.03	72.05	1.00	
p2	14081.95	9231.98	2615.90	1791.78	1284.00	48819.19	48819.16	48819.14	72.03	1.00	
TILE_1_Ratios	WVAuctionVM	WVAuctionK8S	DVDStoreA	DVDStoreB	DVDStoreC	NoSQLBenchA	NoSQLBenchB	NoSQLBenchC	SocialNetwork	Standby	Geo.Mean
p0	1.01	1.00	0.89	0.83	0.84	0.91	0.91	0.91	1.00	1.00	0.92
p1	1.01	1.00	0.90	0.89	0.88	0.89	0.89	0.89	1.00	1.00	0.92
p2	1.01	1.00	0.90	0.83	0.84	0.86	0.86	0.86	1.00	1.00	0.91
TILE_1_QoS	WVAuctionVM%	WVAuctionK8S%	DVDStoreA	DVDStoreB	DVDStoreC	NoSQLBenchA	NoSQLBenchB	NoSQLBenchC			
p0	0.64   0.08	0.36   0.00	681.57	766.57	864.69	0.65	0.65	0.65			

<b>p1</b>	0.71   0.09	0.39   0.00	653.30	768.38	872.93	0.68	0.68	0.68
<b>p2</b>	0.69   0.07	0.38   0.00	652.98	748.24	865.83	0.70	0.70	0.71
<b>p0_score:</b>	1.89							
<b>p1_score:</b>	1.87							
<b>p2_score:</b>	1.84							

<b>Infrastructure_Operations_Scores:</b>	<b>vMotion</b>	<b>SVMotion</b>	<b>XVMotion</b>	<b>Deploy</b>
<b>Completed_Ops_PerHour</b>	29.50	17.00	17.00	18.50
<b>Avg_Seconds_To_Complete</b>	1.07	2.06	2.65	154.57
<b>Failures</b>	0.00	0.00	0.00	0.00
<b>Ratio</b>	1.00	1.31	1.31	1.28
<b>Number_Of_Threads</b>	1	1	1	1
<b>Summary</b>		<b>Run_Is_Compliant</b>		<b>Median_Phase(p1)</b>
<b>Unreviewed_VMmark4_Applications_Score</b>		1.87		
<b>Unreviewed_VMmark4_Infrastructure_Score</b>		1.22		
<b>Unreviewed_VMmark4_Score</b>		1.74 @ 2 Tiles		

## Configuration

<b>Virtualization Software</b>	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 8.0 Update 3, Build 24022510 / 06-25-2024
Server Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server 8.0 Update 3, Build 24022515 / 06-25-2024
Supplemental Software	None
<b>Servers</b>	
Number of Servers in System Under Test (all subsequent fields in this section are per Server)	2
Server Manufacturer and Model	Supermicro AS -2126HS-TN
Processor Vendor and Model	AMD EPYC 9355
Processor Speed (GHz) / Turbo Boost Speed (GHz)	3.55 GHz / 4.4 GHz

Total Sockets/Total Cores/Total Threads	2 Sockets / 64 Cores / 128 Threads						
NUMA Nodes	2						
BIOS Version	1.1						
Memory Size (in GB, Number of DIMMs)	Physical Memory (BIOS): 1536 GB Physical Memory (ESXi): 1536 GB Number of DIMMs: 24						
Memory Type and Speed	<b>Location</b>	<b>Size</b>	<b>Speed</b>	<b>Max Speed</b>	<b>Rank</b>	<b>Type</b>	<b>Detail</b>
	P1-DIMMA1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P1-DIMMB1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P1-DIMMC1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P1-DIMMD1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P1-DIMME1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P1-DIMMF1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P1-DIMMG1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P1-DIMMH1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P1-DIMMI1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P1-DIMMJ1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P1-DIMMK1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P1-DIMML1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P2-DIMMA1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P2-DIMMB1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P2-DIMMC1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P2-DIMMD1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P2-DIMME1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P2-DIMMF1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P2-DIMMG1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P2-DIMMH1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P2-DIMMI1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P2-DIMMJ1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
	P2-DIMMK1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered
P2-DIMML1	64 GB	6000 MT/s	6400 MT/s	2	DDR5	Synchronous, Registered	
Number of SAS Devices	0						
SAS Device Vendors and Models	None						
Number of Virtual Host Bus	4						

