International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

H.248.62

(06/2008)

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Infrastructure of audiovisual services – Communication procedures

Gateway control protocol: Re-answer package

Recommendation ITU-T H.248.62

ITU-T H-SERIES RECOMMENDATIONS

AUDIOVISUAL AND MULTIMEDIA SYSTEMS

CHARACTERISTICS OF VISUAL TELEPHONE SYSTEMS	H.100–H.199
INFRASTRUCTURE OF AUDIOVISUAL SERVICES	
General	H.200–H.219
Transmission multiplexing and synchronization	H.220–H.229
Systems aspects	H.230–H.239
Communication procedures	**H.240–H.259**
Coding of moving video	H.260–H.279
Related systems aspects	H.280–H.299
Systems and terminal equipment for audiovisual services	H.300–H.349
Directory services architecture for audiovisual and multimedia services	H.350–H.359
Quality of service architecture for audiovisual and multimedia services	H.360–H.369
Supplementary services for multimedia	H.450–H.499
MOBILITY AND COLLABORATION PROCEDURES	
Overview of Mobility and Collaboration, definitions, protocols and procedures	H.500–H.509
Mobility for H-Series multimedia systems and services	H.510–H.519
Mobile multimedia collaboration applications and services	H.520–H.529
Security for mobile multimedia systems and services	H.530–H.539
Security for mobile multimedia collaboration applications and services	H.540–H.549
Mobility interworking procedures	H.550–H.559
Mobile multimedia collaboration inter-working procedures	H.560–H.569
BROADBAND AND TRIPLE-PLAY MULTIMEDIA SERVICES	
Broadband multimedia services over VDSL	H.610–H.619
Advanced multimedia services and applications	H.620–H.629
IPTV MULTIMEDIA SERVICES AND APPLICATIONS FOR IPTV	
General aspects	H.700–H.719
IPTV terminal devices	H.720–H.729

For further details, please refer to the list of ITU-T Recommendations.

Recommendation ITU-T H.248.62

Gateway control protocol: Re-answer package

Summary

Re-answer call is a particular channel associated signalling (CAS) service, which is deployed in some networks, e.g., in China and Indonesia. If a media gateway (MG) interconnects with such CAS equipment, it cannot support the re-answer service without the additions defined in the re-answer package.

In the re-answer package, the re-answer event and the procedures on how to use this event are defined.

Source

Recommendation ITU-T H.248.62 was approved on 13 June 2008 by ITU-T Study Group 16 (2005-2008) under Recommendation ITU-T A.8 procedure.

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

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

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/.

CONTENTS

Introduction

In some network architectures where the channel associated signalling (CAS) equipment, such as the public switched telephone network (PSTN), which supports CAS signalling systems (e.g., such as SS R5), are connected to 3G, public land mobile network (PLMN), next generation network (NGN) circuit-switched (CS) core network domains, the bearer between the media gateway (MG) and the CAS equipment can be time division multiplexing (TDM), as shown in Figure 1.

When an NGN user (the caller, such as a mobile terminal) makes a call to a CAS user (the callee, such as a telephone subscriber), and the call enters the session state, the CAS user cannot initiate a re-answer call after the hook-on operation is done. The primary reason is that the re-answer signal information cannot be transferred to the MGC depending on the current interface between the MG and the media gateway controller (MGC). However, the re-answer call function is required sometimes.

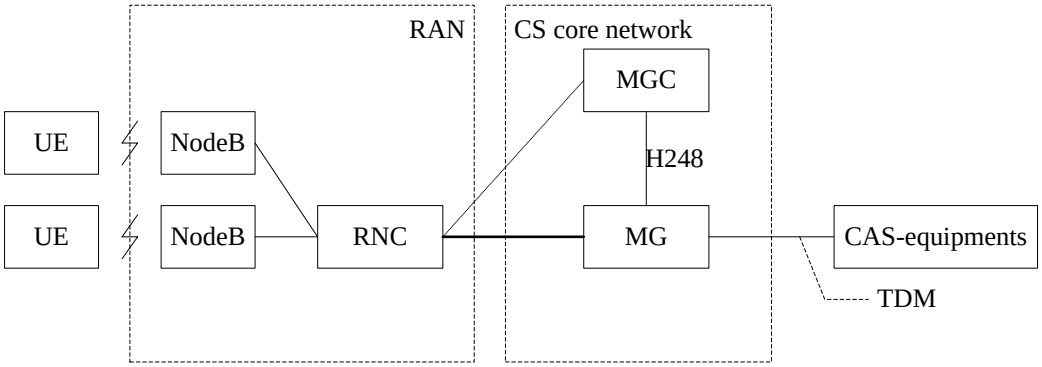
Recommendation ITU-T H.248.62

Gateway control protocol: Re-answer package

1 Scope

This Recommendation defines an H.248 package in order to request the MG to detect re-answer line signal on a particular TDM termination which supports CAS signalling, and to notify the MGC when the signal is detected. The re-answer capability supplements the basic call service and belongs, thus, to a supplementary service. Such a supplementary service was supported in legacy PSTN, leading to particular call control signalling information elements at the network-to-network (NNI) interface, such as CAS-based NNIs or CCS-based NNIs (e.g., SS7 telephone user part; TUP according to [ITU-T Q.723], [ITU-T Q.724]).

