FREQUENTLY ASKED QUESTIONS

TO

COMMISSION REGULATION (EU) No 2019/424

of 15 March 2019

laying down ecodesign requirements for servers and data storage products pursuant to Directive 2009/125/EC of the European Parliament and of the Council and amending Commission Regulation (EU) No 617/2013

This FAQ list is intended to be used only for facilitating the implementation of Commission Regulation (EU) 2019/424. This FAQ cannot go beyond or substitute for the requirements of the Ecodesign Directive or its implementing Regulations. This FAQ list only reflects the opinion of the Commission services and is not legally binding. A finally binding legal Interpretation of EU legislation may only be provided by the European Court of Justice. This FAQ list is without prejudice to the position the Commission might take should an issue arise in a procedure before the European Court of Justice.

Please note that further Q&As on **Commission Regulation (EU) 2019/424 (referred to as 'the Regulation' in the remainder of the text)** are also be published in the *Frequently Asked Questions (FAQ) on the Ecodesign Directive and its Implementing Regulations*[1].

1. **The Regulation, in its definition 12 of Annex I, defines a server product family as '*a high-level description referring to a group of servers sharing one chassis and motherboard combination that may contain more hardware and software configurations*.' What is meant by hardware configurations?**

A given product family can have in excess of tens of thousands of possible combinations of components (separate, distinct configurations). This can include many different processor models with differing core counts and frequencies as well as numerous types of components such as I/O devices, memory, storage devices and expansion cards.

2. **The Regulation, in its definition 12 of Annex I, considers a server product family to have '*the same number of available processor sockets and number of available processor sockets populated*.' Can an example be given to clarify further?**

A separate product family shall be defined for a server that does not have all its processor sockets populated, such as a 2-socket server with only 1 processor installed, compared with a server that has all its processor sockets populated, i.e. a 2-socket server with 2 processors installed. Within a given product family the same number of processor sockets and populated sockets has to be maintained.

3. **How is compliance assessed for partially populated and full populated server configurations? Can an example be given to clarify further?**

When assessing compliance with regard to the requirements of the Regulation for both partially populated and full populated server configurations, the partially populated configurations, such as 2-socket servers with only 1 processor installed, need to be tested as a separate product family from the fully populated configurations, and both product families are required to meet the applicable requirements for the number of processors installed.

4. **How are one or two processor socket servers treated differently from other servers that are in scope of the Regulation (to the extent of the applicable requirements)?**

Servers with one or two processor sockets are subject to additional idle state power and active efficiency requirements as set out in Annex II.2 of the Regulation. PSU efficiency and power factor requirements (Annex II.1.1), materials efficiency (Annex II.1.2) and information (i.e. data reporting) requirements (Annex II.3) are the same for all servers in scope to the Regulation. To be noted that the Regulation excludes from the scope servers with more than 4 processor sockets.

[1] Available at https://ec.europa.eu/docsroom/documents/36842

5. **How are custom made servers affected by the information requirements under Annex II.3.1 of the Regulation?**

The information requirements listed under Annex II.3.1, consisting in the obligation to provide specific product information in instruction manuals and on the free-access websites, do not apply to custom made servers, made on a one-off basis. However, for custom made servers, made on a one-off basis, the information referred under Annex II.3.1 shall be part of the technical documentation to be prepared for the purposes of conformity verification by the Member States market surveillance authorities. Finally, the information requirements listed under Annex II.3.3 apply to custom made servers, made on a one-off basis.

6. **In the case of servers declared as being part of a server product family, can a manufacturer specify more or less than 2 data storage devices for test configurations, as permitted in the ETSI EN 303 470 Standard?**

For the purposes of the Regulation, in the case of servers declared as being part of a server product family, Annex IV.1 to the Regulation foresees that the Member State authorities can test the low-end performance configuration or the high-end performance configuration. As per definitions 21 and 22 of Annex I, these configurations always must contain (only) two data storage devices. Manufacturers will then sell a full range of (server) configurations within a server product family which may have more or fewer components than the two 'designated' configurations, i.e. the low-end performance configuration and the high-end performance configuration.

7. **Since the SERT methodology only supports the testing of servers which have all memory channels populated with the same DIMMs, how is compliance assessed for servers which are:**
   - **not declared as being part of a server product family[2], and**
   - **as-shipped in a configuration without all memory channels populated?**

For the assessment of compliance of the abovementioned products with the idle state power and active efficiency requirements (as set out in Annex II.2 of the Regulation), the servers should be reconfigured, so that all memory channels have the same DIMM raw card design and capacity. This reconfiguration will address the restriction in the test capability and ensure that servers can still be tested for idle state power and active efficiency requirements.

