

# ETSI ES 283 018 V2.7.2 (2010-01)

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ETSI Standard

**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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## Reference

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# Contents

Intellectual Property Rights .....	8
Foreword.....	8
1 Scope .....	9
2 References .....	9
2.1 Normative references .....	9
2.2 Informative references.....	10
3 Definitions and abbreviations.....	11
3.1 Definitions.....	11
3.2 Abbreviations .....	13
4 Applicability.....	14
4.1 Architecture.....	14
4.2 Border Gateway Guidelines .....	14
5 Profile description .....	15
5.1 Profile identification.....	15
5.2 Summary .....	15
5.3 Gateway Control Protocol Version .....	15
5.4 Connection model.....	16
5.5 Context attributes .....	16
5.6 Terminations.....	16
5.6.1 Termination names .....	16
5.6.1.1 IP Termination .....	16
5.6.1.1.1 Overview and prose specification.....	16
5.6.1.1.2 Syntactical Specification .....	19
5.6.2 Multiplexed terminations .....	19
5.7 Descriptors .....	19
5.7.1 TerminationState descriptor.....	19
5.7.2 Stream descriptor .....	20
5.7.2.1 LocalControl descriptor .....	20
5.7.3 Events descriptor .....	20
5.7.4 EventBuffer descriptor.....	21
5.7.5 Signals descriptor.....	21
5.7.6 DigitMap descriptor.....	22
5.7.7 Statistics descriptor.....	22
5.7.8 ObservedEvents descriptor .....	22
5.7.9 Topology descriptor.....	22
5.7.10 Error descriptor.....	23
5.8 Command API.....	23
5.8.1 Add .....	24
5.8.2 Modify .....	24
5.8.3 Subtract.....	24
5.8.4 Move.....	25
5.8.5 AuditValue.....	25
5.8.6 AuditCapabilities .....	25
5.8.7 Notify.....	25
5.8.8 ServiceChange .....	25
5.8.9 Manipulating and auditing context attributes.....	26
5.9 Generic command syntax and encoding.....	26
5.10 Transactions .....	27
5.11 Messages .....	27
5.12 Transport .....	27
5.13 Security .....	28
5.14 Packages.....	28
5.14.1 Overview .....	28

5.14.2	Package usage information .....	29
5.14.2.1	Generic (g) .....	29
5.14.2.2	Base root (root) .....	30
5.14.2.3	Network (nt) .....	31
5.14.2.4	Differentiated Services (ds).....	32
5.14.2.5	Gate Management (gm).....	33
5.14.2.6	Traffic management (tman).....	34
5.14.2.7	IP NAPT Traversal (ipnapt).....	34
5.14.2.8	MPLS (mpls).....	35
5.14.2.9	VLAN (vlan).....	35
5.14.2.10	MGC Information (mgcinfo).....	36
5.14.2.11	Inactivity (it) .....	36
5.14.2.12	Segmentation (seg).....	37
5.14.2.13	RTP (rtp) .....	38
5.14.2.14	Application Data Inactivity Detection (adid) .....	38
5.14.2.15	IP Domain Connection (ipdc) .....	39
5.14.2.16	Media Gateway Overload Control (ocp).....	39
5.14.2.17	Hanging Termination Detection (hangterm) .....	40
5.14.2.18	Statistic Conditional Reporting (scr).....	40
5.15	Mandatory support of SDP and annex C information elements .....	41
5.16	Optional support of SDP and annex C information elements.....	42
5.17	Overview of Procedures .....	43
5.17.1	Overview of Session Dependent Procedures .....	43
5.17.1.1	Gate control.....	44
5.17.1.2	Allocation and translation of IP addresses, ports and versions (NAPT-PT) .....	46
5.17.1.3	Support of Hosted NAT Traversal .....	47
5.17.1.4	QoS marking .....	47
5.17.1.4.1	Copying DSCP/ToS values from the ingress to egress.....	47
5.17.1.4.2	Auditing the "Per-Hop Behaviour" .....	47
5.17.1.5	Bandwidth control - Reservation, Allocation and Policing.....	47
5.17.1.5.1	Admission Control.....	48
5.17.1.5.2	Traffic Descriptor.....	48
5.17.1.5.3	Bandwidth reservation and allocation .....	48
5.17.1.5.4	Bandwidth policing .....	49
5.17.1.5.5	Non-specification of <i>tman</i> properties .....	49
5.17.1.6	Usage metering and statistics reporting.....	49
5.17.1.6.1	Statistics for Media/Transport-agnostic IP packets .....	49
5.17.1.6.2	Traffic Volume related Statistics.....	49
5.17.1.7	RTCP Handling.....	50
5.17.1.7.1	RTCP Transport Address Allocation.....	50
5.17.1.7.2	RTP/RTCP to-H.248 Stream Mapping.....	51
5.17.1.8	RTCP Forwarding.....	51
5.17.1.8.1	Conditions for RTCP packet policing.....	51
5.17.1.8.2	Forwarding of regular RTCP traffic .....	51
5.17.1.8.3	Handling of RTCP XR/HR traffic .....	51
5.17.1.9	Media Inactivity .....	51
5.17.1.10	IP Realm/Domain Indication.....	52
5.17.1.10.1	Codepoint and format/encoding .....	52
5.17.1.10.2	Unsuccessful indication.....	52
5.17.1.10.3	Fix assignment per termination lifetime .....	52
5.17.1.10.4	Number of IP Realms/Domains.....	52
5.17.1.11	Two-Stage BGF Resource Reservation.....	53
5.17.1.12	Hanging Termination Detection.....	53
5.17.1.13	Real Time Statistics Reporting.....	54
5.17.1.14	Transcoding.....	54
5.17.1.14.1	Media types and formats (Codecs) .....	54
5.17.1.14.2	Decision for transcoding.....	54
5.17.1.15	Void.....	54
5.17.1.16	VPN identification .....	55
5.17.1.16.1	VLAN marking.....	55
5.17.2	Overview of Session Independent Procedures.....	55
5.17.2.1	Introduction - Relation to TS 183 025.....	55

