



Home Gateway Initiative

HGI guideline paper

Parental control in the home

Version 1.0

18/05/2008

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29

PAGE LEFT INTENTIONALLY BLANK

1 Table of Contents

2	Table of Contents.....	3
3	1 Important notice, IPR statement, disclaimer and copyright	4
4	2 Acronyms.....	5
5	3 Definitions	6
6	4 Introduction and scope of the Home Gateway Initiative (HGI).....	7
7	4.1 Cooperation with other bodies and initiatives.....	7
8	5 Scope and purpose of this document.....	8
9	6 General description of the capability.....	9
10	7 Architectural setup	10
11	8 Service Flow(s).....	12
12	9 Management flows.....	13
13	10 References.....	14

1 Important notice, IPR statement, disclaimer and 2 copyright

3 The Home Gateway Initiative (HGI) is a non-profit making organization created to define
4 guidelines and specifications for broadband Home Gateways.

5 This document is the output of the Working Groups of the HGI and its members as of the
6 date of release. Readers of this document must be aware that it can be revised, edited or have its
7 status changed according to the HGI working procedures.

8 The HGI makes no representation or warranty on the contents, completeness and accuracy
9 of this publication.

10 This document, though formally approved by the HGI member companies, is not binding in
11 any part on the HGI members.

12 IPRs essential or potentially essential to the present document may have been declared in
13 conformance to the HGI IPR Policy and Statutes available at the HGI website
14 www.homegateway.org.

15 Any parts of this document may be freely reproduced (for example in RFPs and ITTs) by
16 HGI and non-HGI members subject only to the following:

- 17 • HGI Requirement numbers not being changed
- 18 • an acknowledgement to the HGI being given in the resulting document.

19 Trademarks and copyrights mentioned in this document are the property of their respective
20 owners.

21
22 The HGI membership list as of the date of the formal review of this document is: 2 Wire, Inc.,
23 Alcatel-Lucent, Atheros, AVM ,Belgacom, BeWAN, Broadcom, BT, Deutsche Telekom, DS2, DSP
24 Group, Echelon EMEA, ,Ericsson AB, Fastweb SpA, France Telecom, Freescale Semiconductor,
25 Gige Semiconductor, Huawei, InAccess Networks, Infineon Technologies AG, Intel, Intellon, ITRI,
26 JDSU, Jungo Software Technologies, KDDI, KPN, LG-Nortel Co Ltd, Linksys/Cisco, Marvell
27 Semiconductors, Microsoft, Motorola, Netgear, NTT, Philips, Pirelli Broadband Solutions, Portugal
28 Telecom, Sagem, Siemens, Sphairon Access Systems, Spidcom, Supportsoft, Swisscom AG,
29 Telecom Italia, Telefonica, Telekom Slovenije, Telekomunikacja Polska, Telenor, TeliaSonera,
30 Telkom ZA, Telstra, Texas Instruments, Thomson, Tilgin AB, TNO ICT, U4EA Technologies
31 Limited, Ubicom Inc., Vtech, ZTE, Zarlink, ZyXEL .

32

33

1 **2** **Acronyms**

2	ACS	Auto-Configuration Server
3	ADSL	Asymmetric Digital Subscriber Line
4	ASP	Application Service Provider
5	HG	Home Gateway
6	HGI	Home Gateway Initiative
7	HN	Home Network
8	MIB	Management Information Base
9	NTP	Network Time Protocol
10	PC	Personal Computer
11	PCF	Parental Control Function
12	PCP	Parental Control Profile
13	PCPR	Parental Control Proxy
14	URL	Uniform Resource Locator
15		
16		

1 3 Definitions

- 2 • **Application Type:** User applications that require communication through the home
3 gateway, that are related to the protocols as defined in R253 or R254 of the HGI
4 Residential Profile V1.0.1 [1], or are equal to the applications listed in R255. E.g.
5 email is a user application related to the protocols SMTP and POP
- 6 • **Device id:** A device-id is a unique id that identifies a device in LAN (e.g. PC name,
7 MAC address, IP address). See for more details or examples of device ids: HGI
8 Residential Profile V1.0.1 R173 [1]
- 9 • **Home Gateway:** device connecting the HN to the Internet and Service Platforms
- 10 • **Parental Control Function:** entity in the home gateway providing the functions for
11 parental control
- 12 • **Parental Control Profile:** set of parameters describing the parental controls settings
13 that will be used by the Parental Control Function, and defining its behaviour
- 14 • **Home administrator:** Particular member of the home residents, responsible and
15 authorized to change parental control profiles
- 16 • **TR-069:** Home gateway management protocol as defined by DSL Forum, latest
17 version [2]
- 18 • **TR-098:** Home gateway management information base as defined by DSL Forum,
19 latest version [3]
- 20

4 Introduction and scope of the Home Gateway Initiative (HGI)

Home connectivity has evolved dramatically over recent times. From the initial simple voice service, home services evolved in the 80s to include things such as fax and video text, with the 90s seeing the advent of mass-market Internet access via dial-up modems. At the start of the 21st century, the world has entered the broadband era. Network operators have deployed technology that offers much larger bandwidths, such as DSL, cable or fibre-based access systems.