Adapters							
Virtual Host Bus Adapter Vendors and Models	<b>HBA</b>	<b>Model</b>	<b>Speed</b>	<b>Driver</b>	<b>Firmware</b>		
	vmhba0	Emulex LPe35002-M2 2-Port 32Gb Fibre Channel Adapter	16 Gbps	lpfc	14.0.505.12		
	vmhba1	Emulex LPe35002-M2 2-Port 32Gb Fibre Channel Adapter	16 Gbps	lpfc	14.0.505.12		
	vmhba64	Emulex LPe35002-M2 2-Port 32Gb Fibre Channel Adapter	16 Gbps	lpfc	14.0.505.12		
	vmhba65	Emulex LPe35002-M2 2-Port 32Gb Fibre Channel Adapter	16 Gbps	lpfc	14.0.505.12		
Other Hardware	2x of 2KW Redundant Powersupply; PWS-2K07A-1R Servers were air-cooled.						
Other Software	None						
BIOS Availability Date (MM-DD-YYYY)	01-10-2025						
Hardware Availability Date (MM-DD-YYYY)	01-10-2025						
Software Availability Date (MM-DD-YYYY)	06-25-2024						
<b>Network</b>							
Number of Virtual Network Controllers	2						
Virtual Network Controllers, Speeds, MTUs, Firmware, Drivers, Vendors, and Models	<b>Device</b>	<b>Speed</b>	<b>Duplex</b>	<b>MTU</b>	<b>Firmware</b>	<b>Driver</b>	<b>Description</b>
	vmnic2	25 Gbps	Full	9000	8.0.0.1015 rx0 tx0	sfvmk	Solarflare XtremeScale X2522 25G Network Adapter
	vmnic3	25 Gbps	Full	9000	8.0.0.1015 rx0 tx0	sfvmk	Solarflare XtremeScale X2522 25G Network Adapter
Number of Virtual Switches	2						
Virtual Switches, Ports, Port Groups, MTUs, and Uplinks	<b>Switch</b>	<b>Ports</b>	<b>Configured Ports</b>	<b>MTU</b>	<b>Uplinks</b>		
	vSwitch0	9216	128	9000	vmnic2		
	vSwitch1	9216	128	9000	vmnic3		
	<b>Switch</b>	<b>Port Group</b>	<b>VLAN ID</b>	<b>Uplinks</b>			
	vSwitch0	Management Network	0	vmnic2			
	vSwitch1	VM Network	0	vmnic3			
VMkernel Network Adapters, Port Groups, MTUs, TCP/IP Stacks, and Services	<b>Device</b>	<b>Port Group/DVPort</b>	<b>MTU</b>	<b>TCP/IP Stack</b>	<b>Services</b>		
	vmk0	Management Network	9000	Default	vMotion, Management		
Physical Switch Vendors, Models, and Speeds	Mellanox MSN2700 32-port Switch						
<b>Primary Storage</b>							
Storage Category	FC SAN						

Datstores

Datstores	Type	Size	Storage Device
Deploy	VMFS-6	35.2 TB	PURE Fibre Channel Disk
DeployDB	VMFS-6	35.2 TB	PURE Fibre Channel Disk
OSDATA-66da2bff-e845cc5d-b881-905a08103d36	VMFSOS	25.5 GB	PURE Fibre Channel Disk
db0	VMFS-6	2.2 TB	PURE Fibre Channel Disk
db1	VMFS-6	2.2 TB	PURE Fibre Channel Disk
db2	VMFS-6	2.2 TB	PURE Fibre Channel Disk
db3	VMFS-6	2.2 TB	PURE Fibre Channel Disk
db4	VMFS-6	2.2 TB	PURE Fibre Channel Disk
db5	VMFS-6	2.2 TB	PURE Fibre Channel Disk
db6	VMFS-6	2.2 TB	PURE Fibre Channel Disk
db7	VMFS-6	2.2 TB	PURE Fibre Channel Disk
infra_source	VMFS-6	8.8 TB	PURE Fibre Channel Disk
infra_target	VMFS-6	8.8 TB	PURE Fibre Channel Disk
tile0	VMFS-6	2.2 TB	PURE Fibre Channel Disk
tile1	VMFS-6	2.2 TB	PURE Fibre Channel Disk
tile2	VMFS-6	2.2 TB	PURE Fibre Channel Disk
tile3	VMFS-6	2.2 TB	PURE Fibre Channel Disk
tile4	VMFS-6	2.2 TB	PURE Fibre Channel Disk
tile5	VMFS-6	2.2 TB	PURE Fibre Channel Disk
tile6	VMFS-6	2.2 TB	PURE Fibre Channel Disk
tile7	VMFS-6	2.2 TB	PURE Fibre Channel Disk

Number of Storage Devices

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Storage Device	Size	Type	Vendor	Model	Revision	Path Selection Policy	Path Selection Policy Config	# Working Paths
PURE Fibre Channel Disk (Boot Device)	34.4 GB	Direct-Access	PURE	FlashArray	8888	VMW_PSP_RR	policy=iops,iops=1,bytes=10485760,useANO=0	2
Local NVMe Disk	500.1 GB	Direct-Access	NVMe	Samsung SSD 980 PRO 500GB	5B2QGXA7	FIXED	preferred=none	1
PURE Fibre Channel Disk	2.2 TB	Direct-Access	PURE	FlashArray	8888	VMW_PSP_RR	policy=iops,iops=1,bytes=10485760,useANO=0	2
PURE Fibre Channel Disk	2.2 TB	Direct-Access	PURE	FlashArray	8888	VMW_PSP_RR	policy=iops,iops=1,bytes=10485760,useANO=0	2
PURE Fibre Channel Disk	2.2 TB	Direct-Access	PURE	FlashArray	8888	VMW_PSP_RR	policy=iops,iops=1,bytes=10485760,useANO=0	2
PURE Fibre Channel		Direct-						