This H.248 package allows the support of emulation of such a service in NGN environments (like e.g., a PSTN emulation subsystem).



NOTE – Left side of MG: radio access network of the 3GPP defined 3G PLMN: Right side: legacy PSTN with a CAS-based NNI; Middle: 3GPP R3+ CS CN domain with Mc reference point between MSC server (MGC role) and CS-MGW.

Figure 1 – Logical network architecture

1.1 Applicability

The application of the *re-answer* package is limited on H.248 TDM terminations controlled via CAS or SS7 TUP call control signalling.

1.2 Difference between "answer" and "re-answer" signals

The semantic difference is indicated by the signal definitions in clauses 3.1.1 and 3.1.2. The syntactical difference is dependent on the encoding format of the correspondent call control signalling protocol.

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 v3 (2005), *Gateway control protocol: Version 3*.

[ITU-T H.248.25] Recommendation ITU-T H.248.25 (2007), *Gateway control protocol: Basic CAS packages*.

[ITU-T Q.722] Recommendation ITU-T Q.722 (1988), *General function of telephone messages and signals*.

[ITU-T Q.723] Recommendation ITU-T Q.723 (1988), *Telephone user part formats and codes*.

[ITU-T Q.724] Recommendation ITU-T Q.724 (1988), *Telephone user part signalling procedures.*

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 answer signal: (see clauses 3.5.2, 3.5.3 and 3.5.4 in [ITU-T Q.722]) A signal sent in the backward direction indicating that the call is answered.

3.1.2 re-answer signal: (see clause 3.5.6 in [ITU-T Q.722]) A signal sent in the backward direction indicating that the called party, after having cleared, again lifts his receiver or in some other way reproduces the answer condition, e.g., switch-hook flashing.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 ADD.req: H.248.1 add command request.

3.2.2 MOD.req: H.248.1 modify command request.

3.2.3 NOT.req: H.248.1 notify command request.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

3GPP Third Generation Partnership Project

CAS Channel Associated Signalling

CCS Common Channel Signalling

CN Core Network

CS Circuit Switch

MG Media Gateway

MGC Media Gateway Controller

NGN Next Generation Network

MSC Mobile Switching Centre

NNI Network-to-Network Interface

PLMN Public Land Mobile Network

PSTN Public Switched Telephone Network

RA Re-Answer

RAN Radio Access Network

RNC Radio Network Controller

TDM Time Division Multiplexing

TUP Telephone User Part

R2 R2 line signalling and R2 register signalling

SS Signalling System

SS7 Signalling System 7

UE User Equipment

5 Conventions

None.

6 Re-answer call service

Re-answer call, as a supplementary service capability, may be applied in the active call phase, i.e., after the caller and the callee enter the speech state, as follows:

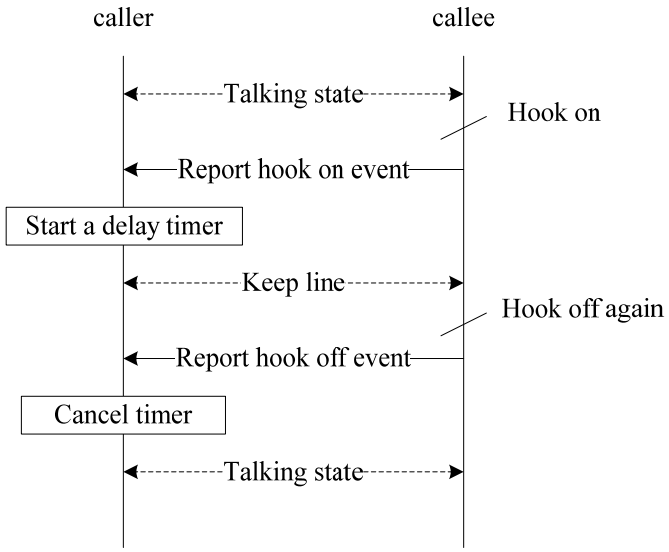


Figure 2 – Example of re-answer call procedure

The caller starts a delay timer to wait for the caller to hook on after the callee hooked on, during this time the line (see Note) between the caller and the callee is kept. If the callee hooks off before the timer expires, the caller can talk with the callee again, and the timer is cancelled.

