broadband forum

TR-68

Base Requirements for an ADSL Modem with Routing

Issue: 3.0

Issue Date: December 2006

Notice

The Broadband Forum is a non-profit corporation organized to create guidelines for broadband network system development and deployment. This Technical Report has been approved by members of the Forum. This document is not binding on the Broadband Forum, any of its members, or any developer or service provider. This document is subject to change, but only with approval of members of the Forum.

This document is provided "as is," with all faults. Any person holding a copyright in this document, or any portion thereof, disclaims to the fullest extent permitted by law any representation or warranty, express or implied, including, but not limited to,

(a) any warranty of merchantability, fitness for a particular purpose, non-infringement, or title;

(b) any warranty that the contents of the document are suitable for any purpose, even if that purpose is known to the copyright holder;

(c) any warranty that the implementation of the contents of the documentation will not infringe any third party patents, copyrights, trademarks or other rights.

This publication may incorporate intellectual property. The Broadband Forum encourages but does not require declaration of such intellectual property. For a list of declarations made by Broadband Forum member companies, please see www.broadband-forum.org.

Technical comments or questions about this document should be directed to:

Editor:	Jaime Fink	2Wire	jfink@2wire.com
	Jack Manbeck	Texas Instruments	jmanbeck@telogy.com
WG Chairs	Greg Bathrick	PMC Sierra	
	Heather Kirksey	Motive	

Table of Contents

Summary

This Technical Report specifies requirements for a North American region specific ADSL modem with embedded router functionality that can be deployed through retail stores and then configured for customer use by service providers. These requirements will lead to retail devices that can provide customers with consistent features, connectivity and operation.

These requirements are both backward and forward-looking. They attempt to address the needs of current DSL services and architectures as well as starting to address future needs. Some requirements have been included in support of TR-059. However, these requirements do not fully complement the capabilities specified in TR-059.

<div align="center">

Broadband Forum Technical Report TR-068 Issue 3

Base Requirements for an ADSL Modem with Routing

</div>

1   Purpose

The document presents base requirements for an ADSL and ADSL 2+ modem with embedded router functionality that can be deployed through North American retail stores and then configured for customer use by service providers. These requirements will lead to retail devices that can provide customers with consistent features, connectivity and operation.

2   Scope

These requirements specify a product profile based on Broadband Forum TR-124 Functional Requirements for Broadband Residential Gateway Devices, and also adds additional default configuration requirements and localized physical product and packaging requirements. It is expected that devices will include these in a superset of features (e.g., wireless, power line, 1394b, firewall, etc…) which may have additional requirements that are defined in Broadband Forum TR-124.

These requirements are both backward and forward-looking. They attempt to address the needs of current DSL service and architectures as well as starting to address future needs.

2.1   Definitions

Please refer to the definitions in Broadband Forum TR-124.

2.2   Conventions

In this document, several words are used to signify the relative importance of the specified requirements.

MUST   This word, or the adjective "REQUIRED", means that the definition is an absolute requirement of the specification.

MUST NOT   This phrase means that the definition is an absolute prohibition of the specification.

SHOULD   This word, or the adjective "RECOMMENDED", means that there may exist valid reasons in particular circumstances to ignore this item, but the full implications must be understood and carefully weighted before choosing a different course.

MAY   This word, or the adjective "OPTIONAL", means that this item is one which vendors may readily implement. Other modem features not identified in this document may also be implemented in the modem and are equivalent to the **MAY** value.

By Default   These words indicate that this is a default setting or operation of the unit which **MUST** be configurable if provided.

Other Residential Gateway type features not identified in this document may also be implemented in the device. An implementation that includes features not identified in this document MUST be prepared to inter-operate with implementations that do not include these features.

References to CPE or LAN devices indicate other equipment such as hosts including PC and workstations.

3   ADSL Modem with Routing Requirements (TR-124 Product Profile)

The following modules specified in the product profile table below based on the TR-124 requirements modules **MUST** be implemented in a device in order to comply with TR-068 Issue 3 Base Requirements for an ADSL Modem with Routing.

3.1   Conventions

The following conventions apply to the product profile table:

- Any modules marked with at check mark (✓) will be considered required, meaning that all MUST requirements in that section are to be satisfied (with exception of any specific line item edits that have been made as discussed in section 4).

- Any modules that are *not* marked with a check MAY be implemented on the product, but are not considered required. Any vendor implementing any module, regardless of being considered required or not, MUST comply with all MUST requirements in the module (i.e. partial implementations of a module MUST NOT be provided).

