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Zlite telekomunikacijske in internetne storitve ter protokoli za napredno omreženje (TISPAN) - Krmiljenje vira in pristopa: Profil H.248 za krmiljenje funkcij mejnega prehoda (BGF) v podsistemu za krmiljenje vira in pristopa (RACS) - Specifikacija protokola

Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN) - Resource and Admission Control: H.248 Profile for controlling Border Gateway Functions (BGF) in the Resource and Admission Control Subsystem (RACS) - 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).

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1 Scope

The present document defines a profile of the Gateway Control Protocol (H.248.1) to be used for controlling Border Gateway Functions (BGF), as defined in ES 282 003 [3].

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

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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] ITU-T Recommendation H.248.1 (2005): "Gateway control protocol: Version 3".

[2] Void.2.

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

[4] ITU-T Recommendation H.248.45 (2006): "Gateway control protocol: MGC information package".

[5] ITU-T Recommendation H.460.18: "Traversal of H.323 signalling across network address translators and firewalls".

[6] IETF RFC 5234: "Augmented BNF for Syntax Specifications: ABNF".

[7] IETF RFC 3264: "An Offer/Answer Model with Session Description Protocol (SDP)".

[8] IETF RFC 2663: "IP Network Address Translator (NAT) Terminology and Considerations".

[9] ITU-T Recommendation H.248.37 (2005): "Gateway control protocol: IP NAPT traversal package".

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[10] ITU-T Recommendation H.248.54 (2007): "Gateway control protocol: MPLS support package".

[11] ITU-T Recommendation H.248.56 (2007): "Gateway control protocol: Packages for virtual private network support".

[12] ITU-T Recommendation H.248.40 (2007): "Gateway Control Protocol: Application Data Inactivity Detection Package".

[13] ITU-T Recommendation H.248.14 (2002): "Gateway control protocol: Inactivity timer package".

[14] ITU-T Recommendation Q.3303.2 (2007): "Protocol at the interface between a Policy Decision Physical Entity (PD-PE) and a Policy Enforcement Physical Entity (PE-PE) (Rw Interface): H.248 Alternative".

[15] ITU-T Recommendation H.248.11 (2002): "Gateway control protocol: Media gateway overload control package".

[16] ITU-T Recommendation H.248.41 (2006): "Gateway control protocol: IP domain connection package".

[17] Draft ITU-T Recommendation H.248.52 (2007): "Gateway control protocol: QOS Support packages".

NOTE: Available at http://ftp3.itu.ch/av-arch/avc-site/2005-2008/0801_Seo/TD-29.zip.

[18] Draft ITU-T Recommendation H.248.43 (2007): "Gateway control protocol: Gate Management and Gate Control packages".

NOTE: Available at http://ftp3.itu.ch/av-arch/avc-site/2005-2008/0801_Seo/TD-66.zip.

[19] Draft ITU-T Recommendation H.248.53 (2007): "Gateway control protocol: Traffic Management packages".

NOTE: Available at http://ftp3.itu.ch/av-arch/avc-site/2005-2008/0801_Seo/TD-30.zip.

[20] Void.3.

[21] Void.4.

[22] ETSI ES 283 018 (V1.1.4): "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Resource and Admission Control: H.248 Profile for controlling Border Gateway Functions (BGF) in the Resource and Admission Control Subsystem (RACS); Protocol specification".

[23] ITU-T Recommendation H.248.49 (2007): "Gateway control protocol: Session description protocol RFC and capabilities packages".

[24] ITU-T Recommendation H.248.36 (2005): "Gateway control protocol: Hanging Termination Detection package".

[25] ITU-T Recommendation H.248.47 (2007): "Gateway control protocol: Statistic conditional reporting package".

[26] Void.5.

[27] Void.6.

[28] IETF RFC 4566: "SDP: Session Description Protocol".

[29] IETF RFC 1123: "Requirements for Internet Hosts - Application and Support".

[30] ITU-T Recommendation H.248.8: "Gateway control protocol: Error code and service change reason description".

[31] IETF RFC 3605: "Real Time Control Protocol (RTCP) attribute in Session Description Protocol (SDP)".

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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.

[32] ETSI TS 102 333: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Gate control protocol".

[33] ETSI TR 183 025 (V2.0.0): "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); H.248 Non-call related procedures and management system interaction".

[34] IETF RFC 2327: "SDP: Session Description Protocol".

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

[36] ITU-T Recommendation V.152: "Procedures for supporting voice-band data over IP networks".

[37] IETF RFC 4301: "Security Architecture for the Internet Protocol".

[38] ITU-T Recommendation H.248.18: "Gateway control protocol: Package for support of multiple profiles".

[39] IETF RFC 3550: "RTP: A Transport Protocol for Real-Time Applications".

[40] IEEE 802.3: "Ethernet Working Group".

[41] ITU-T Recommendation Y.1221 (2002): "Traffic control and congestion control in IP based networks".

[42] ITU-T Recommendation Y.1541 (2006): "Network performance objectives for IP-based services".

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

[44] ETSI TS 183 048: "Telecommunications and Internet Converged Services and Protocols for Advanced Networking (TISPAN); Resource & Admission Control System (RACS); Protocol Signalling flows specification; RACS Stage 3".

[45] 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".

