

MB/ NC ¹	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
MG 1	104	Intro		T	In view of the ETSI desire to use the term ICT site rather data centre, a global change is recommended together with a definition for ICT site as used in other ETSI documents in the STF 516 stable	ICT site site containing structures or group of structures dedicated to the accommodation, interconnection and operation of ICT equipment together with all the supporting facilities and infrastructures for power distribution and environmental control together with the necessary levels of resilience and security required to provide the desired service availability ICT equipment equipment providing data storage, data processing and data transport services	
MG 2	106	Intro		T		Please elaborate or delete Editors NOTE	
MG 3	107	Intro		E		Replace "The present document" with "The metric of the present document"	
MG 4	108	Intro		E		Is there a full and proper reference to be inserted here?	
MG 5	130	1		E		Delete space at beginning of bullet	
MG 6	134	1		E	This list of server and equipment types that the present document does not cover leads to a series of sub-definitions in clause 3.	Do we really need to define products that are not in scope? Or should we place them in an informative Annex?	
MG 7	144	1		E	The second part of this NOTE is stating what is excluded from SERT. The first part explains that you cannot apply the metric to equipment that you cannot apply the metric to!!.	Delete NOTE	
MG 8	169	2.1		E	User Guide is referenced at line 164	Delete	
MG 9	186	3.1		E		Delete comma after e.g.	
MG 10	186	3.1		E		Delete numbers.	
MG 11	188	3.1		E		Not used in document - delete definition And abbreviation	
MG 12	190	3.1		E		Please elaborate or delete Editors NOTE	
MG 13	193	3.1		E		Delete period	
MG 14	196	3.1		E		Delete period	
MG 15	214	3.1		E		Not used in document - delete definition And abbreviation	
MG	220	3.1		E		Delete period	

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16							
MG 17	224	3.1		E	Not mentioned in document (neither in or put of scope)	Delete definition	
MG 18	226	3.1		E	Isn't a dual-node server just a special case of a multi-node server?	Delete definition	
MG 19	227	3.1		E		Delete underscore	
MG 20	236	3.1		E		Delete period	
MG 21	237	3.1		E	Not mentioned in document (neither in or put of scope)	Delete definition	
MG 22	253	3.1		E		Delete period	
MG 23	258	3.1		E	"Resilient" is mentioned in the definition of "large server" but is never mentioned again until we get to Annex B where we define the characteristics of a RAS server.	Delete NOTE Delete Annex B.3 Delete rows in Table B.1 which relate to RAS Delete abbreviation RAS and RASM	
MG 24	261	3.1		E		Delete comma after e.g.	
MG 25	263	3.1		E		Delete comma after e.g.	
MG 26	275	3.1		E		Please decide and delete Editors NOTE	
MG 27	279	3.1		E		Delete period	
MG 28	286	3.1		E	Insert text from Table B.2 to allow deletion of text in Table B.2	a self-contained device, physically separable from the motherboard of the computer server, that converts a.c. or d.c. input power to one or more d.c. power outputs for the purpose of powering the computer server via a removable or hard-wired electrical connection	
MG 29	287	3.1		E		Delete period	
MG 30	293	3.1		E		VDC	
MG 31	294	3.1		E		Insert period at end of NOTE	
MG 32	296	3.1		E	Insert text from Table B.2 to allow deletion of text in Table B.2	power supply unit designed to deliver the majority of its rated output power to one primary direct current (d.c.) output for the purpose of powering a computer server NOTE 1 to Entry: Single-output PSUs may offer one or more standby outputs that remain active whenever connected to an input power source.	

