Comments on ENERGY STAR Small Network Equipment Draft Specification

General: Different and unique requirements found in the industry, place additional burdens on manufacturers adding cost and delays in product introduction. Aligning the ENERGY STAR SNE with the EU Code of Conduct on Energy Consumption of Broadband Equipment would provide momentum to the ENERGY STAR effort and allow a rapid and smooth transition for these network product. Although there are issues and short comings to the EU Code of Conduct, the problems have been and continue to be addressed with each new update. Unification of the specifications would benefit the Energy Star SNE program and many manufacturers active in international marketing of products. The ENERGY STAR time scales could be delayed, but if the requirements were the same, then no additional development effort or time is required for compliance. Historically, other ENERGY STAR efforts and definition, like the External Power Supply, evolved to be eventually equal with the European Union requirements for the External Power Supplies.

One common concern with both the ENERGY STAR and the EU Code of Conduct is in regards to the "off-mode" as relates to specific customer services. In America, there has been a long history regarding "life line" service for emergency telephone calls. The history contains several law suits for cases where damage or death occurred because of failure to provide "life line" service. In Europe, telephone service does not have the same emphasis as in this country. ARRIS does not recommend the disconnection of power or powering off telephony modems or associated products because of past emphasis on "life line" telephone service, hence, we have concerns regarding the "off mode" operation. With the increased use of IP telephone and Analog Network Adapters, this same "life line" service could now be extended to the data only product as well. This would apply to routers, switches, gateways and other devices used in the network providing the IP Telephony path.

Another service which requires a continuously active link is alarm monitoring via phone, Ethernet, or USB service ports. Power switches where alarm monitoring is used should be avoided. The use of alarm services is not within the definition of features for SNE type products as this is an external application and not identified to the network equipment.

The "off mode" does present a technical issue for units that employ internal battery backup and therefore require disconnecting the battery in the "off-mode". In Europe, products are required to use an AC power switch to meet the EU's requirements, however this does not disconnect the batteries. The user is required to physically disconnect the battery to shut down the telephony modem. Internal battery backed up Telephony Modems are rarely used in Europe, unlike in America where "life-line" services continue to be supported. With the AC off, the unit will not pull any power from the AC mains. The battery, if not disconnected, will power the unit for a defined period of time before disconnecting. If the battery is left in a discharged state for a prolonged period of time, the battery will be degraded and eventually damaged beyond use. The use of a double pole power switch would address the issue of having the user remove the battery but, because of the small size requirement and the required electrical isolation by UL and international safety standards, a suitable solution is not available.

Discussion Questions: The following addresses the questions as stated in the Draft Specification Framework Document.

d) Discussion Questions (Page 5):

a. Are there alternate definitions for small network equipment that should be reviewed and considered by EPA?

This document covers the SNE where other ENERGY STAR documents cover the set-top boxes. Multi-media Home Gateway devices are bridging these functions together. Where will these highly integrated devices be defined?

Because newer integrated service products are emerging in the market, ARRIS supports the approach used in the EU code of Conduct on Energy Consumption of Broadband Equipment and the Energy Star requirements for Set-top Converters to provide a unit base power plus incremental feature power for measuring the unit power consumption.

b. Are definitions of operational modes clear and applicable in general to the SNE market? Are there types of low power modes that currently exist which are relevant, and can be defined and included?

In an effort to unify with the definitions used in the EU Code of Conduct, the "Low-Power" or "Idle" mode should be added to this framework requirement based on function. We believe the "low power" or "idle" mode is a required state for operation of services like voice and even data where the traffic capabilities must be restored without noticeable delay. The "low power" or "idle" modes can be included under the "Sleep mode".

e) Questions for Discussion (PAGE 6):

a. Are there any SNE products missing from the list of products under consideration for Tier 1? If so, are there existing efficiency features or methods that could be promoted by ENERGY STAR now or in the future?

Telephony Modems (E-MTA), Analog Network Adapters (ANA), DECT phones, and Gateway products should be considered as applicable products, consistent with those listed in the EU Code of Conduct on Energy Consumption of Broadband Equipment.

b. Are there any product development trends in the SNE market that may have an impact on power consumption or proper categorization of devices?

