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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Infrastructure of audiovisual services – Communication procedures

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Gateway control protocol: Guidelines on the use of the international emergency preference scheme (IEPS) call indicator and priority indicator in ITU-T H.248 profiles

Recommendation ITU-T H.248.81

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Recommendation ITU-T H.248.81

Gateway control protocol: Guidelines on the use of the international emergency preference scheme (IEPS) call indicator and priority indicator in ITU-T H.248 profiles

Summary

Recommendation ITU-T H.248.81 provides guidelines on the use of the international emergency preference scheme (IEPS) call indicator and priority indicator in ITU-T H.248 profiles for ITU-T H.323 and NGN systems. These guidelines may be used by other standards development organizations (SDOs) when defining their profiles in support of priority services, e.g., the emergency telecommunications service (ETS) and the multimedia priority service (MPS).

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T H.248.81	2011-05-14	16

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

INTELLECTUAL PROPERTY RIGHTS

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at http://www.itu.int/ITU-T/ipr/.

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1 Scope

[ITU-T H.248.1] defines the international emergency preference scheme (IEPS) call indicator and priority indicator in support of priority services, e.g., the emergency telecommunications service (ETS) and the multimedia priority service (MPS). Use of the IEPS call indicator and priority indicator, as defined in [ITU-T H.248.1], satisfies the ETS requirements of indicating an ETS context and carrying the priority level.

Any prioritization of ITU-T H.248 procedures in the media gateway controller (MGC) and the transport of ITU-T H.248 control signalling towards the media gateway (MG) is based on the identification of ETS.

The IEPS call indicator, identifying an ETS call/session, indicates to the MG that the context is an ETS context and enables prioritization of ITU-T H.248 control signalling once received. In addition, it enables prioritized resource allocation in the MG for an ETS context.

The priority indicator, carrying the priority level, provides the MG with a means to distinguish different priority handling of resources on the MG when ETS is used.

This Recommendation provides guidelines on the use of the IEPS call indicator and priority indicator in ITU-T H.248 profiles for [ITU-T H.323] and NGN systems. These guidelines may be used by other standards development organizations (SDOs) when defining their ITU-T H.248.1 profiles in support of priority services (e.g., ETS and the MPS). Further details on how these guidelines are used by other networks are outside the scope of this Recommendation. It is up to other SDOs to decide their use when defining their profiles.

ETS and IEPS are defined in [ITU-T E.107] and [ITU-T E.106], respectively. ETS and IEPS involve authority-to-authority communication. The emergency indicator, as defined in [ITU-T H.248.1], is used for identification of emergency calls (i.e., individual-to-authority communication). The IEPS call indicator is used for the identification of a priority call/session (e.g., ETS call/session, IEPS call/session), allowing differentiation from an emergency call/session. The specification of profile procedures for the emergency indicator is outside the scope of this Recommendation.

National regulators may implement ETS in various ways. This Recommendation describes an implementation where the IEPS call indicator and priority indicator are supported.

NOTE 1 – National, regional or local emergency and public safety services, where an individual from the general public is seeking assistance (i.e., individual-to-authority communication), are outside the scope of this Recommendation.

NOTE 2 – [b-ITU-T Q-Sup.53] provides the signalling requirements to support the IEPS. It is also applicable for ITU-T H.248 entities, but does not indicate any requirement in addition to clause 7.

NOTE 3 – [b-ITU-T Q-Sup.57] provides the signalling requirements to support the ETS in IP networks. It is also applicable for ITU-T H.248 entities, but does not indicate any requirement in addition to clause 7.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T E.106] Recommendation ITU-T E.106 (2003), *International Emergency Preference Scheme (IEPS) for disaster relief operations.*

[ITU-T E.107] Recommendation ITU-T E.107 (2007), *Emergency Telecommunications Service (ETS) and interconnection framework for national implementations of ETS.*

[ITU-T H.225.0] Recommendation ITU-T H.225.0 (2009), *Call signalling protocols and media stream packetization for packet-based multimedia communication systems.*

[ITU-T H.248.1] Recommendation ITU-T H.248.1 (2005), *Gateway control protocol: Version 3, including its Amendment 2* (2009).

