



ENERGY STAR® Product Specification for Large Network Equipment

Eligibility Criteria Final Draft Version 1.0

1 Following is the Version 1.0 ENERGY STAR product specification for Large Network Equipment. A
2 product shall meet all of the identified criteria if it is to earn the ENERGY STAR.

3 **1 DEFINITIONS**

4 A) Product Classifications:

- 5 1) Network Equipment: A device whose primary function is to pass Internet Protocol traffic
6 among various network interfaces/ports.
- 7 2) Large Network Equipment (LNE): Network Equipment that is mountable in a Standard
8 Equipment Rack, supports network management protocols (e.g. SNMP) and contains one of
9 the following features:
 - 10 a) Contains more than eleven (11) Physical Network Ports.
 - 11 b) Total aggregate port throughput of the product is greater than 12 Gb/s
- 12 3) Modular Product: An LNE product that accepts Modules, as defined below in 1.(D)(5),
13 modifying the capability of the device.
- 14 4) Fixed Product: An LNE product that cannot accept Modules that modify the capability of the
15 device.

16 B) Product Types:

- 17 1) Router: A network device that routes network packets from one logical network to another,
18 along a predefined or dynamically discovered path, based on network layer information
19 embedded in the Network packet header (OSI layer #3).
- 20 2) Switch: A network device that delivers packet data frames to specific physical ports on the
21 device, based on the destination address of each frame from the Data Link (OSI layer #2),
22 within a logical network.
- 23 3) Security Appliance: A stand-alone network device whose primary function is to protect the
24 network from unwanted traffic (e.g. secure tunnel and firewall appliances). This includes
25 products whose primary function is to provide virtual private network (VPN) services.
- 26 4) Access Point Controller: A network device whose primary function is to manage wireless local
27 area network (WLAN) traffic through one or more wireless access point devices.

28 C) Product Characteristics:

- 29 1) Processor Managed Product: An LNE product whose management is handled through a
30 distinct co-management processor within the product itself that has independent control over
31 the LNE product.
- 32 2) Network Managed Product: An LNE product that is not Processor Managed, where
33 management of the product is handled through processing power provided by a separate
34 device within the network to which it is connected.
- 35 3) Stackable Product: A product, which supports the ability to join multiple discrete products of
36 similar type to form a single larger autonomous functioning unit.

- 37 D) LNE Components:
- 38 1) Power Supply Unit (PSU): A device that converts ac or dc input power to one or more dc
39 power outputs for the purpose of powering an LNE product. An LNE product's PSU must be
40 self-contained and physically separable from the motherboard and must connect to the
41 system via a removable or hard-wired electrical connection.
- 42 A. Ac-Dc Power Supply: A PSU that converts line-voltage ac input power into one or more
43 dc power outputs for the purpose of powering an LNE product.
- 44 B. Dc-Dc Power Supply: A PSU that converts line-voltage dc input power to one or more dc
45 outputs for the purpose of powering an LNE product. For purposes of this specification, a
46 dc-dc converter (also known as a voltage regulator) that is internal to an LNE product and
47 is used to convert a low voltage dc (e.g., 12 V dc) into other dc power outputs for use by
48 the LNE product's components is not considered a dc-dc power supply.
- 49 C. Single-output Power Supply: A PSU that is designed to deliver the majority of its rated
50 output power to one primary dc output for the purpose of powering an LNE product.
51 Single-output PSUs may offer one or more standby outputs that remain active whenever
52 connected to an input power source. For purposes of this specification, the total rated
53 power output from any additional PSU outputs that are not primary and standby outputs
54 shall be no greater than 20 watts. PSUs that offer multiple outputs at the same voltage as
55 the primary output are considered single-output PSUs unless those outputs (1) are
56 generated from separate converters or have separate output rectification stages, or (2)
57 have independent current limits.
- 58 D. Multi-output Power Supply: A PSU that is designed to deliver the majority of its rated
59 output power to more than one primary dc output for the purpose of powering an LNE
60 product. Multi-output PSUs may offer one or more standby outputs that remain active
61 whenever connected to an input power source. For purposes of this specification, the
62 total rated power output from any additional PSU outputs that are not primary and
63 standby outputs is greater than or equal to 20 watts.
- 64 2) Standard Equipment Rack: An equipment enclosure commonly seen in data centers or
65 managed facilities and intended to house a variety of information technology equipment.
66 Front panel width is typically 19 inches (482.6 mm). Standard equipment racks are defined by
67 EIA-310, IEC 60297, or DIN 41494.
- 68 3) Modular Chassis: An equipment enclosure used in a modular LNE product that houses all the
69 components of the product together in one place (e.g. PSUs, backplane, modules).
- 70 4) Backplane: A circuit board within the chassis of a modular LNE product into which line cards
71 or modules are inserted to allow communication between the various connected modules.
- 72 5) Module: A plug in device, not used alone, which can add/change the type of network
73 connections, increase/decrease the number of ports, and add/remove additional functionality
74 for a product. Modules include but are not limited to line cards, port adapters, and network
75 adapters. Modules do not include pluggable transceivers (e.g. SFP, SFP+, XFP) or modular
76 power supplies.
- 77 6) Processor: The logic circuitry that responds to and processes the basic instructions that drive
78 an LNE product. For purposes of this specification, a processor is a central processing unit
79 (CPU) which can be used to provide basic function and/or management function.
- 80 E) Other Enterprise and Datacenter Information Technology Equipment:
- 81 1) Small Network Equipment (SNE): Network Equipment that is intended to serve users in either
82 small networks or a subset of a large network. SNE includes a) all Network Equipment with
83 integral wireless capability and b) other Network Equipment meeting all of the following
84 criteria:
- 85 i) Designed for stationary operation

