International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

H.248.42
(03/2009)

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Infrastructure of audiovisual services – Communication procedures

Gateway control protocol: DCME interworking package

Recommendation ITU-T H.248.42

ITU-T H-SERIES RECOMMENDATIONS

AUDIOVISUAL AND MULTIMEDIA SYSTEMS

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

Recommendation ITU-T H.248.42

Gateway control protocol: DCME interworking package

Summary

The DCME Package is used for interfacing digital circuit multiplication equipment (DCME). DCME types are for instance defined by Recommendations ITU-T G.763, G.767 or G.768. There is a signalling interface defined between DCME and a so-called "international switching centre" (ISC). Recommendation ITU-T Q.50 defines such an interface. The DCME Package scopes DCME with Q.50 interfaces.

This revision of Recommendation ITU-T H.248.42 adds new parameters for events, to allow the media gateway controller (MGC) to resynchronize itself in the event it loses track of this state.

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

Recommendation ITU-T H.248.42

Gateway control protocol: DCME interworking package

1   Scope

The DCME Package is used for interfacing digital circuit multiplication equipment (DCME). DCME types are for instance, defined by [b-ITU-T G.763], [b-ITU-T G.767] or [b-ITU-T G.768]. There is a signalling interface defined between DCME and a so-called "international switching centre" (ISC). [ITU-T Q.50] defines such an interface. The DCME Package scopes DCME with Q.50 interfaces (see Figure 1).

NOTE 1 – Relation to PCME [b-ITU-T G.765]: the DCME package may be applied in principle as well for PCME types with Q.50-based CME signalling and E1/PDH trunk interface types. The final decision is still for further studies, e.g., due to dependencies with the still open clause 19 of [b-ITU-T G.765] on dynamic load control.

NOTE 2 – Relation to IP-CME [b-ITU-T G.769]: the DCME package may be applied for IP-CME types with Q.50-based CME signalling and E1/PDH trunk interface types. Other trunk facilities are for further study.
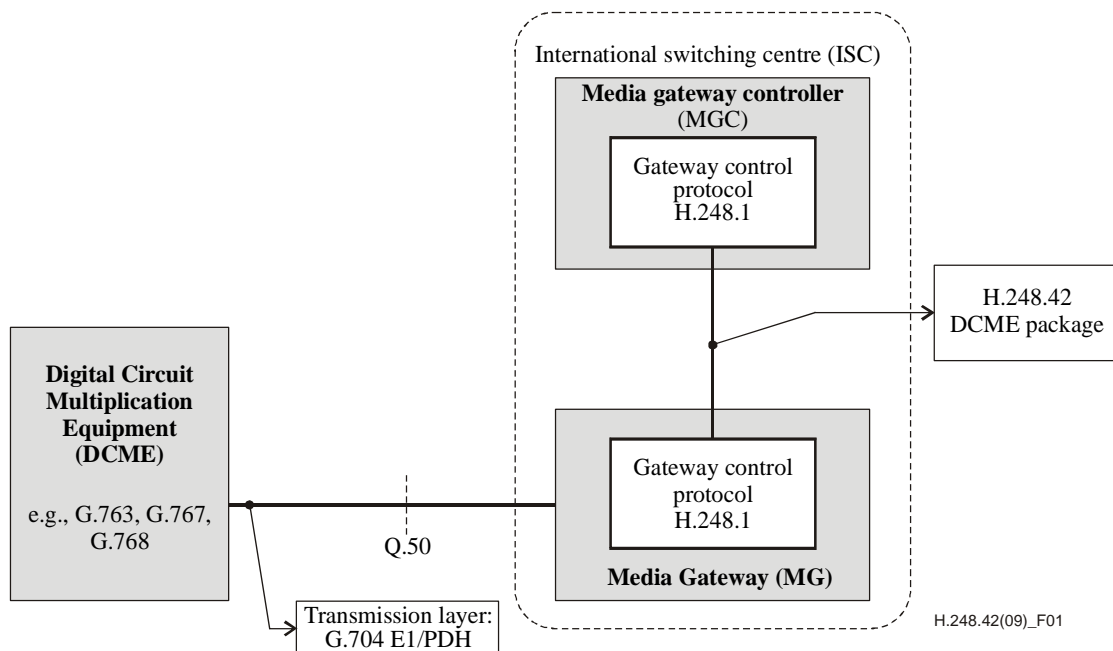
Figure 1 – Scope of the DCME Package

The DCME Package must support DCME-ISC signalling interface functions. The required Package capabilities may be summarized by the following overview from [b-ITU-T G.763] and [ITU-T Q.50]. There are three major groups of functions:

•   *Transmission resource management*

       Facilitates the dynamic load control process within the ISC and the DCME concurrently, based on the status of the traffic loading on the DCME system.