NOTE – "Line" relates to the H.248 context in the MG with the H.248 TDM termination serving as the "line".

Such a type of functionality is optional but is required sometimes according to related call configurations.

In some network architectures, such as Figure 1, the CAS equipment access NGN CS core networks, the CAS protocol applied between the MG and the CAS equipment can be the international signalling system R2 protocol, and so on. The MG receives the CAS signals sent by

the CAS equipment, which are subsequently interpreted and reported to the MGC through the H.248 protocol interface, such as *sz*, *sza* events in the *bcas* package [ITU-T H.248.25].

However, the re-answer signal sent by the CAS equipment cannot be transferred to the MGC depending on the existing interface between the MG and the MGC. Therefore, the CAS user, as a callee, cannot initiate a re-answer call after the hook on/off operation is done, as in Figure 2, and such a type of call functionality is required sometimes, even if the MG can detect a re-answer line signal over the TDM interface.

The package in this Recommendation provides a mechanism for the MGC to request the MG to detect the re-answer signal. The MGC can then perform subsequent processing after the re-answer signal is reported to the MGC. It is assumed that the MG has the ability to detect the re-answer signal on the TDM interface.

7 Re-answer package

Package name: Re-answer package

Package ID: ra (0x00e2)

Description: This package defines an event to enable re-answer functionality for physical terminations which support CAS protocols. Once the event is reported, the MGC may initiate the appropriate call-dependent procedures.

Version: 1

Extends: None

7.1 Properties

None.

7.2 Events

7.2.1 Re-answer

Event name: Re-answer

Event ID: ra (0x0001)

Description: This event applies to an outgoing interface, and is reported when a "Re-answer" line signal occurs on the termination. The event is reported by the MG if either the timed transition to this line signal is detected or the line signal already exists. The condition against which the signal is verified is provisioned in the MG.

7.2.1.1 EventsDescriptor parameters

None.

7.2.1.2 ObservedEventsDescriptor parameters

None.

7.3 Signals

None.

7.4 Statistics

None.

7.5 Error codes

None.

7.6 Procedures

7.6.1 Overview – Example scenario

The re-answer call procedure is illustrated in Figure 3.

It should be noted that the caller side illustrated in Figure 3 means a TDM termination on the MG, but actually it may be a mobile terminal of the NGN radio network. This figure only shows the simple interactions between the MGC/MG in NGN CS core network and the CAS equipment, and the details depend on the implementation.