- 86 ii) Contains no more than eleven (11) wired Physical Network Ports; and
87 iii) Primary configuration for operation outside of standard equipment racks.
- 88 2) Computer Server: A computer that provides services and manages networked resources for
89 client devices (e.g., desktop computers, notebook computers, thin clients, wireless devices,
90 PDAs, IP telephones, other computer servers and other network devices). A computer server
91 is sold through enterprise channels for use in data centers and office/corporate environments.
92 A computer server is primarily accessed via network connections, versus directly-connected
93 user input devices such as a keyboard or mouse. For purposes of this specification, a product
94 must meet all of the following criteria to be considered a computer server:
- 95 i) is marketed and sold as a Computer Server;
96 ii) is designed for and listed as supporting computer server operating systems (OS) and/or
97 hypervisors;
98 iii) is targeted to run user-installed applications typically, but not exclusively, enterprise in
99 nature;
100 iv) provides support for error-correcting code (ECC) and/or buffered memory (including both
101 buffered DIMMs and buffered on board (BOB) configurations)
102 v) is packaged and sold with one or more ac-dc or dc-dc power supplies; and
103 vi) is designed such that all processors have access to shared system memory and are
104 visible to a single OS or hypervisor.
- 105 3) Storage Product: A fully-functional storage system that supplies data storage services to
106 clients and devices attached directly or through a network. Components and subsystems that
107 are an integral part of the storage product architecture (e.g., to provide internal
108 communications between controllers and disks) are considered to be part of the storage
109 product. In contrast, components that are normally associated with a storage environment at
110 the data center level (e.g., devices required for operation of an external SAN) are not
111 considered to be part of the storage product. A storage product may be composed of
112 integrated storage controllers, storage devices, embedded network elements, software, and
113 other devices. For purposes of this specification, a storage product is a unique configuration
114 of one or more SKUs, sold and marketed to the end user as a Storage Product.

115 **Note:** EPA has revised the definition of Storage Product slightly to fully harmonize with the definition of
116 Storage Product found in the ENERGY STAR Version 1.0 Data Center Storage Program Requirements.

