

1 Responses to specific items in Discussion Document

The definition of “modular” vs. “fixed” needs clarification.

In general, the “fixed” category includes devices that have slots to accommodate various transceiver options. This categorization was used for Small Network Devices and continues to be the preferred definition. It should be noted that there are cases where the range of transceiver module speed or power options could pose specific problems for testing but these should be manageable.

In addition to this, there is a category of products that are normally classed as “fixed” in the market analysis but which include expansion slots. The expansion slots can accommodate a variety of modules that can drastically alter the number and type of network ports (and consequently the energy efficiency). It is recommended that such systems should be treated in the same manner as “product families” within other programs and warrant a separate category (e.g. “expandable” or “Partially modular”).

The category of “modular” products is generally taken to describe products that can significantly change function with the addition of modules or products for which the vast majority of supported network ports are on removable (multi-port) modules.

In summary:

Modular – most functional parts of the product can be user replaced/selected

Semi modular - the significant parts of a product is not selectable, some part(s) are user selectable

Fixed configuration - no user selectable parts (except pluggable transceivers and power supplies)

The definition of “managed vs. “unmanaged” needs clarification.

Definition of “managed” products:

Devices that support standards-based management protocols for remote management over networks using automated management systems.

The definition of “unmanaged” products:

Devices that do not support remote management as described above, although such devices may have web based interface for configuration control.

1.1 Question a)

Are there alternate definitions for LNE that should be reviewed and considered by EPA?

The definition given is complementary to the definition used in the Small Networking Equipment program. It has been stated previously that a better definition would separate “equipment for small networks” from “equipment for large networks.”

1.2 Question b)

Are there any LNE product types not addressed above that should be added to the list of products under consideration for Version 1.0? Are there any products that should be explicitly excluded?

There are many types and classifications of network equipment and there are no standard or industry recognized definitions that could be used in a normative manner to partition these classifications. The definitions given for “switch” and “router” are very simplistic and could cause problems if used normatively. Many devices sold as “switches” have the ability to route and many devices sold as “routers” can also perform switching functions. Furthermore some devices include combined functions with firewalls, VPN, encryption modules, or even types of compute server. There is no definition given in the program documentation for “Security Appliances” or “Access Point Controllers.” It is unclear what criteria should be used for inclusion or exclusion of device categories.

It is the view of Cisco that Storage Switches should be included as a separate category. We will assist in providing definitions and test criteria for such a category if required.

1.3 Question c)

Are there any product categories not included above that EPA should be aware of, beyond modular vs. fixed or managed vs. unmanaged? What impact do these categories have on product capabilities and energy consumption?

As stated, there are many classifications in use without normative definitions. Some classifications are based on position within the network architecture (e.g. “core switch”); some are based on market segment (e.g. “data center switch”); some are based on level of functionality (e.g. “L3/L4 switch”); some are based on application (e.g. “video media switch”). Although these classifications may be viewed as informal, or even arbitrary, they are used to segment the market and reflect differences in functional capabilities reflected by significant variation in power usage (and cost).

1.4 Question d)

What is the size of the blade switch market? EPA appreciates any information on blade switches, their typical features, deployments, and power consumption.

Market data should be obtained from market research organizations. Blade switches are deployed with blade chassis systems, comprising one or two switches per chassis depending on architecture. Blade

switches typically resemble data center edge switches with power usage similar to devices that of the same feature set and port count.

2 Comments on Version 1.0 Focus

2.1 Question e)

What is the state of power supply efficiency levels in LNE? Would power supply efficiency requirements be applicable to all product types? Are power supply efficiency levels similar across the various product types listed above?

Power supply efficiency levels may vary significantly according to product type, although it seems that usage of “Eighty-Plus Gold” certified power supplies is proliferating. It is understood that power supply efficiency levels are a common element in Energy Star program requirements, however the explicit specification of one particular system component is not ideal. For simple, fixed configuration, and readily testable equipment it is preferable to consider the efficiency of the complete device and not subsidiary components. For modular or difficult to classify equipment it may be beneficial to specify power supply efficiency to ensure that energy wastage does not proliferate at load points which differ from the system test conditions.

2.2 Question f)

What energy and product characteristic data is most relevant to end users trying to understand their product's energy consumption? This information goes beyond just having an ENERGY STAR label and would be presented in the PPDS.

The most important data is the energy usage in circumstances that will most closely match the expected usage of the device. It should be emphasized that for most users of Large Networking Equipment, the sophisticated information presented in a PPDS is massively more important and useful than a straightforward Energy Star label.

2.3 Question g)

Are there additional requirements or incentives appropriate to LNE that EPA should consider?

Additional incentives should be considered where features have an impact on energy savings beyond the scope of the device under consideration. Or features that may improve the practical application of energy savings in deployed devices. Some of these features are already mentioned, such as Energy Efficient Ethernet or standards-based energy management interfaces.

2.4 Question h)

The preliminary approach document for testing LNE uses the Telecommunications Energy Efficiency Ratio (TEER) to calculate efficiency. Are there any other power, energy, and/or power performance metrics that EPA and DOE should consider?

The use of TEER or derivative specifications (such as EER from ITU-T L1310) should be encouraged wherever possible. In cases where it cannot be applied directly, the same approach should be used – i.e. device power should be assessed in circumstances that most closely resemble the normal usage and should be compared to the maximum useful performance level that can be supported. Furthermore, it is a fundamental principal of TEER that the rating should only be used to compare like candidates for a specific position in the network and the ratings should not be compared across classes or in a generic manner.

3 Comments on Energy Efficiency Considerations

3.1 Question i)

Are there any product features not listed above that EPA should be aware of that provide energy saving opportunities? What are the energy and performance impacts of these features as they currently exist? What about in the near future?

There are many more energy saving features defined and implemented in current systems than are described in the program document. However, in cases where the energy saving features allow devices to exhibit improved ratings when tested using methodologies such as TEER, special consideration of the features would be redundant. If energy saving features have an impact beyond the scope of the testing, or improve the practicality of energy savings then special credit may be appropriate. A primary consideration for whether energy saving features that might be included in this program should be the availability of normative, open standards to define the behavior of the feature.

3.2 Question j)

Are the savings from the more efficient Power over Ethernet (PoE) large enough to include in this specification? Should PoE mid-span devices be considered to be network equipment or external power supplies?

It is imperative that Power over Ethernet (PoE) is considered within this specification as it has a significant effect on the energy consumption of devices – whether the PoE function is actively used during the test or not. The implementation of PoE may be more or less efficient from an energy perspective and some techniques may be considered to rate the efficiency of the PoE in a manner that could be orthogonal to the primary networking function.

It should be expected that Power Sourcing Equipment (PSE) would be under the scope of this program but very few (if any) Powered Devices (PDs) would qualify. In cases where PDs are considered, the power drawn from the PSE should be measured, not the power from the PSE's power source.

Mid-span power injectors would not normally be considered to be networking devices; however they are specifically excluded from external power supply programs and regulations and therefore should be included as a separate category in this program.

3.3 Question k)

What are some strategies that can be promoted by ENERGY STAR to improve power management and data availability in LNE products?

The adoption of open standards for power management and energy data availability should be encouraged. A standard is currently under development in the IETF Energy management work group (eman) and should be supported when ratified. In the interim, many product developers are already offering pre-standard, proprietary equivalents to this function.