Storage Device Names, Sizes, Types, Vendors, Models, and Revisions	Disk	2.2 TB	Access	PURE	FlashArray	8888	VMW_PSP_RR	policy=iops,iops=1,bytes=10485760,useANO=0	2
	PURE Fibre Channel Disk	2.2 TB	Direct-Access	PURE	FlashArray	8888	VMW_PSP_RR	policy=iops,iops=1,bytes=10485760,useANO=0	2
	PURE Fibre Channel Disk	2.2 TB	Direct-Access	PURE	FlashArray	8888	VMW_PSP_RR	policy=iops,iops=1,bytes=10485760,useANO=0	2
	PURE Fibre Channel Disk	2.2 TB	Direct-Access	PURE	FlashArray	8888	VMW_PSP_RR	policy=iops,iops=1,bytes=10485760,useANO=0	2
	PURE Fibre Channel Disk	2.2 TB	Direct-Access	PURE	FlashArray	8888	VMW_PSP_RR	policy=iops,iops=1,bytes=10485760,useANO=0	2
	PURE Fibre Channel Disk	2.2 TB	Direct-Access	PURE	FlashArray	8888	VMW_PSP_RR	policy=iops,iops=1,bytes=10485760,useANO=0	2
	PURE Fibre Channel Disk	2.2 TB	Direct-Access	PURE	FlashArray	8888	VMW_PSP_RR	policy=iops,iops=1,bytes=10485760,useANO=0	2
	PURE Fibre Channel Disk	2.2 TB	Direct-Access	PURE	FlashArray	8888	VMW_PSP_RR	policy=iops,iops=1,bytes=10485760,useANO=0	2
	PURE Fibre Channel Disk	2.2 TB	Direct-Access	PURE	FlashArray	8888	VMW_PSP_RR	policy=iops,iops=1,bytes=10485760,useANO=0	2
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	PURE Fibre Channel Disk	2.2 TB	Direct-Access	PURE	FlashArray	8888	VMW_PSP_RR	policy=iops,iops=1,bytes=10485760,useANO=0	2
	PURE Fibre Channel Disk	2.2 TB	Direct-Access	PURE	FlashArray	8888	VMW_PSP_RR	policy=iops,iops=1,bytes=10485760,useANO=0	2
	PURE Fibre Channel Disk	2.2 TB	Direct-Access	PURE	FlashArray	8888	VMW_PSP_RR	policy=iops,iops=1,bytes=10485760,useANO=0	2
	PURE Fibre Channel Disk	8.8 TB	Direct-Access	PURE	FlashArray	8888	VMW_PSP_RR	policy=iops,iops=1,bytes=10485760,useANO=0	2
	PURE Fibre Channel Disk	8.8 TB	Direct-Access	PURE	FlashArray	8888	VMW_PSP_RR	policy=iops,iops=1,bytes=10485760,useANO=0	2
	PURE Fibre Channel Disk	35.2 TB	Direct-Access	PURE	FlashArray	8888	VMW_PSP_RR	policy=iops,iops=1,bytes=10485760,useANO=0	2
PURE Fibre Channel Disk	35.2 TB	Direct-Access	PURE	FlashArray	8888	VMW_PSP_RR	policy=iops,iops=1,bytes=10485760,useANO=0	2	

How Datastores Map to Storage Devices	All LUNs are backed by the same NVMe disks present on the PureStorage FlashArray FA-X90R2
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VMware vSAN Configuration (if used)	None
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RAID Configuration (if used)	None
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**Server Management**

