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Dostop, priključki, prenos in multipleksiranje (ATTM) - Daljinsko upravljanje opreme pri naročniku (CPE) prek širokopasovnih omrežij - Protokol za upravljanje prostranega omrežja opreme pri naročniku (CWMP)

Access, Terminals, Transmission and Multiplexing (ATTM) - Remote management of CPE over broadband networks - CPE WAN Management Protocol (CWMP)

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Foreword

This ETSI Standard (ES) has been produced by ETSI Technical Committee Access, Terminals, Transmission and Multiplexing (ATTM).

Introduction

The basis of the present document is the Broadband Forum CPE WAN management protocol (CWMP), commonly referred to as TR-069 [1].

The protocol is intended for communication between a CPE and an Auto-Configuration Server (ACS). The CPE WAN management protocol defines a mechanism that encompasses secure auto-configuration of a CPE, and also incorporates other CPE management functions into a common framework.

TR-069 [1] specifies the generic requirements of the management protocol, and methods that can be applied to any TR-069 [1] CPE. Other Broadband Forum Technical Reports (TRs) specify the managed objects, or data models, for specific types of devices or services.

The protocol can be used to manage various types of CPE, including stand-alone routers and LAN-side client devices. It is agnostic to the specific access medium utilized by the service provider, although it does depend on IP-layer connectivity having first been established by the device.

1 Scope

The present document defines a European Standard (ES) for remote management of CPE WAN interfaces over broadband networks. It provides an overview of a set of normative references to the suite of individual specifications comprising the Broadband Forum (BBF) CPE WAN Management Protocol (CWMP) and Data models.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

NOTE 1: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

NOTE 2: Broadband Forum Technical Reports are available at <http://www.broadband-forum.org/technical/trlist.php>.

2.1 Normative references

The following referenced documents are necessary for the application of the present document.

- [1] Broadband Forum TR-069: "CPE WAN Management Protocol (CWMP) v1.1".
- [2] Broadband Forum TR-104: "DSL Home™ Provisioning Parameters for VoIP CPE".
- [3] Broadband Forum TR-106: "Data Model Template for TR-069-Enabled Devices".
- [4] Broadband Forum TR-135: "Data Model for a TR-069 Enabled STB".
- [5] Broadband Forum TR-140: "TR-069 Data Model for Storage Service Enabled Devices".
- [6] Broadband Forum TR-143: "Enabling Network Throughput Performance Tests and Statistical Monitoring".
- [7] Broadband Forum TR-157: "Component Objects for CWMP".
- [8] Broadband Forum TR-181: "Device Data Model for TR-069".
- [9] Broadband Forum TR-196: "Femto Access Point Service Data Model".

2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] ITU-T Recommendation Y.101 (2000): "Global Information Infrastructure terminology: Terms and definitions".
- [i.2] Broadband Forum Technical Report Approval Process.

NOTE: Available at <http://www.broadband-forum.org/about/download/trapprovalprocess.pdf>.

- [i.3] Broadband Forum TR-181 (Issue 1 - February 2010): "Device Data Model TR-069" (superseded by BBF TR-181 Issue 2).

- [i.4] Broadband Forum TR-098 (Amendment 2 - September 2008): "Internet Gateway Device Data Model for TR-069" (superseded by BBF TR-181 Issue 2).

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ITU-T Recommendation Y.101 [i.1], Broadband Forum Technical Report Approval process [i.2] and the following apply:

Customer Premises Equipment (CPE): end use system including private network elements connecting the customer applications to the access line

remote management: management of CPE over a WAN by a service provider

Technical Report (TR): approved technical specification of the Broadband Forum [i.2]

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

3G	Third Generation Mobile
ACS	Auto-Configuration Server
CPE	Customer Premises Equipment
CWMP	CPE WAN Management Protocol
FAP	Femto Access Point
FDD	Frequency Division Duplex
HNB	3G Home NodeB (aka femtocell)
IPTV	Internet Protocol TeleVision
LAN	Local Area Network
MGCP	Media Gateway Control Protocol
NAS	Network Attached Storage
PVR	Personal Video Recorder
QoE	Quality of Experience
QoS	Quality of Service
RG	Residential Gateway
SIP	Session Initiation Protocol
STB	Set-Top Box
TR	Technical Report
UMTS	Universal Mobile Telecommunications System
VoIP	Voice over Internet Protocol
WAN	Wide Area Network
WEP	Wireless Encryption Protocol

4 Conventions

There are no particular notations, styles, presentations, etc., used within the present document.

5 Recommendations

The present document defines the requirements for the remote management of networked devices by a service provider in a consumer's home. It provides an overview of and the necessary normative references to a family of technical specifications (see figure 1). It describes how the various technical specifications in this family are related.

The protocol is intended to provide flexibility in the connectivity model:

- The protocol allows both CPE and ACS initiated connection establishment, avoiding the need for a persistent connection to be maintained between each CPE and an ACS.
- The functional interactions between the ACS and CPE should be independent of which end initiated the establishment of the connection. In particular, even where ACS initiated connectivity is not supported, all ACS initiated transactions should be able to take place over a connection initiated by the CPE.
- The protocol allows one or more ACSs to serve a population of CPE. Each CPE can only be associated with one ACS, while each ACS may be associated with one or more service providers. However, a single physical device may present more than one logical CPE device, each of which may be associated with a different ACS.
- The protocol provides mechanisms for a CPE to discover the appropriate ACS for a given service provider.
- The protocol provides mechanisms to allow an ACS to securely identify a CPE and associate it with a user/customer.

Processes to support such association support models that incorporate user interaction as well as those that are fully automatic.

The protocol allows an ACS to control and monitor various parameters associated with a CPE. The mechanisms provided to access these parameters are designed with the following premises:

- Different CPE may have differing capability levels, implementing different subsets of optional functionality. Additionally, an ACS may manage a range of different device types delivering a range of different services. As a result, an ACS must be able to discover the capabilities of a particular CPE.
- An ACS must be able to control and monitor the current configuration of a CPE.
- Other entities besides an ACS may be able to control some parameters of a CPE's configuration (e.g. via LAN-side auto-configuration). As a result, the protocol must allow an ACS to account for external changes to a CPE's configuration. The ACS should also be able to control which configuration parameters can be controlled via means other than by the ACS.
- The protocol should allow vendor-specific parameters to be defined and accessed.

The protocol is intended to minimize implementation complexity, while providing flexibility in trading off complexity vs. functionality. The protocol incorporates a number of optional components that come into play only if specific functionality is required. The protocol incorporates existing standards where appropriate, allowing leverage of off-the-shelf implementations.

The protocol is agnostic to the underlying access network.

The protocol is also extensible. It includes mechanisms to support future extensions to the standard, as well as explicit mechanisms for vendor-specific extensions.