Fsas Technologies
a Fujitsu company

PRIMERGY Server

Performance Report

PRIMERGY RX1330 M6 / TX1320 M6 / TX1330 M6

This document provides an overview of benchmarks executed on the PRIMERGY RX1330 M6 / TX1320 M6 / TX1330 M6.

Explaines PRIMERGY RX1330 M6 / TX1320 M6 / TX1330 M6 performance data in comparison to other PRIMERGY models. In addition to the benchmark results, the explanation for each benchmark and benchmark environment are also included.

Version
1.1 2025-04-22

Contents

Technical data

PRIMERGY RX1330 M6

PRIMERGY TX1320 M6

PRIMERGY TX1330 M6

Decimal prefixes according to the SI standard are used for measurement units in this white paper (e.g. 1 GB = 10^9 bytes). In contrast, these prefixes should be interpreted as binary prefixes (e.g. 1 GB = 2^{30} bytes) for the capacities of caches and memory modules. Separate reference will be made to any further exceptions where applicable.

Model	PRIMERGY RX1330 M6	PRIMERGY TX1320 M6	PRIMERGY TX1330 M6
Form factor	Rack server	Tower server	Rack/Tower server
Chipset	Intel C266		
Number of sockets	1		
Number of processors orderable	1		
Processor type	Intel Xeon E-2400 Series Processors / Intel Xeon 6300 Series Processors / Pentium Gold G7400		
Number of memory slots	4		
Maximum memory configuration	128 GB		
PCI slots	PCI Express 5.0 : 2 PCI Express 4.0 : 1	PCI Express 5.0 : 2 PCI Express 4.0 : 2	PCI Express 5.0 : 2 PCI Express 4.0 : 2
Max. number of internal storage	10	8	24

Processor model	Number of cores	Number of threads	Cache [MB]	Rated frequency [GHz]	Maximum turbo frequency [GHz]	Maximum memory transfer rate [MT/s]	TDP [W]
Intel Xeon E-2400 Series Processors							
Xeon E-2488	8	16	24	3.2	5.6	4,800	95
Xeon E-2486	6	12	18	3.5	5.6	4,800	95
Xeon E-2478	8	16	24	2.8	5.2	4,800	80
Xeon E-2468	8	16	24	2.6	5.2	4,800	65
Xeon E-2456 *1	6	12	18	3.3	5.1	4,800	80
Xeon E-2436 *1	6	12	18	2.9	5.0	4,800	65
Xeon E-2434 *1	4	8	12	3.4	5.0	4,800	55
Xeon E-2414 *1	4	8	12	2.6	4.5	4,800	55
Intel Pentium Gold Processor Series							
Pentium Gold G7400	2	4	6	3.7	-	4,800	46
Intel Xeon 6300 Series Processors							
Xeon 6369P	8	16	24	3.3	5.7	4,800	95
Xeon 6357P	8	16	24	3.0	5.4	4,800	80
Xeon 6353P	8	16	24	2.7	5.4	4,800	65
Xeon 6349P	6	12	18	3.6	5.7	4,800	95
Xeon 6337P	6	12	18	3.5	5.3	4,800	80
Xeon 6333P	6	12	18	3.1	4.7	4,800	65
Xeon 6325P	4	8	12	3.5	5.2	4,800	55
Xeon 6315P	4	4	12	2.8	5.2	4,800	55

*1: Intel Turbo Boost Technology is supported up to ver.2.0.

All processors that can be ordered with PRIMERGY RX1330 M6 / TX1320 M6 / TX1330 M6 support Intel Turbo Boost Technology 3.0 or 2.0. This technology allows you to operate the processor with higher frequencies than the rated frequency. The "maximum turbo frequency" listed in the processor list above is the theoretical maximum frequency when there is only one active core per processor. The maximum frequency that can be actually achieved depends on the number of active cores, current consumption, power consumption, and processor temperature.

In general, Intel does not guarantee that maximum turbo frequencies will be achieved. This is related to manufacturing tolerances, and the performance of each individual processor model varies from each other. The range of difference covers the range including all of the rated frequency and the maximum turbo frequency. The turbo function can be set in the BIOS option. Generally, we always recommend leaving the [Turbo Mode] option set at the standard setting [Enabled], as performance is substantially increased by the higher frequencies. However, the Turbo Mode frequency depends on the operating conditions mentioned above and is not always guaranteed. The turbo frequency fluctuates in applications where AVX instructions are used intensively and the number of instructions per clock is large. If you need stable performance or want to reduce power consumption, it may be beneficial to set the [Turbo Mode] option to [Disabled] to disable the turbo function.

Memory modules							
Type	Capacity [GB]	Number of ranks	Bit width of the memory chips	Transfer rate [MT/s]	3DS	Registered	ECC
16 GB (1x 16 GB) 1Rx8 DDR5-4800 U ECC	16	1	8	4,800			✓
32 GB (1x 32 GB) 2Rx8 DDR5-4800 U ECC	32	2	8	4,800			✓

Power supplies	Maximum number		
	RX1330 M6	TX1320 M6	TX1330 M6
Standard PSU 280W	--	1	--
Standard PSU 400W	1	--	--
Standard PSU 450W	--	--	1
Modular PSU 500 W Platinum	2	2	2
Modular PSU 900 W Platinum	2	--	2
Modular PSU 500 W Titanium	2	2	2
Modular PSU 900 W Titanium	2	--	2

Some components may not be available in all countries or sales regions.

Detailed technical information is available in the data sheet of PRIMERGY RX1330 M6 / TX1320 M6 / TX1330 M6.

SPEC CPU2017

Benchmark description

SPEC CPU2017 is a benchmark which measures the system efficiency with integer and floating-point operations. It consists of an integer test suite (SPECrate 2017 Integer, SPECspeed 2017 Integer) containing 10 applications and a floating-point test suite (SPECrate 2017 Floating Point, SPECspeed 2017 Floating Point) containing 14 applications. Both test suites are extremely computing-intensive and concentrate on the CPU and the memory. Other components, such as Disk I/O and network, are not measured by this benchmark.

SPEC CPU2017 is not tied to a special operating system. The benchmark is available as source code and is compiled before the actual measurement. The used compiler version and their optimization settings also affect the measurement result.

SPEC CPU2017 contains two different performance measurement methods. The first method (SPECspeed 2017 Integer or SPECspeed 2017 Floating Point) determines the time which is required to process a single task. The second method (SPECrate 2017 Integer or SPECrate 2017 Floating Point) determines the throughput, i.e. the number of tasks that can be handled in parallel. Both methods are also divided into two measurement runs, "base" and "peak." They differ in the use of compiler optimization. When publishing the results, the base values are always used and the peak values are optional.

Benchmark	Number of single benchmarks	Arithmetics	Type	Compiler optimization	Measurement result
SPECspeed2017_int_peak	10	integer	peak	aggressive	Speed
SPECspeed2017_int_base	10	integer	base	conservative	
SPECrate2017_int_peak	10	integer	peak	aggressive	Throughput
SPECrate2017_int_base	10	integer	base	conservative	
SPECspeed2017_fp_peak	10	floating point	peak	aggressive	Speed
SPECspeed2017_fp_base	10	floating point	base	conservative	
SPECrate2017_fp_peak	13	floating point	peak	aggressive	Throughput
SPECrate2017_fp_base	13	floating point	base	conservative	

The measurement results are the geometric average from normalized ratio values which have been determined for individual benchmarks. The geometric average - in contrast to the arithmetic average - means that there is a weighting in favor of the lower individual results. "Normalized" means that the measurement is how fast is the test system compared to a reference system. For example, value "1" was defined for the SPECspeed2017_int_base, SPECrate2017_int_base, SPECspeed2017_fp_base, and SPECrate2017_fp_base results of the reference system. A SPECspeed2017_int_base value of 2 means that the measuring system has handled this benchmark twice as fast as the reference system. A SPECrate2017_fp_base value of 4 means that the measuring system has handled this benchmark about 4/[# base copies] times faster than the reference system. "# base copies" specifies how many parallel instances of the benchmark have been executed.

Not every SPEC CPU2017 measurement is submitted by us for publication at SPEC. This is why the SPEC web pages do not have every result. As we archive the log files for all measurements, it is possible to prove the correct implementation of the measurements at any time.

Benchmark environment

System Under Test (SUT)	
Hardware	
• Model	PRIMERGY RX1330 M6 / TX1320 M6 / TX1330 M6
• Processor	Intel Xeon E-2400 Series Processors / Intel Xeon 6300 Series Processors / Intel Pentium Gold G7400
• Memory	2 x 32 GB 2Rx8 PC5-4800B-E
Software	
• BIOS settings	Please refer to the site below: RX1330 M6 https://spec.org/cgi-bin/osgresults?conf=cpu2017&op=fetch&field=SYSTEM&pattern=RX1330%20M6 TX1320 M6 https://spec.org/cgi-bin/osgresults?conf=cpu2017&op=fetch&field=SYSTEM&pattern=TX1320%20M6 TX1330 M6 https://spec.org/cgi-bin/osgresults?conf=cpu2017&op=fetch&field=SYSTEM&pattern=TX1330%20M6
• Operating system	SUSE Linux Enterprise Server 15 SP5 5.14.21-150500.53-default
• Operating system settings	Stack size set to unlimited using "ulimit -s unlimited" Intel Xeon E-2400 Series Processors / Pentium Gold G7400 SPECrate2017_int_base: tuned-adm = balanced Intel Xeon 6300 Series Processors SPECspeed2017_fp_base, SPECrate2017_int_base: echo 15000000 > /proc/sys/kernel/sched_min_granularity_ns SPECrate2017_fp_base: echo 20000000 > /proc/sys/kernel/sched_wakeup_granularity_ns
• Compiler	Intel Xeon E-2400 Series Processors / Pentium Gold G7400 Fortran: Version 2024.0.2 of Intel Fortran Compiler for Linux C/C++: Version 2024.0.2 of Intel oneAPI DPC++/C++ Compiler for Linux Intel Xeon 6300 Series Processors Fortran: Version 2024.1 of Intel Fortran Compiler for Linux C/C++: Version 2024.1 of Intel oneAPI DPC++/C++ Compiler for Linux

Benchmark results

In terms of processors, the benchmark result depends primarily on the size of the processor cache, the support for Hyper-Threading, the number of processor cores, and the processor frequency. In the case of processors with Turbo mode, the number of cores, which are loaded by the benchmark, determines the maximum processor frequency that can be achieved. In the case of single-threaded benchmarks, which largely load one core only, the maximum processor frequency that can be achieved is higher than with multi-threaded benchmarks.

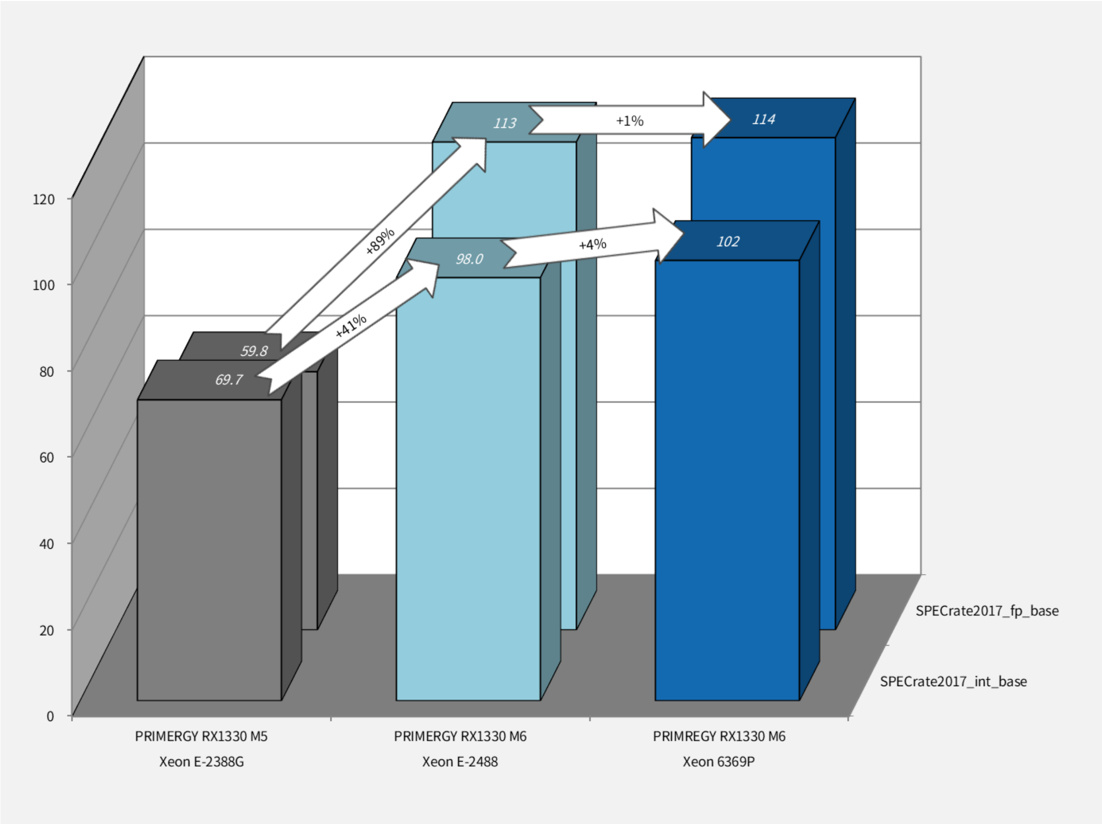
The results with "est." are the estimated values.