- 117 4) Storage Networking Products: Products whose primary purpose is the transfer of data
118 between computers systems and storage products. This includes products that use typical
119 storage networking protocols (e.g. Fibre Channel), as well as those that support IP based
120 storage traffic such as iSCSI capable networking products.
- 121 5) Uninterruptible Power Supply (UPS): Combination of convertors, switches, and energy
122 storage devices (such as batteries) constituting a power system for maintaining continuity of
123 load power in case of input power failure.
- 124 6) Digital Subscriber Line Access Multiplexer (DSLAM): A network device that connects multiple
125 digital subscriber line (DSL) interfaces to a backbone network that in turn connects to a larger
126 service provider network.
- 127 7) Cable Modem Termination System (CMTS): A network device that connects multiple cable
128 television (CATV) interfaces to a backbone network that in turn connects to a larger service
129 provider network. Note that CATV connections are often also used to transfer IP traffic.
- 130 8) Network Caching Device: A network device connected to a network that caches content from
131 a remote source that allows connected devices on the downstream network faster
132 subsequent access by later serving the cached content to the downstream devices rather

- 133 than content accessed directly from the original source.
- 134 9) Load Balancing Device: A network device connected to a network that distributes network
135 traffic across several downstream devices. These products allow increased capacity and
136 reliability of data transfer over the network.
- 137 F) Operational Power States:
- 138 1) Active State: The operating state where the product is carrying out work in response to prior
139 or concurrent external requests.
- 140 2) Idle State: The operating state where the product is capable of carrying out work, but is not
141 actively transferring data.
- 142 G) Additional Terms:
- 143 1) Physical Network Port: An integrated physical connection point primarily intended to accept
144 IP or similar traffic via a cable. Fiber-optic connections are considered Physical Network
145 Ports for the purposes of this specification.
- 146 a) Uplink Port: A port designated for transferring consolidated data traffic from multiple
147 devices or downstream networks attached to the downlink ports to an upstream network
148 or device.
- 149 b) Downlink Port: A port designated for distributing data from the consolidated uplink port to
150 a single device or downstream network.
- 151 2) Energy Efficient Ethernet (EEE): A technology which enables reduced power consumption of
152 Ethernet interfaces during times of low data throughput. Defined in Clause 78 of IEEE 802.3
153 (originally specified in IEEE 802.3az).
- 154 3) Power over Ethernet (PoE): A technology that enables transfer of electrical power, along with
155 data, to network end point devices through an Ethernet cable. PoE is defined in Clause 33 of
156 IEEE 802.3 (originally specified in IEEE 802.3af and IEEE 802.3at). The PoE specification
157 defines two types of equipment:
- 158 a) Type 1: Powered devices up to 13.0 watts
- 159 b) Type 2: Powered devices up to 25.5 watts
- 160 H) Product Family: A group of models/configurations that share a set of common attributes that are
161 variations on a basic design.
- 162 1) Common Product Family Attributes for Modular Products: A set of features common to all
163 models/configurations within a modular product family. All models/configurations within a
164 modular product family must share the following:
- 165 a) Be from the same model line or machine type; and
- 166 b) Share the same mechanical and electrical designs in the chassis with only superficial
167 mechanical differences to enable a design to support a variety of module options.
- 168 2) Product Family Tested Product Configurations:
- 169 a) Minimum Power Configuration: The product configuration that includes the combination
170 of components including modules, power supplies, and other associated processing and
171 power support hardware that generates the least possible energy consumption within a
172 product family.
- 173 b) Maximum Power Configuration: The product configuration that includes the combination
174 of components including modules, power supplies, and other associated processing and
175 power support hardware that generates the greatest possible energy consumption within
176 a product family.
- 177 c) Typical Configuration: A product configuration that lies between the minimum and

178 maximum configurations that is representative of a product with high volumes sales.
179 Product families containing a single product shall be represented by that configuration.

180 **Note:** EPA did not receive enough data or feedback to inform the development of a product family
181 structure for fixed products in Version 1.0. As a result, each configuration of a fixed product that is
182 intended to be ENERGY STAR certified must be tested and certified separately. EPA will revisit the
183 creation of a product family structure for fixed products in Version 2.0, when the greater availability of
184 product performance and power data will allow EPA to better identify product attributes that are
185 appropriate for consolidation into a product family structure.

186 **2 SCOPE**

187 **2.1 Included Products**

188 2.1.1 Products that meet the definition of Large Network Equipment in Section 1 of this document
189 are eligible for ENERGY STAR certification under this specification. Products explicitly
190 excluded from Version 1.0 are identified in Section 2.2.