•   *Seizure/release of 64 kbit/s circuits*

       Used in the DCME for the generation of internal assignment and disconnection messages and in the ISCs for the validation of circuit seizure selection/release based on acknowledgement from the DCME.

- *Maintenance information*

  Facilitates information exchange between the DCME and the ISCs pertaining to the maintenance status. Maintenance status information may be exchanged between the DCME and the ISC.

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 G.704]   Recommendation ITU-T G.704 (1998), *Synchronous frame structures used at 1544, 6312, 2048, 8448 and 44 736 kbit/s hierarchical levels*.

[ITU-T H.248.1]   Recommendation ITU-T H.248.1 (2005), *Gateway control protocol: Version 3*, including its Amendment 1 (2008).

[ITU-T H.248.8]   Recommendation ITU-T H.248.8 (2005), *Gateway control protocol: Error code and service change reason description*.

[ITU-T H.248.33]   Recommendation ITU-T H.248.33 (2005), *Gateway control protocol: PCM frame spare bit package*.

[ITU-T Q.50]   Recommendation ITU-T Q.50 (2001), *Signalling between Circuit Multiplication Equipment (CME) and International Switching Centres (ISC)*.

3 Terms and definitions

None.

4 Abbreviations

This Recommendation uses the following abbreviations:

2PTY   Two-Party

3PTY   Three-Party

C2C   Circuit-to-Circuit

C2P   Circuit-to-Packet

CAS   Channel Associated Signalling

CME   Circuit Multiplication Equipment

CSN   Circuit-Switched Network

DCME   Digital Circuit Multiplication Equipment

DS   Dual Seizure

IP-CME   CME optimized for IP-based networks

ISC   International Switching Centre

MG   Media Gateway

MGC   Media Gateway Controller

MPTY	Multiparty
NGN	Next Generation Network
NROR	No Response On Release
OoS	Out of Service
P2P	Packet-to-Packet
PCM	Pulse Code Modulation
PCME	Packet Circuit Multiplication Equipment
PSN	Packet-Switched Network
RDSD	Remote DCME Signalling Disabled
SNOT	Seizability NOT yet enabled
TDM	Time Division Multiplexing
TRM	Transmission Resource Management
TS	Time-Slot
UKLS	UnKnown Line State

5 DCME interworking package

Package Name: DCME Interworking package

Package ID: dcme (0x009e)

Description: This package defines the H.248 signals and events for a decomposed international switching centre (ISC) following [ITU-T Q.50]. The intention of this package is to be independent of [ITU-T Q.50] Annexes A and B implementation. The H.248 MG provides PCM30 [ITU-T G.704] compliant 2 Mbit/s interface(s), whereas time-slot 16 is used to carry the ISC-DCME signalling protocol. The "term PCM30" is defined in clause 3.1 of [ITU-T H.248.33].

Version: 2

Extends: None

5.1 Properties

5.1.1 DCME protocol

Property Name: DCME Protocol

Property ID: cmeprotocol (0x0001)

Description: The specific protocol (ISC $\leftrightarrow$ DCME) supported for a 2 Mbit/s interface. Note that the MG shall provision this property for the physical termination representing time-slot 16. For the other physical terminations of the 2 Mbit/s interface, this is optional.

Type: Enumeration

Possible values: "None" (0x0001)

                   "Q50AnnexA" (0x0002)

                   "Q50AnnexB" (0x0003)

Default:	Provisioned
Defined in:	TerminationState
Characteristics:	read

5.2 Events

5.2.1 No trunk(s) available for 3.1 kHz audio or speech

Event Name:	Trunk unavailable
Event ID:	tunav (0x0001)
Description:	Generated when no bearer capacity for additional 3.1 kHz audio or speech trunk(s) is available. This event is used by the DCME transmission resource management (TRM).

5.2.1.1 EventDescriptor parameters

5.2.1.1.1 Strict Transition

Parameter Name:	Strict Transition
Parameter ID:	strict (0x0001)
Description:	Indicates how the trunk unavailable event is to be detected.
Type:	Enumeration
Optional:	Yes
Possible values:	"exact" (0x0000): Only an actual transition to trunk unavailable is to be recognized. "state" (0x0001): The event is to be recognized either if the DCME state transition is detected or if the DCME state is already trunk unavailable.
Default:	"exact"

5.2.1.2 ObservedEventsDescriptor parameters

5.2.1.2.1 Initial State

Parameter Name:	Initial State
Parameter ID:	init (0x0002)
Description:	The reason for reporting the trunk unavailable event. Only returned if the Strict Transition parameter is set to "state".
Type:	Boolean
Optional:	Yes
Possible values:	"True": The DCME state was already trunk unavailable when the Events Descriptor containing this event was activated. "False": An actual state transition to trunk unavailable was detected.
Default:	"False"

5.2.2 No channels(s) available for 3.1 kHz

Event Name: Channel unavailable

Event ID: cunav (0x0002)

Description: Generated when no bearer capacity for additional 3.1 kHz channel(s) is available. This event is used by the DCME transmission resource management (TRM) to retain backward compatibility only and is not to be used in implementations based on 1993 or later versions of [ITU-T Q.50].