[ITU-T H.248.4] Recommendation ITU-T H.248.4 (2009), *Gateway control protocol: Transport over Stream Control Transmission Protocol (SCTP).*

[ITU-T H.248.10] Recommendation ITU-T H.248.10 (2001), *Gateway control protocol: Media gateway resource congestion handling package.*

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

[ITU-T H.248.32] Recommendation ITU-T H.248.32 (2005), *Gateway control protocol: Detailed congestion reporting package.*

[ITU-T H.248.52] Recommendation ITU-T H.248.52 (2008), *Gateway control protocol: QoS support packages.*

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

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

[ITU-T H.248.63] Recommendation ITU-T H.248.63 (2009), *Gateway control protocol: Resource management packages.*

[ITU-T H.323] Recommendation ITU-T H.323 (2009), *Packet-based multimedia communications systems*.

[ITU-T Q.1950] Recommendation ITU-T Q.1950 (2002), *Bearer independent call bearer control protocol*.

[ITU-T Q.1950 Amd.1] Recommendation ITU-T Q.1950 (2002) Amendment 1 (2006), *New Annex G – Call bearer control – International Emergency Preference Scheme.*

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following term defined elsewhere:

3.1.1 emergency telecommunications service (ETS) [ITU-T E.107]: A national service providing priority telecommunications to the ETS authorized users in times of disaster and emergencies.

3.2 Terms defined in this Recommendation

This Recommendation defines the following term:

3.2.1 subject to profile specification: When used, this term indicates that the ITU-T H.248 profile template section requires further specification by a profile specification.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations:

DSCP	DiffServ Code Point
ETS	Emergency Telecommunications Service
IEPS	International Emergency Preference Scheme
IP	Internet Protocol
ISUP	ISDN User Part
LSP	Label Switched Path
Lx	Layer number
MG	Media Gateway
MGC	Media Gateway Controller
MLPP	Multi-Level Precedence and Pre-emption
MPLS	Multi-Protocol Label Switching
MPS	Multimedia Priority Service
N/A	Not Applicable
NGN	Next Generation Network
PHB	Per-Hop Behaviour
QoS	Quality of Service
RPH	Resource Priority Header
SCTP	Stream Control Transport Protocol
SDO	Standard Development Organization
SDP	Session Description Protocol
SIP	Session Initiation Protocol
VPN	Virtual Private Network

5 Conventions

This Recommendation uses the term "ETS" according to [ITU-T E.107]. When the term "ETS" is used in this Recommendation, it also means other authority-to-authority priority services that may be using terminology other than ETS (e.g., IEPS, MPS, etc.).

6 Relation to other ITU-T Recommendations

The purpose of this clause is to identify possible relations (or not) to other ITU-T Recommendations and past work on ITU-T H.248 profiles.

6.1 Recommendation ITU-T E.106: International emergency preference scheme for disaster relief operations

There is a link between [ITU-T E.106] and [ITU-T E.107] by a reference from [ITU-T E.107], clause 7, item e) to [ITU-T E.106], indicating that "*IEPS could be used in such a scenario for interconnection of ETS national implementations*".

6.2 Recommendation ITU-T Q.1950 Annex F: Call bearer control – Emergency call indication

[ITU-T Q.1950], Annex F defines call-dependent procedures for emergency call indication, based on the ITU-T H.248 Context Attribute *Emergency Indicator*. This property is not required for applications in the scope of this Recommendation.

6.3 Recommendation ITU-T Q.1950 Annex G: Call bearer control – International emergency preference scheme

[ITU-T Q.1950 Amd.1], Annex G defines call-dependent procedures for IEPS call indication, based on the ITU-T H.248 Context Attribute *IEPS Call Indicator*. These procedures may provide guidance for profile definitions based on this Recommendation (i.e., not [ITU-T Q.1950] related). See also clause 8.17.

7 Functional requirements

The media gateway controller (MGC) and media gateway (MG) may support ETS as specified in [ITU-T E.107]. If ETS is supported and the call/session is an ETS call/session:

- Upon receipt of the priority information (e.g., priority indication and priority level) in call control signalling, the MGC shall provide the MG with the IEPS call indicator and possibly the priority indicator. The priority indicator shall be sent to the MG if a priority level is received in call control signalling.
- If the MGC provides the priority indicator, the MG shall determine from the priority indicator the level of priority to a context and associated resources/connections.
- The priority level received from call-control signalling by the MGC may be overwritten based on local policy.
- The MGC may include a default priority level in the priority indicator if the priority level is not received in call-control signalling. A default priority level is based on policy and provisioned in the MGC. This is national specific, and the policy may require default priority level information to be stored in the MGC.
- The MGC shall apply priority to ITU-T H.248 signalling. An MGC may apply priority handling to ITU-T H.248 transactions related to the priority context, e.g., preferential treatment in any queues or buffers. Where the control association utilizes a transport with the possibility for prioritization (e.g., SCTP), the MGC would use the appropriate prioritization procedures.