VMware vCenter Server	8
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Number of vCPUs																									
VMware vCenter Server Virtual Memory (in GB)	30																								
<b>Clients</b>																									
Total Client VMs (including Prime Client)	3																								
Number of Client Hosts (all subsequent fields in this section are per Client Host)	4																								
System Model(s)	<ul style="list-style-type: none"> <li>Client Host 1: Supermicro AS -1124US-TNRP</li> <li>Client Host 2: Supermicro AS -1124US-TNRP</li> <li>Client Host 3: Supermicro AS -1124US-TNRP</li> <li>Client Host 4: Supermicro AS -1124US-TNRP</li> </ul>																								
Processor Vendor(s) and Model(s)	<ul style="list-style-type: none"> <li>Client Host 1: AMD EPYC 7763</li> <li>Client Host 2: AMD EPYC 7763</li> <li>Client Host 3: AMD EPYC 7763</li> <li>Client Host 4: AMD EPYC 7763</li> </ul>																								
Processor Speed(s) (GHz)	<ul style="list-style-type: none"> <li>Client Host 1: 2.45 GHz</li> <li>Client Host 2: 2.45 GHz</li> <li>Client Host 3: 2.45 GHz</li> <li>Client Host 4: 2.45 GHz</li> </ul>																								
Total Sockets/Total Cores/Total Threads	<table border="1"> <thead> <tr> <th>Client Host</th> <th>Sockets</th> <th>Cores</th> <th>Threads</th> </tr> </thead> <tbody> <tr> <td>Client Host 1</td> <td>2</td> <td>128</td> <td>256</td> </tr> <tr> <td>Client Host 2</td> <td>2</td> <td>128</td> <td>256</td> </tr> <tr> <td>Client Host 3</td> <td>2</td> <td>128</td> <td>256</td> </tr> <tr> <td>Client Host 4</td> <td>2</td> <td>128</td> <td>256</td> </tr> <tr> <td><b>Total</b></td> <td>8</td> <td>512</td> <td>1024</td> </tr> </tbody> </table>	Client Host	Sockets	Cores	Threads	Client Host 1	2	128	256	Client Host 2	2	128	256	Client Host 3	2	128	256	Client Host 4	2	128	256	<b>Total</b>	8	512	1024
Client Host	Sockets	Cores	Threads																						
Client Host 1	2	128	256																						
Client Host 2	2	128	256																						
Client Host 3	2	128	256																						
Client Host 4	2	128	256																						
<b>Total</b>	8	512	1024																						
NUMA Nodes	<ul style="list-style-type: none"> <li>Client Host 1: 2</li> <li>Client Host 2: 2</li> <li>Client Host 3: 2</li> <li>Client Host 4: 2</li> </ul>																								
Memory Size (in GB) per Client Host	<table border="1"> <thead> <tr> <th>Client Host</th> <th>BIOS</th> <th>ESXi</th> </tr> </thead> <tbody> <tr> <td>Client Host 1</td> <td>2048 GB</td> <td>2036 GB</td> </tr> <tr> <td>Client Host 2</td> <td>2048 GB</td> <td>2036 GB</td> </tr> <tr> <td>Client Host 3</td> <td>2048 GB</td> <td>2036 GB</td> </tr> </tbody> </table>	Client Host	BIOS	ESXi	Client Host 1	2048 GB	2036 GB	Client Host 2	2048 GB	2036 GB	Client Host 3	2048 GB	2036 GB												
Client Host	BIOS	ESXi																							
Client Host 1	2048 GB	2036 GB																							
Client Host 2	2048 GB	2036 GB																							
Client Host 3	2048 GB	2036 GB																							

<b>Client Host 4</b>	1920 GB	1920 GB
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Virtual Network Controllers, Speeds, MTUs, Firmware, Drivers, Vendors, and Models

Client Host	Device	Speed	Duplex	MTU	Firmware	Driver	Description
<b>Client Host 1</b>	<b>vmnic0</b>	100 Gbps	Full	9000	20.28.4000	nmlx5_core	Mellanox Technologies MT28908 Family [ConnectX-6]
	<b>vmnic1</b>	100 Gbps	Full	9000	20.28.4000	nmlx5_core	Mellanox Technologies MT28908 Family [ConnectX-6]
<b>Client Host 2</b>	<b>vmnic0</b>	100 Gbps	Full	9000	20.27.1016	nmlx5_core	Mellanox Technologies MT28908 Family [ConnectX-6]
	<b>vmnic1</b>	100 Gbps	Full	9000	20.27.1016	nmlx5_core	Mellanox Technologies MT28908 Family [ConnectX-6]
<b>Client Host 3</b>	<b>vmnic0</b>	100 Gbps	Full	9000	20.28.4000	nmlx5_core	Mellanox Technologies MT28908 Family [ConnectX-6]
	<b>vmnic1</b>	100 Gbps	Full	9000	20.28.4000	nmlx5_core	Mellanox Technologies MT28908 Family [ConnectX-6]
<b>Client Host 4</b>	<b>vmnic0</b>	100 Gbps	Full	9000	20.27.1016	nmlx5_core	Mellanox Technologies MT28908 Family [ConnectX-6]
	<b>vmnic1</b>	100 Gbps	Full	9000	20.27.1016	nmlx5_core	Mellanox Technologies MT28908 Family [ConnectX-6]

Virtual Switches, Ports, Port Groups, MTUs, and Uplinks

Client Host	Switch	Ports	Configured Ports	MTU	Uplinks
<b>Client Host 1</b>	<b>vSwitch0</b>	9216	128	9000	vmnic0
	<b>vSwitch1</b>	9216	128	9000	vmnic1
<b>Client Host 2</b>	<b>vSwitch0</b>	9216	128	9000	vmnic0
	<b>vSwitch1</b>	9216	128	9000	vmnic1
<b>Client Host 3</b>	<b>vSwitch0</b>	9216	128	9000	vmnic0
	<b>vSwitch1</b>	9216	128	9000	vmnic1
<b>Client Host 4</b>	<b>vSwitch0</b>	9216	128	9000	vmnic0
	<b>vSwitch1</b>	9216	128	9000	vmnic1

Client Host	Switch	Port Group	VLAN ID	Uplinks
<b>Client Host 1</b>	<b>vSwitch0</b>	Management Network	0	vmnic0
		VM Network	0	vmnic0
	<b>vSwitch1</b>	vmotion	0	vmnic1
<b>Client Host 2</b>	<b>vSwitch0</b>	Management Network	0	vmnic0
		VM Network	0	vmnic0
	<b>vSwitch1</b>	vmotion	0	vmnic1
<b>Client Host 3</b>	<b>vSwitch0</b>	Management Network	0	vmnic0
		VM Network	0	vmnic0
	<b>vSwitch1</b>	vmotion	0	vmnic1
<b>Client Host 4</b>	<b>vSwitch0</b>	Management Network	0	vmnic0
		VM Network	0	vmnic0
	<b>vSwitch1</b>	vmotion	0	vmnic1

