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Resource control protocols

Resource Control Protocol n° 5 (rcp5) Protocol at the interface between transport resource control physical entity and policy decision physical entity (Rt interface): Diameter-based

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Recommendation ITU-T Q.3325

Resource Control Protocol n° 5 (rcp5) Protocol at the interface between transport resource control physical entity and policy decision physical entity (Rt interface): Diameter-based

Summary

This Recommendation specifies a protocol to be used between the physical implementation of the transport resource control functional entity (TRC-FE) and the policy decision physical entity (PD-PE) of a transport network, defined as the Rt reference point in [ITU-T Y.2111]. It is used to control network transport resources required to convey the media flow in an access or a core network.

Note: Recommendation Q.3325 supersedes Recommendation Q.3305.1.

Keywords

Resource control, RACF, Rt interface.

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1 Scope

This Recommendation provides the stage 3 specification of the Rt interface (rcp5). Rt protocol is used between policy decision physical entity (PD-PE) and transport resource control physical entity (TRC-PE) in the resource and admission control functional block. The Rt interface provides the ability for PD-PE to request the TRC-PE entities in the involved networks to detect and determine the requested QoS resource for a given media flow. PD-PE may also request TRC-PE to provide the path selection information for a given flow in the core network. The functional requirements corresponding to this interface are contained in clause 8.5 of [ITU-T Y.2111] and in [ITU-T Q-sup.51].

2 References

The following ITU-T Recommendations and other references contain provisions, which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- | | |
|-------------------|---|
| [ITU-T Y.2111] | Recommendation ITU-T Y.2111 (2008), <i>Functional requirements and architecture for resource and admission control in Next Generation Networks</i> . |
| [ITU-T Q.3320] | Recommendation ITU-T Q.3320 (2010), <i>Architectural framework for the Q.332x series of Recommendations</i> . |
| [ITU-T Q-sup.51] | ITU-T Q-series Recommendations - Supplement 51 (2004), <i>Signalling Requirements for IP QoS</i> . |
| [ETSI TS 129 209] | ETSI TS 129 209 V6.7.0 (2007-06), <i>Universal Mobile Telecommunications System (UMTS); Policy control over Gq interface</i> (3GPP TS 29.209 version 6.7.0 Release 6). |
| [ETSI TS 183 017] | ETSI TS 183 017 V2.3.1 (2008-09), <i>Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Resource and Admission Control: DIAMETER protocol for session based policy set-up information exchange between the Application Function (AF) and the Service Policy Decision Function (SPDF); Protocol specification; Release 2</i> . |
| [ETSI ES 283 026] | ETSI ES 283 026 V2.4.1 (2008-11), <i>Telecommunications and Internet converged Services and Protocols for Advanced Networks (TISPAN); Protocol for QoS reservation information exchange between the Service Policy Decision Function (SPDF) and the Access-Resource and</i> |

Admission Control Function (A-RACF) in the Resource and Protocol specification.

- [ETSI ES 283 034] ETSI ES 283 034 V2.2.0 (2008-07), *Telecommunications and Internet converged Services and Protocols for Advanced Networks (TISPAN); Network Attachment Sub-System (NASS); e4 interface based on the DIAMETER protocol.*
- [IETF RFC 3588] IETF RFC 3588 (2003), *Diameter Base Protocol.*
- [IETF RFC 4005] IETF RFC 4005 (2005), *Diameter Network Access Server Application.*
- [IETF RFC 4301] IETF RFC 4301 (2005), *Security Architecture for the Internet Protocol*

3 Definitions

3.1 Terms defined elsewhere:

This Recommendation uses the following terms defined elsewhere:

3.1.1 attribute-value pair (AVP) [IETF RFC 3588]: The Diameter protocol consists of a header followed by one or more Attribute-Value-Pairs (AVPs). An AVP includes a header and is used to encapsulate protocol specific data (e.g., routing information) as well as authentication, authorization or accounting information.