- When the MGC marks the context with the IEPS call indicator and, optionally, the priority indicator, the MG shall apply priority treatment to ETS traffic (control signalling and media packets) associated with the context.

NOTE – Since ETS is a national feature, mapping of the SIP resource priority header (RPH), [ITU-T H.225.0] "priorityExtension", or ISUP IEPS call information to the ITU-T H.248.1 priority level is a regional/national matter. See [b-ITU-T H-Sup.9] for more information.

8 ITU-T H.248 profile specification guidelines

This clause provides guidelines for ITU-T H.248 profile specifications. The structure follows the profile template according to Appendix III of [ITU-T H.248.1].

The template elements which are not applicable in this Recommendation are indicated by "*Subject to profile specification*".

8.1 Profile identification

Subject to profile specification.

8.2 Summary

Subject to profile specification.

8.3 Gateway control protocol version

The applicable version of the gateway control protocol is ITU-T H.248.1, Version 3 [ITU-T H.248.1].

NOTE – ITU-T H.248.1 version 3 is required for the support of the IEPS call indicator in the profile.

8.4 Connection Model

Maximum number of contexts:	N/A
Maximum number of terminations per context:	N/A
Allowed termination type combinations in a context:	Context (one or more IP terminations)

NOTE – The scope of this Recommendation is only applicable to ITU-T H.248 gateways in IP networks.

8.5 Context Attributes

Context Attribute	Supported	Values Supported
Topology	Unspecified	See clause 8.7.8
Priority Indicator	Optional (Notes 1, 2)	1-15
Emergency Indicator	*Subject to profile specification* (Note 3)	N/A
IEPS Call Indicator	Yes	N/A
ContextAttribute Descriptor	*Subject to profile specification*	N/A
ContextIDList Parameter	*Subject to profile specification*	N/A

Is the AND/OR Select operation Context Attribute supported?

AND/OR Context Attribute	*Subject to profile specification*	N/A

NOTE 1 – If the priority indicator is not signalled, a default value may be assumed at the MG.

NOTE 2 – If the priority value is not received in call control signalling, a default value may be included in the priority indicator.

NOTE 3 – The use of the emergency indicator is outside the scope of this Recommendation. However, it may be used by profiles using the guidelines in this Recommendation. The emergency indicator is not used to indicate ETS.

8.6 Terminations

Subject to profile specification.

NOTE – The use of ETS does not have implications on terminations other than those terminations that must relate to IP networks. This is covered in clause 8.4 above.

8.7 Descriptors

8.7.1 Stream descriptor

Subject to profile specification.

NOTE – The use of ETS does not have implications on this descriptor.

8.7.2 Events descriptor

Subject to profile specification.

NOTE – The use of ETS does not have implications on this descriptor.

8.7.3 EventBuffer descriptor

Subject to profile specification.

NOTE – The use of ETS does not have implications on this descriptor.

8.7.4 Signals descriptor

Subject to profile specification.

NOTE – The use of ETS does not have implications on this descriptor.

8.7.5 DigitMap descriptor

Subject to profile specification.

NOTE – The use of ETS does not have implications on this descriptor.

8.7.6 Statistics descriptor

Subject to profile specification.

NOTE – The use of ETS does not have implications on this descriptor.

8.7.7 ObservedEvents descriptor

Subject to profile specification.

NOTE – The use of ETS does not have implications on this descriptor.

8.7.8 Topology descriptor

Subject to profile specification.

NOTE – The use of ETS does not have implications on this descriptor.

8.7.9 Error descriptor

Which ITU-T H.248.8 and package defined error codes are supported?

Error codes sent by the MGC:

Supported ITU-T H.248.8 Error Codes:	*Subject to profile specification*
Supported Error Codes defined in packages:	*Subject to profile specification*

Error codes sent by the MG:

Supported ITU-T H.248.8 Error Codes:	All ITU-T H.248.8 error codes or a list of the individual error code numbers
Supported Error Codes defined in packages:	*Subject to profile specification*

8.8 Command API

NOTE – It is assumed that an error descriptor may be returned in any command reply.

