

## VMmark® 3.1 Results

**Server Vendor & Model:** Fujitsu Server PRIMERGY RX1330M4  
**Storage Vendor & Model:** Fujitsu Server PRIMERGY RX2540M4  
**Hypervisor:** VMware ESXi 6.7 EP08 Build 13473784  
**Datacenter Management Software:** VMware vCenter Server Appliance 6.7.0d Build 9451876

**VMmark V3.1 Server and Storage PPKW Score =**  
**2.7464 @ 1 Tiles**

Number of Hosts: 2	Uniform Hosts [yes/no]: yes	Total sockets/cores/threads in test: 2/16/32
Tested By: Fujitsu		Test Date: 10-05-2019
<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>

### Performance

	weathervane			weathervaneE			dvdstoreA			dvdstoreB			dvdstoreC			
TILE_0	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(nRTI MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3571.01	0.99	0.38   0.49	573.10	1.00	0.34   0.00	1163.70	1.58	353.82	881.65	1.76	396.30	666.62	1.92	440.74	1.40
p1	3552.48	0.99	0.40   0.67	573.56	1.00	0.51   0.13	1153.05	1.57	378.07	816.48	1.63	416.79	573.73	1.65	470.49	1.33
p2	3530.62	0.98	0.35   0.36	571.14	1.00	0.37   0.05	1148.67	1.56	379.65	901.05	1.80	416.12	656.40	1.89	460.86	1.39
p0_score:	1.40															
p1_score:	1.33															
p2_score:	1.39															

Infrastructure_Operations_Scores:	vMotion	SVMotion	XVMotion	Deploy
Completed_Ops_PerHour	28.50	28.00	21.00	12.50
Avg_Seconds_To_Complete	4.89	72.45	107.40	248.44
Failures	0.00	0.00	0.00	0.00
Ratio	1.10	1.56	1.17	1.56
Number_Of_Threads	1	1	1	1

PTD_Summary:		
Number_of_PTD_Daemons	2	
Number_of_PTD_Phases	3	
PTD_Phase_Timing	2400secs	
PtdTiming:	ptd0	ptd1
p0	-60	-60
p1	-60	-60
p2	-60	-60

PTD_Results:								
<b>p0</b>	Target	Avg_Watts	Avg_Volts	Avg_Amps	Avg_PF	Samples	UnCert%	
<b>ptd0</b>	SERVER	359.54	206.01	1.80	0.97	2399.00	0.00	
<b>ptd1</b>	EXT_STOR	151.24	206.08	0.76	0.97	2399.00	0.00	
<b>p1</b>	Target	Avg_Watts	Avg_Volts	Avg_Amps	Avg_PF	Samples	UnCert%	
<b>ptd0</b>	SERVER	361.31	203.18	1.83	0.97	2400.00	0.00	
<b>ptd1</b>	EXT_STOR	150.83	203.25	0.76	0.97	2400.00	0.00	
<b>p2</b>	Target	Avg_Watts	Avg_Volts	Avg_Amps	Avg_PF	Samples	UnCert%	
<b>ptd0</b>	SERVER	351.22	201.19	1.80	0.97	2400.00	0.00	
<b>ptd1</b>	EXT_STOR	150.87	201.26	0.77	0.98	2400.00	0.00	
<b>Summary</b>		Run_Is_Compliant				Turbo_Setting:0		
		Number_Of_Compliance_Issues(0)*				Median_Phase(p2)		
<b>Unreviewed_VMmark3_Avg_Watts</b>		502.08						
<b>Unreviewed_VMmark3_Applications_Score</b>		1.39						
<b>Unreviewed_VMmark3_Infrastructure_Score</b>		1.33						
<b>Unreviewed_VMmark3_Score</b>		1.38						
<b>Unreviewed_VMmark3_PPKW</b>		2.7464						

## Configuration

PTD Configuration	
Number of Power Meters	2
Power Meter Vendors and Models	2 x Hioki-3336
Power Meter PTD Target(s) (SERVER/EXT_STOR)	SERVER, EXT_STOR
Power Meter Connection Type(s) (Eth/GPIB/Serial/USB)	USB
Power Meter Calibration Date(s) (MM-DD-YYYY)	02-25-2019
Power Meter Calibration Info (Calibrated By/Duration)	FUJITSU FACILITIES Ltd. / one year /H06400085-1902, H06400088-1902
Power Meter(s) Volt/Amp Range	300 / 5, 300 / 5
Power Source Voltage/Frequency/Phase	200V / 50Hz / 1-phase
PTD Client Configuration	
Number of Power Meter Clients	2(The Prime client served as both power meter clients)
System Model(s)	PrimeClient, details in client configuration section
Processor Vendor(s) and Model(s)	PrimeClient, details in client configuration section
Processor Speed(s) (GHz)	PrimeClient, details in client configuration section
Total Sockets/Total Cores/Total Threads	PrimeClient, details in client configuration section

Memory Per Power Meter Client	PrimeClient, details in client configuration section
Network Controller(s) Vendors and Models	PrimeClient, details in client configuration section
Operating System, Version, and Service Pack	PrimeClient, details in client configuration section
Other Hardware	1 x BUFFALO BSUSRC0605BS USB2.0 > 1 x Serial 1 x REX-USB60F USB2.0 > 1 x Serial
Other Software	None

## Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 6.7EP08, Build 13473784 / 04-30-2019
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server Appliance 6.7.0d, Build 9451876 / 08-14-2018
Supplemental Software	None
Servers	
Number of Servers in System Under Test (all subsequent fields in this section are per server)	2
Server Manufacturer and Model	Fujitsu Server PRIMERGY RX1330M4
Processor Vendor and Model	Intel Xeon E-2288G
Processor Speed (GHz) / Turbo Boost Speed (GHz)	3.7 / 5.0
Total Sockets/Total Cores/Total Threads	1 Sockets / 8 Cores / 16 Threads
Primary CPU Cache	32KB I+32KB D on chip per core
Secondary CPU Cache	256KB I+D on chip per chip
Other CPU Cache	16MB I+D on chip per core
BIOS Version	V5.0.0.13 R1.12.0 for D3675-A1x
Memory Size (in GB, Number of DIMMs)	128,4
Memory Type and Speed	32GB 2Rx8 DDR4 2666MHz UDIMM
Disk Subsystem Type	FC SAN

Number of Disk Controllers	1
Disk Controller Vendors and Models	Fujitsu PRAID EP420i
Total Number of Physical Disks for Hypervisor	1
Disk Vendors, Models, Capacities, and Speeds	Samsung SM883 480GB SATA-SSD 6GB/S
Number of Host Bus Adapters	1
Host Bus Adapter Vendors and Models	Emulex LightPulse LPe31002-M6 2-Port 16Gb
Number of Network Controllers	1
Network Controller Vendors and Models	Intel(R) Ethernet Controller X710 for 10GbE SFP+ Intel(R) I210 Gigabit Network Connection
Other Hardware	None
Other Software	None
Hardware Availability Date (MM-DD-YYYY)	10-31-2019
BIOS Availability Date (MM-DD-YYYY)	09-06-2019
Software Availability Date (MM-DD-YYYY)	04-30-2019
<b>Network</b>	
Network Switch Vendors and Models	1 x Fujitsu SR-X340TR1 1 x Fujitsu ET-7648BFERA-FOS
Network Speed	1Gbps for SUT management, 10Gbps for VMotion, 10Gbps for Clients and VMs
<b>Primary Storage</b>	
Storage Category	SCSI Target
Storage Vendors, Models, and Firmware Versions	Fujitsu Server PRIMERGY RX2540 M4
Storage Configuration Summary	for Storage Server OS: Micron, MTFDDAK960TDC, 960GB, SATA 3.0 6Gb/S SSD for Workload Storage: Intel P4800X 750GB PCIe SSD 3 x Intel P4600 2TB PCIe SSD
<b>Datacenter Management Server</b>	
System Model	Fujitsu Server PRIMERGY RX2530 M2
Processor Vendor and Model	Intel Xeon E5-2698 v4
Processor Speed (GHz)	2.2

Total Sockets/Total Cores/Total Threads	1 Sockets / 20 Cores / 40 Threads
Memory Size (in GB, Number of DIMMs)	Hypervisor: 64GB, 8
Network Controller(s) Vendors and Models	Emulex OneConnect Oce14000 1GbE Dual Port Adapter
Operating System, Version, Bitness, and Service Pack	Hypervisor: VMware ESXi 6.7 EP 02a Build 9214924
Virtual Center VM Number of vCPUs	4
Virtual Center VM Virtual Memory (in GB)	16
Virtual Center VM Operating System, Version, Bitness, and Service Pack	VMware vCenter Server Appliance 6.7.0d Build 9451876
Other Hardware	None
Other Software	None

**Clients**

Total Number of Virtual Clients / Virtual Client Hosts	2 / 1
System Model(s)	Fujitsu PRIMERGY RX2530 M2
Processor Vendor(s) and Model(s)	Intel Xeon E5-2699 v4
Processor Speed(s) (GHz)	2.2
Total Sockets/Total Cores/Total Threads	2 Sockets / 44 Cores / 88 Threads
Memory per Virtual Client Host	256GB
Network Controller(s) Vendors and Models	Emulex OneConnect Oce14000 1GbE Dual Port Adapter Emulex OneConnect Oce14000 10GbE Dual Port Adapter
Virtual Client Networking Notes	1 virtual adapter for management, 2 virtual adapter for workload traffic
Virtual Client Storage Notes	1 x 300GB SAS 10K TOSHIBA AL14SEB03EN HDD with RAID 0 for Client Host OS 2 x 400GB SAS 12G TOSHIBA PX02SMF040 SSD with RAID 0 for Client VMs
Other Hardware	None
Other Software	VMware ESXi 6.7U1 Build 10302608

**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 Lazy

### Virtualization Software Notes

- Logical CPU configuration changed for multi-cpu VMs to 1 socket with multiple cores for primeclient(default: Single core per socket)
- CDROM removed for primeclient
- vSphere DRS Migration Threshold set to Fully Automated level 2

Changes in esx.conf:

