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Zlite telekomunikacijske in internetne storitve ter protokoli za napredno omreženje (TISPAN) - Podsystem 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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Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Resource and Admission Control Sub-System (RACS): Functional Architecture

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Contents

Intellectual Property Rights	10
Foreword.....	10
1 Scope	11
2 References	11
2.1 Normative references	11
2.2 Informative references.....	12
3 Definitions and abbreviations.....	12
3.1 Definitions.....	12
3.2 Abbreviations	14
4 General description of RACS.....	16
4.1 Functional overview	16
4.1.1 Global description.....	16
4.1.2 Basic functionalities.....	16
4.1.3 Restrictions applicable to the present document.....	17
4.2 Functional Requirements.....	17
4.2.1 R1 Requirements	17
4.2.1.1 Overall.....	17
4.2.1.2 Transport Control Service Requests.....	17
4.2.1.3 Resource Handling.....	18
4.2.1.4 QoS Management.....	19
4.2.1.5 Traffic Handling.....	19
4.2.1.6 Charging and Overload Control.....	19
4.2.2 R2 Requirements	19
4.2.2.1 Overall.....	20
4.2.2.2 Resource Handling.....	20
4.2.2.3 QoS Management.....	20
4.2.2.4 e2e QoS Handling	21
4.2.2.5 Multicast/Unicast Handling	21
4.2.2.6 Topology and Resource Information Retrieval	21
4.2.2.7 Network Deployment Scenarios.....	21
4.2.2.8 Charging and Overload Control	22
4.2.3 R3 Requirements	22
4.2.3.1 Interaction with the CPN.....	22
4.2.3.1.1 Direct control by RACS	22
5 RACS functional architecture derivation basis	22
5.1 Resource Control for Unicast and Multicast	22
5.1.1 Resource control scenarios	23
5.1.1.1 Identification of Resources	23
5.1.1.2 Multicast Resource Admission Decision Specifics	23
5.1.1.3 Resource Admission Decision Prerequisites	23
5.1.1.4 Resource Admission Control Approaches	24
5.1.1.5 Multicast Resource Admission Control in the Access Network Domain Transport Nodes.....	24
5.1.1.6 Unicast/Multicast Resource Reuse in the Access Segment.....	25
5.2 Charging.....	25
5.3 QoS Management Functions in Fixed Access Networks.....	25
5.4 Resource Control for QoS Downgrading	27
6 RACS functional architecture definition.....	28
6.1 General	28
6.2 Functional elements.....	30
6.2.1 SPDF.....	30
6.2.1.1 SPDF main functions	30
6.2.1.2 Summary of SPDF Elementary Functions	30
6.2.1.3 Reference points.....	32

6.2.1.4	User profile	32
6.2.1.5	Priority	32
6.2.1.6	Service request	33
6.2.1.7	Coordination function	33
6.2.1.8	Charging	34
6.2.1.9	Deployment considerations	34
6.2.1.10	Overload control	34
6.2.1.11	Discovery mechanism	34
6.2.2	Generic Resource Admission Control Function	34
6.2.2.1	Main functions	34
6.2.2.1.1	Specializations of x-RACF	35
6.2.2.1.2	Reference points applicable to different specializations of x-RACF	35
6.2.2.1.3	Multiple instantiations of x-RACF	35
6.2.2.2	Summary of generic Resource Admission Control Function Elementary Functions	36
6.2.2.3	A-RACF	38
6.2.2.3.1	A-RACF main functions	38
6.2.2.3.2	Reference points	38
6.2.2.4	C-RACF	39
6.2.2.4.1	C-RACF main functions	39
6.2.2.4.2	Reference points	39
6.2.2.5	Admission control process	39
6.2.2.5.1	A-RACF	39
6.2.2.5.2	C-RACF	41
6.2.2.6	Installation of policies	41
6.2.2.7	Charging	42
6.2.2.8	Abnormal condition handling	42
6.2.2.9	Deployment considerations	42
6.2.2.10	Overload control	42
6.2.2.11	Discovery Mechanism	42
6.2.3	BGF	42
6.2.3.1	BGF main functions	42
6.2.3.2	BGF parameters	43
6.2.3.3	Reference points	43
6.2.3.4	Addressing latching	43
6.2.3.5	Abnormal conditions handling	43
6.2.3.6	Overload control	43
6.2.4	RCEF	44
6.2.4.1	RCEF main functions	44
6.2.4.2	Reference points	44
6.2.4.3	RCEF parameters	44
6.2.5	Application Function (AF)	44
6.2.5.1	AF main functions	44
6.2.5.2	Reference points	45
6.2.5.3	Charging	46
6.2.5.4	Abnormal conditions handling	46
6.2.6	BTF	46
6.3	RACS reference points	46
6.3.1	Rq reference point (SPDF - x-RACF)	46
6.3.1.1	Functional requirements	46
6.3.1.1.1	Resource management mechanisms	46
6.3.1.1.2	Service model	47
6.3.1.1.3	Duration semantics	47
6.3.1.1.4	Audit and synchronization support	48
6.3.1.1.5	Report facilities for unsolicited events	48
6.3.1.2	Non-functional requirements	48
6.3.1.2.1	Reliability requirements	48
6.3.1.2.2	Security requirements	48
6.3.1.3	Information exchanged over the Rq Reference Point	48
6.3.1.3.1	Resource Reservation Request	48
6.3.1.3.2	Resource Modification Request	50
6.3.1.3.3	Resource Request/Modification Confirmation	51
6.3.1.3.4	Resource Release Request	51