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						NOTE 2 to Entry: The total rated power output from any additional PSU outputs that are not primary and standby outputs shall be no greater than 20 watts. NOTE 3 to Entry: PSUs that offer multiple outputs at the same voltage as the primary output are considered single-output PSUs unless those outputs are generated from separate converters or have separate output rectification stages, or have independent current limits.	
MG 33	297	3.1		E	Insert text from Table B.2 to allow deletion of text in Table B.2	power supply unit designed to deliver the majority of its rated output power to more than one primary direct current (d.c.) output for the purpose of powering a computer server NOTE 1 to Entry: Multi-output PSUs may offer one or more standby outputs that remain active whenever connected to an input power source. NOTE 2 to Entry: The total rated power output from any additional PSU outputs that are not primary and standby outputs is greater than or equal to 20 watts.	
MG 34	300	3.1		E	This is not a term used in the document unless the terms in 254 and 255 are amended	Delete or add to 254 and 255	
MG 35	308	3.1		E		"More" than what?	
MG 36	309	3.1		E		Delete period	
MG 37	320	3.1		E	Can we remove the words "that supports Storage System Connectivity, Capacity Optimization Management, virtualized storage environment and software defined storage" otherwise we may need some definitions (for no good purpose)	?	
MG 38	321	3.1		E		Delete COMs	
MG 39	327	3.1		E	For lines 327-332	Include definitions or delete lines.	
MG 40	333	3.1		E		Highlight Editors NOTE in yellow	
MG 41	335	3.2		E		Correct the text assuming that we will insert symbols later	
MG 42	338	3.2		E		Highlight Editors NOTE in yellow	
MG 43	341	3.3		E		Correct the text	
MG 44	351	3.3		E	Only used in definition of Annex B (see other comments)	Delete	

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MG 45	352	3.3		E		GPGPU is only used in the definition of APA so delete	
MG 46	352	3.3		E	Only used in definition of buffered DDR channel and in Annex B.3	Delete	
MG 47	368	3.3		E		Highlight Editors NOTE in yellow	
MG 48	370	4		T	Editors NOTE	Take action and delete	
MG 49	372	4.1		T	No subtest below heading	Delete heading	
MG 50	372	4.1		T	Insert new heading	<p>4.1 Computer server specification</p> <p>Insert the text of Table B.1 for computer servers to say</p> <p>“For the purposes of the present document the computer server shall be:</p> <ul style="list-style-type: none"> - marketed and sold as a computer server; - designed for and listed as supporting one or more computer server operating system (OS) and/or hypervisor; - targeted to run user-installed applications typically, but not exclusively, enterprise in nature; - packaged and sold with one or more ac-dc or dc-dc power supplies; - designed such that all processors have access to shared system memory and are visible to a single OS or hypervisor <p>and shall provide support for error-correcting code and/or buffered memory (including both buffered dual in-line memory modules) and buffered on board configurations”</p>	
MG 51	372	4.1		T	Insert new heading	<p>4.2 Computer server family specification</p> <p>Insert the text of Table B.1 for server product family configuration to say</p> <p>“A server product family configuration shall</p> <ul style="list-style-type: none"> - be from the same model line or machine type; - either share the same form factor (i.e., rack-mounted, blade, pedestal) or share the same mechanical and electrical designs with only superficial mechanical differences to enable a design to support multiple form factors; 	