8. **How is the CPU performance determined based on the SERT testing methodology? (CPU performance is defined in Annex I.28 and referred to in table 4 under Annex II to the Regulation)**

The CPU performance ($Perf_{CPU}$) is determined using the geometric mean of the 7 SERT™ CPU worklets at the 100 % interval normalized performance, or load level, values. A system performance multiplier (provided in table 4 under Annex II to the Regulation) is applied to the $Perf_{CPU}$ value to get the idle power allowance, in watts, related to CPU performance. The allowance contributes to the (calculation of the)

[2] In the case of servers which are declared as being part of a server product family, Annex IV.1 to Regulation 2019/424 foresees that the Member State authorities can test the low-end performance configuration or the high-end performance configuration and, as per definitions 21 and 22 of Annex I, these configurations shall have all memory channels populated with the same DIMM raw card design and capacity.

idle state power of a server. The formula and calculations are further explained in ETSI EN 303 470 Clause 5.2. Concerning the calculation of $Perf_{CPU}$, please do also find an example in Annex I to this document.

9. What is the first date under the regulation that the (latest available version of the) firmware must be made available?

As per the provision laid down in Annex II.1.2.3 to the Regulation, the first date a manufacturer must make the (latest available version of the) firmware available is 1 March 2023, for products subject to the Regulation and placed on the market or put into service on 1 March 2021.

10. What constitutes the 'latest version of the firmware' under the regulation? For firmware updates, how does a manufacturer distinguish what is legally required to be provided in relation to the enhanced licensed product functionality or software?

As per the provision laid down in Annex II.1.2.3 to the Regulation, manufacturers must make available the latest available version of the firmware (free of charge or at a fair, transparent and non-discriminatory cost) and the latest available security update to the firmwares (free of charge) within specifically defined periods. Annex I.34 to the Regulation defines what is meant as firmware. An elaboration of the technical features of firmware and firmware updates should be part of the standardisation deliverables in the framework of the '*Standardisation request to the European standardisation organisations in support of Commission Regulation (EU) 2019/424 of 15 March 2019 laying down ecodesign requirements for servers and data storage products pursuant to Directive 2009/125/EC of the European Parliament and of the Council and amending Commission Regulation (EU) No 617/2013*'.

11. How can manufacturers ensure that the joining and other techniques do not prevent disassembly of components?

As per the provision laid down in Annex II.1.2.1 to the Regulation, manufacturers 'shall ensure that joining, fastening or sealing techniques do not prevent the disassembly for repair or reuse purposes of' a number of components (data storage devices, memory, etc..).
An elaboration of the technical features related to the ability of the product to be disassembled should be part of the standardisation deliverables in the framework of the '*Standardisation request to the European standardisation organisations in support of Commission Regulation (EU) 2019/424 of 15 March 2019 laying down ecodesign requirements for servers and data storage products pursuant to Directive 2009/125/EC of the European Parliament and of the Council and amending Commission Regulation (EU) No 617/2013*'.

12. What is meant by '*server nodes in a multi-node servers are NOT designed to be hot-swappable*' (Article 2.1.7 of the Regulation)?

It means that a given server node needs to be powered down first before swapping (without having to power down other server nodes in the system).

ANNEX I: $Perf_{CPU}$ Calculation example

What is CPU Performance Adder ($Perf_{CPU}$):

- CPU Performance Adder was introduced in definition 28 of Annex I to the Regulation:

> (28) 'CPU performance ($Perf_{CPU}$)' means the number of transactions per unit of time performed by the server under standardised testing of the CPU subsystem;

- CPU Performance Adder is an Idle Power adder based on the peak performance of the 7 SERT™ CPU worklets
- The Idle Power adder calculation is different for 1 socket vs. 2 socket Servers (per regulation text below)

Table 4

Additional Idle Power Allowances for Extra Components

System characteristics	Applies to	Additional idle power allowance
CPU Performance	All servers	1 socket: 10 × $Perf_{CPU}$ W 2 socket: 7 × $Perf_{CPU}$ W
Additional PSU	PSU installed explicitly for power redundancy	10 W per PSU
HDD or SSD	Per installed HDD or SSD	5,0 W per HDD or SSD

CPU Performance ($Perf_{CPU}$) Equation:

- CPU Performance is calculated using the geometric mean of the 7 SERT™ CPU worklets at the 100 % interval normalized performance, or load level, values.