Processor	Number of cores	SPECrate2017_int_base			SPECrate2017_fp_base		
		RX1330 M6	TX1320 M6	TX1330 M6	RX1330 M6	TX1320 M6	TX1330 M6
Intel Xeon E-2400 Series Processors							
Xeon E-2488	8	98.0	97.2	97.6	113	112	113
Xeon E-2486	6	79.4 est.	78.8 est.	79.1	99.1 est.	98.4 est.	98.6
Xeon E-2478	8	92.5 est.	91.8 est.	92.1	109 est.	109 est.	109
Xeon E-2468	8	82.8 est.	81.4	82.4	99.3 est.	98.6 est.	98.8
Xeon E-2456	6	75.2 est.	74.6 est.	74.9	94.7 est.	94.0 est.	94.2
Xeon E-2436	6	69.2 est.	68.7 est.	68.9	88.8 est.	88.2 est.	88.4
Xeon E-2434	4	50.2 est.	48.7	50.0	69.3 est.	68.8 est.	69.0
Xeon E-2414	4	40.7 est.	40.4 est.	40.6	66.9 est.	66.4 est.	66.5
Intel Pentium Gold Processor Series							
Pentium Gold G7400	2	22.6 est.	22.4 est.	22.5	37.6 est.	37.3 est.	37.4
Intel Xeon 6300 Series Processors							
Xeon 6369P	8	102	101	101	114	114	114
Xeon 6357P	8	95.3 est.	94.6 est.	95.2 est.	108 est.	108 est.	109 est.
Xeon 6353P	8	85.3 est.	84.7 est.	85.2 est.	99.8 est.	99.6 est.	100 est.
Xeon 6349P	6	81.7 est.	81.1 est.	81.6 est.	99.2 est.	99.0 est.	99.5 est.
Xeon 6337P	6	77.3 est.	76.7 est.	77.2 est.	94.9 est.	94.7 est.	95.2 est.
Xeon 6333P	6	71.9 est.	71.4 est.	71.8 est.	89.0 est.	88.8 est.	89.2 est.
Xeon 6325P	4	51.9 est.	51.5 est.	51.8 est.	70.0 est.	69.9 est.	70.2 est.
Xeon 6315P	4	42.6 est.	42.3 est.	42.5 est.	66.9 est.	66.8 est.	67.1 est.

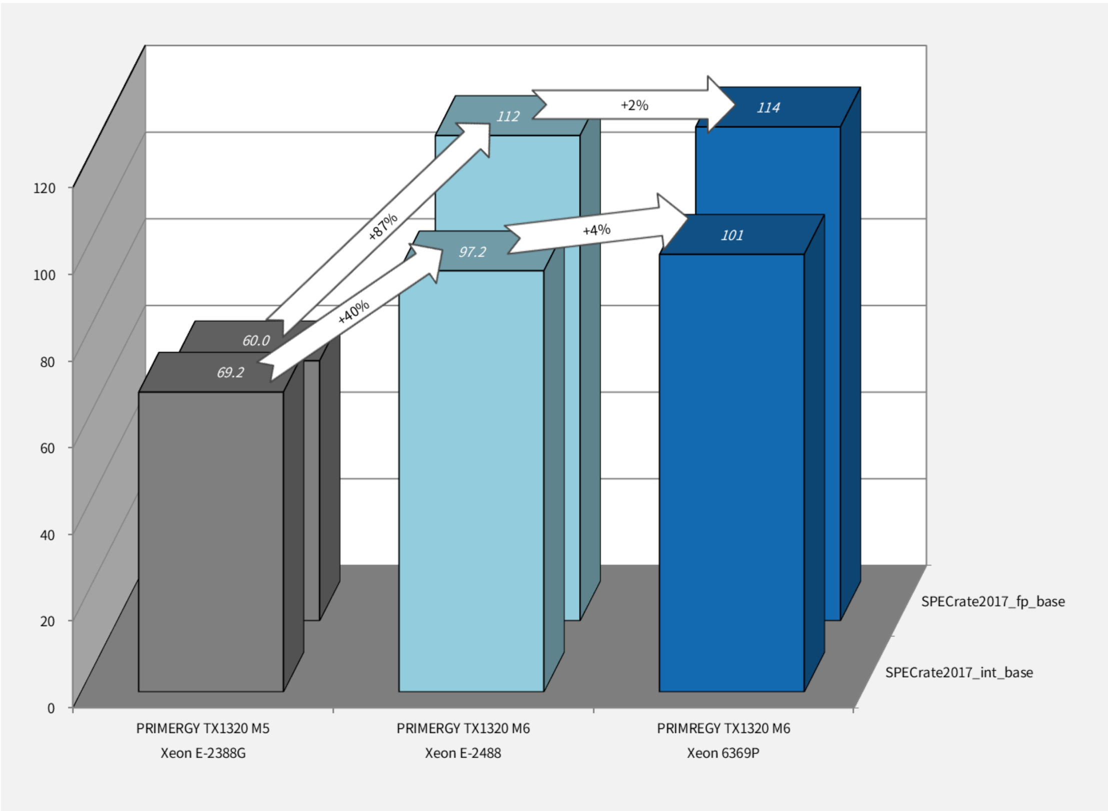
Processor	Number of cores	SPECspeed2017_int_base			SPECspeed2017_fp_base		
		RX1330 M6	TX1320 M6	TX1330 M6	RX1330 M6	TX1320 M6	TX1330 M6
Intel Xeon E-2400 Series Processors							
Xeon E-2488	8	18.3	18.3	18.3	89.5	88.7	89.2
Intel Xeon 6300 Series Processors							
Xeon 6369P	8	18.8	18.8	18.8	90.0	89.5	90.0

The following graphs compare the throughput of PRIMERGY RX1330 M6 / TX1320 M6 / TX1330 M6 and its older model, PRIMERGY RX1330 M5 / TX1320 M5 / TX1330 M5, with maximum performance configurations.

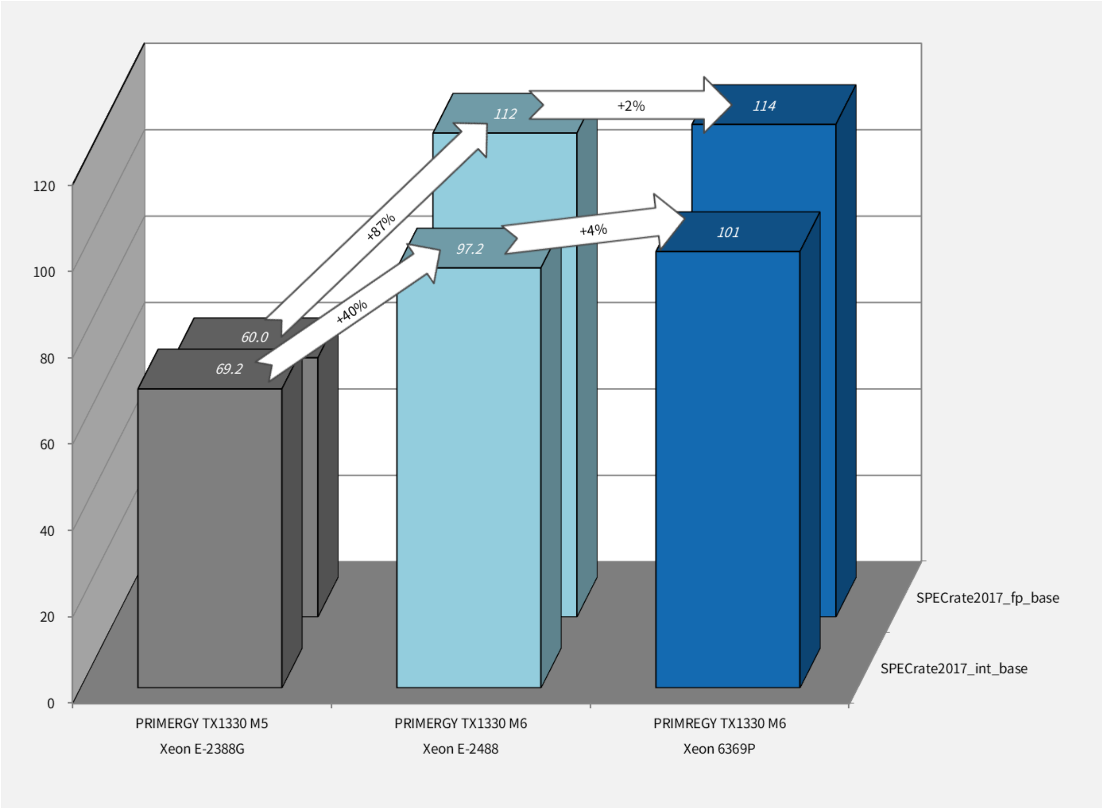
Compared to the Xeon E-2388G, the throughput of the Xeon E-2488 on every model has been improved about 40 percent on SPECrate2017_int_base, 90 percent on SPECrate2017_fp_base respectively. The Xeon 6369P has slightly higher core frequencies than the Xeon E-2488 and the throughput of Xeon 6369P showed a performance improvement of approximately 1~2% on SPECrate2017_int_base and 4% on SPECrate2017_fp_base.



SPECrate2017: Comparison of PRIMERGY RX1330 M6 and PRIMERGY RX1330 M5



SPECrate2017: Comparison of PRIMERGY TX1320 M6 and PRIMERGY TX1320 M5



SPECrate2017: Comparison of PRIMERGY TX1330 M6 and PRIMERGY TX1330 M5

STREAM

Benchmark description

STREAM is a synthetic benchmark that has been used for many years to determine memory throughput and was developed by John McCalpin during his professorship at the University of Delaware. Today STREAM is supported at the University of Virginia, where the source code can be downloaded in either Fortran or C. STREAM continues to play an important role in the HPC environment in particular. It is for example an integral part of the HPC Challenge benchmark suite.

The benchmark is designed in such a way that it can be used both on PCs and on server systems. The unit of measurement of the benchmark is GB/s, i.e. the number of gigabytes that can be read and written per second.

STREAM measures the memory throughput for sequential accesses. These can generally be performed more efficiently than accesses that are randomly distributed on the memory, because the processor caches are used for sequential access.

Before execution the source code is adapted to the environment to be measured. Therefore, the size of the data area must be at least 12 times larger than the total of all last-level processor caches so that these have as little influence as possible on the result. The OpenMP program library is used to enable selected parts of the program to be executed in parallel during the runtime of the benchmark. This provides optimal load distribution for the available processor cores.

In the STREAM benchmark, a data area consisting of 8-byte elements is continuously copied to four operation types. Arithmetic operations are also performed on operation types other than COPY.

Arithmetics type	Arithmetics	Bytes per step	Floating-point calculation per step
COPY	a(i) = b(i)	16	0
SCALE	a(i) = q × b(i)	16	1
SUM	a(i) = b(i) + c(i)	24	1
TRIAD	a(i) = b(i) + q × c(i)	24	2

The throughput is output in GB/s for each type of calculation. The differences between the various values are usually only minor on modern systems. In general, only the determined TRIAD value is used as a comparison.