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						<ul style="list-style-type: none"> - either share processors from a single defined processor series or share processors that plug into a common socket type; - share the power supply unit(s)." 	
MG 52	373	4.2		T	<p>What is the purpose of this sentence. We seem to be mixing up two things in one very long sentence. Are we defining something with a processor with a "product of core count and frequency and memory capacity (in GB) equal to 1.0 to 2.0 times the product of the number of central processing units (CPUs), cores and hardware threads" as being "high-end" What is the relevance of the SSDs.</p>	<p>Clarify objective and classification boundaries properly.</p> <p>Equally importantly, is this some form of classification that needs to be reported with the metric result in the future clause 9? If not what is the point of the text?</p>	
MG 53	378	4.3		T	<p>Is there a middle specification. There seems to be no configuration where the "product of core count and frequency and memory capacity (in GB) equal to 0,75 to 1,0 times the product of the number of central processing units (CPUs), cores and hardware threads"</p>	Clarify objective and classification boundaries properly	
MG 54	379	4.3		T	<p>What is the purpose of this sentence. We seem to be mixing up two things in one very long sentence. Are we defining something with a processor with a "product of core count and frequency and memory capacity (in GB) equal to 0,5 to 0,75 times the product of the number of central processing units (CPUs), cores and hardware threads" as being "low-end" What is the relevance of the HDDs and their rotation rates.</p>	Clarify objective and classification boundaries properly	
MG 55	399	5.1		T	I think this sentence is superfluous	The present document creates a single efficiency metric using the following procedure	
MG 56	409	5.1		TTT	<p>The formula $Eff_{server} = \frac{Perf_{server}}{Pwr_{server}}$ requires knowledge of $Perf_{server}$ and Pwr_{server}.</p> <p>These are defined in equations 3 and 4.</p> <p>Surely equations 3, 4, 6 and 7 should immediately follow equation 1. Line 411 offers an alternative approach using Eff_{serve}</p>	Consider the layout shown below which appear mathematically both more correct and simpler to understand.	
MG 57	411	5.1		E	Please clarify the meaning of "choice"		

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MG 58	417	5.1		T	Unless comments to 409-437 above are adopted	0,60	
MG 59	419	5.1		T	Unless comments to 409-437 above are adopted	0,35	
MG 60	421	5.1		T	Unless comments to 409-437 above are adopted	0,05	
MG 61	445	6		E	I do not understand the value of the Editors NOTE. There is no suggestion that different setups will exist for active and idle. So why is the NOTE there?		
MG 62	493	6.6		E	The rows from Table B.1 for controller system can be inserted here as proposed:	“ The controller system shall be capable of the following functions: - start and stop each segment (phase) of the performance benchmark; - control the workload demands of the performance benchmark; - start and stop data collection from the power analyzer so that power and performance data from each phase can be correlated; - store log files containing benchmark power and performance information; - convert raw data into a suitable format for benchmark reporting, submission and validation; - collect and store environmental data, if automated for the benchmark.”	
MG 63	493	6.6		E	The existing text has a variety of upper case and lower case text - correct as proposed.	The controller system may be a server, a desktop computer, or a laptop and shall be used to record power from the equipment specified in 6.3 and temperature data from the equipment specified in 6.4. The controller system and the UUT shall be connected to each other via an Ethernet network switch.	
MG 64	515	7.2	Table 5	E		D.3 should refer to section 8?	
MG 65	515	7.2	Table 5	E	Item B	Replace “location” with “other static location”	
MG 66	515	7.2	Table 5	E	Item G	Should refer to section 6?	
MG 67	526	8.2		T	I do not understand to what this refers. This can clearly not remain as we move toward publication.	??	
MG 68	561	8.3.2.6		T	I do not understand to what this refers. This can clearly not remain as we move toward publication.	??	
MG	569	B		E		If all other comments to Annex B are accepted delete	

