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Comments to ENERGY STAR® SNE Draft Specification Framework

Please find below comments to the SNE Draft Specification Framework. Numbering of questions from the original document is used.

d) Feedback to Discussion Questions:

d1) Are there alternate definitions for small network equipment that should be reviewed and considered by EPA?
The definition put forward to separate small network equipment from large network equipment is clear in principle but may be difficult in detail. Especially definition c) i. 2. :

2. Contains no more than nine wired network ports;

may not cover some types of IAD. We calculate for example

1 ADSL2+ WAN
2 FXS telephony ports
1 FXO telephony port
4 Ethernet ports
2 USB ports

10 ports in total

Other interfaces like Cable, MOCA, PON, G.hn and powerline must be considered as well.

Proposal is to limit the maximum number of ports of the same type for example to maximum 5 ports.

d2) 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?
The definitions of operational modes are clear but to our mind not exhaustive to describe the relevant states. Gateway equipment usage studies by Fraunhofer Institute [1] show that the relative time share of Off-Mode is low.

The On-Mode clearly defines important usage scenarios.

There is however another important active “Low-Power-State” mode which typically occurs when nobody is at home. During this time a large number of complex functions must remain active to guarantee a good user experience and to fulfill industry standards. In detail the home gateway must provide the following functionality:

- A DSL IP connection is required to receive VoIP calls. For transmission of IP stream the physical layer must be kept active which means that DSL tones are permanently active and analyzed in the system.
- WLAN base station function must be capable of performing association of new mobile devices to the WLAN network and maintain the wireless link to previously associated devices. For this the WLAN has to transmit beacon and to operate the receive path.
- Ethernet link detection must be active and attached devices must be managed when requesting new link.
- For DECT / CatIQ cordless telephony interface incoming call detection must be assured. Therefore DECT/ Cat IQ scanning is active or beacon is send. Ringing must be delivered. This is required for all telephony interfaces.
- The telephone interface FXS has to detect off-hook. Attached telephones must be fed.
- Incoming calls at the FXO telephone interface must be detected.
- Attachment of new devices to USB must be recognized.

The list indicates the minimum active functions for the Low-power-state use case. In addition other services may be required to run for good user experience like for example FTP server functionality, Multimedia server and home automation functions.

For measurement purposes the type and number of primary functions operated in On-Mode must be specified later to greater level of detail.

A Sleep-Mode / Standby-Mode corresponding for example to a TV-set wake-up functionality is thought to be not appropriate for typical gateway use. Same holds for the Auto power down mode (APD) definition since it is directly linked to the usage of Sleep-Mode.

We appreciate the EPA strategy to make use of existing definitions as far as possible. To our mind the Low-Power-State definition given in [2] and already mentioned in this document is the most advanced definition so far and should be considered for inclusion.

e) Questions for Discussion:

e1) 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?
We suggest to consider Home server / storage functionality and devices providing Powerline, MOCA, Cable and PON interfaces.

e2) Are there any product development trends in the SNE market that may have an impact on power consumption or proper categorization of devices?
The trend for integration of storage / NAS functionality into home gateways can lead to a considerable saving in overall power consumption. By this approach continous 24h/day operation of separate storage server and interface device can be avoided.

e3) 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?
We don't expect PoE to play an increasing role for Home Gateways in the near term. Cable voltage drop is one issue which limits energy efficiency.

e5) 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?
Integration of storage / NAS functionality into home gateways as mentioned under point e2) can be such a feature.

e7) 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?
There are enterprise IP Phones with router / switch functionality which fulfil the definitions of end point device but provide important features of a SNE.

e8) 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?
IP telephony is provided by different equipment classes namely IP-Phones, IAD gateway devices with FXS interface, and IAD gateway devices with DECT/CatIQ functionality.

Several features like integration of Voice Codec and DECT / Cat IQ protocol functionality are advantageous for energy consumption. Efficient control of telephony high voltage circuits (SLIC/FXS) is another power saving feature.

f) Questions for Discussion

f1) Are there additional industry-standard test procedures that EPA should consider during development of this specification?
The specification given in the Code of Conduct Annex B [2] seems to us the most advanced specification and should be considered.

f2) 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?
There is an early study by Fraunhofer Institute [1] for EuP Lot6 giving average time shares for "On", "standby", "Off" and "0W Off" modes of Internet devices "Modems incl WLAN" ie. gateways. Following the discussion in EuP Lot26 [3] we conclude that the term "standby" used in the

above study really means "networked standby" as used in [3] or "Low-Power-State" as used in [2].

f3) 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?
We fully support the EPA approach to set a power limit base with a structured set of power allowances over these limits based on the power needed to provide supplemental functions. By this approach the focus is on overall energy efficiency while not limiting architectural freedom and novel solutions.

References

[1] N. F. Nissen, German-French Expert Workshop on Standby and IPP 31.05.2007, Berlin, "Status of the EuP Preparatory Study Lot 6 on Standby and Off-mode Losses", foil 55, Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration IZM, Dept. Environmental Engineering

[2] European Commission, Joint Research Centre, "Code of Conduct on Energy Consumption of Broadband Equipment", Version 3, 18 November 2008 , http://sunbird.jrc.it/energyefficiency/html/ standby_initiative.htm

[3] EuP preparatory study on Networked standby, DG TREN Lot 26 (TREN/D3/91-2007-Lot26). http://www.ecostandby.org/index.php

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About Lantiq

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Lantiq headquarters are located in Neubiberg, near Munich, Germany, from where a global and leading fabless semiconductor organisation of 900 people develop and market a broad portfolio of analogue, digital and mixed-signal integrated circuits. System manufacturers using our hardware and software are enabled to design high-speed data and communication system solutions, for Next Generation Access Networks and the Digital Home.

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