5.17.2.2	Session-independent procedures .....	55
5.17.2.3	MG Overload Control: Rate limitation of H.248 Messages from MGC-to-MG .....	55
5.18	Session Dependent Procedures (Command Level Details) .....	55
5.18.1	Add Termination.....	56
5.18.1.1	Add Termination - Remote Addr and Port Known, Select Local Addr and Port .....	57
5.18.1.1.1	Conditions for Address Policing: SAF, SPF, SAM, SPR, SPRR .....	59
5.18.1.1.2	Assigning IP Domain/Realm to Termination .....	60
5.18.1.1.3	Add Termination - Remote Addr and Port Known, Select Local Addr and Port - Examples.....	61
5.18.1.2	Add Termination - Select Local Addr and Port.....	62
5.18.1.2.1	Add Termination - Select Local Addr and Port - Examples .....	65
5.18.1.3	Add Termination - Remote Addr Known, Select Local Addr.....	66
5.18.1.3.1	Add Termination - Remote Addr Known, Select Local Addr - Examples .....	68
5.18.1.4	Add Termination - Select Local Addr .....	69
5.18.1.4.1	Add Termination - Select Local Addr - Examples .....	70
5.18.1.5	Add Termination - Remote Addr Known and Port Possibly Known, no Local Addr and Port.....	71
5.18.1.5.1	Add Termination - Remote Addr Known and Port Possibly Known, no Local Addr and Port - Examples .....	72
5.18.2	Session Establishment Update .....	72
5.18.2.1	Session Establishment Update - Remote Addr and Port Known.....	73
5.18.2.1.1	Session Establishment Update - Remote Addr and Port Known - Examples .....	75
5.18.2.2	Session Establishment Update - Remote Addr Known .....	78
5.18.2.2.1	Session Establishment Update - Remote Addr Known - Examples .....	79
5.18.2.3	Session Establishment Update - Through Connect .....	80
5.18.2.3.1	Session Establishment Update - Through Connect - Examples.....	82
5.18.2.4	Session Establishment Update - Select Local Port.....	83
5.18.2.4.1	Session Establishment Update - Select Local Port - Examples .....	86
5.18.2.5	Session Establishment Update - Bandwidth Change.....	87
5.18.2.5.1	Session Establishment Update - Bandwidth Change - Examples .....	89
5.18.2.6	Session Establishment Update - Delete Stream.....	89
5.18.2.6.1	Session Establishment Update - Delete Stream - Examples .....	92
5.18.3	Mid-Session Update.....	92
5.18.3.1	Mid-Session Update - Bandwidth Change .....	92
5.18.3.1.1	Mid-Session Update - Bandwidth Change - Examples.....	95
5.18.3.2	Mid-Session Update - Media Change .....	96
5.18.3.2.1	Mid-Session Update - Media Change - Examples.....	98
5.18.3.3	Mid-Session Update - Remote Addr/Port Change .....	99
5.18.3.3.1	Mid-Session Update - Remote Addr/Port Change - Examples.....	102
5.18.3.4	Mid-Session Update - Add Stream, Remote Addr and Port Known .....	103
5.18.3.4.1	Mid-Session Update - Add Stream, Remote Addr and Port Known - Examples.....	105
5.18.3.5	Mid-Session Update - Add Stream.....	107
5.18.3.5.1	Mid-Session Update - Add Stream - Examples .....	109
5.18.3.6	Mid-Session Update - Delete Stream .....	110
5.18.3.6.1	Mid-Session Update - Delete Stream - Examples .....	111
5.18.3.7	Mid-Session Update - Add Stream, Remote Addr Known and Port Possibly Known, no Local Addr and Port.....	114
5.18.3.7.1	Mid-Session Update - Add Add Stream, Remote Addr Known and Port Possibly Known, no Local Addr and Port - Examples .....	115
5.18.4	Auditing .....	116
5.18.4.1	Mid-Session Statistics Audit .....	116
5.18.4.1.1	Mid-Session Statistics Audit - Example .....	117
5.18.4.2	Mid-Session MGC Info Audit.....	118
5.18.4.2.1	Mid-Session MGC Info Audit - Example.....	119
5.18.5	Notification of MG Events .....	119
5.18.5.1	Notification of IP Media Stop .....	119
5.18.5.2	Notification of Hanging Termination.....	120
5.18.5.3	Notification of Statistic Conditional Reporting.....	121
5.18.6	Delete Session/Termination .....	122
5.18.6.1	Delete Session/Termination .....	122
5.18.6.1.1	Delete Session/Termination - Examples.....	123
5.18.6.2	Delete Session/Termination - Wildcarded Reply .....	126
5.18.6.2.1	Delete Session - Wildcarded Reply - Examples .....	126
5.19	Non-Session Related Use Cases.....	126