The measured results primarily depend on the transfer rate of the memory modules. The processors influence the arithmetic calculations.

In this chapter, throughputs are indicated as a power of 10. (1 GB/s = 10^9 Byte/s)

Benchmark environment

System Under Test (SUT)	
Hardware	
• Model	PRIMERGY RX1330 M6 / TX1320 M6 / TX1330 M6
• Processor	Intel Xeon E-2400 Series Processors / Intel Xeon 6300 Series Processors / Intel Pentium Gold G7400
• Memory	2 x 32 GB 2Rx8 PC5-4800B-E
Software	
• BIOS settings	Intel Xeon E-2400 Series Processors / Pentium Gold G7400 FAN Control = Full Intel Xeon 6300 Series Processors Total Memory Encryption = Disabled
• Operating system	SUSE Linux Enterprise Server 15 SP5 5.14.21-150500.53-default
• Operating system settings	Default
• Compiler	Intel Xeon E-2400 Series Processors / Pentium Gold G7400 C/C++: Version 2021.1 of Intel C/C++ Compiler for Linux Intel Xeon 6300 Series Processors C/C++: Version 2024.1 of Intel C/C++ Compiler for Linux
• Benchmark	STREAM Version 5.10

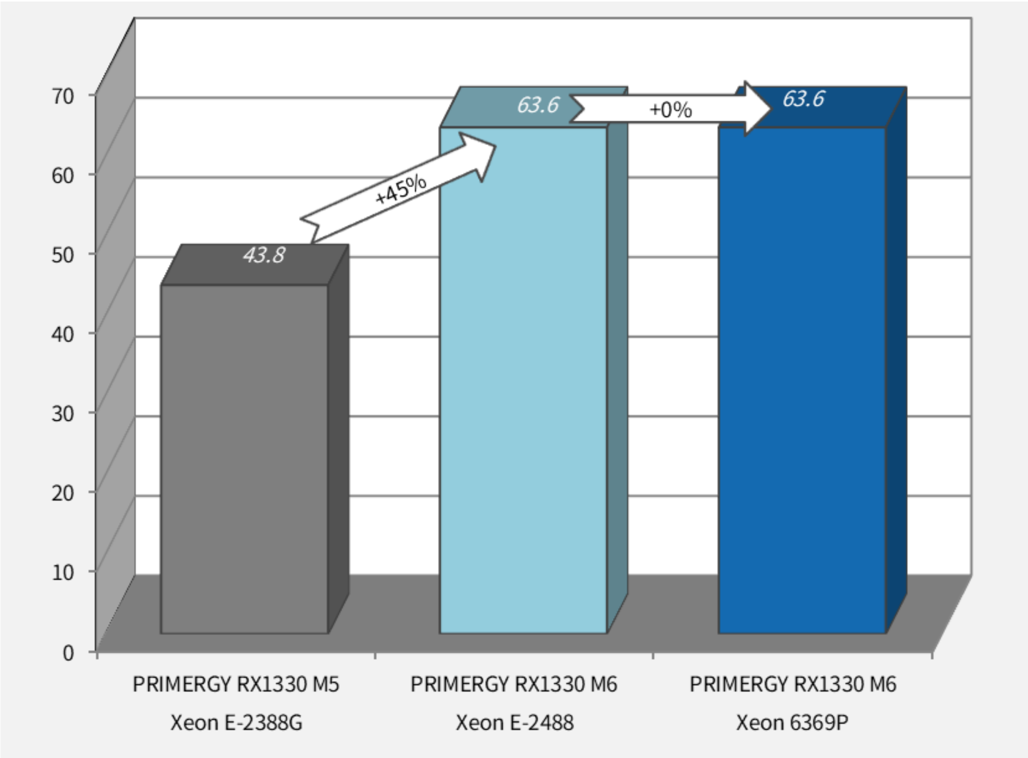
Benchmark results

The results with "est." are the estimated values.

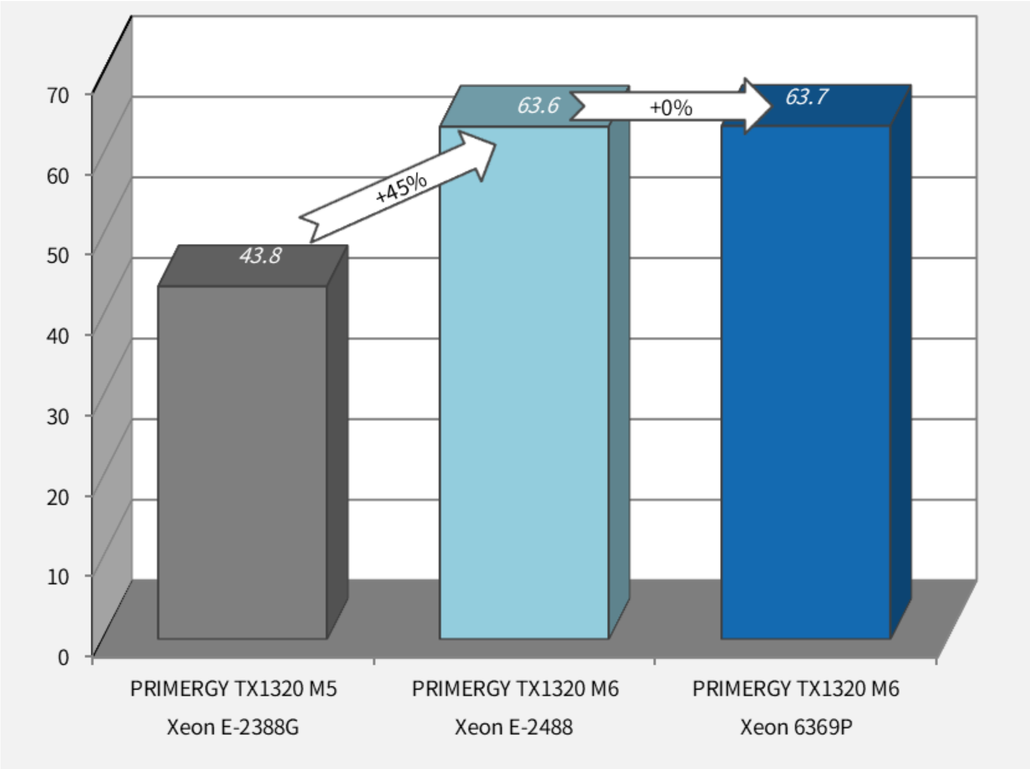
Processor	Memory transfer rate [MT/s]	Maximum memory bandwidth [GB/s]	Number of cores	Rated frequency [GHz]	TRIAD [GB/s]		
					RX1330 M6	TX1320 M6	TX1330 M6
Intel Xeon E-2400 Series Processors							
Xeon E-2488	4,400	70.4	8	3.2	63.6	63.6	63.9
Xeon E-2486	4,400	70.4	6	3.5	61.9 est.	61.9 est.	62.2
Xeon E-2478	4,400	70.4	8	2.8	63.1 est.	63.1 est.	63.4
Xeon E-2468	4,400	70.4	8	2.6	63.6 est.	63.7 est.	64.0
Xeon E-2456	4,400	70.4	6	3.3	61.7 est.	61.7 est.	62.0
Xeon E-2436	4,400	70.4	6	2.9	61.8 est.	61.8 est.	62.1
Xeon E-2434	4,400	70.4	4	3.4	58.3 est.	58.3 est.	58.6
Xeon E-2414	4,400	70.4	4	3.2	58.2 est.	58.2 est.	58.5
Intel Pentium Gold Processor Series							
Pentium Gold G7400	4,400	70.4	2	2.6	46.4 est.	46.4 est.	46.6
Intel Xeon 6300 Series Processors							
Xeon 6369P	4,400	70.4	8	3.3	63.6	63.7	63.6
Xeon 6357P	4,400	70.4	8	3.0	63.5	63.6 est.	63.5 est.
Xeon 6353P	4,400	70.4	8	2.7	63.5	63.7 est.	63.5 est.
Xeon 6349P	4,400	70.4	6	3.6	62.3	62.4 est.	62.3 est.
Xeon 6337P	4,400	70.4	6	3.5	62.2	62.4 est.	62.2 est.
Xeon 6333P	4,400	70.4	6	3.1	62.2	62.3 est.	62.2 est.
Xeon 6325P	4,400	70.4	4	3.5	58.4	58.5 est.	58.4 est.
Xeon 6315P	4,400	70.4	4	2.8	58.2	58.3 est.	58.2 est.

The following diagrams illustrate the throughput of the RX1330 M6 / TX1320 M6 / TX1330 M6 in comparison to its old model, the RX1330 M5 / TX1320 M5 / TX1330 M5 with maximum performance configurations.

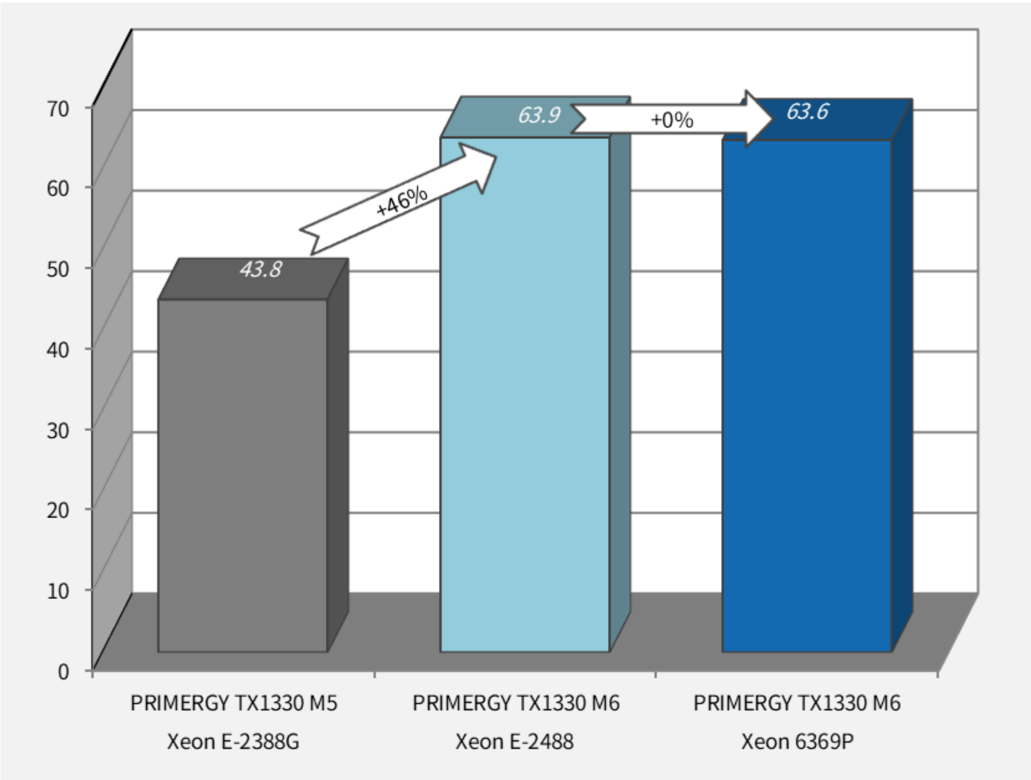
The throughput of the Xeon E-2488 on every model has been improved about 45 percent compared with the predecessor of the Xeon E-2388G. On the other hand, the Xeon 6369P has no specification changes of memory bandwidth and showed almost the same throughput as the Xeon E-2488.