191 **2.2 Excluded Products**

192 2.2.1 Products that are covered under other ENERGY STAR product specifications are not eligible
193 for certification under this specification. The list of specifications currently in effect can be
194 found at www.energystar.gov/specifications.

195 **Note:** EPA received feedback from several stakeholders requesting that fiber optic ports with speeds of
196 40Gb/s or greater be included within the scope of Version 1.0, primarily because products with this
197 functionality will become much more common during the life of Version 1.0. In consideration of this new
198 market information, EPA has removed the fiber optic port speed exclusion introduced in Draft 2.

199 2.2.2 The following products are not eligible for certification under this specification:

- 200 i. Small Network Equipment;
- 201 ii. Computer Servers, including blade switches sold within a Blade Server configuration;
- 202 iii. Storage Products, including Blade Storage;
- 203 iv. Storage Networking Products;
- 204 v. Security Appliances;
- 205 vi. Access Point Controllers;
- 206 vii. DSLAM/CMTS equipment;
- 207 viii. Network Caching Devices; and
- 208 ix. Load Balancing Devices.

209 **3 CERTIFICATION CRITERIA**

210 **3.1 Significant Digits and Rounding**

211 3.1.1 All calculations shall be carried out with directly measured (unrounded) values.

212 3.1.2 Unless otherwise specified in this specification, compliance with specification limits shall be
213 evaluated using directly measured or calculated values without any benefit from rounding.

214 3.1.3 Directly measured or calculated values that are submitted for reporting on the ENERGY STAR
215 website shall be rounded to the nearest significant digit as expressed in the corresponding
216 specification limit.

217 3.2 Power Supply Requirements

218 3.2.1 Power supply test data and test reports from testing entities recognized by EPA to perform
219 power supply testing shall be accepted for the purpose of certifying the ENERGY STAR
220 product.

221 3.2.2 Power Supply Efficiency Criteria: Power Supplies used in products eligible under this
222 specification must meet the following requirements when tested using the Generalized Internal
223 Power Supply Efficiency Test Protocol, Rev. 6.6 (available at www.efficientpowersupplies.org).
224 Power Supply data generated using Rev. 6.4.2, 6.4.3, or 6.5 are acceptable provided the test
225 was conducted prior to the effective date of Version 1.0 of this specification.

226 i. Fixed LNE Products: To certify for ENERGY STAR, a fixed LNE product must be configured
227 with **only** PSUs that meet or exceed the applicable efficiency requirements specified in Table
228 2 **prior to shipment**.

229 ii. Modular LNE Products: To certify for ENERGY STAR, a modular LNE product shipped with a
230 chassis must be configured such that **all** PSUs supplying power to the chassis meet or
231 exceed the applicable efficiency requirements specified in Table 2 **prior to shipment**.

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Table 2: Efficiency Requirements for PSUs

Power Supply Type	Rated Output Power	10% Load	20% Load	50% Load	100% Load
Multi-output	All Output Levels	N/A	85%	88%	85%
Single-output	All Output Levels	80%	88%	92%	88%

233 **Note:** EPA received feedback that the proposed power supply requirements are too restrictive for lower
234 capacity non-redundant power supplies, and that the 10% load requirement is not appropriate as this load
235 level is not a typically used. EPA has observed power supplies of various loads in other ENERGY STAR
236 IT product categories that can meet the levels required in Table 2, and has not received any data to
237 support that power supplies in LNE products (particularly those that support PoE loads) do not operate at
238 low loading conditions. As such, EPA remains committed to recognizing power supply efficiency at all
239 load levels. Should data supporting an easing of these requirements become available, EPA will consider
240 updates to this specification in the future.

241 3.2.3 Power Supply Power Factor Criteria: Ac-Dc Power Supplies used in products eligible under
242 this specification must meet the following requirements when tested using the Generalized
243 Internal Power Supply Efficiency Test Protocol, Rev. 6.6 (available at
244 www.efficientpowersupplies.org). Power Supply data generated using Rev. 6.4.2, 6.4.3, or 6.5
245 are acceptable provided the test was conducted prior to the effective date of Version 1.0.