The Internet has been a major driver for the evolution to broadband, creating a new experience for the customer and offering him new services such as email and Internet browsing, and “online” versions of existing services such as digital photo labs, ticket booking etc.

The next generation of broadband services (triple or even “multiple-play”) has created a set of new requirements for the Home Gateway, namely:

- the need to manage the Home Gateway, and to a lesser extent, the home network and the devices beyond the Home Gateway
- allowing the right device or application to connect to the right service platform with the right service class / Quality of Service
- unifying device capabilities in order to offer customers a better “integrated home environment”.

Due to the lack of suitable off-the-shelf and standardized products to support this new, end-to-end network and service model, several major Telecom Operators have recently worked separately with a very small number of Home Gateway vendors to specify and develop suitable Gateways. However, such custom development is not cost-effective for either operators or vendors.

It became apparent that many operators had similar service aspirations, and so were asking for similar equipment. Therefore in December 2004, nine Telecom Operators founded the Home Gateway Initiative to agree on a common Gateway specification. The intention was to involve the relevant vendor community (i.e. vendors of gateways, chipsets, software, devices and transmission systems) so that the specifications would also be pragmatic and could be realized in a cost-effective manner.

The aim of HGI is therefore to specify a small range of low cost, high capability Gateways which will provide multi-service communication support for the residential and SOHO environments. While an end-to-end network view has been taken, the specifications mainly focus on the Home Gateway device which sits between the access network and service platforms on one side, and the in-home networked devices and applications on the other.

4.1 Cooperation with other bodies and initiatives

The Home Gateway Initiative does not wish to become a new, long-term de facto standardization body. Its task is to agree a set of functional requirements for a Home Gateway, wherever possible re-using or referring out to existing specifications. An important aspect of the work is to identify gaps and inconsistencies in or between existing specifications. The HGI publishes its own specifications, but works alongside other SDOs to ensure that issues are addressed in the most appropriate body, that there is no unnecessary duplication of effort, and that the HGI specifications are downstreamed in the most appropriate way.

43

1 **5 Scope and purpose of this document**

2 This guideline paper provides a description of the parental control concept supported by
3 requirements (R331-341) the HGI Residential Profile V1.0.1 [1] specification document. The
4 requirements for parental control imply an architecture and functions as described in this document.
5 As such this document is meant to better understand the requirements by describing the context.

6 This description is conceptual and functional, and as such is not meant as an
7 implementation specification description.

8

9

6 General description of the capability

The HG contains a **Parental Control Function (PCF)**, enforcing the parental control access restrictions and a **Parental Control Profile (PCP)**, describing the restrictions.

The PCF is managed by the ACS, including enabling/disabling of the PCF, although activation/deactivation is set by the home administrator via the LM Remote UI.

The actions of the PCF (basically filtering entering service requests) are dependent upon settings in the PCP. The PCP is the set of restrictions in the HG limiting access to (a) user(s) in the home network performing a service request to the Internet. The PCP is based on device-id, time of day on a weekly basis, and on application type, and arbitrary combinations thereof. This PCP in the home gateway is the PCP1. The PCP is only managed by the home administrator.