Client Host	Device	Port Group/DVPort	MTU	TCP/IP Stack	Services

VMkernel Network Adapters, Port Groups, MTUs, TCP/IP Stacks, and Services	<b>Client Host 1</b>	<b>vmk0</b>	Management Network	1500	Default	Management
		<b>vmk1</b>	vmotion	9000	Default	vMotion
	<b>Client Host 2</b>	<b>vmk0</b>	Management Network	1500	Default	Management
		<b>vmk1</b>	vmotion	9000	Default	vMotion
	<b>Client Host 3</b>	<b>vmk0</b>	Management Network	1500	Default	Management
		<b>vmk1</b>	vmotion	9000	Default	vMotion
	<b>Client Host 4</b>	<b>vmk0</b>	Management Network	1500	Default	Management
		<b>vmk1</b>	vmotion	9000	Default	vMotion
Client Storage Notes	See Client Notes Section					
Other Hardware	2x 1200W Redundant power supplies Servers were air-cooled					
Other Software	VMware ESXi 8.0 Update 3, Build 24022510					

## Notes for Workload

Template deployed with disk type: Thick Eager

### Virtualization Software Notes

- vSphere DRS Enabled
- vSphere DRS Automation Level set to Fully Automated
- vSphere DRS Migration Threshold set to 1
- All Standby VMs had CPU shares set to low (default normal)
- All DS35DB, NoSQLBench, and AuctionK VMs had CPU shares set to High (default normal)
- All DS35DB VM memory shares set to High (default normal)
- Added sched.mem.lpage.enable1GPage to True for all DS35DB VMs (default normal)
- All memory reserved for DS35DB VMs (default non-reserved)
- Memory was pinned for all DS35DB VMs.
- CD/DVD device was removed from all VMs except PrimeClient. (default present)
- Logical CPU layout changed for all multi-CPU VMs to 1 socket with multiple cores except Template, PrimeClient, and Client VMs. (default single core per socket)
- Logging was disabled for all VMs except Template, PrimeClient, and Client VMs (default enabled)

SUT Host ESXi Advanced Settings:

Advanced Setting	Host 1	Host 2	Default
<b>Cpu.CreditAgePeriod</b>	1000	1000	3000
<b>Cpu.HTWholeCoreThreshold</b>	0	0	800
<b>Disk.IdleCredit</b>	64	64	32
<b>Disk.ReqCallThreshold</b>	1	1	8
<b>Mem.CtlMaxPercent</b>	0	0	65
<b>Mem.ShareScanGHz</b>	0	0	4

<b>Numa.LTermFairnessInterval</b>	0	0	5
<b>Numa.LocalityWeightActionAffinity</b>	0	0	130
<b>Numa.MigImbalanceThreshold</b>	57	57	10
<b>Numa.PageMigEnable</b>	0	0	1
<b>Numa.PreferHT</b>	1	1	0
<b>Numa.RebalancePeriod</b>	60000	60000	2000
<b>Numa.SwapLoadEnable</b>	0	0	1
<b>Numa.SwapLocalityEnable</b>	0	0	1
<b>Power.CpuPolicy</b>	Performance	Performance	Balanced
<b>UserVars.HostClientCEIPOptIn</b>	2	2	0
<b>UserVars.SuppressShellWarning</b>	1	1	0

SUT Host ESXi Module Options:

<b>Module</b>	<b>Host 1</b>	<b>Host 2</b>	<b>Default</b>
<b>tcpip4</b>	ipv6=1	ipv6=1	ipv6=1

## Server Notes

Server BIOS Settings

- NUMA per Socket = 1 (Default Auto)
- APBDis = 1 (Default Auto)
- xGMI Link Width Control = Force (Default Unforce)
- xGMI Force Link Width = 2 (Default 1)
- xGMI Link Max Speed = 22 Gbps (Default Auto)

## Networking Notes

- vSwitch0 configured for Management Network and vmotion
  - Connected to vmnic2
  - vSwitch0, vmk0, and vmnic2 set to MTU 9000 (default 1500)
- vSwitch1 configured for VM Network
  - Connected to vmnic3
  - vSwitch1 and vmnic3 set to MTU 9000 (default 1500)
  - All VMs connected to default portgroup VM Network

## Storage Notes

- All client server OS installed on 64GB LUN PureStorage FA-X90R2 Array
- All SUT hosts OS installed on 32GB LUN PureStorage FA-X90R2 Array
- All FC ports regardless of model are running at 16Gbps
- FC LUN Folder configuration:
  - All LUNs are backed by the same NVMe disks present on the PureStorage FA-X90R2 Array

- All DS35DB and AuctionWebEDB VMs were stored on a 2TB LUN associated with a corresponding tile number.
- All NoSQLBench and AuctionWebDNosql VMs were stored on a 32TB LUN named Deploy
- The template VM was stored on an 8TB LUN named infra\_source.
- All DS35WebA VMs were stored on an 8TB LUN named infra\_source.
- All AuctionWebF VMs were stored on an 8TB LUN named infra\_source.
- All other VMs were stored on a 2TB LUN associated with a corresponding tile number.
- All VM infrastructure operations were on an 8TB LUN called infra\_target for its destination.
- All FC LUNs were configured with:
  - Round Robin Path Policy (Default: Most Recently Used)
  - IO Operations Limit 1 (Default: 1000)

## Server Management Notes

VMware vCenter Server Appliance 8.0 Update 3, Build 24022515 was hosted on the Client Cluster and automatically load balanced along with the other Client VMs through DRS.