5.19.1	Enable MG	127
5.19.1.1	Enable MG (at MGC)	127
5.19.1.2	Enable MG (at MG)	127
5.19.1.2.1	Enable MG (at MG): Cold Boot	128
5.19.1.2.2	Enable MG (at MG): Warm Boot	129
5.19.2	Enable MGC	130
5.19.3	Disable MG (Graceful)	130
5.19.3.1	Disable MG (Graceful) (at MGC)	130
5.19.3.2	Disable MG (Graceful) (at MG)	131
5.19.4	Disable MG (Immediate)	131
5.19.4.1	Disable MG (Immediate) (at MGC)	131
5.19.4.2	Disable MG (Immediate) (at MG)	132
5.19.5	Disable MGC	132
5.19.6	Enable Termination	132
5.19.7	Disable Termination (Graceful)	132
5.19.8	Disable Termination (Immediate) (at MG)	132
5.19.9	MG Failure and Recovery	133
5.19.10	MG Termination Failure and Recovery	133
5.19.11	MGC Failure and Recovery	134
5.19.12	User Plane Failure	134
5.19.13	MGC-MG Control Association Failure and Recovery	135
5.19.14	MG Overload	137
5.19.15	MGC Overload	138
5.19.16	MGC Hand-Off	138
5.19.17	MGC Re-Direct	138
5.19.18	MG Failover	139
5.20	Session Independent Procedures (Command Level Details)	139
5.20.1	MG Registration (Cold Boot)	140
5.20.2	MG Restoration	141
5.20.3	Packages Audit	141
5.20.4	Context Audit	142
5.20.5	MG Termination Available	143
5.20.6	MG Termination Unavailable	143
5.20.7	Audit Termination State	144
5.20.8	Set ROOT Termination Events/Properties	144
5.20.9	MGC Initiated Service Restoration	145
5.20.10	Check MG Availability	145
5.20.11	MG Service Cancellation (Graceful)	146
5.20.12	MG Service Cancellation (Immediate)	146
5.20.13	MGC Hand-Off	147
5.20.14	MG Re-Registration (Hand-Off)	148
5.20.15	MG Termination OOS Graceful	148
5.20.16	MGC Overload Notification	148
5.20.17	Registration Redirect	149
5.20.18	User Plane Failure	150
5.20.19	ROOT Event Notification	151
5.20.20	MG Lost Communication (Disconnected)	151
5.20.21	MG Lost Communication (Failover)	152
5.20.22	MG Redundant Takeover (Primary)	152
5.20.23	Void	153
5.20.24	MG Re-Registration (Restart)	153
5.20.25	Wildcarded Subtract	153
5.20.26	MG Redundant Takeover (Secondary)	154
5.20.27	MGC Initiated Service Cancellation	154
5.20.28	Audit Service State	154
5.20.29	Audit ROOT Properties	154