246 i. Fixed LNE Products: To certify for ENERGY STAR, a fixed LNE product must be configured
247 with **only Ac-Dc** PSUs that meet or exceed the applicable power factor requirements

248 specified in Table 3 **prior to shipment**, under all loading conditions for which output power is
 249 greater than or equal to 75 watts. Partners are required to measure and report PSU power
 250 factor under loading conditions of less than 75 watts, though no minimum power factor
 251 requirements apply.

252 ii. Modular LNE Products: To certify for ENERGY STAR, a modular LNE product shipped with a
 253 chassis must be configured such that **all** Ac-Dc PSUs supplying power to the chassis meet or
 254 exceed the applicable power factor requirements specified in Table 3 **prior to shipment**,
 255 under all loading conditions for which output power is greater than or equal to 75 watts.
 256 Partners are required to measure and report PSU power factor under loading conditions of
 257 less than 75 watts, though no minimum power factor requirements apply.

258 **Table 3: Power Factor Requirements for Ac-Dc PSUs**

Power Supply Type	Rated Output Power	10% Load	20% Load	50% Load	100% Load
Multi-output	All Output Ratings	N/A	0.80	0.90	0.95
Single-output	Output Rating ≤ 500 W	N/A	0.80	0.90	0.95
	Output Rating > 500 W and Output Rating ≤ 1,000 W	0.65	0.80	0.90	0.95
	Output Rating > 1,000 watts	0.80	0.90	0.90	0.95

259 **3.3 Energy Efficiency Feature Requirements**

260 3.3.1 To certify for ENERGY STAR, an LNE product must have the following features enabled in its
 261 as-shipped configuration, implemented as specified:

262 i. Remote Port Administration: An LNE product must provide the end-user with the ability to
 263 conduct remote administration of individual physical network ports.

264 ii. Adaptive Active Cooling: Primary components of an LNE product must utilize adaptive
 265 cooling technologies that reduce the energy consumed by the cooling technology in
 266 proportion to the current cooling needs of the LNE product. (e.g., reduction of variable speed
 267 fan or blower speeds at lower ambient air temperature). This requirement is not applicable to
 268 devices that employ passive cooling.

269 iii. Energy Efficient Ethernet: All copper-based physical network ports in an LNE product must
 270 be compliant with IEEE 802.3 Clause 78.

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Note: EPA received stakeholder feedback to only apply the Energy Efficiency Ethernet (EEE) requirement to ports with a speed of 1Gb/s or greater. While EPA understands that the energy savings per port is much lower for a 100Mb/s port than a 1Gb/s or faster port on an individual basis, the resulting savings do add up when looking at the system level savings of an LNE product providing connectivity to many EEE capable edge products (e.g., VOIP phones). With the intention of capturing these system level savings, EPA has maintained the EEE requirement for all copper based physical network ports in Version 1.0.

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3.4 Active State Efficiency Criteria for all LNE Products

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3.4.1 EPA is pursuing this approach to active state evaluation to encourage further testing of the energy efficiency of LNE products. EPA will evaluate this data when considering active state efficiency levels in Version 2.0 of the specification. Efficiency data will be measured and disclosed in a consistent manner and is provided along with the hardware and software characteristics of each system. Thus, this reporting approach will assist manufacturers in differentiating the efficiency of their products and purchasers interested in buying efficient products.

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3.4.2 Active State Data Reporting: To certify for ENERGY STAR, an LNE product or LNE Product Family must be submitted for certification with the following information disclosed in full and in the context of the complete Active State efficiency rating test report:

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- i. Full power and performance shall be measured and reported, both in certification materials and as required in Section 4 for each applicable configuration within the product family as defined in Section 1.H)4) above.

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3.4.3 The testing of modular Large Network Equipment for compliance with Section 3.4.1 shall be carried out with the following additional considerations:

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- i. Power and performance values shall be measured and reported using a fully-populated chassis

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- ii. Heterogeneous module configurations are permitted.

