SLOVENSKI STANDARD
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Zlite telekomunikacijske in internetne storitve ter protokoli za napredno omreženje (TISPAN) - Krmiljenje vira in pristopa - Protokol za izmenjavo informacij o rezervaciji QoS med funkcijo odločanja o storitveni politiki (SPDF) ter funkcijo krmiljenja dostopovnega vira in pristopa (A-RACF) pri specifikaciji vira in protokola

Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN) - Resource and Admission Control - Protocol for QoS reservation information exchange between the Service Policy Decision Function (SPDF) and the Access-Resource and Admission Control Function (A-RACF) in the Resource and Protocol specification

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Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Resource and Admission Control; Protocol for QoS reservation information exchange between the Service Policy Decision Function (SPDF) and the Access-Resource and Admission Control Function (A-RACF) in the Resource and Protocol specification

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Foreword

This ETSI Standard (ES) has been produced by ETSI Technical Committee Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN).

1 Scope

The present document provides the stage 3 specification of the Rq interface. The functional requirements and the stage 2 specifications of the Rq interface are contained in ES 282 001 [1] and ES 282 003 [2]. The Rq interface is the interface between the Service Policy Decision Function (SPDF) and the Access - Resource and Admission Control Function (A-RACF) and is used for QoS resource reservation information exchange between the SPDF and the A-RACF. Via the Rq interface the SPDF issues requests for resources in the access network, indicating IP QoS characteristics. The A-RACF uses the IP QoS information to perform admission control and indicate to the SPDF via the Rq interface its admission control decisions. Due to the possible business roles in an access environment, the SPDF may be either in the same domain or in a different domain as the A-RACF.

The present document defines:

- The information to be exchanged between SPDF and A-RACF over the Rq interface.
- An Rq interface definition based on the Diameter protocol.

In situations where no generic overload control mechanism is used on the Rq interface, the interface shall only be capable of supporting a one-to-one relationship between the A-RACF and SPDF (i.e. one SPDF may only contact one A-RACF, and that A-RACF may only contact that same SPDF). Overload control need not be supported in this situation due to the fact that it should be possible to traffic engineer the capabilities of the two entities, so that the capacity of one entity matches the capacity of the other.

2 References

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2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

[1] ETSI ES 282 001: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN Functional Architecture Release 1".

[2] ETSI ES 282 003: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Resource and Admission Control Sub-system (RACS); Functional Architecture".

[3] ETSI ES 282 004: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN Functional Architecture; Network Attachment Sub-System (NASS)".

[4] ETSI ES 283 034: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Network Attachment Sub-System (NASS); e4 interface based on the DIAMETER protocol".

[5] ETSI TS 183 017: "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".

[6] ETSI TS 129 207: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Policy control over Go interface (3GPP TS 29.207)".

[7] ETSI TS 129 209: "Universal Mobile Telecommunications System (UMTS); Policy control over Gq interface (3GPP TS 29.209)".

[8] ETSI TS 133 210: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); 3G security; Network Domain Security (NDS); IP network layer security (3GPP TS 33.210)".

[9] IETF RFC 2960: "Stream Control Transmission Protocol".

[10] IETF RCF 3309: "Stream Control Transmission Protocol (SCTP) Checksum Change".

[11] IETF RFC 3588: "Diameter Base Protocol".

[12] IETF RFC 4005: "Diameter Network Access Server Application".

2.2 Informative references

Not applicable.

3 Definitions and abbreviations

3.1 Definitions

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

Attribute-Value Pair (AVP): See RFC 3588 [11], corresponds to an Information Element in a Diameter message.

hard-state reservation: type of reservation whereby the requested resources are reserved without time limit

NOTE: Hard-state reservations are terminated if the DIAMETER session is terminated.

soft-state reservation: 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

3.2 Abbreviations

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

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 VC	Asynchronous Transfer Mode Virtual Circuit
AVP	Attribute-Value Pair
CEA	Capabilities-Exchange-Answer
CER	Capabilities-Exchange-Request
IANA	Internet Assigned Numbers Authority
IP-CAN	IP-Connectivity Access Network
NASREQ	Network Access Server REQuirements
NASS	Network Access Sub-System
QoS	Quality of Service
RAA	Re-Auth-Answer
RACF	Resource and Admission Control Function
RACS	Resource and Admission Control Subsystem
RAR	Re-Auth-Request
RCEF	Residual Code Excited Field
SCTP	Stream Control Transfer Protocol
SPDF	Service-based Policy Decision Function
STA	Session-Termination-Answer
STR	Session-Termination-Request
xDSL	x Digital Subscriber Line

