SLOVENSKI STANDARD
SIST ES 282 003 V3.4.1:2009

01-november-2009

Zlite telekomunikacijske in internetne storitve ter protokoli za napredno omreženje (TISPAN) - Podsistem za krmiljenje vira in pristopa (RACS) - Funkcijska arhitektura

Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN) - Resource and Admission Control Sub-System (RACS) - Functional Architecture

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Ta slovenski standard je istoveten z: **ES 282 003 Version 3.4.1**

ICS:

33.040.01	Telekomunikacijski sistemi na splošno	Telecommunication systems in general
33.080	Digitalno omrežje z integriranimi storitvami (ISDN)	Integrated Services Digital Network (ISDN)

SIST ES 282 003 V3.4.1:2009 **en**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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SIST ES 282 003 V3.4.1:2009

ETSI ES 282 003 V3.4.1 (2009-09)

ETSI Standard

Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Resource and Admission Control Sub-System (RACS): Functional Architecture

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SIST ES 282 003 V3.4.1:2009

Reference
RES/TISPAN-02072-NGN-R3

Keywords
architecture, control, system

ETSI

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Siret N° 348 623 562 00017 - NAF 742 C
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Sous-Préfecture de Grasse (06) N° 7803/88

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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).

The present document describes the architecture of the Resource and Admission Control Sub-System (RACS) identified in the overall TISPAN NGN architecture.

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1 Scope

The present document describes the functional architecture of the Resource and Admission Control Sub-System (RACS), for TISPAN NGN Release 3, in line with the service requirements described in TS 181 005 [1], in line with the QoS Requirements described in TS 181 018 [13] and its role in the TISPAN NGN architecture as defined in ES 282 001 [2]. It specifies as well high level stage 2 requirements that are also considered when describing its functional operation.

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  - for informative references.

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

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

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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 TS 181 005: "Telecommunications and Internet Converged Services and Protocols for Advanced Networking (TISPAN); Service and Capability Requirements".

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

[3] IETF RFC 3312: "Integration of Resource Management and Session Initiation Protocol (SIP)".

[4] IETF RFC 2475: "An Architecture for Differentiated Services".

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

[6] ETSI TR 180 000: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN Terminology".

[7] ETSI TS 123 107: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Quality of Service (QoS) concept and architecture (3GPP TS 23.107)".

[8] ITU-T Recommendation Y.1541: "Network performance objectives for IP-based services".

[9] IETF RFC 3198: "Terminology for Policy-Based Management".

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[10] IETF RFC 2753: "A Framework for Policy-based Admission Control".

[11] Broadband Forum: "Policy Control Framework for DSL", Draft Working Text WT-134.

[12] Damianou, N. et. al.: "The Ponder policy based Management toolkit", August 2002.

[13] ETSI TS 181 018: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Requirements for QoS in a NGN".

[14] ETSI TS 187 001: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN SECurity (SEC); Requirements".

[15] ETSI TS 185 005: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Services requirements and capabilities for customer networks connected to TISPAN NGN".

[16] ETSI TS 123 228: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); IMS Multimedia Subsystem (IMS); Functional Architecture".

[17] IETF RFC 2474: "Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers".

2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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[i.1] ETSI TS 182 027: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); IPTV Architecture; IPTV functions supported by the IMS subsystem".

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https://standards.iteh.ai/catalog/standards/sist/2a4f3c1d-5e6b-4a7c-9d0e-1f2a3b4c5d6e/sist-es-282-003-v3.4.1-2009

[i.2] ETSI ES 283 026: "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".

[i.3] 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".

[i.4] ETSI TS 185 003: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Customer Network Gateway (CNG) Architecture and Reference Points".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 180 000 [6] and the following apply:

access network policies: policies which are used to make decisions for resource admission control and are designed to derive the traffic policies to be enforced by the A-RACF

NOTE: Access network policies are constructed using Conditions and Actions that are specifically supported by A-RACFs. An example would be a policy which checks the condition that resources are available and the action to reserve the resource.

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Application Function (AF): functional entity that offers applications the control of IP bearer resources when required

NOTE: The AF is capable of communicating with the RACS to transfer dynamic QoS-related service information.

application session: end-to-end user session, which is setup by an AF (using SIP or another protocol) and requiReservation one or more resource reservations to take place

NOTE: An application session may involve one, two or more end users.

BGF service: traffic flow function performed by the BGF Functional Entity on media flows and/or the allocation of BGF resources

DiffServ: DiffService networks classify packets into one of a small number of aggregated flows or "classes", based on the DiffService code point (DSCP) in the packet's IP header

gate: operates on a unidirectional flow of packets, i.e. in either the upstream or downstream direction

NOTE: A gate consists of a packet classifier, and a gate status (open/closed). When a gate is open, the packets in the flow are accepted. When a gate is closed, all of the packets in the flow are dropped.

"Last mile" access network segment: comprises the functional elements that enable communication between a CPN and an Access Node

local A-RACF policies: specific Access network policies that are currently active on an A-RACF (may be a subset of all access network policies)

NOTE: Local A-RACF policies are instances of Access network policies.

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local SPDF policies: specific Service based policies that are currently active on an SPDF (may be a subset of all service based policies)

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NOTE: Local SPDF policies are instances of Service based policies.

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media flow: uni-directional media stream of a particular type, which is specified by two endpoint identifiers, bandwidth and class of service

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NAT: generic term for Network Address Translation that includes NAT-PT and NA(P)T

overbooking admission control: situation whereby the A-RACF considers that different AF-sessions can reserve the same resources bearing in mIndication that these resources cannot be committed to more than one AF-session at a time

NOTE: This enables optimal resource management in certain service conditions (e.g. Call Hold, Communication waiting).

path-coupled signalling: mode of signalling where the signalling messages follow a path that is tied to the data packets

NOTE: Signalling messages are routed only through the nodes that are in the data path.

policy: set of rules which govern the choices in behaviour of a system and that comprises conditions and actions, where conditions are evaluated when triggered by an event

NOTE 1: See annex B for further details.

NOTE 2: The content of policies is outside of the scope of the present document.

QoS classes: As defined in ITU-T Recommendation Y.1541 [8] and TS 123 107 [7].

QoS "Push" model: model where the RACS "pushes" traffic policies to the transport functions to enforce its policy decisions

NOTE: In this model, the CPN does not itself support native application independent QoS procedures.