6.3.1.3.5	Abort Resource Reservation	51
6.3.2	e4 reference point (A-RACF - NASS)	52
6.3.3	Ia Reference Point (SPDF - BGF)	52
6.3.3.1	Functional Requirements	52
6.3.3.1.1	Control of NAT, Hosted NAT traversal and Gating	52
6.3.3.1.2	Transport Protocol Type Policing	52
6.3.3.1.3	Bandwidth control	52
6.3.3.1.4	QoS marking	52
6.3.3.1.5	Usage metering and statistics reporting	52
6.3.3.1.6	Resource state synchronization	53
6.3.3.2	Non-Functional Requirements	53
6.3.3.2.1	Reliability requirements	53
6.3.3.2.2	Security requirements	53
6.3.3.3	Information exchanged over the Ia Reference Point	53
6.3.3.3.1	BGF Service Request	53
6.3.3.3.2	BGF Service Confirmation	56
6.3.3.3.3	BGF Service Modify Request	57
6.3.3.3.4	BGF Service Modify Confirmation	58
6.3.3.3.5	BGF Service Audit Request	59
6.3.3.3.6	BGF Service Audit Response	60
6.3.3.3.7	BGF Service Notify Request	61
6.3.3.3.8	BGF Service Notify Indication	62
6.3.3.3.9	BGF Service Release Request	62
6.3.3.3.10	BGF Service Release Confirmation	63
6.3.4	Gq' Reference Point (AF - SPDF)	64
6.3.4.1	Functional Requirements	64
6.3.4.2	Non-Functional Requirements	64
6.3.4.3	Information exchanged over the Gq' Reference Point	64
6.3.5	Ri' Reference Point (SPDF-SPDF inter-domain)	65
6.3.5.1	Functional Requirements	65
6.3.5.1.1	Resource management mechanisms	65
6.3.5.1.2	Service model	65
6.3.5.1.3	Duration semantics	65
6.3.5.1.4	Audit and Synchronization support	66
6.3.5.1.5	Report facilities for unsolicited events	66
6.3.5.2	Non-Functional Requirements	66
6.3.5.2.1	Reliability requirements	66
6.3.5.2.2	Security requirements	66
6.3.5.3	Information exchanged over the Ri' Reference Point	66
6.3.6	Rd' Reference Point (SPDF-SPDF intra-domain)	66
6.3.6.1	Functional Requirements	66
6.3.6.1.1	Resource management mechanisms	66
6.3.6.1.2	Service model	66
6.3.6.1.3	Duration semantics	67
6.3.6.1.4	Audit and Synchronization support	67
6.3.6.1.5	Report facilities for unsolicited events	67
6.3.6.2	Non-Functional Requirements	67
6.3.6.2.1	Reliability requirements	67
6.3.6.2.2	Security requirements	67
6.3.6.3	Information exchanged over the Rd' Reference Point	67
6.3.7	Re Reference Point (x-RACF - RCEF)	67
6.3.7.1	Functional Requirements	67
6.3.7.1.1	Policy Enforcement Management	67
6.3.7.2	Non-functional requirements	68
6.3.7.2.1	Reliability requirements	68
6.3.7.2.2	Security requirements	68
6.3.7.3	Information exchanged over the Re Reference Point	69
6.3.7.3.1	Information exchanged by using the push mode	69
6.3.7.3.2	Information exchanged by using the pull mode	74
6.3.7.3.3	Information exchanged by using both QoS mechanisms	81
6.3.8	Rr Reference Point (x-RACF - x-RACF intra-domain)	82
6.3.8.1	Functional Requirements	82