4 Rq interface

4.1 Overview

In the following, the Rq interface is described in detail concerning what type of information that needs to be transported between the SPDF and the A-RACF. The Rq reference point is used for resource reservation as defined in ES 282 003 [2]. Due to the possible business roles in an access environment, an SPDF instance may be either in the same domain or in a different domain as the A-RACF instance with which it interacts. This means that Rq reference point should support both the case when an SPDF instance and the A-RACF instance with which it interacts are located in the same domain, and when they are located in different domains.

The Rq reference point is an open vendor interface and an open operator interface. One A-RACF instance shall be able to serve more than one SPDF instance and one given SPDF instance may interact with a number of A-RACF instances, although on a session basis, it shall interact with only a single A-RACF instance.

4.2 Rq reference model

The Rq interface is defined between the SPDF and the A-RACF.

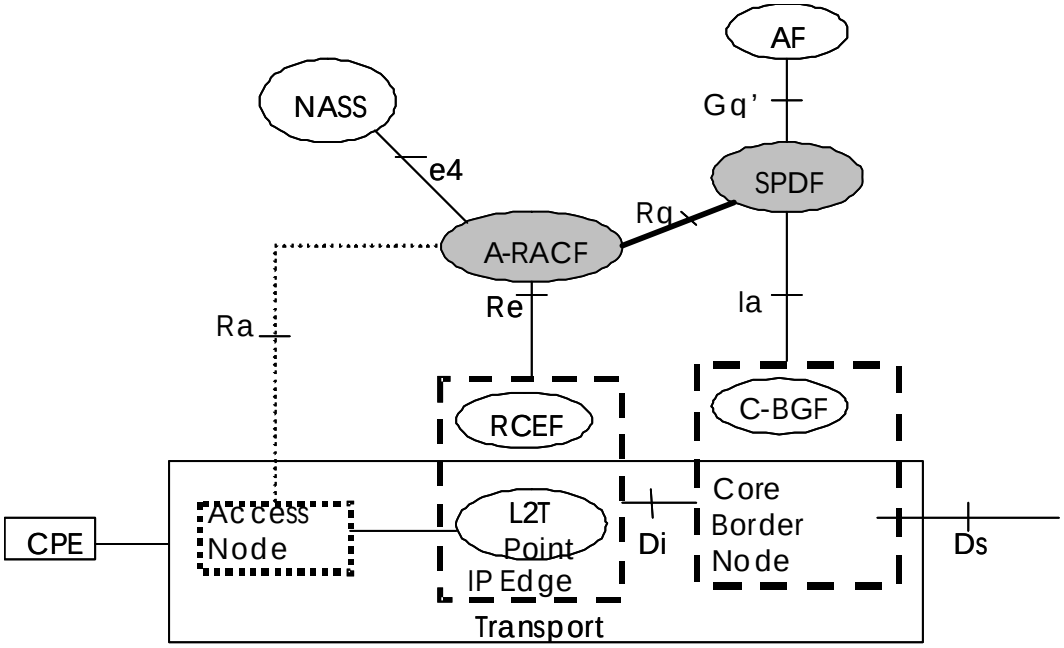

Figure 1: Rq interface architecture model

4.3 Functional elements and capabilities

4.3.1 Service-based Policy Decision Function (SPDF)

The SPDF is a functional element that coordinates the resource reservations requests received from by the AF. The SPDF makes policy decisions using policy rules and forwards the session and media related information obtained from the AF to the A-RACF via the Rq reference point for admission control purposes. The functionality of the SPDF is further detailed in ES 282 003 [2].

4.3.2 Access-Resource and Admission Control Function (A-RACF)

The A-RACF is a functional element performing resource reservation admission control and network policy assembly. The A-RACF receives resource reservation requests from the SPDF via the Rq reference point. The functionality of the SPDF is further detailed in ES 282 003 [2].

5 Resource control procedures

The resource control procedures are defined in seven interaction procedures:

1) Reservation.
2) Commit.
3) Reservation and commit.
4) Refresh.
5) Modification.
6) Release.