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3 Definitions and abbreviations

3.1 Definitions

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

BGF: packet-to-packet gateway for user plane media traffic. The BGF performs both policy enforcement functions and NA(P)T functions under the control of the SPDF

NOTE: A Border Gateway Function (BGF) provides the interface between two IP-transport domains. It may reside at the boundary between an access network and a core network or between two core networks, as defined in ES 282 001 [35]. The BGF has the "H.248 MG" role in the scope of this Profile.

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GATE: represents a transport plane function enabling or disabling the unidirectional forwarding of IP packets under specified conditions (e.g. QoS)

NOTE: See TS 102 333 [32].

IP-to-IP Interworking Modes: available SDP information elements and values in the signalled SDP "media description" (mainly "m=" and "a=" lines) by the SPDF (MGC), may be used to categorize following interworking modes from BGF (MG) perspective:

(1) "**Media-agnostic**":

- The "m=" line values of *media type* (<media>) and *media format* (<fmt>) are not allowing to conclude for the BGF (MG) on the transported "media" information.

(2) "**Media-aware**":

- The "m=" line values of *media type* (<media>), *transport protocol* (<proto>) and *media format* (<fmt>) are unambiguously defining the entire protocol stack of the H.248 IP termination, i.e. the BGF (MG) knows transported "media" information and the underlying transport protocol type.

(3) "**Transport protocol-agnostic**" (or briefly "**transport-agnostic**"):

- The BGF (MG) may not conclude from signalled SDP information elements on the transported IP payload information (see note).

(4) "**Transport protocol-aware**" (or briefly "**transport-aware**"):

- The value of the IP *protocol* field is indicated by the signalled SDP information elements, e.g. by the "m=" line value of the *transport protocol* (<proto>) field.

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NOTE: The BGF (MG) could principally derive the used transport protocol by analyzing the protocol field (http://www.iana.org/assignments/protocol-numbers) in the IP header, but such a function is beyond H.248. The BGF (MG) is still transport protocol-agnostic from H.248 point of view.

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PINHOLE: configuration of two associated H.248 IP Terminations within the same H.248 Context, which allows/prohibits unidirectional forwarding of IP packets under specified conditions

NOTE 1: A pinhole may also be referred to as a "gate".

NOTE 2: E.g. address tuple.

NOTE 3: See ITU-T Recommendation H.248.37 [9].

Resource and Admission Control Subsystem (RACS): provides admission control and gate control functionalities

NOTE: Including the control of NAPT and priority marking.

Service Policy Decision Function (SPDF): logical policy decision element for service-based policy control (SBP)

NOTE: The SPDF makes policy decisions using policy rules for Service Based Policy Control (SBP). The SPDF has the "H.248 MGC" role in the scope of this Profile.

TRANSCODING: transcoding in general is the translation from one type of encoded media format to another different media format

EXAMPLE 1: G.711 A-law to μ-law or vice versa.

EXAMPLE 2: G.711 to G.726-40K.

EXAMPLE 3: G.729 to AMR with 4.75 rate.

EXAMPLE 4: G.711 to a broadband codec that operates at 256 kbps, etc.

NOTE 1: The definition of "transcoding" is according clause 3.10/ITU-T Recommendation V.152 [36].

NOTE 2: Transcoding belongs to the category of "media aware" IP-to-IP interworking (see above).

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3.2 Abbreviations

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

ABNF	Augmented Backus-Naur Form
BGF	Border Gateway Function
C-BGF	Core-BGF
CBR	Constant BitRate
CoAC	Context Admission Control
DSCP	Differentiated Services Code Point
GCP	Gate Control Protocol
I-BGF	Interconnect-BGF
IP	Internet Protocol
IPsec	IP Security (RFC 4301 [37])
LD	Local Descriptor (H.248)
MG	Media Gateway
MGC	Media Gateway Controller
MID	Message Identifier (H.248)
MPLS	Multi Protocol Label Switching
NA	Not Applicable
NAPT	Network Address and Port Translation
NAPT-PT	NAPT and Protocol Translation
NAT	Network Address Translation
PCI	Protocol Control Information
QoS	Quality of Service
RACS	Resource and Admission Control Subsystem
RD	Remote Descriptor (H.248)
RFC	Request For Comments (IETF)
RTCP	RTP Control Protocol
RTP	Real-time Transport Protocol
SCTP	Stream Control Transport Protocol
SDP	Session Description Protocol
SIP	Session Initiation Protocol
SPDF	Service Policy Decision Function
StAC	Stream Admission Control
TISPAN	Telecommunications and Internet converged Services and Protocols for Advanced Networking
VBR	Variable BitRate
VLAN	Virtual LAN
VPN	Virtual Private Network

NOTE: It has to be noted that there is also a different definition for "pinhole", which is used in the context of H.323 systems (see ITU-T Recommendation H.460.18 [5]). The difference is the fact that the "H.248 pinhole" and "gate" are unidirectional, whereas the "H.323 pinhole" is bidirectional.

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4 Applicability

4.1 Architecture

The present document defines an H.248 Profile for the reference point between the Service Policy Decision Function (SPDF) and the Border Gateway Function (BGF), known as the Ia reference point. The SPDF interacts with the BGF to request services. This reference point is used for communication between the SPDF and a Core Border Gateway Function (C-BGF) and between the SPDF and an Interconnect Border Gateway Function (I-BGF).

Specific requirements for this reference point are described in ES 282 003 [3]. Figure 1 illustrates the architecture assumed in the present document.