- /adv/Cpu/CreditAgePeriod = 1000 (default 3000)
- /adv/Cpu/HTWholeCoreThreshold = 0 (default 800)
- /adv/DataMover/HardwareAcceleratedInit = 0 (default 1)
- /adv/DataMover/HardwareAcceleratedMove = 0 (default 1)
- /adv/Mem/CtlMaxPercent = 0 (default 65)
- /adv/Mem/ShareScanGHz = 0 (default 4)
- /adv/UserVars/HostClientCEIPOptIn = 1(default 0)
- /adv/Numa/LTermFairnessInterval = 0 (default 5)
- /adv/Numa/PageMigEnable = 0 (default 1)
- /adv/Numa/SwapLoadEnable = 0 (default 1)
- /adv/Numa/SwapLocalityEnable = 0 (default 1)
- /adv/Disk/ReqCallThreshold = 1 (default 8)
- /adv/Disk/IdleCredit = 64 (default 32)
- /adv/Power/CpuPolicy = High Performance (default balanced)
- /adv/VMFS3/HardwareAcceleratedLocking = 0 (default 1)
- /vmkernel/hyperthreadingMitigation = TRUE (default FALSE)

### Server Notes

- Server/Partition BIOS settings:
  - Turbo Mode: Enabled (Intel Turbo Boost up to 5.0GHz, default Enabled)

### Networking Notes

- vSwitch Configuration:
  - vSwitch0 for Management Network on vmnic0 at 1Gb/s

- vSwitch1 for all workload on vmnic2 at 10Gb/s
- vSwitch2 for vMotion connection on vmnic3 at 10Gb/s
  - 9000 MTU (default 1500)

## Storage Notes

- Fujitsu Server PRIMERGY RX2540 M4 configured as a Fibre Channel Target:
  - Hardware details:
    - 2 x Intel Xeon Gold 6134@3.2GHz processors
    - 64GB RAM (4 x 16 GB dual rank PC4-2666 Registered DDR4 / 2666 MHz DIMMs)
    - 1 x QLogic QLE2742 Dual Port 32Gb FC HBA used as FC target controller
    - 1 x 960GB SATA-SSD Micron MTFDDAK480TDC
    - 4 x Intel P4800X 750GB PCIe SSD
  - Software details:
    - Operating System: SUSE Linux Enterprise Server 12 SP3 - 4.4.162-94.72-default (64-bit)
    - Fibre Channel Target SW: LIO (part of SUSE Linux Enterprise Server 12 SP3)

### RAID configuration:

- SATA-SSD 1:
  - LUN 1: Storage system OS (960GB, this LUN is not counted in the Storage section)
- First PCIe-SSD:
  - LUN 1: DS3DB, DS3WebA, DS3WebB, DS3WebC for tile 0 (600GB)
- Second PCIe-SSD:
  - LUN 1: AuctionNoSQL, ElasticDB for tile 0 (300GB)
  - LUN 2: AuctionDB, ElasticLB for tile 0 (300GB)
  - LUN 3: AuctionWebA, AuctionWebB, AuctionAppA, AuctionAppB, AuctionLB, AuctionMSQ, Standby, ElasticWebA, ElasticWebB, ElasticAppA, ElasticAppB for tile 0 (300GB)
  - LUN 4: vmmark3.1-template-020419 (300GB)
  - LUN 5: XvMotion TargetLun (300GB)
- Third PCIe-SSD:
  - LUN 1: SvMotion TargetLun (300GB)
  - LUN 1: Deploy Lun (300GB)
- All LUNs were configured as block devices; no system memory was used for caching

## Datacenter Management Server Notes

- Virtual Center realized as a VM running on a dedicated Hypervisor system:
  - Number of vCPUs: 4 (Four vSocket)
  - Size of vRAM: 16GB
- The host operating system VMware ESXi 6.7.0 EP 02a Build 9214924 was installed using 'Fujitsu Custom Image for VMware ESXi 6.7.0 EP 02a' named VMware-ESXi-6.7.0-9214924-Fujitsu-v451-1.iso

## Operating System Notes

VMware ESXi 6.7.0 EP 08 Build 13473784 was installed using 'Fujitsu Custom Image for VMware ESXi 6.7.0 EP 08' named VMware-ESXi-6.7.0-13473784-Fujitsu-v470-1.iso

## Software Notes

None

## Client Notes

- Client Host1: Client0,PrimeClient

## Network Notes

- vSwitch Configuration
  - vSwitch0 for Management Network on vmnic0 at 1Gb/s
  - vSwitch1 for all workload on vmnic2 and vmnic3 at 10Gb/s

## Other Notes

None

---

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.

For information about VMmark and the rules regarding its usage visit [www.vmware.com/products/vmmark](http://www.vmware.com/products/vmmark).

VMware and VMmark are trademarks or registered trademarks of VMware, Inc. VMmark is a product of [VMware, Inc.](http://www.vmware.com) VMmark utilizes the SPEC Power and Temperature Daemon (SPEC PTDaemon), which is available from the Standard Performance Evaluation Corporation (SPEC®). VMmark results are not SPEC metrics and cannot be compared to SPEC metrics in any way.