Energy Star 3.0 Certifications for ThinkSystem Servers

Planning / Implementation

Energy Star is a U.S. Environmental Protection Agency voluntary program that helps business and individuals maximize energy efficiency with their electrical and electronic equipment. Energy Star 3.0 is the newest version of the standard.

The timeline for implementation of Energy Star 3.0 is as follows:

- 17 September 2018: U.S. EPA published Energy Star for Computer Servers v3.0. New active efficiency criteria released with expected passing rate: 24% among 2014~2017 server portfolio.
- 1 February 2019: Only Energy Star 3.0 submissions will be accepted. Existing Energy Star 2.1 certificates are still valid however, new 2.1 submissions will be rejected.
- 17 June 2019: Energy Star for computer server v3.0 is now in effect. Existing 2.0 and 2.1 certificates are not longer valid

The key difference between Energy Star v2.1 and v3.0 is as follows:

- Energy Star v2.1 required only system idle state power
- Energy Star v3.0 requires active state efficiency in addition to system idle state power

Energy Star 3.0

To certify for Energy Star 3.0, a computer server product family must be evaluated and submitted to the Environmental Protection Agency (EPA) for certification. The following system configurations must comply with the Active State efficiency criteria:

- High-end performance configuration:

  The combination of Processor Socket Power, PSUs, Memory, Storage Devices, and I/O devices that represents the highest-performance computing platform within the product family. This configuration shall include the highest processor performance per socket, as represented by the highest numerical value resulting from the multiplication of the core count by the frequency in GHz, offered for sale and capable of meeting the Energy Star requirement.

- Typical configuration:

  A product configuration that lies between the Low-end performance and High-end performance configurations and is presentative of a deployed product with high volume sales.

- Low-end performance configuration:

  The combination of Processor Socket Power, PSUs, Memory, Storage Devices, and I/O devices that represents the lowest-performance computing platform within the product family. This configuration shall include the lowest processor performance per socket, as represented by the lowest numerical value resulting from the multiplication of the core count by the frequency in GHz, offered for sale and capable of meeting the Energy Star requirement.

The following table provides more details regarding processors for each configuration.

Table 1. Energy Star v3.0 - Product family tested configurations

System configuration	Processor	Other commodity
High-end performance configuration	Highest value of core count multiple by frequency (GHz)	The combination that represents the highest-performance computing platform within the product family
Typical configuration	Between high-end and low-end processor, or high volume sale	A product configuration that lies between the Low-end performance and High-end performance configurations and is presentative of a deployed product with high volume sales
Low-end performance configuration	Lowest value of core count multiple by frequency (GHz)	The combination that represents the lowest-performance computing platform within the product family

Processor support in ThinkSystem servers

Lenovo ThinkSystem servers meet all the criteria for Energy Star 3.0 when using these configurations:

- High-End Performance configuration
- Typical configurations

For the Low-End Performance configurations, some low-end processor models (SKUs) with a low number of cores and/or low frequency that do not meet the minimum criteria for Energy Star 3.0. The processor SKUs listed in the following table cannot achieve a high enough performance/watt efficiency metric to meet the Energy Star 3.0 criteria.

If the server has one of the processors listed in the table, then the server is not certified for Energy Star 3.0.

Table 2. Processors that do not meet Energy Star 3.0

Lenovo ThinkSystem	Processors that do not meet Energy Star 3.0
Servers with Intel Xeon processors (Intel "Mehlow" processors)	
SR250*	Intel Pentium Gold processors: G5400, G5400T Intel Celeron processors: G4900, G4900T
ST250*	None (all processor qualified)
ST50	All processors (server is not Energy Star 3.0 compliant)
Servers with Intel Xeon processors (Intel "Tatlow" processors)	
SR250 V2	Intel Pentium processors: G6405, G6405T, G6505, G6505T, G6605
ST250 V2	None (all processor qualified)
ST50 V2	All processors (server is not Energy Star 3.0 compliant)
Servers with 1st Gen and 2nd Gen Intel Xeon Scalable processors (Intel "Purley" platform)	
SR630, SR650, SR530, SR550, SR590	First-gen Intel Xeon Scalable processors: 3104, 4112, 5122, 8156
SR570	First-gen Intel Xeon Scalable processors: 3104, 4112, 5122, 8156 Second-gen Intel Xeon Scalable processors: 5222, 8256
SR670	None (all processors qualify)
SR850, SR860	First-gen Intel Xeon Scalable processors: 5122, 8156 Second-gen Intel Xeon Scalable processors: 5222, 8256
ST550	First-gen Intel Xeon Scalable processors: 3104, 4112, 5122, 8156 Second-gen Intel Xeon Scalable processors: 3204, 5222, 8256

Lenovo ThinkSystem	Processors that do not meet Energy Star 3.0
SD530	First-gen Intel Xeon Scalable processors: 3104, 4112, 3106, 4108, 5122, 8156 Second-gen Intel Xeon Scalable processors: 5222, 8256
SN550	First-gen Intel Xeon Scalable processors: 3104, 4112, 3106, 4108, 5122, 8156, 4109T, 4110 Second-gen Intel Xeon Scalable processors: 3204, 3206R, 5222, 8256
SN850	None (all processors qualify)
SD650	None (all processors qualify)
SR950	First-gen Intel Xeon Scalable processors: 5122, 8156 Second-gen Intel Xeon Scalable processors: 5222, 8256
Servers with 3rd Gen Intel Xeon Scalable processors (Intel Whitley and Cedar Island platforms)	
All servers	None (all processors qualify)
Servers with AMD 7002 and 7003 processors (AMD Rome and Milan processors)	
All servers	None (all processors qualify)

* With one or two hot-swap power supplies installed; fixed power supply is not Energy Star 3.0 compliant

More information

For more information, see these links:

- Lenovo Energy Star Certification Reference
  https://lenovopress.com/lp0630-energy-star-certification-reference
- Energy Star certification results (SERT Version 2.0.1 corresponds to Energy Star 3.0)
  https://www.energystar.gov/productfinder/product/certified-enterprise-servers/results

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