6.3.8.1.1	Overall features	82
6.3.8.1.2	Resource management mechanisms	83
6.3.8.1.3	Service model	84
6.3.8.1.4	Duration semantics	84
6.3.8.1.5	Audit and Synchronization support	84
6.3.8.1.6	Report facilities for unsolicited events	85
6.3.8.2	Non-Functional Requirements	85
6.3.8.2.1	Reliability requirements	85
6.3.8.2.2	Security requirements	85
6.3.8.3	Information exchanged over the Rr Reference Point	85
6.3.8.3.1	Information exchanged over the Rr Reference Point for request model	85
6.3.8.3.2	Information exchanged over the Rr Reference Point for delegated model	88
6.3.9	Rf Reference Point (SPDF-Charging Functions and x-RACF-Charging Functions)	92
6.4	RACS Flows: Interaction Procedures	92
6.4.1	Subscriber Attaches to the Access Network	93
6.4.2	Request Resource	93
6.4.2.1	Request Resource by using the push mode	93
6.4.2.1.1	Admission control using push mode when only one x-RACF is involved	93
6.4.2.1.2	Admission control using push mode when multiple x-RACFs are involved	95
6.4.2.2	Request Resource by using the pull mode	98
6.4.2.2.1	Admission control using pull mode when only one x-RACF is involved	98
6.4.2.2.2	Admission control using pull mode when multiple x-RACFs are involved	99
6.4.2.3	Request resource by combining push and pull mode	100
6.4.3	Request Resource Wholesale/Retail Scenario	103
6.4.3.1	Request Resource with access to the A-RACF in the retail domain	103
6.4.3.2	Request Resource without access to the A-RACF in the retail domain	105
6.4.4	Release Resource	106
6.4.4.1	Release Resource Request by using the push mode	106
6.4.4.2	Release Resource Request by using the pull mode	107
6.4.4.2.1	Resource Release using pull mode when only one x-RACF is involved	107
6.4.4.2.2	Resource release using pull mode when multiple x-RACFs are involved	108
6.4.5	Commit Resources procedure	110
6.4.6	Resource Modification Request	111
6.4.6.1	Resource Modification Request by using the push mode	111
6.4.6.2	Resource Modification Request by using the pull mode	112
6.4.7	RACS Retrieves Access Profile from NASS	112
6.4.8	Subscriber Detaches from the access network	113
6.4.9	Abnormal event from the RCEF	115
6.4.10	Report of BGF Events	116
6.4.11	Indication of a BGF Service Failure (Autonomous Release of BGF)	116
Annex A (informative): Binding Information in RACS, NASS and AF		118
Annex B (informative): Policy nomenclature for RACS		119
B.1	Overview	119
B.2	Policy Terminology	119
B.2.1	Policy	119
B.2.2	Conditions	119
B.2.3	Actions	119
B.2.4	Events	119
B.3	Types of Policy	120
B.3.1	Authorization Policy	120
B.3.2	Obligation Policy	120
B.3.3	Traffic Policy	120
B.3.4	Control Policy	120
Annex C (informative): Admission control scenarios		121
C.1	Example of the handling of Connection Oriented network in the aggregation segment	121
Annex D (informative): Network deployment scenarios		122

