

**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), and is now submitted for the ETSI standards Membership Approval Procedure.

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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 [2].

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## 2 References

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

- For a specific reference, subsequent revisions do not apply.
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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" including its Amendment 1 (05/2008).
- [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".
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- [4] ITU-T Recommendation H.460.18: "Traversal of H.323 signalling across network address translators and firewalls".
- [5] IETF RFC 5234: "Augmented BNF for Syntax Specifications: ABNF".
- [6] IETF RFC 3264: "An Offer/Answer Model with Session Description Protocol (SDP)".
- [7] IETF RFC 2663: "IP Network Address Translator (NAT) Terminology and Considerations".
- [8] ITU-T Recommendation H.248.37 (2008): "Gateway control protocol: IP NAPT traversal package".
- [9] ITU-T Recommendation H.248.54 (2007): "Gateway control protocol: MPLS support package".
- [10] ITU-T Recommendation H.248.56 (2007) Corrigendum 1 (2009): "Gateway control protocol: Packages for virtual private network support".

- [11] ITU-T Recommendation H.248.40 (2007): "Gateway Control Protocol: Application Data Inactivity Detection Package".
- [12] ITU-T Recommendation H.248.14 (2002) Revision 1 (2009): "Gateway control protocol: Inactivity timer package".
- [13] 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".
- [14] ITU-T Recommendation H.248.11 (2002) Corrigendum 1(2008): "Gateway control protocol: Media gateway overload control package".
- [15] ITU-T Recommendation H.248.41 (2006): "Gateway control protocol: IP domain connection package".
- [16] ITU-T Recommendation H.248.52 (2008) Amendment 1 (2009): "Gateway control protocol: QoS support packages".
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- [20] ITU-T Recommendation H.248.49 (2007): "Gateway control protocol: Session description protocol RFC and capabilities packages".
- [21] ITU-T Recommendation H.248.36 (2005): "Gateway control protocol: Hanging Termination Detection package".
- [22] ITU-T Recommendation H.248.47 (2008): "Gateway control protocol: Statistic conditional reporting package".
- [23] IETF RFC 4566: "SDP; Session Description Protocol".
- [24] IETF RFC 1123: "Requirements for Internet Hosts - Application and Support".
- [25] ITU-T Recommendation H.248.8: "Gateway control protocol: Error code and service change reason description".
- [26] IETF RFC 3605: "Real Time Control Protocol (RTCP) attribute in Session Description Protocol (SDP)".
- [27] ITU-T Recommendation H.248 Sub-series Implementors' Guide (2008): "Implementors' Guide for the H.248 Sub-series of Recommendations ("Media Gateway Control Protocol")".

## 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.

- [i.1] ETSI TS 102 333: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Gate control protocol".
- [i.2] ETSI TR 183 025 (V2.5.1): "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); H.248 Non-call related procedures and management system interaction".

- [i.3] IETF RFC 2327: "SDP: Session Description Protocol".
- [i.4] ETSI ES 282 001: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN Functional Architecture".
- [i.5] ITU-T Recommendation V.152: "Procedures for supporting voice-band data over IP networks".
- [i.6] IETF RFC 4301: "Security Architecture for the Internet Protocol".
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- [i.13] ETSI TS 183 048: "Telecommunications and Internet Converged Services and Protocols for Advanced Networking (TISPAN); Resource and Admission Control System (RACS); Protocol Signalling flows specification; RACS Stage 3".
- [i.14] 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.15] ITU-T H.Supp6 (Supplement 6 to ITU-T H-series Recommendations) (2006): "Decomposed gateways -Control load quantum - Busy hour context attempts (BHCa) and busy hour session attempts (BHSA)".
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## 3 Definitions and abbreviations

### 3.1 Definitions

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

**address:** term used for "network address" (a.k.a. IP address)

**BGF:** packet-to-packet gateway for user plane media traffic

NOTE 1: The BGF performs both policy enforcement functions and NA(P)T functions under the control of the SPDF.

NOTE 2: 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 [i.4]. The BGF has the "H.248 MG" role in the scope of this Profile.

**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 [i.1].

**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.

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.

**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 [8].

**port:** term used for "transport port" (a.k.a. L4 port)

**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  $\mu$ -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 [i.5].

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

**Transport Address:** term used for the combination of an Address and a Port

## 3.2 Abbreviations

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

ABNF	Augmented Backus-Naur Form
AC	Admission Control
AF	Application Function
AGW	Access GateWay
API	Application Programming Interface
AS	Application Specific
AVP	Attribute Value Pair
BGF	Border Gateway Function
BGW	Border GateWay
C-BGF	Core-BGF
CBR	Constant BitRate
CoAC	Context Admission Control
DSCP	Differentiated Services Code Point
GCP	Gate Control Protocol
HR	High Resolution (Report)
HW	HardWare
I-BGF	Interconnect-BGF
ID	IDentity
IP	Internet Protocol
IPsec	IP Security (RFC 4301)
L2VPN	Layer 2 Virtual Private Network
L3VPN	Layer 3 Virtual Private Network
LD	Local Descriptor (H.248)
LS	Local Source
MG	Media Gateway
MGC	Media Gateway Controller
MID	Message Identifier (H.248)
MP	Measurement Point
MPLS	Multi Protocol Label Switching
NA	Not Applicable
NAPT	Network Address and Port Translation
NAPT-PT	NAPT and Protocol Translation
NAT	Network Address Translation
NGN	Next Generation Network
PCI	Protocol Control Information
PHB	Per-Hop Behaviour
QoS	Quality of Service
RACS	Resource and Admission Control Subsystem
RD	Remote Descriptor (H.248)
RFC	Request For Comments (IETF)
RP	Reporting Point
RS	Remote Source
RTCP	RTP Control Protocol
RTP	Real-time Transport Protocol
RTSP	Real Time Streaming Protocol
SAF	Source Address Filtering
SAM	Source Address Mask
SBP	Service Based Policy
SCTP	Stream Control Transport Protocol
SDP	Session Description Protocol
SIP	Session Initiation Protocol
SPDF	Service Policy Decision Function
SPF	Source Port Filtering
SPR	(Remote) Source Port
SPRR	(Remote) Source Port Range
SSRC	Synchronization Source (Identifier)
StAC	Stream Admission Control