8.8.1 Add

The ContextAttribute descriptor containing the priority and IEPS call indicators will be used in conjunction with an Add command. The use of other descriptors is "*Subject to profile specification*".

NOTE – In order to signal the IEPS call indicator and priority indicator, the ContextAttribute descriptor must accompany a command.

8.8.2 Modify

The ContextAttribute descriptor containing the IEPS call indicator and priority indicator will be used in conjunction with a Modify command. The use of other descriptors is "*Subject to profile specification*".

NOTE – In order to signal the IEPS call indicator and priority indicator, the ContextAttribute descriptor must accompany a command.

8.8.3 Subtract

Subject to profile specification.

NOTE – No statistics are associated with the ETS, thus no impact is envisaged on this command.

8.8.4 Move

The ContextAttribute descriptor containing the IEPS call indicator and priority indicator will be used in conjunction with a Move command. The use of other descriptors is "*subject to profile specification*".

NOTE – In order to signal the IEPS call indicator and priority indicator, the ContextAttribute descriptor must accompany a command.

8.8.5 AuditValue

Subject to profile specification.

NOTE – No statistics are associated with the ETS, thus no impact is envisaged on this command. Clause 8.8.9 deals with auditing context attributes.

8.8.6 AuditCapabilities

Subject to profile specification.

NOTE – No statistics are associated with the ETS, thus no impact is envisaged on this command. Clause 8.8.9 deals with auditing context attributes.

8.8.7 Notify

Subject to profile specification.

NOTE – No events are associated with the ETS, thus no impact is envisaged on this command.

8.8.8 ServiceChange

This clause is "*subject to profile specification*" with the exception of parameter ServiceChange Version.

Which version of ITU-T H.248.1 is used by ServiceChangeVersion? The lowest value here should be the minimum version defined in clause 8.3.

Version used in ServiceChangeVersion:	3

NOTE – As the IEPS call indicator was added to ITU-T H.248.1v3, this version must be offered in a ServiceChange. While the IEPS call indicator and priority indicator have no direct impact on ServiceChange procedures, the values of these indicators may be taken into account. If the MG needs to change the ServiceState of a termination(s), it should consider whether the termination is related to a context that is ETS marked.

8.8.9 Manipulating and auditing context attributes

Which context attributes may be manipulated and/or audited?

Context attributes manipulated:	Priority indicator, IEPS call indicator Other context attributes are "*subject to profile specification*".
Context attributes audited:	Priority indicator, IEPS call indicator Other context attributes are "*subject to profile specification*".

8.9 Generic command syntax and encoding

Subject to profile specification.

NOTE – ETS has no impact on encoding.

8.10 Transactions

Subject to profile specification.

NOTE – ETS has no impact on transactions other than those transactions that relate to a context that has the IEPS call indicator and priority indicator set which may receive preferential handling.

8.11 Messages

Subject to profile specification.

NOTE – ETS has no impact on the number of transaction per message.

8.12 Transport

Subject to profile specification.

NOTE – ETS does not mandate any particular ITU-T H.248 transport modes. However, given the nature of these services, profile specifications should consider the use of a transport that provides priority handling.

8.13 Security

Subject to profile specification.

NOTE – ETS has no impact on ITU-T H.248 transport security.

8.14 Packages

Although ITU-T H.248.81 does not mandate any ITU-T H.248 package for profile specifications that are based on this Recommendation, there might be some useful packages for supporting ETS. The following is a non-exhaustive list of available ITU-T H.248 capabilities:

– ITU-T H.248 transport:
  - [ITU-T H.248.4] for SCTP-based transport

– ITU-T H.248 MG overload control:
  - [ITU-T H.248.11], and [ITU-T H.248.10]
– ITU-T H.248 MG resource congestion control in general:
  - [ITU-T H.248.32]
– ITU-T H.248 MG resource management support:
  - [ITU-T H.248.63]
– Bearer network related "QoS concepts" support:
  - [ITU-T H.248.52] in case of IP differentiated services and IP header "QoS tagging" in general
  - [ITU-T H.248.54] in case of MPLS-based QoS support
  - [ITU-T H.248.56] in case of VPN-based QoS support.

The use of the above Recommendations has not been taken into account in the definition of this profile specification guide.

NOTE – The above Recommendations contain many different properties, signals, and events. However, as they are optional, to simplify the definition of this profile specification guideline, these impacts are not listed.

