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1 Scope

The present document defines a core set of features that enable multiple subscriber devices to gain access to operator provided high-speed data service using DOCSIS. This core set of features allows for both IPv4- and IPv6-enabled devices to gain connectivity to the Internet.

The eRouter is specified as an Embedded Service/Application Functional Entity (eSAFE) device that is implemented in conjunction with a DOCSIS cable modem device.

The core set of features defined in the present document includes the ability to provision multiple CPE devices, a description of how to forward data to and from CPE devices, and also the ability to forward IP Multicast traffic to CPE devices and among CPE devices.

2 References

2.1 Normative references

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3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

Customer Edge Router (CER): provides specific services and forwarding capabilities necessary for establishing and maintaining the customer edge on the Operator-Facing Interface (WAN)

NOTE: In this role, Router application services such as DHCP, NAPT and Packet Filtering Firewall are enabled.

Customer-Facing Interface: eRouter interface used for connecting CPE devices

NOTE: As defined in [57], this is a Local Area Network (LAN) interface and is represented by a physical port.

Customer-Facing IP Interface: IP interface connected to the eRouter that is not necessarily mapped one-to-one with the number of customer-facing ports on the eRouter

NOTE: As defined in [57], this is an IP LAN interface in which one or many physical ports are associated with an IP address.

Customer-Facing Logical Interface: logical interface connected to the eRouter that is not necessarily mapped one-to-one with the number of customer-facing ports on the eRouter

NOTE: As defined in [57], this is a LAN interface in which one or more physical ports are associated with a logical interface, such as a VLAN.

DNS Proxy Forwarding: mechanism in which the DNS queries of the LAN clients are proxied by the eRouter before being transmitted to the service provider's DNS servers that the eRouter learned during DHCP

Down Interface: interface on a router that is further away from the ISP network than the 'Up' interface on that same router

eRouter: eSAFE device that is implemented in conjunction with the DOCSIS embedded cable modem

Hard Reset: full reset of the eDOCSIS device and its constituent eSAFE application elements (such as the eRouter) and embedded CM

Internet Gateway Device: remotely managed gateway device as defined in CPE WAN Management Protocol [62]

Link ID: 16 bits of both IPv4 and IPv6 addresses chosen to uniquely identify each "link" or LAN segment (Customer-Facing IP Interface) within the home network. Counting from the left, the Link ID includes bits 49 - 64 (fourth 16-bit block) in an IPv6 address and bits 9 - 24 (middle two octets) in an IPv4 address

Multicast Subscription Database: simple table of entries for the IPv4 or IPv6 Multicast Group Membership information maintained by the eRouter on respective interfaces

NOTE: Implementation details for storage of records are completely vendor-defined.

Operator-Facing Interface: eRouter interface that is connected to the embedded cable modem

NOTE: As defined in [57], this is a Wide Area Network (WAN) interface. In CPE WAN Management Protocol (CWMP) this is called an upstream interface.

Operator-Facing IP Interface: IP interface that is connected to the embedded cable modem and is provisioned with an IP address provided by the operator

NOTE: As defined in [57], this is a WAN interface.

Prefix: common address component, which defines a portion of a network

NOTE: The meanings of the terms Prefix and Subnet are interchangeable. The term Prefix is favored in the present document. See also Prefix Delegation.

Prefix Delegation: form of IPv6 address assignment allowing the operator's DHCP server to delegate a prefix of a specific length, such as /56, to a customer's router

NOTE: The delegation of one or more prefixes allows the router to further sub-divide and assign individual prefixes (which are /64 in length) to its interfaces and/or provide prefix sub-delegation to additional routers within the customer's network. Prefix Delegation occurs only between the operator's DHCP server and a router operating in the role of Customer Edge Router (CER). See also Customer Edge Router.

Reset: routine in which the operational state is interrupted by the instruction to shut down and restart

NOTE: The term is synonymous with the terms re-initialization and reboot. The term can describe either a full device reset (a Hard Reset) or the re-initialization of an individual eSAFE's software application (a Soft Reset) and any associated routines necessary to notify connected clients or other nodes of the device becoming temporarily unavailable.

Service Discovery: set of protocols and methods that are used to discover services that are made available by hosts and nodes within the customer network

Soft Reset: reset operation in which the software layer of the eRouter eSAFE application is re-initialized without impacting other eSAFEs or the embedded CM within an eDOCSIS device

Subnet: portion of a network that shares a common address component

NOTE: The meanings of the terms Prefix and Subnet are interchangeable. The term Prefix is favored in the present document.

TR-069: term used to refer to the CPE WAN Management Protocol suite defined in [62]

TR-069 CPE: term used to refer to the CPE managed using the CPE WAN Management Protocol suite defined in [62]

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