VMmark® 3.1.1 Results

Server Vendor & Model: Fujitsu Server PRIMERGY RX1330 M5 **Storage Vendor & Model: Fujitsu Server PRIMERGY RX2540 M4** **Hypervisor: VMware ESXi 7.0 U3 Build 19193900** **Datacenter Management Software: VMware vCenter Server Appliance 7.0 U2 17694817**	**VMmark 3.1.1 Server PPKW Score = 6.3858 @ 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: 04-19-2022**	

Performance Section	**Configuration Section**	**Notes Section**
Performance	Configuration	Notes for Workload

Performance

	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	3580.00	1.00	0.27 | 0.00	569.80	1.00	0.53 | 0.12	1207.30	1.64	284.25	908.40	1.81	328.90	696.08	2.01	356.83	1.43
p1	3567.71	0.99	0.29 | 0.00	567.59	0.99	0.40 | 0.06	1205.58	1.64	286.16	855.60	1.71	322.66	607.70	1.75	363.60	1.37
p2	3549.23	0.99	0.26 | 0.00	563.13	0.98	0.28 | 0.05	1200.17	1.63	291.43	946.00	1.89	321.58	691.08	1.99	358.57	1.43

p0_score:	1.43
p1_score:	1.37
p2_score:	1.43

Infrastructure_Operations_Scores:	vMotion	SVMotion	XVMotion	Deploy
Completed_Ops_PerHour	29.00	27.00	23.00	13.50
Avg_Seconds_To_Complete	4.21	73.74	91.13	228.34
Failures	0.00	0.00	0.00	0.00
Ratio	1.12	1.50	1.28	1.69
Number_Of_Threads	1	1	1	1

PTD_Summary:		
Number_of_PTD_Daemons	1	
Number_of_PTD_Phases	3	
PTD_Phase_Timing	2400secs	
PtdTiming:	ptd0	ptd1
p0	-60	---
p1	-60	---
p2	-60	---
PTD_Results:		

p0	Target	Avg_Watts	Avg_Volts	Avg_Amps	Avg_PF	Samples	UnCert%
ptd0	SERVER	222.04	201.18	1.12	0.99	2399.00	0.00
p1	Target	Avg_Watts	Avg_Volts	Avg_Amps	Avg_PF	Samples	UnCert%
ptd0	SERVER	220.57	201.61	1.11	0.99	2400.00	0.00
p2	Target	Avg_Watts	Avg_Volts	Avg_Amps	Avg_PF	Samples	UnCert%
ptd0	SERVER	220.40	201.55	1.11	0.99	2400.00	0.00

Summary	Run_Is_Compliant	Turbo_Setting:0
	Number_Of_Compliance_Issues(0)*	Median_Phase(p0)
Unreviewed_VMmark3_Avg_Watts	222.04	
Unreviewed_VMmark3_Applications_Score	1.43	
Unreviewed_VMmark3_Infrastructure_Score	1.38	
Unreviewed_VMmark3_Score	1.42	
Unreviewed_VMmark3_PPKW	6.3858	

Configuration

PTD Configuration	
Number of Power Meters	1
Power Meter Vendors and Models	2 x Hioki PW3336
Power Meter PTD Target(s) (SERVER/EXT_STOR)	SERVER
Power Meter Connection Type(s) (Eth/GPIB/Serial/USB)	Serial
Power Meter Calibration Date(s) (MM-DD-YYYY)	03-14-2022
Power Meter Calibration Info (Calibrated By/Duration)	Kyosai Technos Co.,Ltd. / one year / CF223000538
Power Meter(s) Volt/Amp Range	300 / 5
Power Source Voltage/Frequency/Phase	200V / 50Hz / 1-phase
PTD Client Configuration	
Number of Power Meter Clients	1
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 BSUSRC06 USB-Serial converter
Other Software	None

Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 7.0 U3, Build 19193900 / 03-07-2022
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server Appliance 7.0 Update 2, Build 17694817 / 03-09-2021
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 RX1330 M5
Processor Vendor and Model	Intel Xeon E-2388G
Processor Speed (GHz) / Turbo Boost Speed (GHz)	3.2 / 5.1
Total Sockets/Total Cores/Total Threads	1 Sockets / 8 Cores / 16 Threads
Primary CPU Cache	32KB I+48KB D on chip per core
Secondary CPU Cache	512KB I+D on chip per core
Other CPU Cache	16MB I+D on chip per chip
BIOS Version	V5.0.0.22 R1.33.0 for D3929-B1x
Memory Size (in GB, Number of DIMMs)	128, 4
Memory Type and Speed	32GB 2Rx8 DDR4 3200MHz UDIMM
Disk Subsystem Type	FC SAN
Number of Disk Controllers	Fujitsu PRAID EP520i
Disk Controller Vendors and Models	1
Total Number of Physical Disks for Hypervisor	1
Disk Vendors, Models, Capacities, and Speeds	Micron MTFDDAK480TDS 480GB SATA-SSD 6GB/s
Number of Host Bus Adapters	1

Host Bus Adapter Vendors and Models	Emulex LPe35002 dual port 32Gb PCIe Adapter
Number of Network Controllers	2
Network Controller Vendors and Models	1 x Mellanox MCX4121A-ACAT dual port 25Gb SFP28 PCIe Adapters 1 x Intel I210 1Gb dual port onboard
Other Hardware	None
Other Software	None
Hardware Availability Date (MM-DD-YYYY)	04-28-2022
BIOS Availability Date (MM-DD-YYYY)	04-28-2022
Software Availability Date (MM-DD-YYYY)	03-07-2022
Network	
Network Switch Vendors and Models	1 x Fujitsu SR-X340TR1 1 x Extreme Networks SLX 9150-48Y
Network Speed	1 x 1Gbps for SUT management, 1 x 25Gbps for vMotion, 1 x 25Gbps for Client and VMs
Primary Storage	
Storage Category	SCSI Target
Storage Vendors, Models, and Firmware Versions	Fujitsu Server PRIMERGY RX2540 M4, Firmware V5.0.0.12 R1.22.0 for D3384-A1x