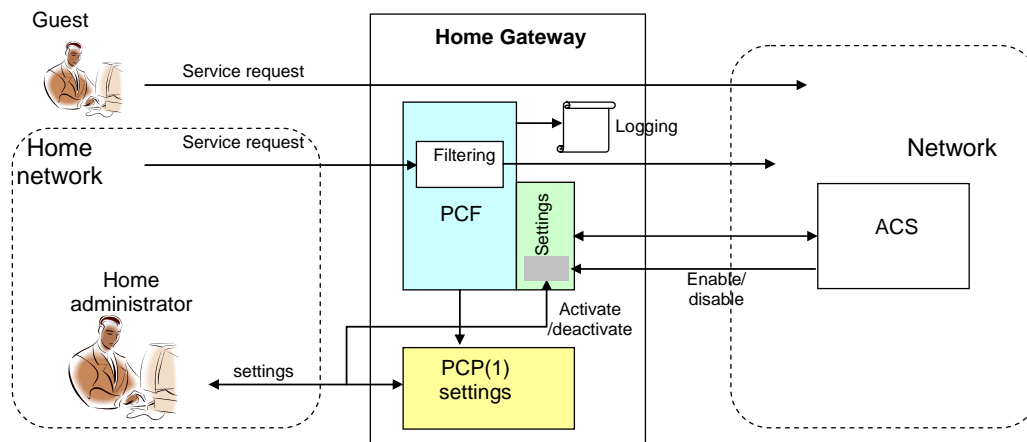


Figure 1 Parental control general scenario

All parental control PCP restrictions different from the ones mentioned above, like category restriction, user based restrictions, blacklist and white list are subject of a “service subscription to a parental control service”, which is totally independent of the functions described in the previous paragraph. This includes another authentication for administration, and possible authentication of home users. The only relation to this service subscription is a setting in the home gateway management data base of a URL to the Parental Control Proxy related to this subscription in order to be able to forward service requests in case this additional independent service is active. This set of PCP settings as offered by the Parental control ASP (Application Service Provider) is the PCP2. PCP1 and PCP2 are totally independent.

The PCF does not apply to guest access devices.

The default and initial settings imply full access (no parental control restrictions).

7 Architectural setup

The following figure shows the full architectural setup for the parental control function, including both the Home gateway Parental control and the 'ASP offered parental control' based on a Parental control Proxy (PCPR).

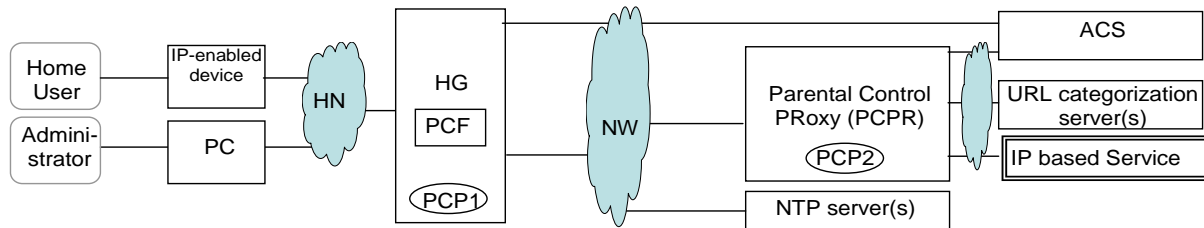


Figure 2 Parental control architecture

Involved parties/servers:

Service related parties:

- The parental controlled home users ('user'): connected in the home via an IP-enabled device to the HG.

Managing related parties:

- The ACS configuring both the home gateway and the PCPR for parental control operation
- The home parental control administrator (administrator): connected in the home via a PC to the HG, setting the PCP (PCP1+ possibly PCP2) for the home users after authentication. He may also activate/deactivate the PCP.

Control enablers in the Internet:

- The Parental Control PROxy (PCPR), an Internet server offering some services with regard to PCP2, including user authentication; and allowing the home administrator to change PCP2 settings, after authentication
- NTP server (to provide exact timing): server connected to the Internet
- URL/URI categorization servers (to categorize URLs): server(s) connected to the Internet.

The Parental Control Profile

The Parental Control Profile contains the restrictions with regard to particular devices, time of day on a weekly basis, and on application type, or combinations thereof. These restrictions are set by the home administrator, and cannot be accessed by the ACS. The activation/deactivation setting of the PCP by the home administrator can be read by the ACS.

If the home administrator did not enter any restriction, or deleted all restrictions, the PCP is 'empty'. This is also the default and initial status.

The Parental Control Function

1 The Home Gateway contains a functional entity for parental control, called PCF (Parental
2 Control Function).

3 The Parental Control Function:

- 4 • Can be enabled/disabled via the ACS
- 5 • Contains the URL-address of the PCPR if there is an Internet based Parental
6 Control
- 7 • Intercepts service requests and acts when PCP1 conditions are met; if not, the
8 service request is forwarded to the PCPR for further handling (if a PCPR-URL is
9 entered via management, so if a PCP2 is applicable)

10 When a user performs a service request, and its PCP is not empty nor deactivated, the
11 service request is checked against the PCP. The outcome of this is ALLOWED or BLOCKED. In
12 the home gateway a check is performed against PCP1, if there is a PCPR-URL available, the
13 service request is forwarded to the PCPR for checking against PCP2.

14 If the outcome is BLOCKED, the user is offered an output in web form (only for web browser
15 based applications). He may be offered a login window (requesting credentials of administrator).

16 A service request will only be completed, when it is not blocked by either the HG for a PCP1
17 conditions or the PCPR for a PCP2 condition.

18 When a user performs a service request, and its PCP is empty or deactivated, the request is
19 ALLOWED and passed to the Internet.