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4 STANDARD INFORMATION REPORTING REQUIREMENTS

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4.1 Data Reporting Requirements

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4.1.1 All required data fields in the ENERGY STAR Version 1.0 LNE Qualified Product Exchange form shall be submitted to EPA for each ENERGY STAR certified LNE product or LNE Product Family.

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4.1.2 The following data will be displayed on the ENERGY STAR website through the product finder tool:

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- i. model name and number, identifying SKU and/or configuration ID;

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- ii. product characteristics (utilization type, modular vs. fixed, power specifications, etc.);

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- iii. product type (management scheme, stackable, etc.);

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- iv. tested system configuration(s), including port counts, port speeds, number of modules supported, types of ports supported, etc.;

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- v. energy consumption and performance data from required Active State Efficiency Criteria

- 310 testing;
- 311 vi. PoE capability (number of PoE ports supported, maximum PoE class supported, maximum
312 total PoE power supported, etc.);
- 313 vii. available and enabled user configurable power management features of the system;
- 314 viii. for product family certifications, a list of certified configurations with qualified SKUs or
315 configuration IDs; and
- 316 ix. for a modular LNE products, a list of compatible chassis that meet ENERGY STAR
317 qualification criteria.
- 318 4.1.3 EPA may periodically revise this list, as necessary, and will notify and invite stakeholder
319 engagement in such a revision process.

320 **Note:** EPA received feedback to revise Section 4.1.2.viii above to specify the listing of power
321 management features that are configurable by the end-user. EPA has revised the language accordingly
322 to focus the description of power management features to those relevant to end-users at a product level,
323 as opposed to deeper improvements at the component level.

324 5 STANDARD PERFORMANCE DATA MEASUREMENT AND OUTPUT 325 REQUIREMENTS

326 5.1 Data Elements

- 327 5.1.1 Data Elements: LNE products with a nameplate power rating greater than 250 watts shall be
328 capable of measuring and reporting the following data elements at the LNE product level:
- 329 i. Input Power, in watts. Input power measurements must be reported with accuracy within
330 $\pm 5\%$ of the actual value for measurements greater than 200 W, through the full range of
331 operation. For measurements less than or equal to 200 W, the accuracy must be less than
332 or equal to 10 W multiplied by the number of installed PSUs; and
- 333 ii. Inlet Air Temperature, in degrees Celsius, with accuracy of $\pm 2^\circ\text{C}$.

334 **Note:** As “Core” products are no longer defined in the Version 1.0 specification, EPA has included
335 nameplate power as a differentiator to separate out low end products that may be unduly burdened by the
336 Section 5 requirements. This general approach was suggested by stakeholders. EPA developed the
337 more than 250 watt limit for applicability of 5.1.1 based on review of the current product offerings from the
338 ten largest manufacturers of LNE products in the U.S.

- 339 5.1.2 Reporting Implementation:
- 340 i. Data shall be made available in a published or user-accessible format that is readable by
341 third-party, non-proprietary management systems;
- 342 ii. Data shall be made available to end users and third-party management systems over a
343 standard network connection;
- 344 iii. Data shall be made available via embedded components or add-in devices that are
345 packaged with the LNE product (e.g., a service processor, embedded power or thermal
346 meter or other out-of-band technology, iPDU, or pre-installed OS);
- 347 5.1.3 Sampling Requirements:

- 348 i. *Input power*: Input power measurements must be sampled internally to the LNE product at
349 a rate of greater than or equal to 1 measurement per contiguous 10-second period.
- 350 ii. *Inlet air temperature (optional)*: Inlet air temperature measurements must be sampled
351 internally to the LNE product at a rate of greater than or equal to 1 measurement every 10
352 seconds.
- 353 iii. *Timestamping*: Systems that implement time stamping of environmental data shall sample
354 internally to the LNE product data at a rate of greater than or equal to 1 measurement
355 every 30 seconds.
- 356 iv. *Management Software*: All sampled measurements shall be made available to external
357 management software either via an on-demand pull method, or via a coordinated push
358 method. In either case the system's management software is responsible for establishing
359 the data delivery time scale while the LNE product is responsible to assuring data
360 delivered meets the above sampling and currency requirements.
- 361 5.1.4 Documentation Requirements: The following information shall be included in the data
362 submission:
- 363 i. Guaranteed accuracy levels for power and optional temperature measurements, and
364 ii. The time period used for data averaging (if present).
- 365 5.1.5 Use of iPDUs: Section 5.1 may be satisfied using iPDUs. In order to satisfy the Data Elements
366 requirement, an iPDU must:
- 367 i. Meet all requirements for accuracy, sampling, and data reporting;
368 ii. Be made available for sale and delivery with certified ENERGY STAR LNE products by
369 appearing on the manufacturer's website and/or in marketing material where information
370 on the LNE product is displayed.