STREAM TRIAD: Comparison of PRIMERGY RX1330 M6 and PRIMERGY RX1330 M5



STREAM TRIAD: Comparison of PRIMERGY TX1320 M6 and PRIMERGY TX1320 M5



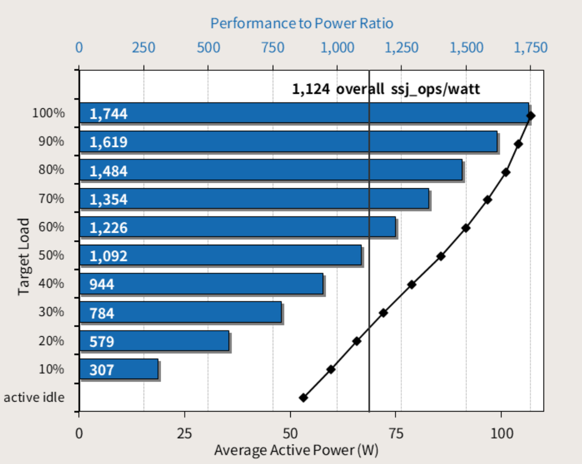
STREAM TRIAD: Comparison of PRIMERGY TX1330 M6 and PRIMERGY TX1330 M5

SPECpower_ssj2008

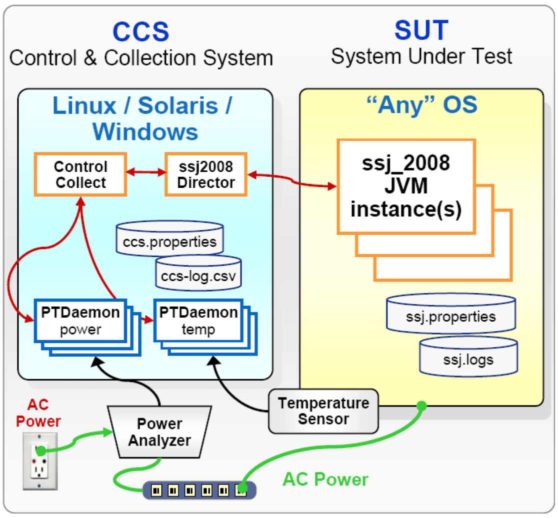
Benchmark description

SPECpower_ssj2008 is the first industry-standard SPEC benchmark that evaluates the power and performance characteristics of a server. With SPECpower_ssj2008 SPEC has defined standards for server power measurements in the same way they have done for performance.

The benchmark workload represents typical server-side Java business applications. The workload is scalable, multi-threaded, portable across a wide range of platforms, and easy to run. The benchmark tests CPUs, caches, the memory hierarchy, and scalability of symmetric multiprocessor systems (SMPs), as well as the implementation of Java Virtual Machine (JVM), Just In Time (JIT) compilers, garbage collection, threads, and some aspects of the operating system.



SPECpower_ssj2008 reports power consumption for servers at different performance levels — from 100% to “active idle” in 10% segments — over a set period of time. The graduated workload recognizes the fact that processing loads and power consumption on servers vary substantially over the course of days or weeks. To compute a power-performance metric across all levels, measured transaction throughputs for each segment are added together and then divided by the sum of the average power consumed for each segment. The result is a figure of merit called “overall ssj_ops/watt”. This ratio provides information about the energy efficiency of the measured server. The defined measurement standard enables customers to compare it with other configurations and servers measured with SPECpower_ssj2008. The diagram shows a typical graph of a SPECpower_ssj2008 result.



The benchmark runs on a wide variety of operating systems and hardware architectures and does not require extensive client or storage infrastructure. The minimum equipment for SPEC-compliant testing is two networked computers, plus a power analyzer and a temperature sensor. One computer is the System Under Test (SUT) which runs one of the supported operating systems and the JVM. The JVM provides the environment required to run the SPECpower_ssj2008 workload which is implemented in Java. The other computer is a “Control & Collection System” (CCS) which controls the operation of the benchmark and captures the power, performance, and temperature readings for reporting. The diagram provides an overview of the basic structure of the benchmark configuration and the various components.

Benchmark environment

System Under Test (SUT)	
Hardware	
• Model	PRIMERGY RX1330 M6 / TX1320 M6 / TX1330 M6
• Processor	1 x Xeon E-2488 1 x Xeon 6369P
• Memory	2 x 16 GB 1Rx8 PC5-4800B (with Xeon E-2488) 2 x 16GB (1x16GB) 1Rx8 DDR5-4800 U ECC (with Xeon 6369P)
• Network interface	2 x RJ45 with integrated LEDs for fixed onboard 1Gb LAN
• Disk subsystem	1 x SSD M.2 240GB, PYBMF24YN5 (with Xeon E-2488) 1 x SSD M.2 240GB, PY-MF24YN5 (with Xeon 6369P)
• Power Supply Unit	1 x Standard 400 W Platinum PSU, S26113-E664-V70-1 (RX1330 M6) 1 x Standard 280 W Platinum PSU, S26113-E665-V71-1 (TX1320 M6) 1 x Standard 450 W Platinum PSU, S26113-E663-V50-1 (TX1330 M6)
Software	
• BIOS	R1.0.0 (with Xeon E-2488) R2.1.0 (with Xeon 6369P)
• BIOS settings	See “Details”
• iRMC Firmware	2.50f (with Xeon E-2488) 2.58S (with Xeon 6369P)
• Operating system	Microsoft Windows Server 2022 Standard
• Operating system settings	See “Details”
• JVM	(with Xeon E-2488) Oracle Java HotSpot 64-Bit Server VM 18.9 (build 11.0.16.1+1-LTS, mixed mode) (with Xeon 6369P) Oracle Java HotSpot(TM) 64-Bit Server VM (build 17.0.10+11-LTS-240, mixed mode, sharing)
• JVM settings	See “Details”

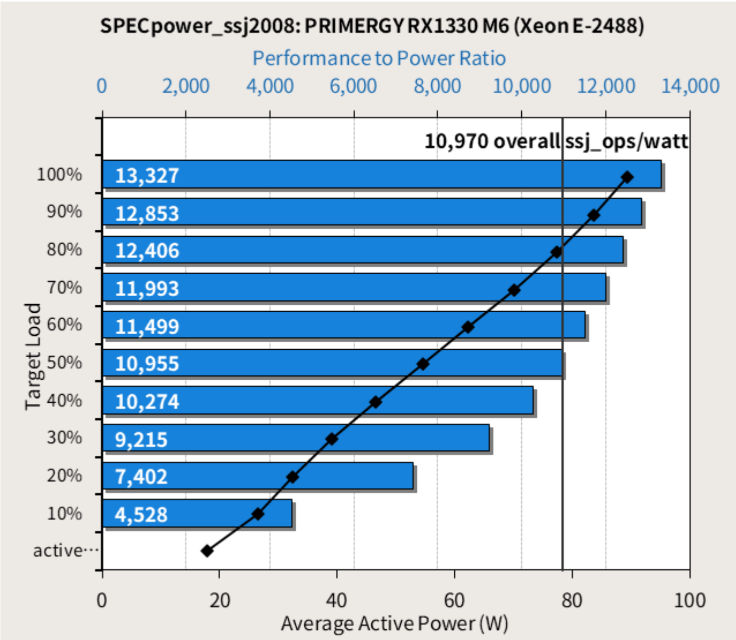
Details	
See disclosure	RX1330 M6 (Xeon E-2488) https://www.spec.org/power_ssj2008/results/res2024q2/power_ssj2008-20240325-01384.html TX1320 M6 (Xeon E-2488) https://www.spec.org/power_ssj2008/results/res2024q2/power_ssj2008-20240325-01383.html TX1330 M6 (Xeon E-2488) https://www.spec.org/power_ssj2008/results/res2024q2/power_ssj2008-20240325-01382.html RX1330 M6 (Xeon 6369P) https://www.spec.org/power_ssj2008/results/res2025q2/power_ssj2008-20250325-01520.html TX1320 M6 (Xeon 6369P) https://www.spec.org/power_ssj2008/results/res2025q2/power_ssj2008-20250325-01519.html TX1330 M6 (Xeon 6369P) https://www.spec.org/power_ssj2008/results/res2025q2/power_ssj2008-20250325-01518.html

Benchmark results (PRIMERGY RX1330 M6)

RX1330 M6 (Xeon E-2488)

The PRIMERGY RX1330 M6 equipped with Xeon E-2488 achieved the following result in the Microsoft Windows Server 2022 Standard environment:

SPECpower_ssj2008 = 10,970 overall ssj_ops/watt



The adjoining diagram shows the result of the configuration described above. The blue horizontal bars show the performance to power ratio in ssj_ops/watt (upper x-axis) for each target load level tagged on the y-axis of the diagram. The black line graph shows the run of the curve for the average power consumption (bottom x-axis) at each target load level marked with a small rhomb. The black vertical line shows the benchmark result of 10,970 overall ssj_ops/watt for the PRIMERGY RX1330 M6. This is the quotient of the sum of the transaction throughputs for each load level and the sum of the average power consumed for each measurement interval.

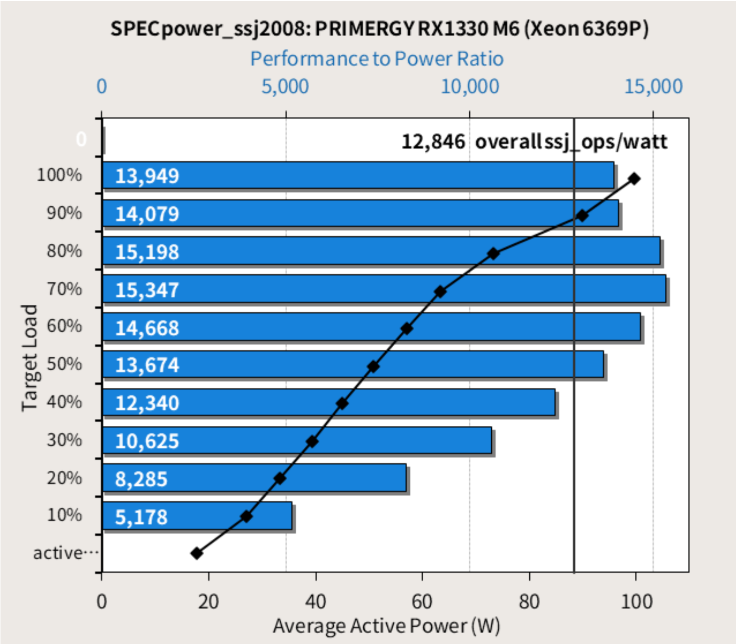
The following table shows the benchmark results for the throughput in ssj_ops, the power consumption in watts and the resulting energy efficiency for each load level.

Performance		Power	Energy Efficiency
Target Load	ssj_ops	Average Power (W)	ssj_ops/watt
100%	1,192,063	89.4	13,327
90%	1,076,253	83.7	12,853
80%	958,773	77.3	12,406
70%	840,616	70.1	11,993
60%	715,321	62.2	11,499
50%	598,879	54.7	10,955
40%	478,906	46.6	10,274
30%	360,209	39.1	9,215
20%	239,829	32.4	7,402
10%	120,047	26.5	4,528
Active Idle	0	17.8	0
			Σ ssj_ops / Σ power = 10,970

RX1330 M6 (Xeon 6369P)

The PRIMERGY RX1330 M6 equipped with Xeon 6369P achieved the following result in the Microsoft Windows Server 2022 Standard environment:

SPECpower_ssj2008 = 12,846 overall ssj_ops/watt



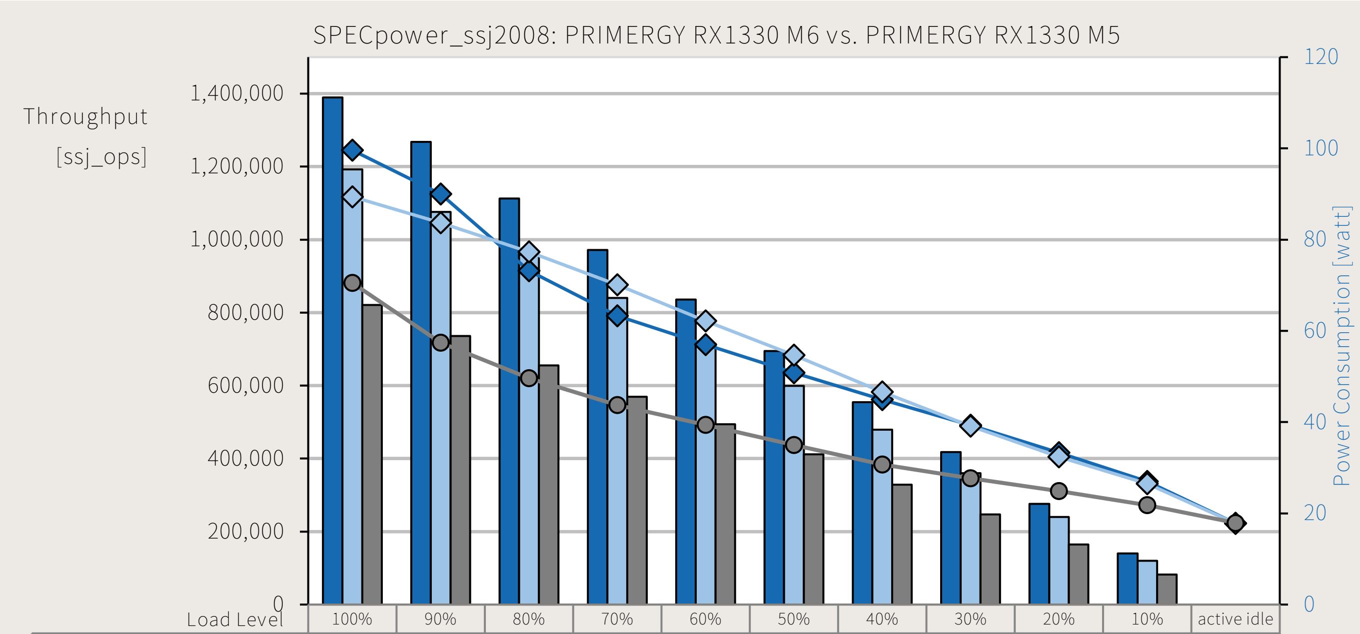
The adjoining diagram shows the result of the configuration described above. The blue horizontal bars show the performance to power ratio in ssj_ops/watt (upper x-axis) for each target load level tagged on the y-axis of the diagram. The black line graph shows the run of the curve for the average power consumption (bottom x-axis) at each target load level marked with a small rhomb. The black vertical line shows the benchmark result of 12,846 overall ssj_ops/watt for the PRIMERGY RX1330 M6. This is the quotient of the sum of the transaction throughputs for each load level and the sum of the average power consumed for each measurement interval.

The following table shows the benchmark results for the throughput in ssj_ops, the power consumption in watts and the resulting energy efficiency for each load level.

Performance		Power	Energy Efficiency
Target Load	ssj_ops	Average Power (W)	ssj_ops/watt
100%	1,389,450	99.6	13,949
90%	1,267,818	90.0	14,079
80%	1,112,398	73.2	15,198
70%	971,915	63.3	15,347
60%	835,562	57.0	14,668
50%	694,336	50.8	13,674
40%	554,521	44.9	12,340
30%	417,482	39.3	10,625
20%	275,730	33.3	8,285
10%	139,803	27.0	5,178
Active Idle	0	17.8	0
			∑ssj_ops / ∑power = 12,846

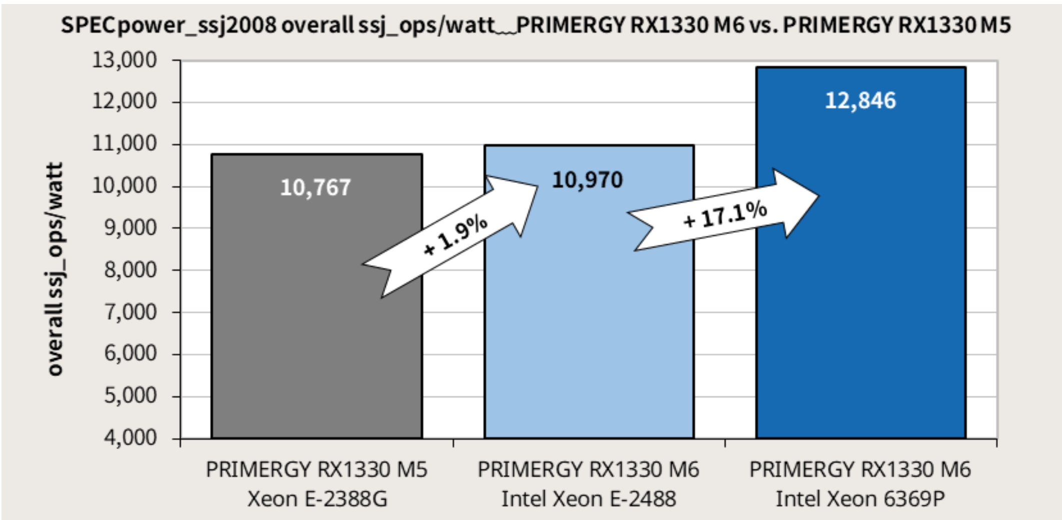
Comparison with the predecessor

The following diagram shows for each load level (on the x-axis) the throughput (on the left y-axis) and the power consumption (on the right y-axis) of the PRIMERGY RX1330 M6 compared to the predecessor PRIMERGY RX1330 M5.



Load Level	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	active idle
RX1330 M6 6369P ssj_ops	1,389,450	1,267,818	1,112,398	971,915	835,562	694,336	554,521	417,482	275,730	139,803	0
RX1330 M6 E-2488 ssj_ops	1,192,063	1,076,253	958,773	840,616	715,321	598,879	478,906	360,209	239,829	120,047	0
RX1330 M5 E-2388G ssj_ops	820,751	735,856	655,157	569,227	493,752	411,493	328,344	247,043	164,504	82,121	0
RX1330 M6 6369P watt	99.6	90.0	73.2	63.3	57.0	50.8	44.9	39.3	33.3	27.0	17.8
RX1330 M6 E-2488 watt	89.4	83.7	77.3	70.1	62.2	54.7	46.6	39.1	32.4	26.5	17.8
RX1330 M5 E-2388G watt	70.5	57.4	49.6	43.7	39.4	35.0	30.7	27.7	24.9	21.8	17.9

Although the PRIMERGY RX1330 M6 with a Xeon E-2488 processor increased the average power consumption at each load level by 43% compared to the previous PRIMERGY RX1330 M5, it increased the throughput by 46%, resulting in a 1.9% improvement in overall energy efficiency. Moreover, the PRIMERGY RX1330 M6 with a Xeon 6369P processor improved its overall energy efficiency by 17.1% thanks to the processor performance improvements and increased throughput through the software level improvements.

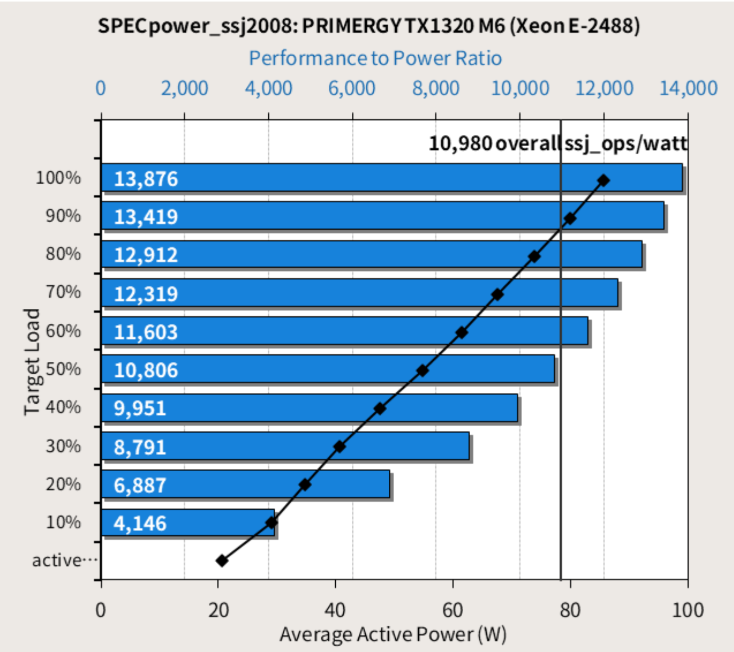


Benchmark results (PRIMERGY TX1320 M6)

TX1320 M6 (Xeon E-2488)

The PRIMERGY TX1320 M6 equipped with Xeon E-2488 achieved the following result in the Microsoft Windows Server 2022 Standard environment:

SPECpower_ssj2008 = 10,980 overall ssj_ops/watt



The adjoining diagram shows the result of the configuration described above. The blue horizontal bars show the performance to power ratio in ssj_ops/watt (upper x-axis) for each target load level tagged on the y-axis of the diagram. The black line graph shows the run of the curve for the average power consumption (bottom x-axis) at each target load level marked with a small rhomb. The black vertical line shows the benchmark result of 10,980 overall ssj_ops/watt for the PRIMERGY TX1320 M6. This is the quotient of the sum of the transaction throughputs for each load level and the sum of the average power consumed for each measurement interval.

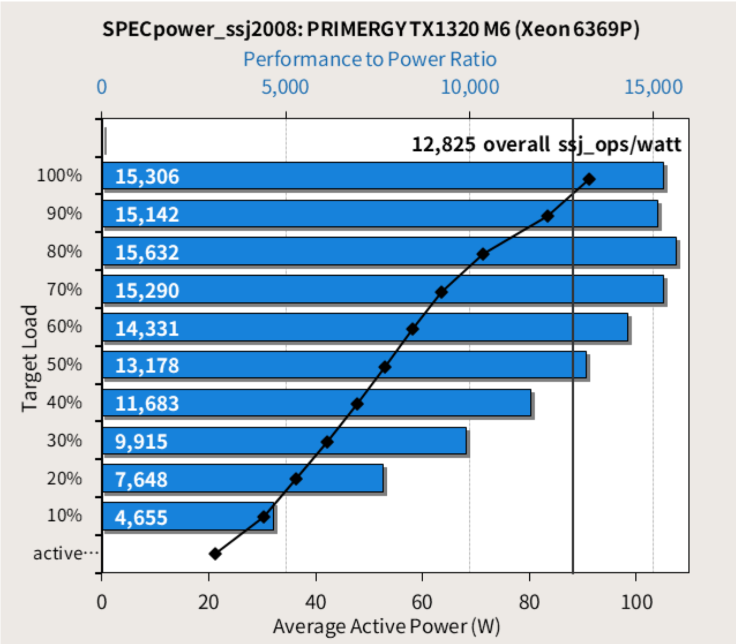
The following table shows the benchmark results for the throughput in ssj_ops, the power consumption in watts and the resulting energy efficiency for each load level.

Performance		Power	Energy Efficiency
Target Load	ssj_ops	Average Power (W)	ssj_ops/watt
100%	1,188,203	85.6	13,876
90%	1,071,548	79.9	13,419
80%	952,747	73.8	12,912
70%	832,889	67.6	12,319
60%	712,301	61.4	11,603
50%	592,276	54.8	10,806
40%	474,069	47.6	9,951
30%	357,893	40.7	8,791
20%	239,231	34.7	6,887
10%	120,383	29.0	4,146
Active Idle	0	20.6	0
			∑ssj_ops / ∑power = 10,980

TX1320 M6 (Xeon 6369P)

The PRIMERGY TX1320 M6 equipped with Xeon 6369P achieved the following result in the Microsoft Windows Server 2022 Standard environment:

SPECpower_ssj2008 = 12,825 overall ssj_ops/watt



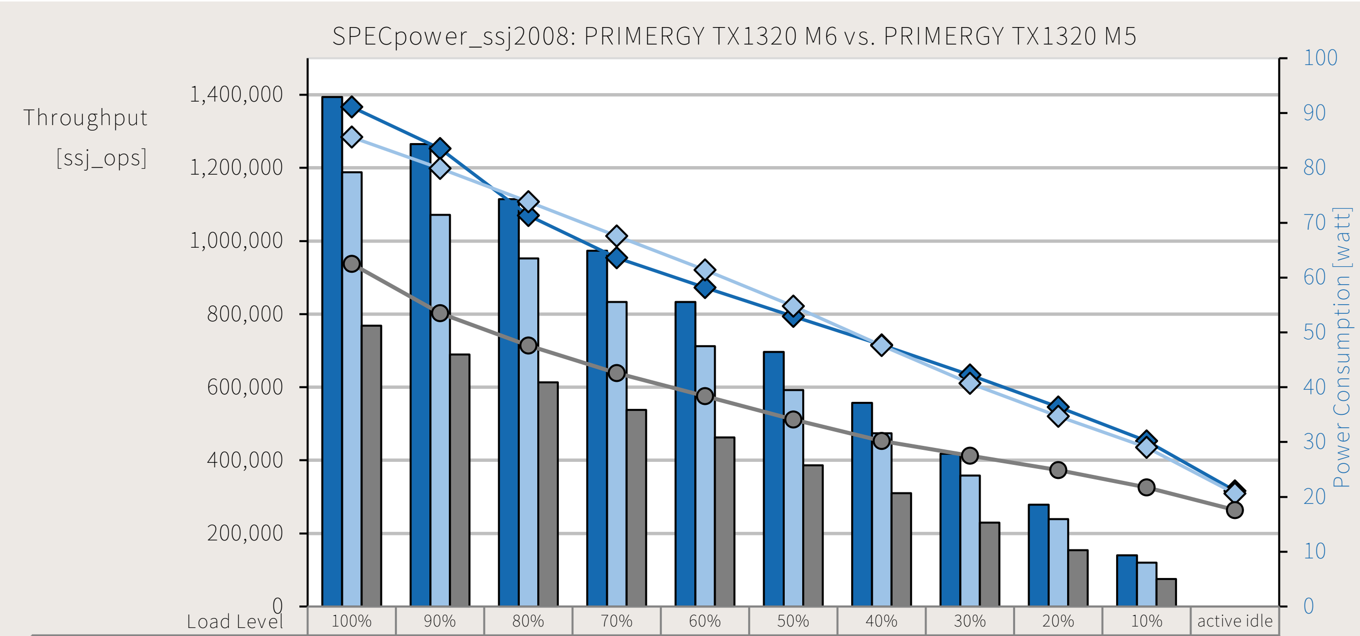
The adjoining diagram shows the result of the configuration described above. The blue horizontal bars show the performance to power ratio in ssj_ops/watt (upper x-axis) for each target load level tagged on the y-axis of the diagram. The black line graph shows the run of the curve for the average power consumption (bottom x-axis) at each target load level marked with a small rhomb. The black vertical line shows the benchmark result of 12,825 overall ssj_ops/watt for the PRIMERGY TX1320 M6. This is the quotient of the sum of the transaction throughputs for each load level and the sum of the average power consumed for each measurement interval.

The following table shows the benchmark results for the throughput in ssj_ops, the power consumption in watts and the resulting energy efficiency for each load level.

Performance		Power	Energy Efficiency
Target Load	ssj_ops	Average Power (W)	ssj_ops/watt
100%	1,393,596	91.1	15,306
90%	1,264,824	83.5	15,142
80%	1,114,062	71.3	15,632
70%	973,036	63.6	15,290
60%	833,346	58.2	14,331
50%	696,888	52.9	13,178
40%	556,798	47.7	11,683
30%	418,234	42.2	9,915
20%	278,520	36.4	7,648
10%	140,368	30.2	4,655
Active Idle	0	21.1	0
			Σ ssj_ops / Σ power = 12,825

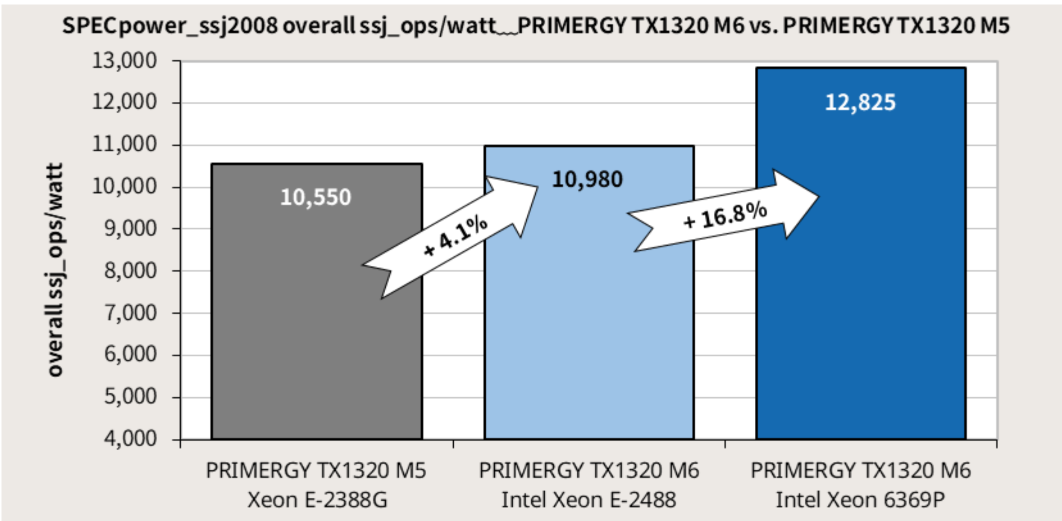
Comparison with the predecessor

The following diagram shows for each load level (on the x-axis) the throughput (on the left y-axis) and the power consumption (on the right y-axis) of the PRIMERGY TX1320 M6 compared to the predecessor PRIMERGY TX1320 M5.



Load Level	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	active idle
TX1320 M6 6369P ssj_ops	1,393,596	1,264,824	1,114,062	973,036	833,346	696,888	556,798	418,234	278,520	140,368	0
TX1320 M6 E-2488 ssj_ops	1,188,203	1,071,548	952,747	832,889	712,301	592,276	474,069	357,893	239,231	120,383	0
TX1320 M5 E-2388G ssj_ops	767,959	689,775	613,561	537,611	462,676	386,312	309,872	229,528	153,923	75,010	0
TX1320 M6 6369P watt	91.1	83.5	71.3	63.6	58.2	52.9	47.7	42.2	36.4	30.2	21.1
TX1320 M6 E-2488 watt	85.6	79.9	73.8	67.6	61.4	54.8	47.6	40.7	34.7	29.0	20.6
TX1320 M5 E-2388G watt	62.5	53.5	47.6	42.6	38.4	34.1	30.2	27.5	24.9	21.7	17.6

Although the PRIMERGY TX1320 M6 with a Xeon E-2488 processor increased the average power consumption at each load level by 49% compared to the previous PRIMERGY TX1320 M5, it increased the throughput by 55%, resulting in a 4.1% improvement in overall energy efficiency. Moreover, the PRIMERGY TX1320 M6 with a Xeon 6369P processor improved its overall energy efficiency by 16.8% thanks to the processor performance improvements and increased throughput through the software level improvements.

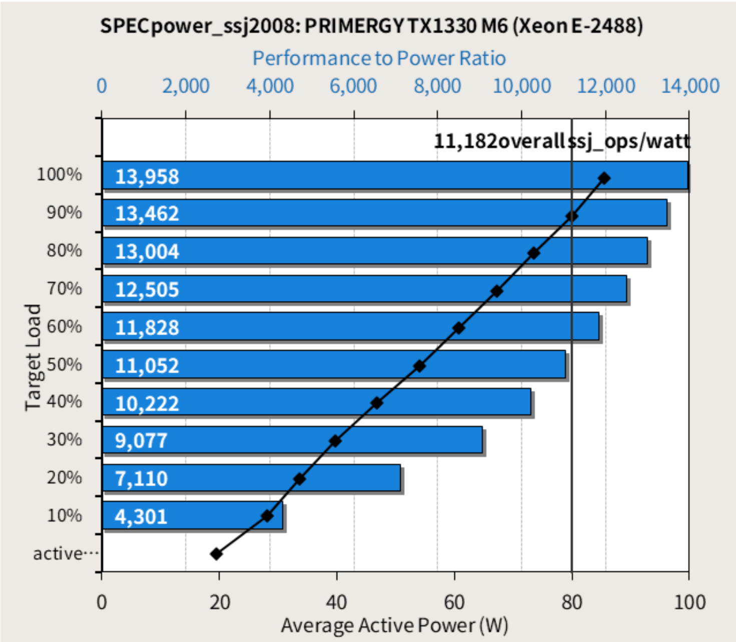


Benchmark results (PRIMERGY TX1330 M6)

TX1330 M6 (Xeon E-2488)

The PRIMERGY TX1330 M6 equipped with Xeon E-2488 achieved the following result in the Microsoft Windows Server 2022 Standard environment:

SPECpower_ssj2008 = 11,182 overall ssj_ops/watt



The adjoining diagram shows the result of the configuration described above. The blue horizontal bars show the performance to power ratio in ssj_ops/watt (upper x-axis) for each target load level tagged on the y-axis of the diagram. The black line graph shows the run of the curve for the average power consumption (bottom x-axis) at each target load level marked with a small rhomb. The black vertical line shows the benchmark result of 11,182 overall ssj_ops/watt for the PRIMERGY TX1330 M6. This is the quotient of the sum of the transaction throughputs for each load level and the sum of the average power consumed for each measurement interval.

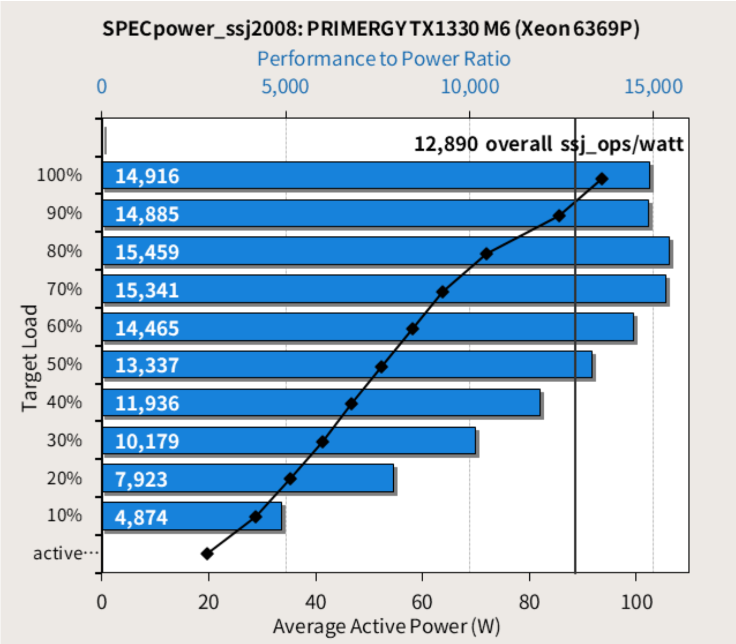
The following table shows the benchmark results for the throughput in ssj_ops, the power consumption in watts and the resulting energy efficiency for each load level.

Performance		Power	Energy Efficiency
Target Load	ssj_ops	Average Power (W)	ssj_ops/watt
100%	1,193,983	85.5	13,958
90%	1,076,009	79.9	13,462
80%	955,309	73.5	13,004
70%	840,061	67.2	12,505
60%	717,799	60.7	11,828
50%	597,211	54.0	11,052
40%	477,585	46.7	10,222
30%	360,592	39.7	9,077
20%	238,716	33.6	7,110
10%	120,553	28.0	4,301
Active Idle	0	19.4	0
			Σ ssj_ops / Σ power = 11,182

TX1330 M6 (Xeon 6369P)

The PRIMERGY TX1330 M6 equipped with Xeon 6369P achieved the following result in the Microsoft Windows Server 2022 Standard environment:

SPECpower_ssj2008 = 12,890 overall ssj_ops/watt



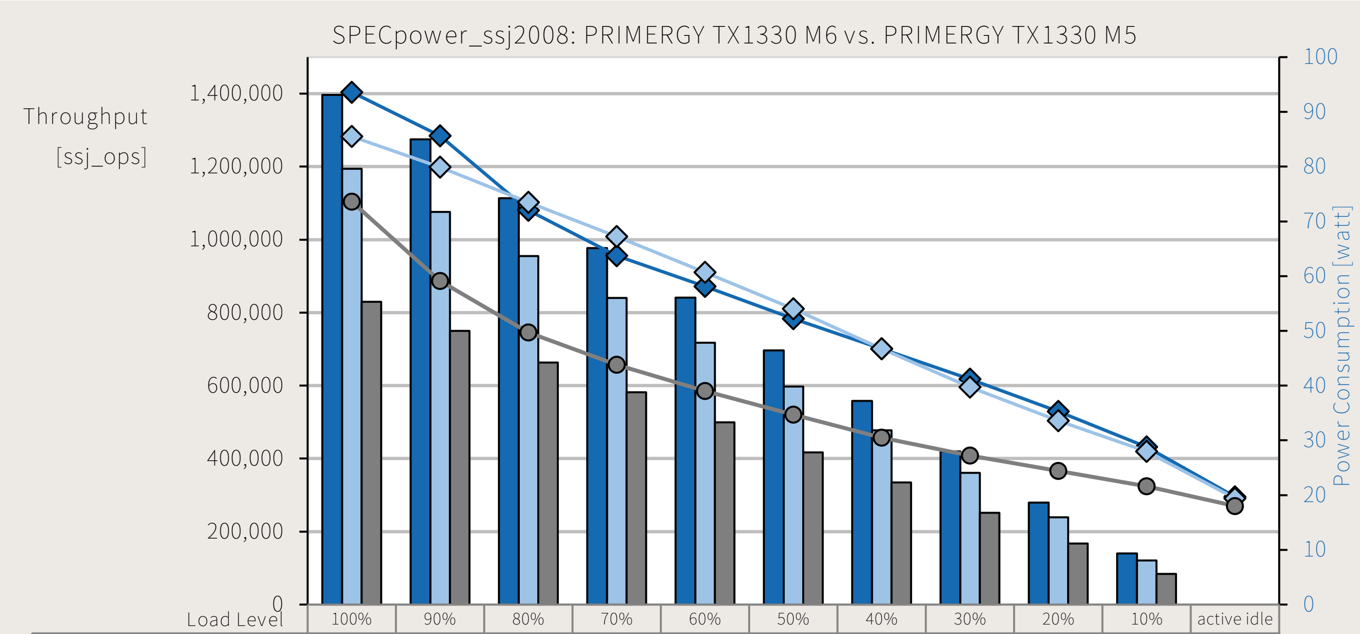
The adjoining diagram shows the result of the configuration described above. The blue horizontal bars show the performance to power ratio in ssj_ops/watt (upper x-axis) for each target load level tagged on the y-axis of the diagram. The black line graph shows the run of the curve for the average power consumption (bottom x-axis) at each target load level marked with a small rhomb. The black vertical line shows the benchmark result of 12,890 overall ssj_ops/watt for the PRIMERGY TX1330 M6. This is the quotient of the sum of the transaction throughputs for each load level and the sum of the average power consumed for each measurement interval.

The following table shows the benchmark results for the throughput in ssj_ops, the power consumption in watts and the resulting energy efficiency for each load level.

Performance		Power	Energy Efficiency
Target Load	ssj_ops	Average Power (W)	ssj_ops/watt
100%	1,396,439	93.6	14,916
90%	1,274,884	85.6	14,885
80%	1,113,458	72.0	15,459
70%	977,230	63.7	15,341
60%	840,844	58.1	14,465
50%	696,455	52.2	13,337
40%	557,626	46.7	11,936
30%	419,872	41.2	10,179
20%	279,401	35.3	7,923
10%	140,376	28.8	4,874
Active Idle	0	19.7	0
			Σ ssj_ops / Σ power = 12,890

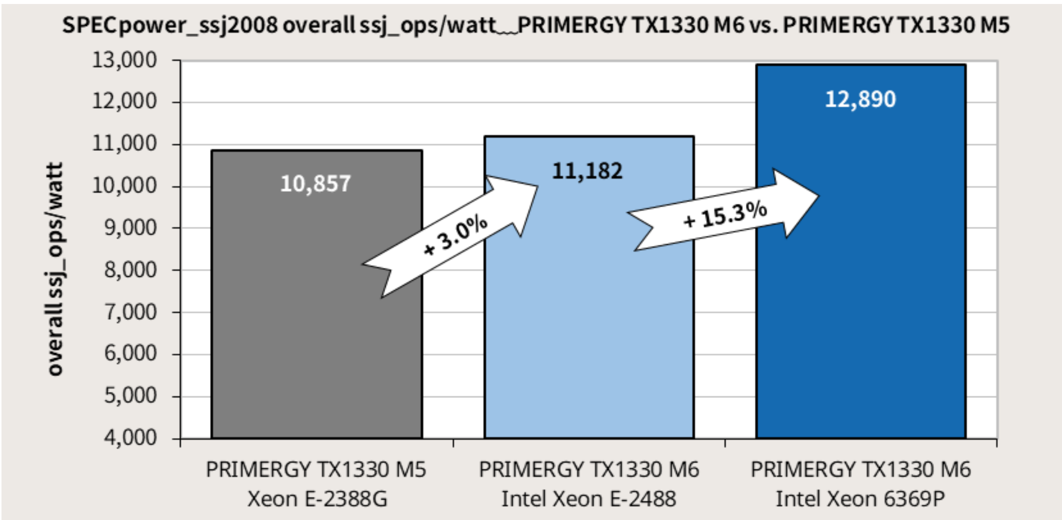
Comparison with the predecessor

The following diagram shows for each load level (on the x-axis) the throughput (on the left y-axis) and the power consumption (on the right y-axis) of the PRIMERGY TX1330 M6 compared to the predecessor PRIMERGY TX1330 M5.



Load Level	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	active idle
TX1330 M6 6369P ssj_ops	1,396,439	1,274,884	1,113,458	977,230	840,844	696,455	557,626	419,872	279,401	140,376	0
TX1330 M6 E-2488 ssj_ops	1,193,983	1,076,009	955,309	840,061	717,799	597,211	477,585	360,592	238,716	120,553	0
TX1330 M5 E-2388G ssj_ops	829,272	749,606	663,603	582,017	498,986	416,552	334,849	251,087	167,056	83,722	0
TX1330 M6 6369P watt	93.6	85.6	72.0	63.7	58.1	52.2	46.7	41.2	35.3	28.8	19.7
TX1330 M6 E-2488 watt	85.5	79.9	73.5	67.2	60.7	54.0	46.7	39.7	33.6	28.0	19.4
TX1330 M5 E-2388G watt	73.6	59.1	49.7	43.8	39.0	34.7	30.5	27.2	24.4	21.6	18.0

Although the PRIMERGY TX1330 M6 with a Xeon E-2488 processor increased the average power consumption at each load level by 40% compared to the previous PRIMERGY TX1330 M5, it increased the throughput by 44%, resulting in a 3.0% improvement in overall energy efficiency. Moreover, the PRIMERGY TX1330 M6 with a Xeon 6369P processor improved its overall energy efficiency by 15.3% thanks to the processor performance improvements and increased throughput through the software level improvements.



Measurement results of SPECpower_ssj2008 (April 23, 2024)

11,182 SPECpower_ssj2008

On April 23, 2024, PRIMERGY TX1330 M6 with a Xeon E-2488 processor achieved a performance value of 11,182 on the Windows Server 2022 Standard in the SPECpower_ssj2008 benchmark and won first place in SPECpower_ssj2008 performance of Intel Xeon E-2400 Series processors category.

Measurement results of SPECpower_ssj2008 (April 9, 2025)

12,890 SPECpower_ssj2008

On April 9, 2025, PRIMERGY TX1330 M6 with a Xeon 6369P processor achieved a performance value of 12,890 on the Windows Server 2022 Standard in the SPECpower_ssj2008 benchmark and won first place in SPECpower_ssj2008 performance of Intel Xeon 6300 Series processors category.

For the latest results of the SPECpower_ssj2008, see https://www.spec.org/power_ssj2008/results/.

Disk I/O: Performance of storage media

Benchmark description

Performance measurements of disk subsystems for PRIMERGY servers are carried out with a defined measurement method, which models the accesses of real application scenarios on the basis of specifications.

The essential specifications are as follows.

- Random access / sequential access ratio
- Read / write access ratio
- Block size (kiB)
- Queue Depth (number of IO requests to issue at one time)

A given value combination of these specifications is known as "load profile." The following five standard load profiles can be allocated to typical application scenarios.

Standard load profile	Access	Type of access		Block size [kiB]	Application
		read	write		
Filecopy	Random	50%	50%	64	Copying files
Fileserver	Random	67%	33%	64	Fileserver
Database	Random	67%	33%	8	Database (data transfer) Mail server
Streaming	Sequential	100%	0%	64	Database (log file), Data backup, Video streaming (partial)
Restore	Sequential	0%	100%	64	Restoring files

In order to model applications that access in parallel with a different load intensity the Queue Depth is increased from 1 to 512 (in steps to the power of two).

The measurements of this document are based on these standard load profiles.

The main measurement items are as follows.

- Throughput [MiB/s] Throughput in megabytes per second
- Transactions [IO/s] Transaction rate in I/O operations per second
- Latency [ms] Average response time in ms

The data throughput has established itself as the normal measurement variable for sequential load profiles, whereas the measurement variable "transaction rate" is mostly used for random load profiles with their small block sizes. Data throughput and transaction rate are directly proportional to each other and can be transferred to each other according to the following formula.

Data throughput [MiB/s] = Transaction rate [IO/s] x Block size [MiB]
Transaction rate [IO/s] = Data throughput [MiB/s] / Block size [MiB]

In this section, a power of 10 (1 TB = 10^{12} bytes) is used to indicate the capacity of the hard storage medium, and a power of 2 (1 MiB / s = 2^{20} bytes) is used to indicate the capacity of other media, file size, block size, and throughput.

All the details of the measurement method and the basics of disk I/O performance are described in the white paper "Basics of Disk I/O Performance."

Controller

PRIMERGY server can use the following controllers.

Controller name	Cache	Supported interfaces			RAID levels
		host	drive	port	
PSAS CP 2200-16i	-	PCIe 4.0 x8	SATA 6G SAS 12G	16	0, 1, 10, 5
PRAID CP600i	-	PCIe 4.0 x8	SATA 6G SAS 12G	8	0, 1, 10
PRAID EP640i	4GB	PCIe 4.0 x8	SATA 6G SAS 12G	8	0, 1, 1E, 10, 5, 50, 6, 60
PRAID EP680i	8GB	PCIe 4.0 x8	SATA 6G SAS 12G	16	0, 1, 1E, 10, 5, 50, 6, 60
PRAID EP 3252-8i	2GB	PCIe 4.0 x8	SATA 6G SAS 24G	8	0, 1, 10, 5, 50, 6, 60
Onboard controller M.2 slot	-	DMI 4.0 x8	SATA 6G	2	-
			PCIe 4.0 x4	1	
PDUAL CP300	-	PCIe 4.0 x8	SATA 6G	2	0, 1
			PCIe 4.0 x4	2	

Storage media

When selecting the type and number of storage media you can move the weighting in the direction of storage capacity, performance, security or price. The following types of HDD and SSD storage media can be used for PRIMERGY servers.

Model	Storage media type	Interface	Form factor
3.5 inch model	HDD	SAS 12G	3.5 inch
		SATA 6G	3.5 inch
	SSD	SATA 6G	2.5 inch (*1)
2.5 inch model	HDD	SAS 12G	2.5 inch
	SSD	SATA 6G	2.5 inch
model common	SSD	SATA 6G	M.2
		PCIe 4.0	M.2

(*1) It is available with a 3.5 inch cage.

HDDs and SSDs are operated via host bus adapters, usually RAID controllers, with a SATA or SAS interface. The interface of the RAID controller to the chipset of the system board is typically PCIe or, in the case of the integrated onboard controllers, an internal bus interface of the system board.

Of all the storage medium types SSDs offer by far the highest transaction rates for random load profiles as well as the shortest access times. In return, however, the price per gigabyte of storage capacity is substantially higher.

Cache settings

In most cases, the cache of HDDs has a great influence on disk I/O performance. It is frequently regarded as a security problem in case of power failure and is thus switched off. On the other hand, it was integrated by hard disk manufacturers for the good reason of increasing the write performance. For performance reasons it is therefore advisable to enable the hard disk cache. To prevent data loss in case of power failure you are recommended to equip the system with a UPS.

For the purpose of easy and reliable handling of the settings for RAID controllers and hard disks it is advisable to use the RAID-Manager software "ServerView RAID" that is supplied for PRIMERGY servers. All the cache settings for controllers and hard disks can usually be made en bloc - specifically for the application - by using the pre-defined mode "Performance" or "Data Protection." The "Performance" mode ensures the best possible performance settings for the majority of the application scenarios.

Benchmark environment

The following hardware and software components were used for benchmarking.