## **Annex A (informative): Illustration of Gate/Pinhole Concept .....155**

A.1	General	155
A.2	Relationships between gates and H.248 Streams	155

<b>Annex B (informative):</b>	<b>Comparison between ES 283 018 V1.1.4 (Ia Profile Version 1) and TS 102 333 (GCP) .....</b>	<b>156</b>
B.1	General .....	156
B.2	Differences between TS 102 333 (GCP) and ES 283 018 V1.1.4 (Ia Profile Version 1).....	156
<b>Annex C (informative):</b>	<b>Comparison with Ia Profile Version 1 .....</b>	<b>157</b>
C.1	General .....	157
C.2	Differences between ES 283 018 V1.1.4 (Ia Profile Version 1) and ES 283 018 V2.7.1 (Ia Profile Version 2).....	157
<b>Annex D (informative):</b>	<b>Illustration of an IP processing model for an H.248 (IP, IP) Context.....</b>	<b>159</b>
D.1	Example model.....	159
D.2	Aspects of filter interaction .....	161
D.2.1	Interaction between address latching and address policing .....	161
<b>Annex E (informative):</b>	<b>Guidelines for Ia-to-Gq' mapping .....</b>	<b>163</b>
E.1	Guidelines for Ia-to-Gq' mapping with regards to session-independent procedures.....	163
E.1.1	Introduction .....	163
E.1.2	Mapping guidelines .....	163
E.1.2.1	Session-dependent procedures .....	163
E.1.2.2	Session-independent procedures .....	164
E.2	Guidelines for Ia-to-Gq' mapping with regards to bearer-specific events.....	164
E.2.1	Introduction .....	164
E.2.2	Mapping guidelines .....	165
E.2.2.1	Guidelines for <i>Specific Action</i> AVPs.....	165
E.2.2.2	Other AVPs.....	165
<b>Annex F (informative):</b>	<b>Bibliography .....</b>	<b>166</b>
<b>Annex G (informative):</b>	<b>Change history .....</b>	<b>167</b>
History .....		168



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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 [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.

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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".
- [3] ITU-T Recommendation H.248.45 (2006): "Gateway control protocol: MGC information package".
- [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".
- [17] ITU-T Recommendation H.248.43 (2008): "Gateway control protocol: Packages for gate management and gate control".
- [18] ITU-T Recommendation H.248.53 (2008) Revision 1 (2009): "Gateway control protocol: Traffic management packages".
- [19] 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".
- [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 TS 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".
- [i.7] ITU-T Recommendation H.248.18: "Gateway control protocol: Package for support of multiple profiles".
- [i.8] IETF RFC 3550: "RTP: A Transport Protocol for Real-Time Applications".
- [i.9] IEEE 802.3 Ethernet Working Group.
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- [i.11] ITU-T Recommendation Y.1541 (2006): "Network performance objectives for IP-based services".
- [i.12] ETSI TS 181 005: "Telecommunications and Internet Converged Services and Protocols for Advanced Networking (TISPAN); Service and Capability Requirements".
- [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)".
- [i.16] IETF RFC 4145: "TCP-Based Media Transport in the Session Description Protocol (SDP)".

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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 [i.6])
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