Newer integrated products, with multiple feature integration, are prone to increased power consumption because of the need to keeping circuits active for certain services and features. The power building block approach based on features will allow addressing of these enhanced capabilities.

c. Is supply of PoE an expected technology in the SNE market? Are more devices that support supplying PoE expected in the future? How should test procedures accommodate SNE powered over PoE? Should PoE mid-span devices be considered to be network equipment or external power supplies?

ARRIS sees the need to support various capabilities of powering downstream devices including Power over Ethernet, Power over USB, and Power over Coax.

The POE and other powered mid span devices should be considered network equipment as opposed to an external power supply as a better fit to the application except where an existing specification exists.

d. For devices with Ethernet, the Energy Efficient Ethernet effort was identified as a technology that could save energy both in the SNE and attached end point devices. Are there analogous technologies available for other wired or wireless network protocols?

Yes, there are analogous technologies in the WIFI products where power is a function of activity and range. Telephony products employ state dependent power consumption techniques, consuming minimum power in states of no activity.

e. EPA believes that "power management" features could enable off-hours power-down scheduling and provide end-users a better understanding of network usage and power consumption over time. What are some strategies that can be promoted by ENERGY STAR to improve power management and data availability?

No comment.

f. EPA is aware of the growth potential in ONT devices as direct fiber connections to the home become more prevalent. What does EPA need to know about the types of products that provide this service and how they perform from an energy perspective?

No comment.

g. While IP Telephony fits the definition of a network end point device, it is possible for some IP telephones to function as a wired router or switch for a connected PC? Do IP Telephony devices share characteristics with other SNE devices identified in this document? What features or technologies exist to promote energy efficiency in IP Telephony?

Yes, combined ANA and routers are used in the network today for IP phone service and local Ethernet services. These devices however interface a standard telephones as opposed to an IP telephone.

ANAs and IP Telephones have similar characteristics to Telephony modems and should have similar requirements.

The IP Telephones can utilize the same capabilities of other state dependent devices. In addition, they have full control over the load since these devices terminate the end point and do not interface other external devices. This will provide a lower power consuming design.

f) Questions for Discussion (Page 10):

a. Are there additional industry-standard test procedures that EPA should consider during development of this specification?

ARRIS supports the EU Code of Conduct on Energy Consumption of Broadband Equipment as a model for this standard and measurement procedure.

ARRIS recommends adapting the External Power Supply requirements for the products using internal power supplies as this promotes efficient designs. The requirements and measurements methods would apply to the primary input power stage. The no-load condition would not be applicable unless designed for use in a state consuming less than 25% of the power supply capability.

b. Stakeholders commented to EPA that the expected duty cycle of SNE primarily consists of "idle" with very short periods of active use and short (if any) periods in low power modes. Are there any comprehensive studies of SNE usage patterns that should be considered by EPA?

Numerous studies exist for telephony services and utilization. These studies show the usage rate for residential services to be in the range of 8 to 16% during the daytime peak traffic periods and less that 5% during the night.

c. Are there any concerns/support for features included in the preliminary list? Are there additional features EPA should be aware of that represent energy saving opportunities?

No comment.

Other Comments: The following comments are provided as related to specific sections.

Page 3, Operational Modes: The EU Code of Conduct on Energy Efficiency of Broadband Equipment includes a definition of a "Low-Power" state as opposed to "Sleep" mode. ARRIS believe the "Low Power", "Idle", "Stand-by" and "Sleep" modes are all equal.

Page 4, Off-Mode: The EU Code of Conduct defines an "Off-Mode" which has been interrupted as a requirement for a physical power switch. On page 8, a "hard off switch" is discussed but with some expressed reservation as to use. Because of the importance of having operating phone service, ARRIS would recommend not including a power switch on Telephony modems (E-MTA) but inform the user as to the procedure to power down a unit for extended periods of no use. This would remove the Telephony modem (E-MTA) from the requirements for the "Off-mode", but applicable to the "Low-Power state" requirements. Cable modems, ANA, and integrated Telephony services on other products may equally need to be considered like the Telephony Modem and not have a power switch.

Page 5, Eligible Equipment Types for inclusion in Tier 1: Telephony Modems or E-MTAs are not specifically identified in the list. Are these type devices being considered as part of the discussion on the IP Telephony products?