D.1	Resource control scenarios according to distribution of Service-based Policy Decision and Admission Control Functions.....	122
D.1.1	Single NGN operator performs Service-based Policy Decision and Admission Control Functions	122
D.1.1.1	Scenario Overview.....	122
D.1.1.2	Business Need.....	122
D.1.1.3	Mapping to TISPAN Architecture: RACS requirements.....	123
D.1.1.4	Technical Analysis.....	123
D.1.1.4.1	Functional Element Analysis	123
D.1.1.4.2	Elementary Functions Analysis.....	123
D.1.1.4.3	Reference Point Analysis	123
D.1.2	Service-based Policy Decision function handled in two domains	123
D.1.2.1	Scenario Overview.....	123
D.1.2.2	Business Need.....	124
D.1.2.3	Mapping to TISPAN Architecture: RACS requirements.....	124
D.1.2.4	Technical Analysis.....	124
D.1.2.4.1	Functional Element Analysis	124
D.1.2.4.2	Elementary Functions Analysis.....	124
D.1.2.4.3	Reference Point Analysis	124
D.1.3	Service-based Policy Decision and Admission Control functions distributed across two domains	125
D.1.3.1	Scenario Overview.....	125
D.1.3.2	Business Need.....	125
D.1.3.3	Mapping to TISPAN Architecture: RACS requirements.....	125
D.1.3.4	Technical Analysis.....	126
D.1.3.4.1	Functional Element Analysis	126
D.1.3.4.2	Elementary Functions Analysis.....	126
D.1.3.4.3	Reference Point Analysis	126
D.2	Resource control scenarios for Multicast and Unicast.....	126
D.2.1	Independent scenario - Unicast and Multicast admission control are separated.....	126
D.2.1.1	Scenario Overview.....	126
D.2.1.2	Business Need.....	126
D.2.1.3	Mapping to TISPAN Architecture: RACS requirements.....	126
D.2.1.4	Technical Analysis.....	127
D.2.1.4.1	Functional Element Analysis	127
D.2.1.4.2	Elementary Functions Analysis.....	127
D.2.1.4.3	Reference Point Analysis	127
D.2.2	Synchronized Scenario	127
D.2.2.1	Scenario Overview.....	127
D.2.2.2	Business Need.....	127
D.2.2.3	Mapping to TISPAN Architecture: RACS requirements.....	127
D.2.2.4	Technical Analysis.....	127
D.2.2.4.1	Functional Element Analysis	127
D.2.2.4.2	Elementary Functions Analysis.....	127
D.2.2.4.3	Reference Point Analysis	128
D.2.3	Integrated scenario - Integrated Unicast and Multicast Admission Control.....	128
D.2.3.1	Scenario Overview.....	128
D.2.3.2	Business Need.....	128
D.2.3.3	Mapping to TISPAN Architecture: RACS requirements.....	128
D.2.3.4	Technical Analysis.....	128
D.2.3.4.1	Functional Element Analysis	128
D.2.3.4.2	Elementary Functions Analysis.....	128
D.2.3.4.3	Reference Point Analysis	128
D.3	Resource control scenario for Metro Network.....	129
D.3.1	Scenario Overview	129
D.3.2	Business Need	129
D.3.3	Mapping to TISPAN Architecture: RACS requirements	129
D.3.4	Technical Analysis	129
D.3.4.1	Functional Element Analysis	129
D.3.4.2	Elementary Functions Analysis	129
D.3.4.3	Reference Point Analysis.....	130
D.4	Resource control scenario for CPNs.....	130

D.4.1	Scenario Overview	130
D.4.2	Business Need	131
D.4.3	Mapping to TISPAN Architecture: RACS requirements	131
D.4.4	Technical Analysis	131
D.4.4.1	Functional Element Analysis	131
D.4.4.2	Elementary Functions Analysis	131
D.4.4.3	Reference Point Analysis	131

Annex E (informative): Topology and Resource Management Use Cases and Elementary Functions132

E.1	Topology and Resource Management Use Cases	132
E.1.1	Initial RACS Start-up	132
E.1.2	Network Auto-Discovery	133
E.1.3	Managing Network Elements	133
E.1.4	Managing Network Topology	134
E.1.5	Real-Time Monitoring	134
E.1.5.1	Real-time Monitoring (Network Integration)	134
E.1.5.2	Real-time Monitoring (OSS Integration)	135
E.1.5.3	OSS-based Monitoring	136
E.1.6	Just-In-Time Information Pull	136
E.2	Topology and Resource Management Elementary Functions	137
E.2.1	Provisioning Elementary Function	137
E.2.2	Discovery Elementary Function	137
E.2.3	Partitioning Elementary Function	137
E.2.4	Monitoring Elementary Function	137
E.3	Topology and Resource Management Architectural Models	138
E.3.1	Centralized Model	138
E.3.2	Distributed Model	139