- If a module is explicitly not to be included in the product, it is marked with an x mark (✗) to indicate that it MUST NOT be included.

- For the optional LAN/WAN modules the specific interfaces and number of ports required are indicated. The following conventions apply:
  - A number by itself (e.g. 1) indicates the exact number of ports of the interface type specified required on the device.
  - If the word "Minimum" is used, the implementation MAY add additional ports (e.g. "Minimum 1" under IF.LAN.ETH would indicate that you MUST implement at least 1-port of Ethernet, but you MAY provide additional ports if desired).
  - If the word "Recommend" is used, this indicates that while the specific interface is not required, the device SHOULD implement this type of interface.

3.2   Product Profile

Section	Title	Required? (✓,✗, or blank)
GEN	**General Device Requirements**	
DESIGN	Design	✓
OPS	Device Operation	✓
NET	Networking Protocols	✓
WAN	**Wide Area Networking (WAN)**	
ATM	ATM	✓
ATM.MULTI	ATM Multi-PVC	✓
CONNECT	Connection Establishment	✓
ETHOAM	Ethernet OAM	
BRIDGE	Bridging	✓
DHCPC	DHCP Client	✓

Section	Title	Required? (✓,✗, or blank)
PPP	PPP Client	✓
dot1x	802.1x Client	
DoS	Denial of Service Prevention	✓
QoS	Quality of Service	✓
LAN	**Local Area Networking (LAN)**	
GEN	General LAN Protocols	✓
ADDRESS	Private Addressing	✓
DHCPS	DHCP Server	✓
DNS	Naming Services	✓
NAT	NAT/NATP	✓
PFWD	Port Forwarding	✓
ALG	ALG Functions	✓
FWD	Connection Forwarding	
IGMP.BRIDGED	IGMP and Multicast in Bridged Configurations	
IGMP.ROUTED	IGMP and Multicast in Routed Configurations	
FW	Firewall (Basic)	✓
FW.SPI	Firewall (Advanced)	
FILTER.TIME	Time of Day Filtering	
FILTER.CONTENT	Content Filtering	
DIAGNOSTICS	Automated User Diagnostics	
CAPTIVE	Captive Portal with Web Redirection	
MGMT	**Management & Diagnostics**	
GEN	General	✓
UPnP	UPnP	
UPnP.IGD	UPnP IGD	
LOCAL	Local Management	✓
REMOTE.TR-069	Remote Management (TR-069)	✓
REMOTE.WEB	Remote Management (Web Browser)	✓
NTP	Network Time Client	✓
IF.WAN	**WAN Interface Modules**	Enter Quantity
ADSL	ADSL and ADSL2+	1
VDSL2	VDSL2	
xDSL	xDSL General Requirements	✓
xDSL.INP	xDSL INP Values	
xDSL.BOND	xDSL Bonding	
xDSL.REPORT	xDSL Reporting of Physical Layer Issues	
xDSL.SEALING	DC Sealing Current	
xDSL.SURGE	AC Power Surge Protection	
ETH	Ethernet (WAN)	
GPON	GPON	
MoCA	MoCA (WAN)	
IF.LAN	**LAN Interface Modules**	Enter Quantity
ETH	Ethernet (LAN)	Minimum 1
ETH.SWITCH	Ethernet Switch	
USB.PC	USB (PC)	Recommend 1

4

Section	Title	Required? (✓,✗, or blank)
VOICE.ATA	Voice ATA Ports	
WIRELESS.AP	Wireless: General Access Point Functions	
WIRELESS.11g	Wireless: 802.11g Access Point	
WIRELESS.11a	Wireless: 802.11a Access Point	
WIRELESS.11h	Wireless: 802.11h Access Point	
HomePNA	HomePNA (Phoneline/Coax)	
MoCA	MoCA (LAN)	
HomePlugAV	HomePlug AV (LAN)	
REGIONAL	**Regional Annexes**	
NA.POWER	North American Power and Environmental	✓
NA.LED	North American LED Indicators	✓

4   Modification of Individual TR-124 Requirements

The following requirements are included in a TR-124 module which has been indicated as required in TR-068 Issue 3 (in the table above), however are to be replaced with the modified requirement language in the table below:

GEN.OPS.	24	In the event of a failure occurring during an update, the device **SHOULD** be able to back off to the prior version of the firmware installed on the DSL device. That is, the prior version of the device's firmware MUST continue to be useable in the event that a firmware update fails to complete. This is not a requirement for a dual image, but that is one manner in which this requirement might be achieved.
WAN.BRIDGE.	3	If bridge mode is enabled on the device by default for LAN connected devices, the device **SHOULD** be able to support additional connections for TR-069 remote management addressability (using direct DHCP or Static IP, PPP, etc.), and connections for any locally terminated service which require IP addressability (e.g. gateway integrated Voice ATA ports, etc.). Note that this special bridge mode that includes a device remote management session connection requires an additional WAN connection from the network. This requirement is considered conditional as a result due to the network side dependency, but the device must support this type of configuration.
LAN.ALG	4	The device **SHOULD** allow multiple users on the LAN to launch independent and simultaneous IPsec sessions. These sessions can be to the same or unique destinations.
LAN.FW.	2	The device SHOULD support a separate firewall log to maintain records of all transactions that violate firewall rules.
LAN.FW.	3	If LAN.FW.2 is implemented, the firewall log file SHOULD be able to hold at least the last 100 entries or 10 Kbytes of text.

5   Device Default Configuration Requirements

R - 1   **By default** the device **MUST** be configured to PPPoE or use an operator-specific configuration.

R - 2   **By default** the mode for connections **MUST** be "connect on demand" or use an operator-specific configuration.

R - 3   **By default** if UPnP IGD is supported, it **MUST** be disabled or use an operator-specific configuration.

R - 4   **By default** the device modem access code **MUST** be set to a random 10 digit decimal number (using digits 0 through 9) or use an operator-specific configuration.

6   Device General Requirements

R - 5   The device **MUST NOT** experience degradation in service when running the firewall.

7   Device Physical Requirements

The following requirements specify details regarding the physical device (buttons, colors, LED text labels, etc.), product labels, packaging and documentation:

R - 6   The device **MUST** have an on/off switch. This switch **MUST** be positioned on the device in such a manner as to prevent accidental switching.

R - 7   If the on/off switch is labeled, it **SHOULD** be labeled "ON/OFF".

R - 8   The device **MAY** be provided with a standby switch on the front, to stop or allow traffic to flow between WAN and LAN connections, without switching the device off and on.

R - 9   The reset button on the device **MAY** be labeled as "reset" so a help desk can more easily identify it to a user.

R - 10 Each port on the back of the device **MAY** have an icon displayed near it identifying the type of port.

R - 11 The ports on the device **MUST** be identified by color with the appropriate connection/interface color reflected above, below or around each port.

The ports **MUST** be colored as follows:

- Ethernet   Yellow

- Power   Black

- Phone   Grey

- USB   Blue

The preferred Pantone colors for blue and yellow are:

- Blue   285C

- Yellow   114C

- Gray   Cool Gray 3U (matte)

R - 12   Each port on the back of the device **MUST** be labeled using icons and/or words, and any words must be spelled out completely (e.g., "Ethernet", "Power", …).

R - 13   If a USB port is provided on the device, it **MUST** be covered with a sticker than warns the customer not to install the USB cable until instructed to do so in the documentation or installation software.

R - 14   If the device can be wall mounted, specifications for screws and a template **SHOULD** be included with the device.

8   PACKAGING

R - 15   Cables **MUST** be colored as identified in R - 11.

R - 16   The device **MUST** be packaged with a quick start or installation guide.

R - 17   The Quick Start Guide **SHOULD** be made available in alternate formats including large print.

R - 18   All necessary end user documentation **MUST** be included with the device.

R - 19   Additional detailed product documentation **SHOULD** be included with the device.

R - 20   The documentation **SHOULD** include manuals containing detailed installation procedures, corrective actions for troubleshooting, and subsequent release notes for all software versions, network driver versions, modem firmware versions, fixes and changes.

R - 21   A phone cable with two pairs and RJ-11 endpoints **MUST** be packaged with the product to connect the device to the ADSL wall jack on the WAN interface. The cable **MUST** be a minimum length of 6 feet. The endpoints **MUST** meet the specifications for a miniature 6-position plug in TIA-968-A.

R - 22   The phone cable **SHOULD** be CAT3 or CAT5 and be a length of 14 feet.

R - 23   A CAT5 (or better) straight through (patch) Ethernet cable with RJ-45 endpoints **MUST** be packaged with the product to connect the device to the first computer. The cable **MUST** be a minimum length of 6 feet. The endpoints **MUST** meet the specifications for a miniature 8-position unkeyed plug in TIA-968-A.

R - 24   If the device has a USB port, the packaging **MUST** clearly state for which operating systems this is supported.

R - 25   If the device has a client USB port, a USB Implementers Forum certified USB 2.0 high-speed cable MUST be packaged with the device. The cable MUST be a minimum length of 6 feet.