7) Event notification.

These interactions are described in the following clauses. During the interactions Diameter AVPs are passed between the SPDF and the A-RACF.

Figure 2 describes the flow states as maintained by the A-RACF according to the procedures. Annex A provides a table further clarifying how states change at different events and actions taken by the A-RACF.

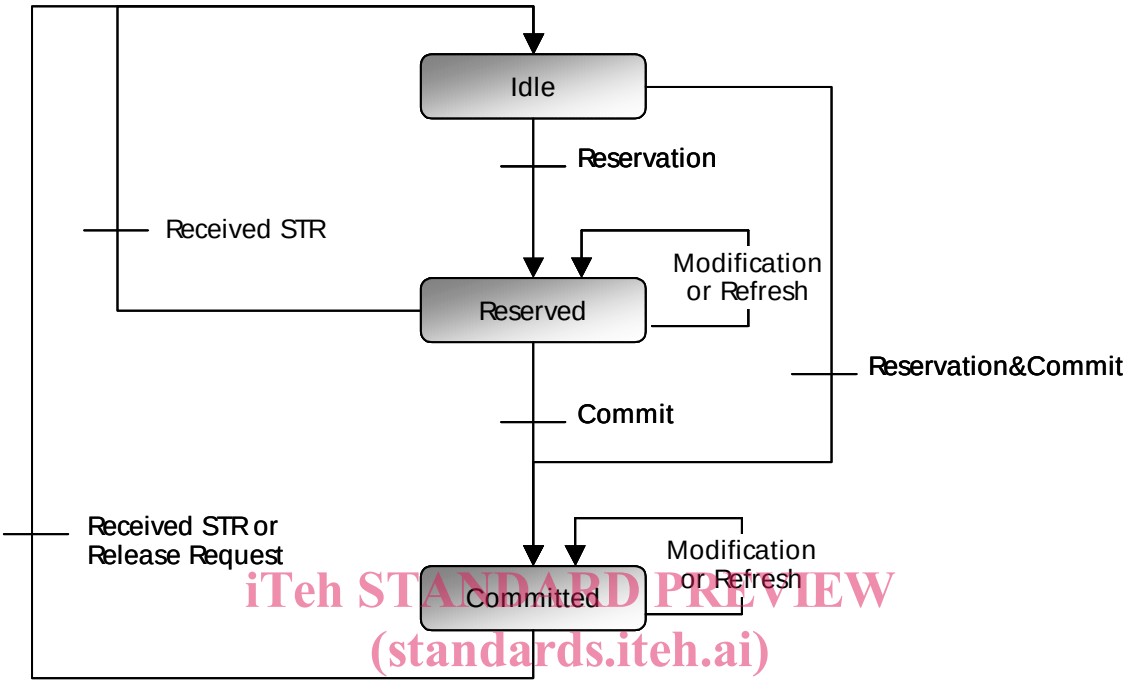

Figure 2: Flow state

The Flow-Status AVP (clause 6.4.11 Flow-Status AVP "Flow-Status AVP") is used to define the action to be taken for each AA-Request made by the SPDF to the A-RACF. The rules for interpreting the Flow-Status AVP are the following:

- Reservation: New Media-Description-Component AVP(s) and Media-Sub-Component AVP(s). Optional Flow-Status AVP(s) set to DISABLED (3).
- Modification: Updated Media-Description-Component AVP(s) and/or Media-Sub-Component AVP(s). Flow-Status AVP not modified, unless the state needs to be modified (e.g. for committing a resource reservation, or for releasing a resource reservation).
- Commit: Media-Description-Component AVP(s) and optionally Media-Sub-Component AVP(s) of existing reservations with Flow-Status AVP(s) set to ENABLED-UPLINK (0), ENABLED-DOWNLINK (1) or ENABLED (2).
- ReservationAndCommit: New Media-Component-Description AVP(s) and Media-Sub-Component AVP(s). Flow-Status AVP(s) set to ENABLED-UPLINK (0), ENABLED-DOWNLINK (1) or ENABLED (2).
- Release: Media-Description-Component AVP(s) and optionally Media-Sub-Component AVP(s) of existing reservations with Flow-Status AVP(s) set to REMOVED (4).
- Refresh: Existing reservation unchanged (Media-Component-Description AVP(s) not specified or unchanged), Flow-Status AVP unchanged.