Annex F (informative): Architectural scenarios for supporting unicast and multicast.....141

F.1	Example of an NGN Access Network Architecture for support of Multicast Resource Admission Control	141
F.2	Scenario for supporting multicast in push mode	142
F.3	Scenario for supporting multicast with UE requested QoS policy-pull mode	143
F.4	Scenario for supporting service authorization control when multicast uses the pull mode	143

Annex G (informative): Information flows for supporting unicast and multicast.....145

G.1	Information flows for enabling and disabling the multicast service	145
G.1.1	Control flow for enabling multicast service	145
G.1.2	Control flow for disabling multicast service	147
G.2	Information flows for supporting multicast in pull mode	148
G.2.1	Request Resource in the pull mode	148
G.2.2	Multicast stream in pull mode when a A-RACF is present in the AN	149
G.2.3	Multicast stream in pull mode when a A-RACF is not present in the AN and the content is in the IP_Edge	151
G.2.4	Multicast stream in pull mode when a A-RACF is not present in the AN and the content is in the AN	152
G.2.5	Multicast Admission Control for the Access Segment only	154
G.2.6	Multicast Admission Control when the maximum bandwidth associated with Multicast service is over-provisioned in the aggregation segment and beyond	155
G.3	Information flows for supporting multicast in mixed push and pull mode	157
G.3.1	Multicast stream in mixed push and pull mode when a A-RACF is present in the AN	157
G.3.2	Multicast stream in mixed push and pull mode when a A-RACF is not present in the AN and the content is in the IP_Edge	159
G.3.3	Multicast stream in mixed push and pull mode when a A-RACF is not present in the AN and the content is in the AN	161

G.4	Information flows for supporting combined unicast and multicast together with resource handling ..	163
G.4.1	Unicast and multicast services do NOT share resources on the Access Segment	163
G.4.2	Unicast and multicast applications share resources on the Access Segment	165
G.4.3	Unicast and multicast applications share resources on the Access Segment	167
Annex H (informative):	Session modification procedures	172
H.1	The status of the connection during the session modification	172
H.2	The session modification procedure	173
Annex I (informative):	Change history	177
Annex J (informative):	Bibliography	179
History		180

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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 Subsystem (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.

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

2.1 Normative references

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

- [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 Service".
- [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); LTE; 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".
- [10] IETF RFC 2753: "A Framework for Policy-based Admission Control".
- [11] Void.
- [12] Damianou, N. et. al.: "The Ponder policy based management toolkit", August 2002.
- NOTE: Available at: <http://www-dse.doc.ic.ac.uk/Research/policies/ponder/PonderSummary.pdf>.
- [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: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; IP Multimedia Subsystem (IMS); Stage 2 (3GPP TS 23.228)".
- [17] Void.

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

[SIST ES 282 003 V3.5.1:2011](https://standards.iteh.ai/catalog/standards/sist/1d4b6fd2-c037-4a24-9c66-e82f70a28a86/sist-es-282-003-v3-5-1-2011)

[https://standards.iteh.ai/catalog/standards/sist/1d4b6fd2-c037-4a24-9c66-](https://standards.iteh.ai/catalog/standards/sist/1d4b6fd2-c037-4a24-9c66-e82f70a28a86/sist-es-282-003-v3-5-1-2011)

[e82f70a28a86/sist-es-282-003-v3-5-1-2011](https://standards.iteh.ai/catalog/standards/sist/1d4b6fd2-c037-4a24-9c66-e82f70a28a86/sist-es-282-003-v3-5-1-2011)

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.

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 requires 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.

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

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

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

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 mind 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.

QoS "Pull" model: model where, upon request from the transport processing functions, the RACS provides traffic policies to the transport processing functions

NOTE: The request from the transport processing functions may itself, for example, be triggered by path-coupled requests coming from user equipment and/or transport network elements.

resource: allocatable physical network capability

NOTE 1: A resource can be characterized by a set of parameters, including, but not limited to; memory bandwidth forwarding capacity, scheduling capacity, or other.

NOTE 2: Description and measurement metric of a resource is technology dependent.

resource identifier: single key or group of keys used to refer to a resource

NOTE: Resource identifiers can be the same as or derived from Layer-1 keys (e.g. physical port or reference point), Layer-2 keys (e.g. Ethernet VLAN ID), or Layer-3 keys (e.g. IP-address).