8.15 Mandatory support of SDP and ITU-T H.248.1 Annex C information elements

Subject to profile specification.

NOTE – ETS has no impact on SDP or ITU-T H.248.1 Annex C elements.

8.16 Optional support of SDP and ITU-T H.248.1 Annex C information elements

Subject to profile specification.

NOTE **–** ETS has no impact on SDP or ITU-T H.248.1 Annex C elements.

8.17 Procedures

8.17.1 ETS Context

When an MGC determines that the call/session is an ETS call/session based on the priority information (e.g., priority indicator and priority level) received in call-control signalling, the MGC shall send the IEPS call indicator and possibly the priority indicator with the appropriate priority value to the MG. The priority indicator shall be sent to the MG if a priority level is received in call control signalling. The IEPS call indicator indicates to the MG that the context is associated with an ETS call/session. The priority indicator provides the MG with information about a certain prioritization level to be used for resources/connections for the indicated context. Both the IEPS call indicator, and possibly the priority indicator, are used to trigger appropriate priority treatment at an MG for an ETS call/session. If the priority level is not available, a default value may be included in the priority indicator.

The "ETS Context" procedure may be used in conjunction with other profile-defined procedures.

NOTE 1 – Since ETS is a national feature, the mapping between the call-control signalling (e.g., SIP, [ITU-T H.225.0], and ISUP) and the ITU-T H.248.1 priority level is a regional/national matter. See [b-ITU-T H-Sup.9] for more information.

Upon receipt of the IEPS call indicator, and possibly the priority indicator, the MG shall mark the contexts accordingly and apply priority treatment to media packets that are related to an ETS call/session. Example traffic management mechanisms that can be used to provide priority treatment for ETS traffic (signalling and media packets) include packet marking (DiffServ) and per-hop behaviour (PHB), bandwidth reservation and allocation using various types of

multi-protocol label switching (MPLS) networks (e.g., DiffServ-aware MPLS, reserved LSPs for ETS traffic), queuing of an ETS call/session, etc.

NOTE 2 – Appendix I discusses a traffic model example for decomposed gateways. Physical realization is "*Subject to profile specification*".

Figure 1 illustrates an example signalling flow for creating an ITU-T H.248 context with ETS-specific information. For simplicity, only the ITU-T H.248 signalling message impacted by ETS is shown. If priority is honoured, the Add.Response message provides a confirmation that the MG shall apply the priority treatment. If the priority handling cannot be honoured by the MG, the Add.Response message shall include the appropriate error code based on the reason why priority could not be applied.

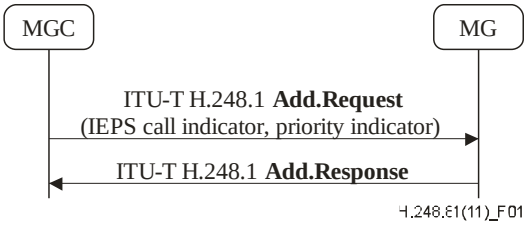

Figure 1 – MGC and MG interaction for an ETS call/session

Appendix I

Overall example traffic model for decomposed gateways

(This appendix does not form an integral part of this Recommendation.)

It is expected that ETS (priority) services will be supported by functions (which are typically out of the scope of ITU-T H.248 Recommendations), like precedence handling, priority treatment, local policies, traffic-management mechanisms, etc. This appendix provides an example of an overall traffic model as complementary information. The purpose of this model is to indicate "gateway components" that are relevant for "priority traffic handling" and to structure the "ITU-T H.248 gateway" in suitable sub-models.

This appendix highlights potential areas of the entire decomposed gateways that may have relevance to priority call handling in a specific environment. The entire "picture" might be worth of consideration, depending on the particular use case. This appendix does not provide any guidelines; rather, it is assumed that the specific support of ETS priority services is up to application-specific ITU-T H.248 profile definitions, which may then specify functional behaviour at a level beyond the scope of [ITU-T H.248.81].

I.1 Overview

I.1.1 Introduction

Priority call handling as such affects multiple areas in a decomposed gateway due to the distributed architecture and the involvement of many components. "Priority" in general is related to some ITU-T H.248 context attributes (e.g., emergency indicator, priority indicator, and IEPS call indicator) that indicate a specific handling of bearer traffic across the corresponding ITU-T H.248 context. Although in this Recommendation "Priority" relates to the combination of the IEPS call indicator and the priority indicator, this does not restrict the model itself.