5.2.2.1 EventDescriptor parameters

5.2.2.1.1 Strict Transition

Parameter Name: Strict Transition

Parameter ID: strict (0x0001)

Description: Indicates how the channel unavailable event is to be detected.

Type: Enumeration

Optional: Yes

Possible values: "exact" (0x0000): Only an actual transition to channel unavailable is to be recognized.

                  "state" (0x0001): The event is to be recognized either if the DCME state transition is detected or if the DCME state is already channel unavailable.

Default: "exact"

5.2.2.2 ObservedEventsDescriptor parameters

5.2.2.2.1 Initial State

Parameter Name: Initial State

Parameter ID: init (0x0002)

Description: The reason for reporting the channel unavailable event. Only returned if the Strict Transition parameter is set to "state".

Type: Boolean

Optional: Yes

Possible values: "True": The DCME state was already channel unavailable when the Events Descriptor containing this event was activated.

                  "False": An actual state transition to channel unavailable was detected.

Default: "False"

5.2.3 Trunk(s) available for 3.1 kHz audio or speech

Event Name: Trunk available

Event ID: tav (0x0003)

Description: Generated to notify the end of "No trunk available for 3.1 kHz audio or speech" condition. This event is used by the DCME transmission resource management (TRM).

5.2.3.1 EventDescriptor parameters

5.2.3.1.1 Strict Transition

Parameter Name:	Strict Transition
Parameter ID:	strict (0x0001)
Description:	Indicates how the trunk available event is to be detected.
Type:	Enumeration
Optional:	Yes
Possible values:	"exact" (0x0000): Only an actual transition to trunk available is to be recognized.
	"state" (0x0001): The event is to be recognized either if the DCME state transition is detected or if the DCME state is already trunk available.
Default:	"exact"

5.2.3.2 ObservedEventsDescriptor parameters

5.2.3.2.1 Initial State

Parameter Name:	Initial State
Parameter ID:	init (0x0002)
Description:	The reason for reporting the trunk available event. Only returned if the Strict Transition parameter is set to "state".
Type:	Boolean
Optional:	Yes
Possible values:	"True": The DCME state was already trunk available when the Events Descriptor containing this event was activated.
	"False": An actual state transition to trunk available was detected.
Default:	"False"

5.2.4 No 64 kbit/s capacity available

Event Name:	64 kbit/s capacity unavailable
Event ID:	kb64Unav (0x0004)
Description:	Generated when no 64 kbit/s capacity is available, i.e., only bearer capabilities for speech and 3.1 kHz audio are available. This event is used by the DCME transmission resource management (TRM).

5.2.4.1 EventDescriptor parameters

5.2.4.1.1 Strict Transition

Parameter Name:	Strict Transition
Parameter ID:	strict (0x0001)
Description:	Indicates how the 64 kbit/s capacity unavailable event is to be detected.
Type:	Enumeration
Optional:	Yes

Possible values:	"exact" (0x0000): Only an actual transition to 64 kbit/s capacity unavailable is to be recognized.
	"state" (0x0001): The event is to be recognized either if the DCME state transition is detected or if the DCME state is already 64 kbit/s capacity unavailable.
Default:	"exact"

5.2.4.2 ObservedEventsDescriptor parameters

5.2.4.2.1 Initial State

Parameter Name:	Initial State
Parameter ID:	init (0x0002)
Description:	The reason for reporting the 64 kbit/s capacity unavailable event. Only returned if the Strict Transition parameter is set to "state".
Type:	Boolean
Optional:	Yes
Possible values:	"True": The DCME state was already 64 kbit/s capacity unavailable when the Events Descriptor containing this event was activated.
	"False": An actual state transition to 64 kbit/s capacity unavailable was detected.
Default:	False

5.2.5 Trunk(s) available for 64 kbit/s

Event Name:	64 kbit/s capacity available
Event ID:	kb64Av (0x0005)
Description:	Generated to notify the end of "No 64 kbit/s capacity available" overload condition, i.e., all bearer capabilities are available, and thus corresponding to DCME normal operation. This event is used by the DCME transmission resource management (TRM).