  Note: It requires a system performance multiplier (provided in the Regulation), which is applied to the $Perf_{CPU}$ value to get the system performance adder in watts, used to determine idle state power of servers

- Compress, CryptoAES, LU, SOR, Sort, SHA256, SSJ
- Equation: $Perf_{CPU}$ = *Geomean (100% Norm Perf Score COMPRESS, 100% Norm Perf Score CRYPTO, 100% Norm Perf Score LU, 100% Norm Perf Score SOR, 100% Norm Perf Score SORT, 100% Norm Perf Score SHA256, 100% Norm Perf Score HYBRID_SSJ)*

Example values for a typical 2 socket server system

- Geomean (4.420139, 6.736487, 5.081652, 2.892043, 3.397429, 5.119569, 3.857942) = 4.35
- System performance multiplier for 2 socket system is '7'
- System performance adder (W) = 7*4.35 = 30.4 Watts

Note: The formula and calculations are further explained in ETSI EN 303 470 Clause 5.2.

*Note 2: There has been anecdotal evidence of certain datasets related to SERT testing results which may display the SERT CPU Workload Efficiency score calculated in the form of (1000 * CPU Performance). Care*

must be taken, in such cases, in 'extracting' the correct value for the calculation of the idle power allowance.

100% Normalized Performance Score (Data Source):

Two worklet examples of where to get this data in the SERT Test Report. Similar data will be required for remaining 5 CPU worklets.

- Compress
- CryptoAES

CPU: Compress

Total Clients	32
CPU Threads per Client	1
Sample Client Command-line	cmd /c start /b /wait /NODE 0 /AFFINITY 0000000000000002 "Client 2 of 32" C:\Program Files\Java\jre1.8.0_144\bin\java -classpath lib\sert.jar;lib\chauffeur.jar;lib\chauffeurCommon.jar;lib\ptdaemonClientApi.jar;lib\mtrandom.jar;lib\xsrandom.jar;lib\saxon9he.jar;lib\groovy.jar;lib\groovy-jsr223.jar; -Djava.util.logging.config.file=logging.properties -DtotalHostHardwareThreads=32 -Xms256m -Xmx256m -XX:+AggressiveOpts -XX:+UseLargePages -XX:SurvivorRatio=60 -XX:TargetSurvivorRatio=90 -XX:MaxInlineSize=6 -XX:InlineSmallCode=3900 -XX:FreqInlineSize=300 org.spec.chauffeur.client.ClientJvm -director localhost:49809 -jvmid 1 -numJvms 32 -hostId WIN-IS9SF4HPQ88

Efficiency Scores

Load Level	Raw Performance Score	Normalized Performance Score	Average Active Power (W)	Load Level Efficiency Score
100%	30,606.813	4.420	214.500	20.607
75%	22,943.345	3.313	193.210	17.149
50%	15,318.074	2.212	170.733	12.957
25%	7,637.037	1.103	135.749	8.125
Compress worklet		**Geomean of load level performance: 2.445**	**Geomean of load level power: 176.046**	**Worklet Efficiency Score: 13.888**

CPU: CryptoAES

Total Clients	32
CPU Threads per Client	1
Sample Client Command-line	cmd /c start /b /wait /NODE 0 /AFFINITY 0000000000000002 "Client 2 of 32" C:\Program Files\Java\jre1.8.0_144\bin\java -classpath lib\sert.jar;lib\chauffeur.jar;lib\chauffeurCommon.jar;lib\ptdaemonClientApi.jar;lib\mtrandom.jar;lib\xsrandom.jar;lib\saxon9he.jar;lib\groovy.jar;lib\groovy-jsr223.jar; -Djava.util.logging.config.file=logging.properties -DtotalHostHardwareThreads=32 -Xms256m -Xmx256m -XX:+AggressiveOpts -XX:+UseLargePages -XX:SurvivorRatio=60 -XX:TargetSurvivorRatio=90 -XX:MaxInlineSize=6 -XX:InlineSmallCode=3900 -XX:FreqInlineSize=300 org.spec.chauffeur.client.ClientJvm -director localhost:49842 -jvmid 1 -numJvms 32 -hostId WIN-IS9SF4HPQ88

Efficiency Scores

Load Level	Raw Performance Score	Normalized Performance Score	Average Active Power (W)	Load Level Efficiency Score
100%	397,507.387	6.736	227.478	29.614
75%	297,973.384	5.050	206.586	24.444
50%	198,756.742	3.368	178.102	18.912
25%	99,399.180	1.684	138.997	12.119
CryptoAES worklet		**Geomean of load level performance: 3.727**	**Geomean of load level power: 184.684**	**Worklet Efficiency Score: 20.182**