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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS  
Infrastructure of audiovisual services – Communication  
procedures

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**Gateway control protocol: Media gateway  
instance package**

Recommendation ITU-T H.248.83



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## **Recommendation ITU-T H.248.83**

### **Gateway control protocol: Media gateway instance package**

#### **Summary**

Recommendation ITU-T H.248.83 defines functionality that allows a media gateway (MG) to indicate to a media gateway controller (MGC) what media gateway instance is in use. A media gateway instance relates to a named set of configuration parameters associated with a media gateway (or virtual media gateway). These configuration parameters may relate to (but are not limited to) the provisioned values associated with ITU-T H.248 packages, allocated memory, allocated storage and allocated processing resources, etc.

#### **History**

Edition	Recommendation	Approval	Study Group
1.0	ITU-T H.248.83	2012-02-13	16

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## Recommendation ITU-T H.248.83

### Gateway control protocol: Media gateway instance package

#### 1 Scope

There has been a trend towards virtualized or cloud-based networks where a physical device or network hosts several virtual instances meeting the needs of different customers. Different service models exist, usually utilizing the terminology "x – as a service (xASS)", e.g., platform as a service (PAAS) and infrastructure as a service (IAAS).

A common aspect of the different cloud service models is that a certain set of resources is allocated (via an operations and maintenance (O&M) system) based on a set of customer requirements. These requirements may detail the applications, libraries, data, memory, processing resources, storage, and associated configuration settings.

One of the main concepts of ITU-T H.248 is the use of the virtual media gateway (VMG). This allows multiple VMG instances per physical media gateway (MG). Each VMG is treated as a separate MG instance and thus has its own control association and set of resources, configurations, etc. Thus, it has similarities to cloud virtualization concepts.

ITU-T H.248 is largely silent on provisioning resources for VMGs, apart from clause 11.1 of [ITU-T H.248.1], which states that the mechanism for allocating terminations to VMGs is a management method outside the scope of [ITU-T H.248.1]. Whilst the provisioning of terminations is out of the scope of ITU-T H.248, it does have the "ITU-T H.248 Profile" concept. Profiles specify what options associated with [ITU-T H.248.1] have been used. Appendix III of [ITU-T H.248.1] provides an example profile template showing the information that can be derived from the profile ID. ITU-T H.248 profiles, when used by a virtual media gateway (VMG), indicate what ITU-T H.248 elements can be used. Profiles have been defined by several standards development organizations (e.g., 3GPP, ETSI TISPAN, MSF) and several vendors to define the ITU-T H.248 functionality of certain interfaces.

ITU-T H.248 provides an abstraction model for an MGC to access and control physical resources on an MG without having to address these physical resources. The concepts of Contexts, Terminations, Streams and Descriptors are used. Whilst terminations are typically statically provisioned, the underlying resources may be statically or dynamically allocated between the VMGs. The physical resources may relate to the central processing unit (CPU), digital signal processor (DSP), memory, storage, or power use. So whilst the ITU-T H.248 options defined by an ITU-T H.248 Profile are related to these resources, there is not a one-to-one mapping due to the abstraction layer. Some form of provisioning is required to assign the physical resources to a VMG instance.

ITU-T H.248 allows an MG and MGC to negotiate the use of a certain profile (functionality set) via the use of the *ServiceChangeProfile* parameter (see clause 7.2.8.1.5 of [ITU-T H.248.1]). An example profile is the *Mn* interface (profile name: *threegbicsn*) defined by [b-3GPP TS 29.232]. However, this does not identify a particular resource profile. The MGC cannot deduce from the profile name how resources are provisioned on the (V)MG. The set of provisioned resources could be tied to the media gateway identity (ITU-T H.248 Mid) but this unnecessarily ties the transport network configuration to the MG hardware configuration. Many ITU-T H.248 packages specify a default of "provisioned" for the elements defined by the package. It is assumed that these are co-ordinated via other provisioning means (e.g., SNMP MIBs). As an ITU-T H.248 MG can be provisioned with different sets of resources per ITU-T H.248 Profile Name and/or Mid another form of correlation identity between the MGC and MG to coordinate what has been provisioned is required.

This identifier can be used by network operators as a pointer to a set of provisioned configuration data. Upon reception of the identifier, the MGC can uniquely identify the provisioned defaults and other configuration data and then request (V)MG resources accordingly.