## Operating System Notes

SUT Host ESXi Image Profile: ESXi-8.0U3-24022510-standard

## Software Notes

None

## Client Notes

- vSphere DRS Enabled
- vSphere DRS Automation Level set to Fully Automated
- vSphere DRS Migration Threshold set to 1

Client Host ESXi Advanced Settings:

Advanced Setting	Host 1	Host 2	Host 3	Host 4	Default
UserVars.SuppressShellWarning	1	1	1	1	0

Client Host ESXi Module Options:

Module	Host 1	Host 2	Host 3	Host 4	Default
tcpip4	ipv6=1	ipv6=1	ipv6=1	ipv6=1	ipv6=1

Client Host ESXi Image Profile: (Updated) ESXi-8.0U3-24022510-standard

## Other Notes

None

## VMmark4.properties Settings

- TileDelay = 15 (default 60)
- ReporterSkipNonCompliant = 1 (default 0)

## Virtual Machines

### SUT Host Virtual Machines

VM	vCPUs	Cores Per Socket	Memory (MB)	Sync Time	Logging	CD/DVD	CPU Res	CPU Limit	CPU Shares	Mem Res	Mem Limit	Mem Shares	Mem Pin	Mem 1G Page	Disk Shares	Datastore	Port Group	vHW Version	Tools Version
AuctionAppA0	4	4	8192	TRUE	FALSE	Removed	0	Unlimited	normal	0	Unlimited	normal	FALSE	FALSE	normal	tile0	VM Network	17	12325
AuctionAppA1	4	4	8192	TRUE	FALSE	Removed	0	Unlimited	normal	0	Unlimited	normal	FALSE	FALSE	normal	tile1	VM Network	17	12325
VM	vCPUs	Cores Per Socket	Memory (MB)	Sync Time	Logging	CD/DVD	CPU Res	CPU Limit	CPU Shares	Mem Res	Mem Limit	Mem Shares	Mem Pin	Mem 1G Page	Disk Shares	Datastore	Port Group	vHW Version	Tools Version
AuctionAppB0	4	4	8192	TRUE	FALSE	Removed	0	Unlimited	normal	0	Unlimited	normal	FALSE	FALSE	normal	tile0	VM Network	17	12325
AuctionAppB1	4	4	8192	TRUE	FALSE	Removed	0	Unlimited	normal	0	Unlimited	normal	FALSE	FALSE	normal	tile1	VM Network	17	12325
VM	vCPUs	Cores Per Socket	Memory (MB)	Sync Time	Logging	CD/DVD	CPU Res	CPU Limit	CPU Shares	Mem Res	Mem Limit	Mem Shares	Mem Pin	Mem 1G Page	Disk Shares	Datastore	Port Group	vHW Version	Tools Version
AuctionAppC0	4	4	8192	TRUE	FALSE	Removed	0	Unlimited	normal	0	Unlimited	normal	FALSE	FALSE	normal	tile0	VM Network	17	12325
AuctionAppC1	4	4	8192	TRUE	FALSE	Removed	0	Unlimited	normal	0	Unlimited	normal	FALSE	FALSE	normal	tile1	VM Network	17	12325
VM	vCPUs	Cores Per Socket	Memory (MB)	Sync Time	Logging	CD/DVD	CPU Res	CPU Limit	CPU Shares	Mem Res	Mem Limit	Mem Shares	Mem Pin	Mem 1G Page	Disk Shares	Datastore	Port Group	vHW Version	Tools Version
AuctionKA0	8	8	32768	TRUE	FALSE	Removed	0	Unlimited	high	0	Unlimited	normal	FALSE	FALSE	normal	tile0	VM Network	17	12325
AuctionKA1	8	8	32768	TRUE	FALSE	Removed	0	Unlimited	high	0	Unlimited	normal	FALSE	FALSE	normal	tile1	VM Network	17	12325
VM	vCPUs	Cores Per Socket	Memory (MB)	Sync Time	Logging	CD/DVD	CPU Res	CPU Limit	CPU Shares	Mem Res	Mem Limit	Mem Shares	Mem Pin	Mem 1G Page	Disk Shares	Datastore	Port Group	vHW Version	Tools Version
AuctionKB0	8	8	32768	TRUE	FALSE	Removed	0	Unlimited	high	0	Unlimited	normal	FALSE	FALSE	normal	tile0	VM Network	17	12325
AuctionKB1	8	8	32768	TRUE	FALSE	Removed	0	Unlimited	high	0	Unlimited	normal	FALSE	FALSE	normal	tile1	VM Network	17	12325
VM	vCPUs	Cores Per Socket	Memory (MB)	Sync Time	Logging	CD/DVD	CPU Res	CPU Limit	CPU Shares	Mem Res	Mem Limit	Mem Shares	Mem Pin	Mem 1G Page	Disk Shares	Datastore	Port Group	vHW Version	Tools Version
AuctionKC0	8	8	32768	TRUE	FALSE	Removed	0	Unlimited	high	0	Unlimited	normal	FALSE	FALSE	normal	tile0	VM Network	17	12325
AuctionKC1	8	8	32768	TRUE	FALSE	Removed	0	Unlimited	high	0	Unlimited	normal	FALSE	FALSE	normal	tile1	VM Network	17	12325
VM	vCPUs	Cores Per Socket	Memory (MB)	Sync Time	Logging	CD/DVD	CPU Res	CPU Limit	CPU Shares	Mem Res	Mem Limit	Mem Shares	Mem Pin	Mem 1G Page	Disk Shares	Datastore	Port Group	vHW Version	Tools Version
																	VM		