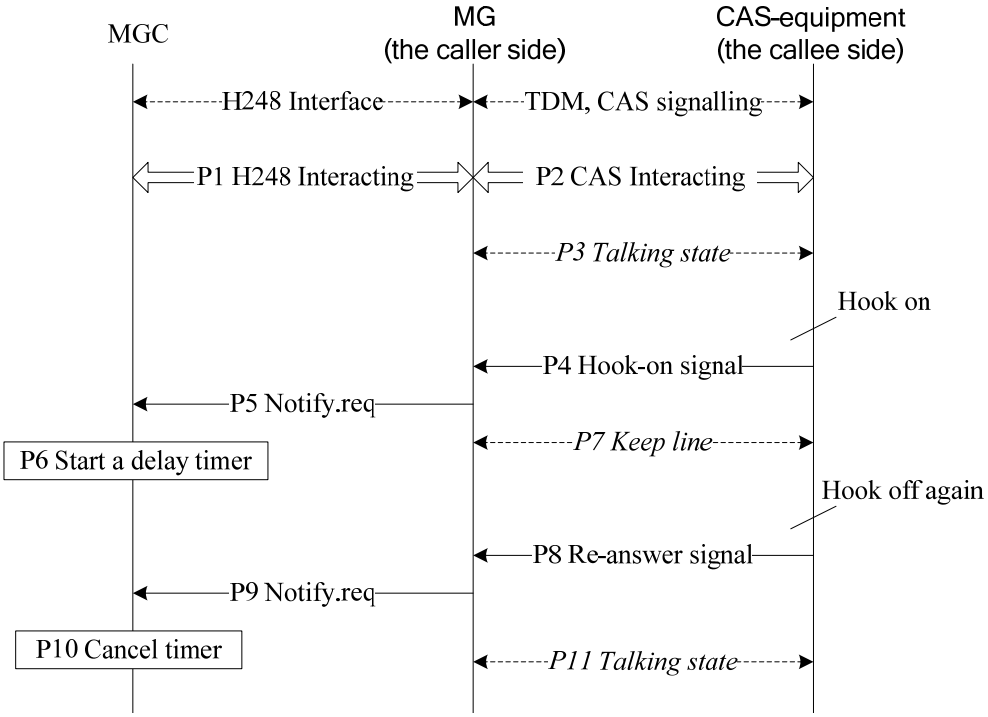


Figure 3 – Re-answer call procedure

7.6.2 Individual procedural steps

P1, P2: When a call is initiated by the NGN side, the MGC interacts with the MG over the H.248 interface, and the MG interacts with the CAS equipment over CAS signalling interface (using, e.g., packages of [ITU-T H.248.25]). In procedure P1, the MGC should perform an H.248 ADD.req or MOD.req on the MG's TDM termination, with event *Re-answer* (*ra*) to request the MG to detect the re-answer signal that may occur in subsequent call procedures.

P3: When the callee is found available, the callee rings until the callee performs a hook-off operation, then the call between the caller and the callee enters speech state after the appropriate P1 and P2 procedures.

P4: A hook-on backward signal is sent to the MG as the signal is detected on the callee side.

P5: The MG subsequently performs an H.248 NOT.req command on the TDM termination, with event *Clear Back* (*cb*) to notify the MGC that a hook-on backward signal is verified.

P6: The MGC then starts a delay timer to wait for the caller to hook on, the delay time may be predefined or configured before the call is initiated. The timer on the callee side depends on the implementation.

P7: At the same time, the line (resource) between the caller and the callee is kept.

P8: If the callee hooks off before the timer expires, a re-answer signal is sent to the MG by the CAS equipment.

P9: The MG subsequently performs an H.248 NOT.req command on the TDM termination, with event *Re-answer* (*ra*) to notify the MGC that a re-answer signal is verified.

P10: The MGC then cancels the timer.

P11: The caller and the callee may talk again as per procedure P3 described above.

7.6.3 Invocation of supplementary service "re-answer" indication

The service invocation is related to the event arming procedure at the H.248 interface. This is either related to P1 in case of a signalled event subscription, or a configuration management activity in case of a pre-provisioned arming of the event.

7.6.4 Relation to charging/billing of the supplementary service

Any call may be principally charged for the calling party or called party or both. This supplementary service may affect charging, e.g., due to the interruption of conversation phases, or exceptional long call holding times (which might be out of control by one or even both parties). However, any possible relation to charging is out of scope of this Recommendation.

7.6.5 Unsuccessful calls

7.6.5.1 Caller side releases the call during the time period (P6-P8)

If the caller releases the call before the callee (PSTN side) hooks off again when the line is kept, the delay timer will be cancelled at once and the call will be released accordingly. Even if the callee (PSTN side) hooks off again right after that, the call will not continue.

7.6.5.2 Caller side never releases the call

If neither the callee (PSTN side) hooks off again, nor the caller releases the call, then the call will be released accordingly right after the delay timer expires.

Bibliography

[b-GF002-9002] GF002-9002 (1991), *Ministry of Posts and Telecommunications of the Total Telephone Switching Equipment, Technical Specifications*, China Telecom.

[b-HKTA 2201] HKTA 2201 (2005), *General Technical Characteristics Of Fixed Telecommunications Networks In Hong Kong*. <http://www.ofta.gov.hk/zh/standards/hktaspec/hkta2201.pdf>

[b-C-SV1.00-02-TS] PHS MoU C-SV1.00-02-TS (2000), *PHS-FWA System: Service of PHS-FWA System*. <http://www.phsmou.org/resources/pdf/C-SV1.00-02-TS.pdf>

SERIES OF ITU-T RECOMMENDATIONS

Series A	Organization of the work of ITU-T
Series D	General tariff principles
Series E	Overall network operation, telephone service, service operation and human factors
Series F	Non-telephone telecommunication services
Series G	Transmission systems and media, digital systems and networks
Series H	**Audiovisual and multimedia systems**
Series I	Integrated services digital network
Series J	Cable networks and transmission of television, sound programme and other multimedia signals
Series K	Protection against interference
Series L	Construction, installation and protection of cables and other elements of outside plant
Series M	Telecommunication management, including TMN and network maintenance
Series N	Maintenance: international sound programme and television transmission circuits
Series O	Specifications of measuring equipment
Series P	Telephone transmission quality, telephone installations, local line networks
Series Q	Switching and signalling
Series R	Telegraph transmission
Series S	Telegraph services terminal equipment
Series T	Terminals for telematic services
Series U	Telegraph switching
Series V	Data communication over the telephone network
Series X	Data networks, open system communications and security
Series Y	Global information infrastructure, Internet protocol aspects and next-generation networks
Series Z	Languages and general software aspects for telecommunication systems

Printed in Switzerland
Geneva, 2009