Hardware

3.5 inch model

Storage media	Category	Drive name
HDD	NL-SAS HDD (SAS 12Gbps, 7.2k rpm) [512e]	MG08SDA600E (*1) MG08SDA800E (*1) ST12000NM004J (*1) ST14000NM004J (*1) ST16000NM004J (*1) ST18000NM004J (*1) ST20000NM002D (*1)
	NL-SAS HDD (SAS 12Gbps, 7.2k rpm) [512n]	ST2000NM001B (*1) ST4000NM001B (*1)
	BC-SATA HDD (SATA 6Gbps, 7.2k rpm) [512e]	MG08ADA600E MG08ADA800E
	BC-SATA HDD (SATA 6Gbps, 7.2k rpm) [512n]	ST2000NM000B ST4000NM000B
	SATA HDD (SATA 6Gbps, 5.4k rpm) [512e]	ST1000VN0009 ST2000VN0009

Storage media	Category	Drive name
SSD	SATA SSD (SATA 6Gbps, Mixed Use)	MTFDDAK480TGB (*1) MTFDDAK960TGB (*1) MTFDDAK1T9TGB (*1) MTFDDAK3T8TGB (*1)
	SATA SSD (SATA 6Gbps, Read Intensive)	MTFDDAK240TGA (*1) MTFDDAK480TGA (*1) MTFDDAK960TGA (*1) MTFDDAK1T9TGA (*1) MTFDDAK3T8TGA (*1) MTFDDAK7T6TGA (*1)

(*1) Not supported on TX1320 M6.

2.5 inch model

Storage media	Category	Drive name
HDD	SAS HDD (SAS 12Gbps, 10k rpm) [512e]	AL15SEB18EQ AL15SEB24EQ
	SAS HDD (SAS 12Gbps, 10k rpm) [512n]	AL15SEB030N AL15SEB060N AL15SEB120N

Storage media	Category	Drive name
SSD	SATA SSD (SATA 6Gbps, Mixed Use)	MTFDDAK480TGB MTFDDAK960TGB MTFDDAK1T9TGB MTFDDAK3T8TGB
	SATA SSD (SATA 6Gbps, Read Intensive)	MTFDDAK240TGA MTFDDAK480TGA MTFDDAK960TGA MTFDDAK1T9TGA MTFDDAK3T8TGA MTFDDAK7T6TGA

Model common

Storage media	Category	Drive name
M.2 SSD	SATA M.2 drive	MTFDDAV240TGA MTFDDAV480TGA MTFDDAV960TGA
	PCIe M.2 drive	MTFDKBA480TFR (*1) MTFDKBA960TFR (*1)

(*1) Not supported on TX1320 M6.

Software

Operating system	Microsoft Windows Server
Measuring tool	Iometer 1.1.0 (icf: benchmark version 3.0)

Logical drive settings to measure

<table>
<tr><td colspan="2">Target Drive</td><td>Type RAID 0 logical drive consisting of 1 drive</td></tr>
<tr><td colspan="2">Stripe size</td><td>HDD：256KB、SSD：64 KB</td></tr>
<tr><td rowspan="2">Measurement area</td><td>HDD, SSD (Except M.2)</td><td>RAW file system is used. The first 32GB of available LBA space is used for sequential access. The following 64GB is used for random access.</td></tr>
<tr><td>SSD(M.2)</td><td>NTFS file system is used. The first 32GB of available LBA space is used for sequential access. The following 64GB is used for random access.</td></tr>
<tr><td colspan="2">Number of Iometer worker</td><td>Sequential Access: 1
Random Access: 1 (except SAS 24G or PCIe 5.0 SSD),
4 (SAS 24G SSD),
16 (PCIe 5.0 SSD)</td></tr>
<tr><td colspan="2">Alignment of Iometer accesses</td><td>Aligned to access block size</td></tr>
</table>

Benchmark results

The results shown here are intended to help you select the appropriate storage media under the aspect of disk-I/O performance. For this purpose, a single storage medium was measured in the configuration specified in the subsection "Benchmark environment."

Performance values

The performance values are summarized in the following tables. In each case specifically for a single storage medium and with various access types and block sizes. The established measurement variables, as already mentioned in the subsection "Benchmark description" are used here. Thus, transaction rate is specified for random accesses and data throughput for sequential accesses.

The table cells contain the maximum achievable values. This means that each value is the maximum achievable value of the whole range of load intensities (number of Outstanding I/Os). In order to also visualize the numerical values each table cell is highlighted with a horizontal bar, the length of which is proportional to the numerical value in the table cell. All bars shown in the same scale of length have the same color. In other words, a visual comparison only makes sense for table cells with the same colored bars. Since the horizontal bars in the table cells depict the maximum achievable performance values, they are shown by the color getting lighter as you move from left to right. The light shade of color at the right end of the bar tells you that the value is a maximum value and can only be achieved under optimal prerequisites. The darker the shade becomes as you move to the left, the more frequently it will be possible to achieve the corresponding value in practice.

3.5 inch model

HDDs

Capacity [GB]	Storage device	Interface	Transactions [IO/s]			Throughput [MiB/s]	
			Database	Fileserver	Filecopy	Streaming	Restore
☐ NL-SAS 12Gbps HDD 7.2krpm [512e]							
6,000	MG08SDA600E	SAS 12G	545	455	442	234	234
8,000	MG08SDA800E	SAS 12G	542	449	449	250	250
12,000	ST12000NM004J	SAS 12G	609	578	534	266	266
14,000	ST14000NM004J	SAS 12G	616	589	524	270	269
16,000	ST16000NM004J	SAS 12G	610	586	548	270	270
18,000	ST18000NM004J	SAS 12G	603	578	522	265	262
20,000	ST20000NM002D	SAS 12G	642	593	502	271	271
☐ NL-SAS 12Gbps HDD 7.2krpm [512n]							
2,000	ST2000NM001B	SAS 12G	489	431	428	200	200
4,000	ST4000NM001B	SAS 12G	541	486	471	239	239
☐ BC-SATA HDD 7.2krpm [512e]							
6,000	MG08ADA600E	SATA 6G	497	452	447	239	239
8,000	MG08ADA800E	SATA 6G	477	429	430	248	248
☐ BC-SATA HDD 7.2krpm [512n]							
2,000	ST2000NM000B	SATA 6G	415	366	389	197	196
4,000	ST4000NM000B	SATA 6G	468	422	435	236	236
☐ SATA HDD 5.4krpm [512n] (Drive cache = On)							
1,000	ST1000VN009	SATA 6G	249	237	245	182	190
2,000	ST2000VN009	SATA 6G	258	244	246	185	185
☐ SATA HDD 5.4krpm [512n] (Drive cache = Off) (*1)							
1,000	ST1000VN009	SATA 6G	203	195	189	181	6
2,000	ST2000VN009	SATA 6G	204	197	189	185	6

(*1) If you disable the drive cache, sequential write performance is degraded. We recommend that you use a UPS to protect data and enable drive caching.

SSDs

Capacity [GB]	Storage device	Interface	Transactions [IO/s]			Throughput [MiB/s]	
			Database	Fileserver	Filecopy	Streaming	Restore
☐ SATA SSD (MU)							
480	MTFDDAK480TGB	SATA 6G	43,705	5,729	5,839	491	449
960	MTFDDAK960TGB	SATA 6G	43,732	6,155	6,257	491	449
1,920	MTFDDAK1T9TGB	SATA 6G	43,735	6,394	6,513	490	449
3,840	MTFDDAK3T8TGB	SATA 6G	43,415	6,576	6,636	483	446
☐ SATA SSD (RI)							
240	MTFDDAK240TGA	SATA 6G	41,808	5,120	5,293	480	360
480	MTFDDAK480TGA	SATA 6G	43,618	5,625	5,761	490	450
960	MTFDDAK960TGA	SATA 6G	43,631	5,878	6,033	484	449
1,920	MTFDDAK1T9TGA	SATA 6G	43,688	6,334	6,447	491	450
3,840	MTFDDAK3T8TGA	SATA 6G	43,392	6,539	6,626	483	445
7,680	MTFDDAK7T6TGA	SATA 6G	42,940	7,065	7,278	491	446

2.5 inch model

HDDs

Capacity [GB]	Storage device	Interface	Transactions [IO/s]			Throughput [MiB/s]	
			Database	Fileserver	Filecopy	Streaming	Restore
☐ SAS 12Gbps HDD 10krpm [512e]							
1,800	AL15SEB18EQ	SAS 12G	767	631	624	255	249
2,400	AL15SEB24EQ	SAS 12G	754	620	617	264	260
☐ SAS 12Gbps HDD 10krpm [512n]							
300	AL15SEB030N	SAS 12G	641	547	557	231	230
600	AL15SEB060N	SAS 12G	682	558	568	232	231
1,200	AL15SEB120N	SAS 12G	732	603	593	230	225

SSDs

Capacity [GB]	Storage device	Interface	Transactions [IO/s]			Throughput [MiB/s]	
			Database	Fileserver	Filecopy	Streaming	Restore
☐ SATA SSD (MU)							
480	MTFDDAK480TGB	SATA 6G	43,705	5,729	5,839	491	449
960	MTFDDAK960TGB	SATA 6G	43,732	6,155	6,257	491	449
1,920	MTFDDAK1T9TGB	SATA 6G	43,735	6,394	6,513	490	449
3,840	MTFDDAK3T8TGB	SATA 6G	43,415	6,576	6,636	483	446
☐ SATA SSD (RI)							
240	MTFDDAK240TGA	SATA 6G	41,808	5,120	5,293	480	360
480	MTFDDAK480TGA	SATA 6G	43,618	5,625	5,761	490	450
960	MTFDDAK960TGA	SATA 6G	43,631	5,878	6,033	484	449
1,920	MTFDDAK1T9TGA	SATA 6G	43,688	6,334	6,447	491	450
3,840	MTFDDAK3T8TGA	SATA 6G	43,392	6,539	6,626	483	445
7,680	MTFDDAK7T6TGA	SATA 6G	42,940	7,065	7,278	491	446

Model common

Capacity [GB]	Storage device	Interface	Transactions [IO/s]			Throughput [MiB/s]	
			Database	Fileserver	Filecopy	Streaming	Restore
☐ M.2 SATA SSD (PDUAL CP300)							
240	MTFDDAV240TGA	SATA 6G	45,009	5,324	5,490	474	353
480	MTFDDAV480TGA	SATA 6G	48,771	5,870	6,022	501	484
960	MTFDDAV960TGA	SATA 6G	51,373	6,252	6,429	471	486
☐ M.2 NVMe SSD (PDUAL CP300)							
480	MTFDKBA480TFR	PCIe4 x4	75,126	15,502	12,241	4,923	682
960	MTFDKBA960TFR	PCIe4 x4	139,598	31,160	25,761	4,923	1,380
☐ M.2 SATA SSD (Onboard)							
240	MTFDDAV240TGA	SATA 6G	36,515	5,658	5,744	496	353
480	MTFDDAV480TGA	SATA 6G	44,854	6,448	6,464	507	490
960	MTFDDAV960TGA	SATA 6G	49,454	6,854	6,918	503	492
☐ M.2 NVMe SSD (Onboard)							
480	MTFDKBA480TFR	PCIe4 x4	75,220	15,978	12,251	4,934	690
960	MTFDKBA960TFR	PCIe4 x4	152,358	31,430	25,626	4,934	1,379

Literature

PRIMERGY Servers

https://www.fujitsu.com/global/products/computing/servers/primergy/

PRIMERGY RX1330 M6 / TX1320 M6 / TX1330 M6

This Whitepaper

- https://docs.ts.fujitsu.com/dl.aspx?id=c35a2f2a-d527-442d-80ab-3a58019917db
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Data sheet

- RX1330 M6: https://docs.ts.fujitsu.com/dl.aspx?id=4c1bab39-9d91-4669-962b-f60045fb8aa1
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Document change history

Version	Date	Description
1.1	2025-04-22	Update: • New Visual Identity format • Technical data • SPECcpu2017, STREAM Measured and calculated with Intel Xeon 6300 Series Processors • SPECpower_ssj2008 Measured with Xeon 6369P
1.0	2024-05-24	New: • Technical data • SPECcpu2017, STREAM Measured and calculated with Intel Xeon E-2400 Series Processors / Pentium Gold G7400 • SPECpower_ssj2008 Measured with Xeon E-2488 • Disk I/O Measured with 2.5” and 3.5” storage media

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PRIMERGY Performance and Benchmarks

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