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69						Annex B	
MG 70	572	B.1	Table B.1	E		As the present document does mention "managed server" except in definitions, delete the rows for managed server	
MG 71	572	B.1	Table B.1	E		As the present document does not address HPC systems, delete rows for HPC system	
MG 72	572	B.1	Table B.1	E	If all other comment to Table B.1 are accepted	Delete sub-clause B.1	
MG 73	574			E	If all comments to remove text from Table B.2 are accepted then	Delete sub-clause B.2	
MG 74	576	B.2	Table B.2	E	I/O Device is no tused in main body and only appears in B.2 and B.3	Delete	
MG 75	576	B.2	Table B.2	E	I/O Port is no tused in main body and only appears in B.2 and B.3	Delete	
MG 76	576	B.2	Table B.2	E	Motherboard is used in main body and should be in definitions	main circuit board of the server typically accommodating the processor, memory, BIOS, expansion slots and enabling the attachment of additional circuit boards,	
MG 77	576	B.2	Table B.2	E	Procesor is used in main body and should be in definitions	the central processing unit of the computer server comprising logic circuitry that responds to and processes the basic instructions that drive the server	
MG 78	576	B.2	Table B.2	E	Memory is used in main body and should be in definitions	server component external to the processor in which information is stored for immediate use by the processor	
MG 79	578	B.2	Table B.2	E	If comment to line 258 is accepted	Delete sub-clause B.3	
MG 80	578	B.3		E	If comment to line 258 is accepted	Delete sub-clause B.3	
MG 81	593	C.1		T		Delete 593-594 Provide full text	
MG 82	596	C.2		T		Provide full text	
MG 83	598	D		T	I do not understand the positioning of his Annex. Is it normative or informative and how does it relate to the procedure of clause 5?	Please clarify	
MG 84	665			E		Italicise <i>Perfmax</i>	
MG 85	666			E		Italicise <i>Perfmax</i>	

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Proposal for lines 409-437

The active state metric is defined as

$$Eff_{server} = \frac{Perf_{server}}{Pwr_{server}} \quad \text{Equation 1}$$

where:

$$Perf_{server} = \exp \left[W_{CPU} \times \ln \left(Perf_{CPU} \right) + W_{Memory} \times \ln \left(Perf_{Memory} \right) + W_{Storage} \times \ln \left(Perf_{Storage} \right) \right] \quad \text{Equation 2}$$

$$Pwr_{server} = \exp \left[W_{CPU} \times \ln \left(Pwr_{CPU} \right) + W_{Memory} \times \ln \left(Pwr_{Memory} \right) + W_{Storage} \times \ln \left(Pwr_{Storage} \right) \right] \quad \text{Equation 3}$$

$$Perf_{CPU} = \left(\prod_{i=1}^7 Perf_i \right)^{1/7} \quad \text{and} \quad Pwr_{CPU} = \left(\prod_{i=1}^7 Pwr_i \right)^{1/7} \quad \text{Equation 4}$$

where i = 1 for worklet_{compress}, 2 for worklet_{LU}, 3 for worklet_{SOR}, 4 for worklet_{Crypto}, 5 for worklet_{Sort}, 6 for worklet_{SHA256} and 7 for worklet_{Hybrid SSJ}

$$Perf_{Memory} = \left(\prod_{i=1}^2 Perf_i \right)^{1/2} \quad \text{and} \quad Pwr_{Memory} = \left(\prod_{i=1}^2 Pwr_i \right)^{1/2} \quad \text{Equation 5}$$

where i = 1 for worklet_{Flood3} and 2 for worklet_{Capacity3}

$$Perf_{Storage} = \left(\prod_{i=1}^2 Perf_i \right)^{1/2} \quad \text{and} \quad Pwr_{Storage} = \left(\prod_{i=1}^2 Pwr_i \right)^{1/2} \quad \text{Equation 6}$$

where i = 1 for worklet_{Sequential} and 2 for worklet_{Random}

Alternatively {choice depending on assessment}

$$Eff_{server} = \exp \left[W_{CPU} \times \ln \left(Eff_{CPU} \right) + W_{Memory} \times \ln \left(Eff_{Memory} \right) + W_{Storage} \times \ln \left(Eff_{Storage} \right) \right] \quad \text{Equation 7}$$

$$Eff_{worklet} = \left(\prod_{i=1}^n Eff_i \right)^{1/n} = \frac{Perf_{worklet}}{Pwr_{worklet}} \quad \text{as in equations 4, 5 and 6} \quad \text{Equation 8}$$

Independent of the approach taken the following weighting are applied:

- W_{CPU} is the weighting assigned to the CPU worklets = 0,60
- W_{Memory} is the weighting assigned to the Memory worklets = 0,35
- $W_{Storage}$ is the weighting assigned to the Storage worklets = 0,05

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