This Recommendation defines functionality that allows an MG to indicate to an MGC what media gateway instance is in use. It also allows an MGC to audit an MG to determine the MG instance in use. This Recommendation utilises a ServiceChangeExtension parameter that allows the MG instance to be reported during an initial ServiceChange command exchange. An ITU-T H.248 package is defined to allow an MGC to audit packages to determine if the MG instance functionality is supported. It also allows the auditing of a root Termination property to determine the MG instance.

## 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 H.248.1] Recommendation ITU-T H.248.1 (2005), *Gateway Control Protocol: Version 3*.
- [ITU-T H.248.46] Recommendation ITU-T H.248.46 (2007), *Gateway Control Protocol: Connection capability control package*.
- [ITU-T H.248.63] Recommendation ITU-T H.248.63 (2009), *Gateway Control Protocol: Resource management packages*.

## 3 Definitions

### 3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

- 3.1.1 AuditCapabilities.req** [ITU-T H.248.1]: H.248.1 AuditCapabilities command request.
- 3.1.2 AuditValue.req** [ITU-T H.248.1]: H.248.1 AuditValue command request.
- 3.1.3 ServiceChange.req** [ITU-T H.248.1]: H.248.1 ServiceChange command request.

### 3.2 Terms defined in this Recommendation

This Recommendation defines the following term:

- 3.2.1 media gateway (MG) instance:** A media gateway instance relates to a named set of configuration parameters associated with a media gateway (or virtual media gateway (VMG)). These configuration parameters may relate to (but are not limited to) the provisioned values associated with ITU-T H.248 packages, allocated memory, allocated storage and allocated processing resources, etc.

## 4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

CPU	Central Processing Unit
DSP	Digital Signal Processor
IAAS	Infrastructure As A Service
MG	Media Gateway
MGC	Media Gateway Controller
MIB	Management Information Base
Mid	Media Gateway Identity
O&M	Operation and Maintenance
PAAS	Platform As A Service
SNMP	Simple Network Management Protocol
VMG	Virtual Media Gateway

## 5 Conventions

Elements of the ITU-T H.248 protocol model, e.g., Context, Termination, Stream, and Event, are represented using the first letter capitalized. ITU-T H.248 Property, Event, Signal and Parameter identities are given in *italics*.

## 6 Media gateway instance package

Package name:	Media Gateway Instance Package
Package ID:	mgc (0x010c)
Description:	This Package provides the ability to assign a media gateway instance name to a set of MG configuration parameters. Upon learning the identity, the MGC is able to determine the MG configuration.
Version:	1
Extends:	None.

### 6.1 Properties

#### 6.1.1 MG instance name

Property name:	MG instance name
Property ID:	iname (0x0001)
Description:	This root only property provides the name (or identifier) of the MG instance.
Type:	String
Possible values:	Any string compliant to the "SafeChar" syntax (see clause B.2 of [ITU-T H.248.1]) definition of "String" up to 64 characters long.
Default:	Provisioned
Defined in:	TerminationState (Root Only)
Characteristics:	ReadOnly

## 6.2 Events

None.

## 6.3 Signals

None.

## 6.4 Statistics

None.

## 6.5 Error codes

None.

## 6.6 Procedures

### 6.6.1 ServiceChange – Media gateway instance reporting

This package defines a parameter that is used in the *ServiceChangeExtension* parameter. It may be used by an MG to report to the MGC the MG instance that is initiating *ServiceChange* exchange. For more information regarding the definition of parameters in the *ServiceChangeExtension* parameter, see clause 7.2.8.1.8 of [ITU-T H.248.1]. The package also defines a property that may be audited by the MGC to determine the MG instance in use.

#### 6.6.1.1 MG instance extension parameter definition

Name: mginst

Type: String

Possible values: Any string compliant to the "SafeChar" syntax (see clause B.2 of [ITU-T H.248.1]) definition of "String" up to 64 characters long.

### 6.6.2 Media gateway instance assignment

Every (V)MG is characterised by its configuration parameters. These configuration parameters relate to both the ITU-T H.248 configuration (possibly detailed by an ITU-T H.248 Profile) and the physical characteristics (e.g., CPU, DSP, memory, storage, or power use). It is assumed that the configuration parameters are determined "off-line" via O&M provisioning. Thus, the set of configuration parameters uniquely identifies the operation of a particular (V)MG. This configuration set is the "MG instance".

This package allows MG operators to assign a name (string) to the MG instance. When a (V)MG is instantiated, this name is associated with the (V)MG. It may then be reported to the MGC. This MG instance name is then used as a pointer to the configuration set defined by O&M. As the operator has assigned the MG instance name and the associated configuration, it is assumed that the information is understood by the MGC. How the name is structured, as well as to which configuration parameters it relates, is operator-dependent.