Storage Configuration Summary	FC switches:
	• 1 x Brocade G620 32Gb 48 port
	Storage Servers:
	• for OS storage
	  ◦ 2 x Micron MTFDDAK480TDC 480GB SATA SSD
	• for Workload storage
	  ◦ 2 x Intel P4800X 750GB PCIe SSD
	  ◦ 1 x Intel P4600 4TB PCIe SSD

Datacenter Management Server	
System Model	Fujitsu Server PRIMERGY RX2540 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)	64 GB, 8

Network Controller(s) Vendors and Models	Emulex OneConnect OCe14000 1GbE dual port Adapter
Operating System, Version, Bitness, and Service Pack	VMware ESXi 6.7 EP 02a Build 9214924
Virtual Center VM Number of vCPUs	4
Virtual Center VM Virtual Memory (in GB)	19
Virtual Center VM Operating System, Version, Bitness, and Service Pack	VMware vCenter Server Appliance 7.0 U2 Build 17694817
Other Hardware	None
Other Software	None

Clients

Total Number of Virtual Clients / Virtual Client Hosts	2 / 2
System Model(s)	Fujitsu Server PRIMERGY RX2530 M2
Processor Vendor(s) and Model(s)	Intel Xeon E5-2699 v4 (for Client Host 1 and 3)
Processor Speed(s) (GHz)	2.2
Total Sockets/Total Cores/Total Threads	2 Sockets / 44 Cores / 88 Threads
Memory per Virtual Client Host	256 GB
Network Controller(s) Vendors and Models	1 x Emulex OneConnect OCe14000 1Gb dual port 1 x Emulex OneConnect OCe14000 10Gb dual port
Virtual Client Networking Notes	1 virtual adapter for management, 2 virtual adapters for workload traffic
Virtual Client Storage Notes	1 x 300GB SAS 10K TOSHIBA AL14SEB03EN HDD with RAID0 for Client Host OS 2 x 400GB SAS 12G TOSHIBA PX02SMF040 SSD with RAID0 for Client VMs
Other Hardware	None
Other Software	VMware ESXi 6.7 EP 08 Build 13473784

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 (except PrimeClient VM, default: single core per socket)
- CPU shares set to high for all DS3DB VMs, ElasticDB and ElasticLB VMs(default normal)
- MEM shares set to high for all DS3DB VMs (default normal)
- CPU shares set to low for all Standby VMs (default normal)
- vSphere DRS Migration Threshold set to Fully Automated level 2
- CD-ROM was removed from all VMs (default Enabled)

Changed 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/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 BIOS settings:

- Turbo Boost Technology = Disabled (Intel Turbo Boost up to 5.1GHz, default: Enabled)
- Hardware Prefetcher = Disabled (default Enabled)

Networking Notes

vSwitch Configuration:

- vSwitch0 for Service Console on vmnic0 at 1Gb/s
- vSwitch1 for all workloads on vmnic2 at 25Gb/s

- vSwitch2 for vMotion connection on vmnic3 at 25Gb/s

Storage Notes

Fujitsu Server (PRIMERGY RX2540 M4) configured as a Fibre Channel Target:

- Hardware details:
  - 2 x Intel Xeon Gold 6134M@3.2GHz processors
  - 64 GB RAM (2 x 32GB 2Rx4 2666MHz DDR4 RDIMMs)
  - 2 x QLogic QLE2742 dual port 32Gb FC HBA used as FC target controller
  - 2 x 480GB SATA SSD Micron MTFDDAK480TDC
  - 1 x Intel P4600 4TB PCIe SSD
  - 2 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, 2 (RAID1):
    - LUN 1 : Storage system OS (480GB, this LUN is not counted in the Storage section)
  - First PCIe-SSD (4TB):
    - LUN 1 : AuctionNoSQL, ElasticDB for tile 0 (300GB)
    - LUN 2 : AuctionDB, ElasticLB for tile 0 (300GB)
    - LUN 3 : AuctionWebA, AuctionWebB, AuctionAppA, AuctionAppB, AuctionLB, AuctionMSQ, ElasticWebA, ElasticWebB, ElasticAppA, ElasticAppB, Standby for tile 0 (300GB)
    - LUN 4 : vmmark3.1.1-template-031420 (300GB)
    - LUN 5 : XvMotion TargetLun (300GB)
    - LUN 6 : SvMotion TargetLun (300GB)
  - Second PCIe-SSD (750GB):
    - LUN 1 : DS3DB, DS3WebA, DS3WebB, DS3WebC for tile 0 (600GB)
  - Third PCIe-SSD (750GB):
    - LUN 1 : Depoly Lun (600GB)

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: 19GB
- 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 7.0 U3 Build 19193900 was installed using 'VMware Image for VMware ESXi 7.0 U3' named VMware-ESXi-7.0.3.update03-19193900-Fujitsu-v530-1.iso

Software Notes

None

Client Notes

The location of Client VMs:

- Client Host 1: Client0
- Client Host 3: PrimeClient

Changes in esx.conf:

- /adv/Power/CpuPolicy = High Performance (default balanced)

vSwitch Configuration:

- vSwitch0 for Service Console on vmnic0 at 1Gb/s
- vSwitch1 for all workloads on vmnic2 and vmnic3 at 10Gb/s

Other Notes

Changes in VMmark3.properties files:

- VMmark3.properties was renamed as VMmark3-run1tiles_ptd.properties

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