There is also a possible relation to the selected policy and QoS architectures of the bearer network, at least in the case of packet-switched networks.

The proposed model may help to identify:

– *which* resource component types would be affected;

– *how* priority call support appears for such resources; and

– indicate possible *interactions* (concerning the above entire set of ITU-T H.248 context attributes).

I.1.2 Overall model

Figure I.1 illustrates a model which is an extension of the traffic model from Appendix II "*Basic traffic models for ITU-T H.248 systems*" in [b-ITU-T H-Sup.6]. Priority handling not only affects bearer traffic (user plane), but also signalling traffic (control plane); therefore, a *combined control/user plane model* is required (e.g., clause II.3 of [b-ITU-T H-Sup.6]).

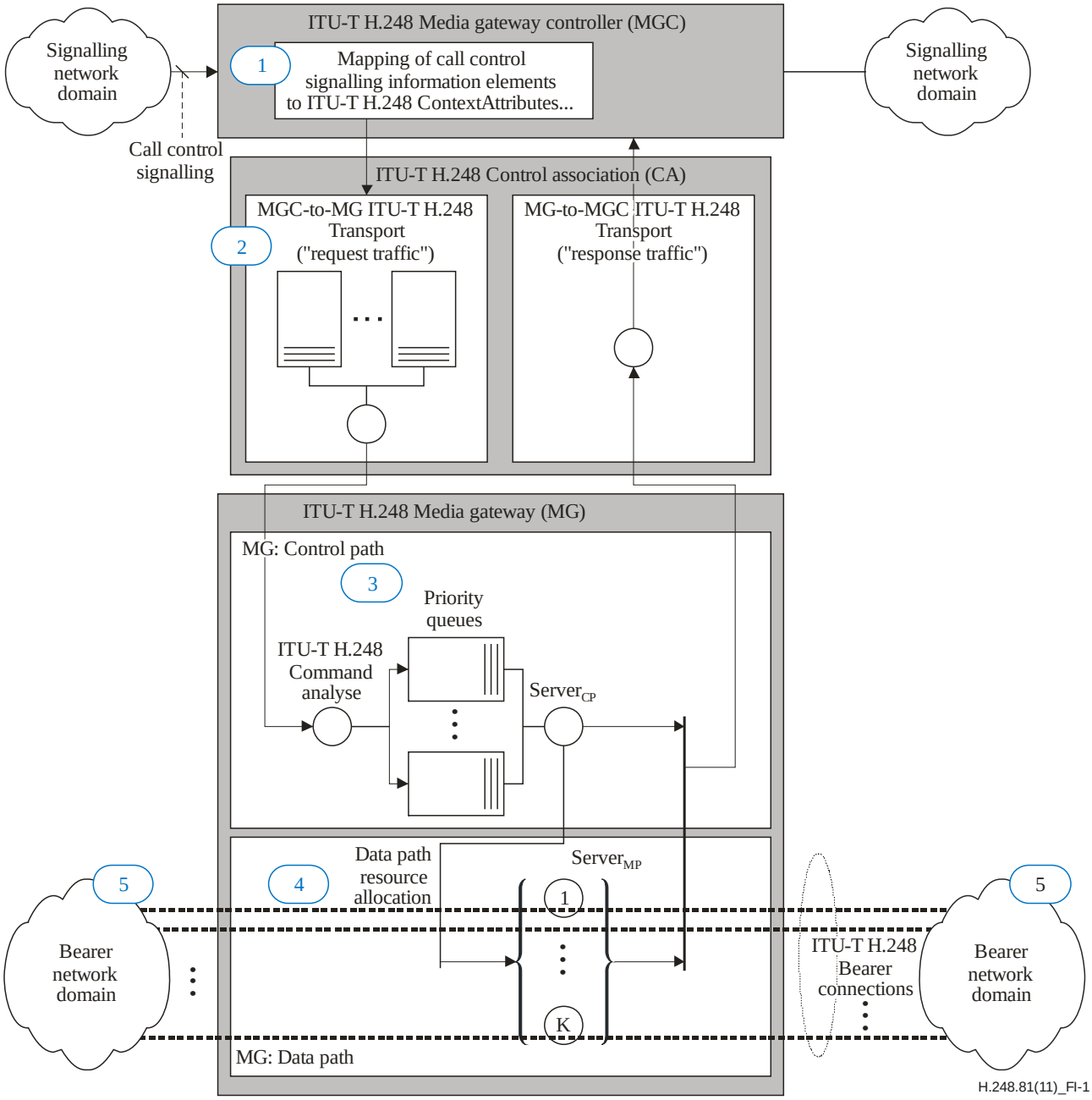

Figure I.1 – Example overall traffic model for priority services

Five relevant areas may be identified (from a MG perspective):