20

1 8 Service Flow(s)

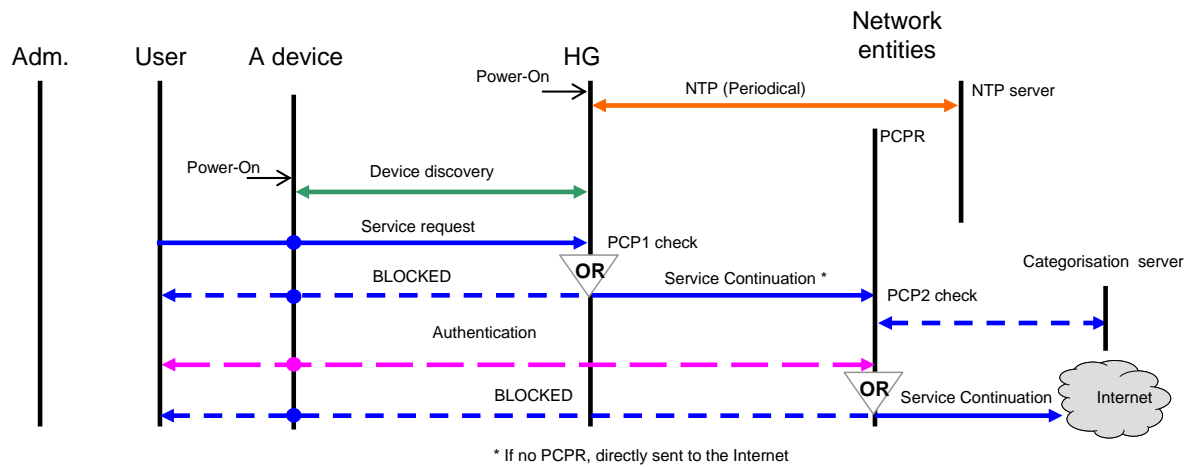


Figure 3 Parental control service flows

The flows for the service are as follows (management related actions are show in brackets)

- The HG is powered on and boots up
- *(the ACS is configuring the HG)*
- An NTP request is sent out at regular times in order to get timing synchronized
- Device discovery is operational
- *(The home administrator enters/modifies PCP settings)*
- A parental controlled user powers on a device
- This device is discovered by the HG
- The user starts a web service request to URLx, which is intercepted by the HG
- The HG checks hitting of PCP1 rules; if PCP1 rules are hit, the blocked procedure is executed, else the service_request_URLx is passed to the PCPR
- The PCPR initiates authentication procedures if there are limitations in the HG based on users
- The PCPR checks hitting of PCP2 rules; if PCP2 rules are hit, the blocked procedure is executed; else the service_request_URLx is passed to the URL-addressed entity.

Authentication procedure: a method of authentication of users and authorisation used by the PCPR; it is up to the PCPR how the authentication is done and how authorisation is ended. This is outside the scope of the HG.

'Blocked' procedure: Procedure followed when a PCP rule is hit. There are following options for web browser based applications:

- Send a web page indicating that the user is blocked
- Send a web page indicating that the user is blocked, with the option of performing another authentication.

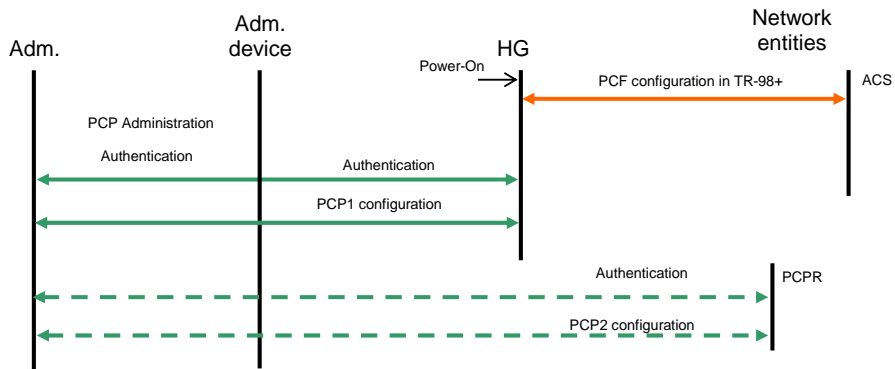
Note that the HG and PCPR 'blocked' procedures are independent.

1 **9 Management flows**

2 The ACS is configuring the Parental Control Function (PCF) in the HG, using TR-069
 3 procedures and TR-098+ MIB.

4 The home parental control administrator authenticates via a user interface to the HW. Then
 5 he enters the PCP1 configuration settings.

6 The parameters with regard to the parental control profile 2 (PCP2) are subject to the
 7 offering by the parental control ASP, and are transparent to the HG, so totally out of scope of the
 8 HG.



9

Figure 4 Parental control management flows

10
11

1 10 References

- 2 [1] Home Gateway Technical Requirements: Residential Profile, Version 1.0.1;
3 http://www.homegateway.org/publis/HGI_V1.01_Residential.pdf
4 [2] TR-069 Amendment 2, CPE WAN Management protocol, December 2007
5 [3] TR-098 Amendment 1, Internet Gateway Device Data Model for TR-069, December 2006
6
7