DS35WebA0	6	6	512	TRUE	FALSE	Removed	0	Unlimited	normal	0	Unlimited	normal	FALSE	FALSE	normal	infra_source	VM Network	17	12325
DS35WebA1	6	6	512	TRUE	FALSE	Removed	0	Unlimited	normal	0	Unlimited	normal	FALSE	FALSE	normal	infra_source	VM Network	17	12325
<b>VM</b>	<b>vCPUs</b>	<b>Cores Per Socket</b>	<b>Memory (MB)</b>	<b>Sync Time</b>	<b>Logging</b>	<b>CD/DVD</b>	<b>CPU Res</b>	<b>CPU Limit</b>	<b>CPU Shares</b>	<b>Mem Res</b>	<b>Mem Limit</b>	<b>Mem Shares</b>	<b>Mem Pin</b>	<b>Mem 1G Page</b>	<b>Disk Shares</b>	<b>Datastore</b>	<b>Port Group</b>	<b>vHW Version</b>	<b>Tools Version</b>
DS35WebB0	6	6	512	TRUE	FALSE	Removed	0	Unlimited	normal	0	Unlimited	normal	FALSE	FALSE	normal	tile0	VM Network	17	12325
DS35WebB1	6	6	512	TRUE	FALSE	Removed	0	Unlimited	normal	0	Unlimited	normal	FALSE	FALSE	normal	tile1	VM Network	17	12325
<b>VM</b>	<b>vCPUs</b>	<b>Cores Per Socket</b>	<b>Memory (MB)</b>	<b>Sync Time</b>	<b>Logging</b>	<b>CD/DVD</b>	<b>CPU Res</b>	<b>CPU Limit</b>	<b>CPU Shares</b>	<b>Mem Res</b>	<b>Mem Limit</b>	<b>Mem Shares</b>	<b>Mem Pin</b>	<b>Mem 1G Page</b>	<b>Disk Shares</b>	<b>Datastore</b>	<b>Port Group</b>	<b>vHW Version</b>	<b>Tools Version</b>
DS35WebC0	6	6	512	TRUE	FALSE	Removed	0	Unlimited	normal	0	Unlimited	normal	FALSE	FALSE	normal	tile0	VM Network	17	12325
DS35WebC1	6	6	512	TRUE	FALSE	Removed	0	Unlimited	normal	0	Unlimited	normal	FALSE	FALSE	normal	tile1	VM Network	17	12325
<b>VM</b>	<b>vCPUs</b>	<b>Cores Per Socket</b>	<b>Memory (MB)</b>	<b>Sync Time</b>	<b>Logging</b>	<b>CD/DVD</b>	<b>CPU Res</b>	<b>CPU Limit</b>	<b>CPU Shares</b>	<b>Mem Res</b>	<b>Mem Limit</b>	<b>Mem Shares</b>	<b>Mem Pin</b>	<b>Mem 1G Page</b>	<b>Disk Shares</b>	<b>Datastore</b>	<b>Port Group</b>	<b>vHW Version</b>	<b>Tools Version</b>
NoSQLBenchA0	8	8	8192	TRUE	FALSE	Removed	0	Unlimited	high	0	Unlimited	normal	FALSE	FALSE	normal	Deploy	VM Network	17	12325
NoSQLBenchA1	8	8	8192	TRUE	FALSE	Removed	0	Unlimited	high	0	Unlimited	normal	FALSE	FALSE	normal	Deploy	VM Network	17	12325
<b>VM</b>	<b>vCPUs</b>	<b>Cores Per Socket</b>	<b>Memory (MB)</b>	<b>Sync Time</b>	<b>Logging</b>	<b>CD/DVD</b>	<b>CPU Res</b>	<b>CPU Limit</b>	<b>CPU Shares</b>	<b>Mem Res</b>	<b>Mem Limit</b>	<b>Mem Shares</b>	<b>Mem Pin</b>	<b>Mem 1G Page</b>	<b>Disk Shares</b>	<b>Datastore</b>	<b>Port Group</b>	<b>vHW Version</b>	<b>Tools Version</b>
NoSQLBenchB0	8	8	8192	TRUE	FALSE	Removed	0	Unlimited	high	0	Unlimited	normal	FALSE	FALSE	normal	Deploy	VM Network	17	12325
NoSQLBenchB1	8	8	8192	TRUE	FALSE	Removed	0	Unlimited	high	0	Unlimited	normal	FALSE	FALSE	normal	Deploy	VM Network	17	12325
<b>VM</b>	<b>vCPUs</b>	<b>Cores Per Socket</b>	<b>Memory (MB)</b>	<b>Sync Time</b>	<b>Logging</b>	<b>CD/DVD</b>	<b>CPU Res</b>	<b>CPU Limit</b>	<b>CPU Shares</b>	<b>Mem Res</b>	<b>Mem Limit</b>	<b>Mem Shares</b>	<b>Mem Pin</b>	<b>Mem 1G Page</b>	<b>Disk Shares</b>	<b>Datastore</b>	<b>Port Group</b>	<b>vHW Version</b>	<b>Tools Version</b>
NoSQLBenchC0	8	8	8192	TRUE	FALSE	Removed	0	Unlimited	high	0	Unlimited	normal	FALSE	FALSE	normal	Deploy	VM Network	17	12325
NoSQLBenchC1	8	8	8192	TRUE	FALSE	Removed	0	Unlimited	high	0	Unlimited	normal	FALSE	FALSE	normal	Deploy	VM Network	17	12325
<b>VM</b>	<b>vCPUs</b>	<b>Cores Per Socket</b>	<b>Memory (MB)</b>	<b>Sync Time</b>	<b>Logging</b>	<b>CD/DVD</b>	<b>CPU Res</b>	<b>CPU Limit</b>	<b>CPU Shares</b>	<b>Mem Res</b>	<b>Mem Limit</b>	<b>Mem Shares</b>	<b>Mem Pin</b>	<b>Mem 1G Page</b>	<b>Disk Shares</b>	<b>Datastore</b>	<b>Port Group</b>	<b>vHW Version</b>	<b>Tools Version</b>
SocialNetwork0	36	36	16384	TRUE	FALSE	Removed	0	Unlimited	normal	0	Unlimited	normal	FALSE	FALSE	normal	tile0	VM Network	17	12325
SocialNetwork1	36	36	16384	TRUE	FALSE	Removed	0	Unlimited	normal	0	Unlimited	normal	FALSE	FALSE	normal	tile1	VM Network	17	12325
<b>VM</b>	<b>vCPUs</b>	<b>Cores Per Socket</b>	<b>Memory (MB)</b>	<b>Sync Time</b>	<b>Logging</b>	<b>CD/DVD</b>	<b>CPU Res</b>	<b>CPU Limit</b>	<b>CPU Shares</b>	<b>Mem Res</b>	<b>Mem Limit</b>	<b>Mem Shares</b>	<b>Mem Pin</b>	<b>Mem 1G Page</b>	<b>Disk Shares</b>	<b>Datastore</b>	<b>Port Group</b>	<b>vHW Version</b>	<b>Tools Version</b>
Standby0	1	1	2048	TRUE	FALSE	Removed	0	Unlimited	low	0	Unlimited	normal	FALSE	FALSE	normal	tile0	VM Network	17	12325
Standby1	1	1	2048	TRUE	FALSE	Removed	0	Unlimited	low	0	Unlimited	normal	FALSE	FALSE	normal	tile1	VM Network	17	12325
<b>VM</b>	<b>vCPUs</b>	<b>Cores Per Socket</b>	<b>Memory (MB)</b>	<b>Sync Time</b>	<b>Logging</b>	<b>CD/DVD</b>	<b>CPU Res</b>	<b>CPU Limit</b>	<b>CPU Shares</b>	<b>Mem Res</b>	<b>Mem Limit</b>	<b>Mem Shares</b>	<b>Mem Pin</b>	<b>Mem 1G Page</b>	<b>Disk Shares</b>	<b>Datastore</b>	<b>Port Group</b>	<b>vHW Version</b>	<b>Tools Version</b>