### 6.6.3 Media gateway instance reporting

If an MG operator has assigned an MG instance name and the "Media Gateway Instance" package is enabled, the MG shall include the *ServiceChangeExtension* parameter with the "mginst" parameter in the initial *ServiceChange.req* sent to the MGC.

The MG should include the "mginst" parameter in any further *ServiceChange.req* resulting from a change of configuration or state of the (V)MG.

If the MGC supports the MGC instance functionality, it shall use this information as a pointer to an associated configuration. Where the MGC is unable to access the associated configuration, it should be flagged to the O&M system.

If the MGC does not support the functionality then it shall ignore the "*mginst*" parameter.

The MGC may subsequently (e.g., in case of state loss) perform an Auditvalue.req on the "Media Gateway Instance" (*iname*) property on the Root Termination. This will return the MG instance in use. The use of an AuditCapability.req on the *iname* property is not allowed.

#### **6.6.4 Media gateway instance use**

What actions a MGC takes based on a MG instance name is driven by the configuration parameters. As such, it is not possible to provide an exhaustive list of behaviours. This clause provides several example uses.

##### **6.6.4.1 Provisioned package values**

An MG instance name may point to a configuration that contains the default values for a number of packages. An ITU-T H.248 Profile may provide defaults for some values but not others. For example the "Base Root Package" (*root*) clause E.2 of [ITU-T H.248.1] contains a number of properties related to the operation of the protocol.

An ITU-T H.248 Profile may indicate the "Maximum Terminations per Context" as this would relate to service provided (such as supplementary services). However it would not specify the "Maximum Number of Contexts" as this relates to the capacity of the MG.

The "Maximum Number of Contexts" relates to the number of connections that an MG can handle. These connections relate directly to the number of calls that can be supported on an MGC. This type of "capacity" constraint may be negotiated with a customer. For example: Customer A may require a VMG that handles 1000 simultaneous calls. Customer B may require a 200 simultaneous call service. The customers may both require the same profile. Thus, the MG instance name provides a means to indicate to an MGC that, when VMG Customer A is in use, the maximum number of Contexts it can create is 1000 and that, when VMG Customer B is in use, the maximum number of Contexts it can create is 200. The use of the same ITU-T H.248 Profile name for both customers can indicate additional service constraints.

##### **6.6.4.2 Independent parameters**

Configuration parameters may be set so that there is no direct relationship to an ITU-T H.248 Property or other ITU-T H.248 element. For example, a customer C may agree with an operator that a maximum of 20 simultaneous video calls is supported for their particular service. This capacity constraint would then form part of the configuration of the MG instance. The MG thus can either statically or dynamically allocate the necessary resources. When the MG instance name associated with customer C is sent to the MGC, the MGC can determine that it should not request more than 20 Contexts containing video streams. It can then handle call-setup requests requesting additional video calls without the need to signal the MG and receive error responses.

#### **6.6.5 Media gateway instance interactions**

The ITU-T H.248.x sub-series provide several different methods via packages for managing resources. In general, this Recommendation does not directly interact with these mechanisms. However, the MG instance package may be used in conjunction with these other packages to provide a pointer to a set of default values (and/or a set of possible values) as discussed in clause 6.6.4.1 above.

Particular scenarios that illustrate the general behaviour are discussed below.

[ITU-T H.248.46] provides a package that allows the indication of whether a media gateway can apply optimization mechanisms to the MG internal connection. An MG instance may be provisioned with information indicating the default value for the "Connection Capability" (*ccc/cc*) property. Clause 1 of [ITU-T H.248.46] discusses the applicability of this property to scenarios where multiple VMGs are involved. The use of the MG instance package does not have an influence on multiple VMG scenarios.

[ITU-T H.248.63] provides several packages that allow an MGC and MG to manage resource allocation. It also discusses interaction with other ITU-T H.248.x sub-series Recommendations in clause 6.1 of [ITU-T H.248.63]. The MG Instance package may in general be used in conjunction with [ITU-T H.248.63] by providing a pointer to provisioned values or a set of allowed resources. For example, an MGC may utilize the fact that an MG instance is provisioned with information that it is related to a video conferencing provider to set the "Resource Description" (*rmc/rd*) property to indicate that audio and video will be used in the Context.

## Bibliography

- [b-3GPP TS 29.232] 3GPP TS 29.232 (2009), *3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Media Gateway Controller (MGC) – Media Gateway (MGW) interface; Stage 3 (Release 8)*.  
<<http://www.3gpp.org>>





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