– Part I: MGC – Mapping function for setting ITU-T H.248 context attributes values

– Part II: ITU-T H.248 control association (i.e., ITU-T H.248 signalling transport) – Priority transport

– Part III: MG control path – Priority command processing

– Part IV: MG data path – Reservation, allocation and pre-emption of resources depending on national variation

– Part V: Bearer network – Support of dedicated "QoS and policy architectures"

I.2 Traffic processing stages – Model subcomponents

I.2.1 Part I: MGC – Mapping function for ITU-T H.248 context attributes

Call control signalling information provides input to the mapping function on ITU-T H.248 context attribute property values. There might also be some interaction in the case of MLPP support, i.e., signal settings according to the *Multi-level Precedence and Pre-emption* package [b-ITU-T H.248.44]. Since the mapping function between call control level ETS/MLPP information and ITU-T H.248 signalling is internally located in the MGC, it is out of the scope of this and other Recommendations of the ITU-T H.248.x-series.

I.2.2 Part II: ITU-T H.248 control association – Priority transport

I.2.2.1 Transport layer

Priority call handling may be supported by priority transport at ITU-T H.248 interfaces. There are many ITU-T H.248 transport modes for carrying ITU-T H.248 signalling traffic between MGC and MG (see Table 1 of [b-ITU-T H.248.67]).

In particular, the ITU-T H.248-over-SCTP based transport mode could benefit from SCTP capabilities.

NOTE – Control associations based on [ITU-T H.248.4] allow the support of SCTP streams for ITU-T H.248 signalling traffic. It should be noted that multiple SCTP streams may be used (see clause 11 of [H.248.4]), which allows the mapping of multiple " ITU-T H.248 traffic classes" on dedicated SCTP streams. Such mappings may be based on context attributes, e.g., the use of particular SCTP streams for priority traffic.

I.2.2.2 Network layer or/and Lx-VPNs

For IP layer or others (e.g., in the case of ITU-T H.248-over-IP), different "QoS levels" may be applied for different ITU-T H.248 messages of the same ITU-T H.248 control association.

I.2.3 Part III: MG control path – Priority command processing

Priority call handling relates to priority command and priority context processing at ITU-T H.248 MG level (see also [b-ITU-T H-Sup.6]), particularly in phases of high load or overload of the MG control path. Such a kind of MG internal prioritized processing of ITU-T H.248 commands, etc., is implementation-specific, thus out of the scope of this Recommendation.

It may be noted that a more detailed congestion reporting capability (according to [ITU-T H.248.32]) may be a helpful complementary function for priority-call support.

I.2.4 Part IV: MG data path – Reservation, allocation and pre-emption of resources

The MG internal data path may be modelled by applicable resources, which may be reserved, allocated, modified and released again. However, possible pre-emption also needs to be considered in the scope of priority calls.

The consideration of ITU-T H.248 resource-management packages according to [ITU-T H.248.63] may be useful here.

[ITU-T H.248.32] may also be applied in monitoring the usage level of MG data path resources.

NOTE – For certain national implementations, pre-emption of resources in support of ETS is not required.

I.2.5 Part V: Bearer network – Support of dedicated "QoS architectures"

Any network engineering for ETS support is tightly coupled with the underlying QoS architecture of the network transport stratum. It would be ineffective to separately consider node and network capabilities. For instance:

– There might be an implicit, MG-level configuration for linking ITU-T H.248 context attribute value settings to a specific "QoS class" at the bearer network.

– There might be explicit procedures defined (i.e., "call-dependent procedures in ITU-T H.248 profiles"), which link priority calls to ITU-T H.248 capabilities accordingly, e.g.,:

  a) [ITU-T H.248.52] ("QoS marking of priority traffic")

  b) [ITU-T H.248.54] ("dedicated MPLS LSPs for priority traffic")

  c) [ITU-T H.248.56] ("dedicated Lx-VPNs for priority traffic").

Bibliography

[b-ITU-T H.248.44] Recommendation ITU-T H.248.44 (2007), *Gateway control protocol: Multi-level precedence and pre-emption package.*

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