VMmark-4.0.1-208	4	1	32768	TRUE	TRUE	Removed	0	Unlimited	normal	0	Unlimited	normal	FALSE	FALSE	normal	infra_source	VM Network	17	12325
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## Client Host Virtual Machines

VM	vCPUs	Cores Per Socket	Memory (MB)	Sync Time	Logging	CD/DVD	CPU Res	CPU Limit	CPU Shares	Mem Res	Mem Limit	Mem Shares	Mem Pin	Mem 1G Page	Disk Shares	Datastore	Port Group	vHW Version	Tools Version
Client0	64	1	98304	TRUE	TRUE	Removed	0	Unlimited	normal	0	Unlimited	normal	FALSE	FALSE	normal	Client	VM Network	17	12325
Client1	64	1	98304	TRUE	TRUE	Removed	0	Unlimited	normal	0	Unlimited	normal	FALSE	FALSE	normal	Client	VM Network	17	12325
PrimeClient	4	1	32768	TRUE	TRUE	Present	0	Unlimited	normal	0	Unlimited	normal	FALSE	FALSE	normal	Client	VM Network, VM Network	17	12325
VCSA8.0U3-IA	8	1	30720	FALSE	TRUE	Present	0	Unlimited	normal	0	Unlimited	normal	FALSE	FALSE	normal	Client	VM Network	10	12389

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