3.1.2 flow identifier [b-ETSI TS 129 207]: used for the identification of the IP flows, described within a media component associated with an AF session.

Note: A Flow identifier consists of two parts: 1) the ordinal number of the position of the media component description in the session description information and 2) the ordinal number of the IP flow(s) within the media component description assigned in the order of increasing port numbers.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 SCE session: a session established by a service or session control signalling protocol offered by the SCE that requires a session set-up with explicit session description before the use of the service.

NOTE – One example of an SCE session is an IMS session.

3.2.1 SCE session signalling protocol: the signalling protocol used to control the SCE session.

NOTE – One example of an SCE session signalling protocol is SIP with SDP.

3.2.2 hard-state reservation: a type of reservation whereby the requested resources are reserved without time limit. Hard-state reservations are terminated when the DIAMETER session is terminated.

3.2.3 soft-state reservation: a type of reservation whereby the requested resources are reserved for a finite amount of time. Soft-state reservations are terminated when the DIAMETER session is terminated.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

AAA AA-Answer
AAR AA-Request

AF	Application Function
A-RACF	Access Resource and Admission Control Function
ASA	Abort-Session-Answer
ASR	Abort-Session-Request
ATM	Asynchronous Transfer Mode
AVP	Attribute-Value Pair
CEA	Capabilities-Exchange-Answer
CER	Capabilities-Exchange-Request
CGPE-FE	CPN Gateway Policy Enforcement Functional Entity
CGPE-PE	CPN Gateway Policy Enforcement Physical Entity
CPN	Customer Premises Network
IANA	Internet Assigned Numbers Authority
IMS	IP Multimedia Subsystem
IP-CAN	IP-Connectivity Access Network
IPSec	Internet Protocol Security
NASREQ	Network Access Server Application
NGN	Next Generation Networks
PD-FE	Policy Decision Functional Entity
PD-PE	Policy Decision Physical Entity
PE-FE	Policy Enforcement Functional Entity
PE-PE	Policy Enforcement Physical Entity
QoS	Quality of Service
RAA	Re-Auth-Answer
RACF	Resource and Admission Control Function
RAC-PE	Resource and Admission Control Physical Entity
RAR	Re-Auth-Request
RTCP	RTP Control Protocol
RTP	Real Time Transport
SCE	Service Control Entity
SCTP	Stream Control Transport Protocol
SDI	Session Description Information
SDP	Session Description Protocol
SDPF	Service-based Policy Decision Function
SIP	Session Initiation Protocol
STA	Session-Termination-Answer
STR	Session-Termination-Request
TRC-FE	Transport Resource Control Functional Entity
TRC-PE	Transport Resource Control Physical Entity
TRE-FE	Transport Resource Enforcement Functional Entity

TRE-PE	Transport Resource Enforcement Physical Entity
UE	User Equipment
VC	Virtual Channel

5 Conventions

None

6 Rt interface

6.1 Overview

The Rt interface is used between PD-PE and TRC-PE in the resource and admission control physical entity (RAC-PE) to control network transport resources required to convey the media flow. It is utilised by PD-PE to request the TRC-PE entities in the involved networks to detect and determine the requested QoS resource for a given media flow and to provide the path selection information for a given flow in the core network. The Rt interface and functional requirements corresponding to this interface are defined in clause 8.5 of [ITU-T Y.2111] and in [ITU-T Q-sup.51].

The Rt interface localization is shown on Figure 6-1, which provides generic resource and admission control functional architecture in NGN. It is based on Figure 5/Y.2111 [ITU-T Y.2111] with the following modifications:

- “Service Control Functions” replaced by “Service Control Entity”
- “Network Attachment Control Functions” replaced by “Network Attachment Control Entity”
- CGPE-FE replaced by CGPE-PE
- PD-FE replaced by PD-PE
- TRC-FE replaced by TRC-PE
- TRE-FE replaced by TRE-PE
- PE-FE replaced by PE-PE
- RACF replaced by RAC-PE