371 6 TESTING

372 6.1 Test Methods

- 373 6.1.1 Manufacturers may select whether to test product with a half-port **or** full-port configuration for
374 ENERGY STAR certification purposes. The testing configuration used for certification
375 purposes will be noted in the Qualified Product Exchange form and displayed on the ENERGY
376 STAR website.

377 **Note:** In this draft, EPA has enabled manufacturers to select the testing configuration from the ENERGY
378 STAR LNE Test Method. For products that only operate at the edge of a network, half-port testing may
379 be ideal, while for products that only operate in the core of a network, full-port testing may make more
380 sense. For products that can be used at either the edge or in the core of a network, manufacturers can
381 select the testing configuration that best represents the use case for which the product is optimized.
382 This option allows manufacturers to focus testing resources. The test configuration will be reported in
383 QPX. Test methods identified in Table 1 shall be used to determine certification for ENERGY STAR.

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Table 1: Test Methods for ENERGY STAR Certification

Product Type	Test Method
All	ENERGY STAR Test Method for Large Network Equipment (Rev. Sept-2015)

385 **6.2 Number of Units Required for Testing**

- 386 6.2.1 Representative Models shall be selected for testing per the following requirements:
- 387 i. For certification of an individual product configuration, the unique configuration that is
- 388 intended to be marketed and labeled as ENERGY STAR is considered the Representative
- 389 Model.
- 390 ii. For certification of a product family of all product types, one product configuration for each of
- 391 the required configurations defined in Section 1.H)4) within the family are considered
- 392 Representative Models. All such representative models shall have the same Common
- 393 Product Family Attributes as defined in 1.H).

394 **6.3 International Market Certification**

- 395 6.3.1 Products shall be tested for certification at the relevant input voltage/frequency combination for
- 396 each market in which they will be sold and promoted as ENERGY STAR.

397 **7 EFFECTIVE DATE**

- 398 7.1.1 Effective Date: The Version 1.0 ENERGY STAR Large Network Equipment specification shall
- 399 take effect on **TBD**. To certify for ENERGY STAR, a product model shall meet the ENERGY
- 400 STAR specification in effect on the model's date of manufacture. The date of manufacture is
- 401 specific to each unit and is the date on which a unit is considered to be completely assembled.

402 **Note:** Stakeholders may begin to certify LNE products to Version 1.0 as soon as: Version 1.0 LNE

403 Program Requirements are finalized and posted on the ENERGY STAR website; and EPA-recognized

404 labs and certification bodies are available to test and certify LNE products. EPA will work to complete the

405 accompanying LNE Qualified Product Exchange form and website updates as quickly as possible, but

406 these final two items will not delay certification of products to Version 1.0.

- 407 7.1.2 Future Specification Revisions: EPA reserves the right to change this specification should
- 408 technological and/or market changes affect its usefulness to consumers, industry, or the
- 409 environment. In keeping with current policy, revisions to the specification are arrived at
- 410 through stakeholder discussions. In the event of a specification revision, please note that the
- 411 ENERGY STAR certification is not automatically granted for the life of a product model.

412 **8 CONSIDERATIONS FOR FUTURE REVISIONS**

413 8.1.1 Product Scope: EPA will investigate expanding the scope to include additional product types
414 that are not covered in Version 1.0, as appropriate.

415 8.1.2 Active State Efficiency Criteria: EPA will investigate the product data generated through
416 Version 1.0 certification to support setting active levels in Version 2.0 of this specification
417 wherever possible.

418 **Note:** EPA has added two considerations for development in the Version 2.0 specification.

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