5.2.5.1 EventDescriptor parameters

5.2.5.1.1 Strict Transition

Parameter Name:	Strict Transition
Parameter ID:	strict (0x0001)
Description:	Indicates how the 64 kbit/s capacity available event is to be detected.
Type:	Enumeration
Optional:	Yes
Possible values:	"exact" (0x0000): Only an actual transition to 64 kbit/s capacity available is to be recognized.
	"state" (0x0001): The event is to be recognized either if the DCME state transition is detected or if the DCME state is already 64 kbit/s capacity available.
Default:	exact

5.2.5.2 ObservedEventsDescriptor parameters

5.2.5.2.1 Initial State

Parameter Name: Initial State

Parameter ID: init (0x0002)

Description: The reason for reporting the 64 kbit/s capacity available event. Only returned if the Strict Transition parameter is set to "state".

Type: Boolean

Optional: Yes

Possible values: "True": The DCME state was already 64 kbit/s capacity available when the Events Descriptor containing this event was activated.

                   "False": An actual state transition to 64 kbit/s capacity available was detected.

Default: False

5.2.6   64 kbit/s positive acknowledgement

Event Name: 64 kbit/s positive acknowledgement

Event ID: kb64PosAck (0x0006)

Description: Generated when a positive acknowledgement is received from DCME equipment due to a previously sent 64 kbit/s request. This event is used by the DCME bearer service selection.

5.2.6.1   EventDescriptor parameters

None.

5.2.6.2   ObservedEventsDescriptor parameters

None.

5.2.7   64 kbit/s negative acknowledgement

Event Name: 64 kbit/s negative acknowledgement

Event ID: kb64NegAck (0x0007)

Description: Generated when a negative acknowledgement is received from DCME equipment due to a previously sent 64 kbit/s request. This event is used by the DCME bearer service selection.

5.2.7.1   EventDescriptor parameters

None.

5.2.7.2   ObservedEventsDescriptor parameters

None.

5.2.8   Release 64 kbit/s positive acknowledgement

Event Name: Release 64 kbit/s positive acknowledgement

Event ID: kb64RelPosAck (0x0008)

Description: Generated when a positive acknowledgement is received from DCME equipment due to a 64 kbit/s release request, thus indicating normal service availability. This event is used by the DCME bearer service selection.

5.2.8.1 EventDescriptor parameters

None.

5.2.8.2 ObservedEventsDescriptor parameters

None.

5.2.9 Positive acknowledgement

Event Name: Positive acknowledgement

Event ID: PosAck (0x0009)

Description: Generated when a positive acknowledgement is received from DCME equipment due to a previously sent request for 3.1 kHz service or speech. This event is used by the DCME bearer service selection.

5.2.9.1 EventDescriptor parameters

None.

5.2.9.2 ObservedEventsDescriptor parameters

None.

5.2.10 Negative acknowledgement

Event Name: Negative acknowledgement

Event ID: NegAck (0x000A)

Description: Generated when a negative acknowledgement is received from DCME equipment due to a previously sent request for 3.1 kHz service or speech. This event is used by the DCME bearer service selection.

5.2.10.1 EventDescriptor parameters

None.

5.2.10.2 ObservedEventsDescriptor parameters

None.

5.2.11 Maintenance release

Event Name: Maintenance release

Event ID: MaintRel (0x000B)

Description: Generated when a request from the DCME equipment is received to prevent renewed seizure. This event is used by the DCME maintenance signalling.

5.2.11.1 EventDescriptor parameters

5.2.11.1.1 Strict Transition

Parameter Name: Strict Transition

Parameter ID: strict (0x0001)

Description: Indicates how the Maintenance Release event is to be detected.

Type: Enumeration

Optional: Yes

Possible values: "exact" (0x0000): Only an actual transition to Maintenance Release is to be recognized.

"state" (0x0001): The event is to be recognized either if the DCME state transition is detected or if the DCME state is already Maintenance Release.

Default: exact

5.2.11.2 ObservedEventsDescriptor parameters

5.2.11.2.1 Predecessor seizure signal

Parameter Name: Predecessor seizure signal

Parameter ID: preseiz (0x0001)

Description: May be used to report whether a circuit was seized for speech or 64 kbit/s (Annex B of [ITU-T Q.50]).

Type: Enumeration

Optional: Yes

Possible values: "PRESPEECH" (0x0001) "3.1 kHz, speech seizure"

"PRE64" (0x0002) "64 kbit/s seizure"

Default: Provisioned

5.2.11.2.2 Initial State

Parameter Name: Initial State

Parameter ID: init (0x0002)

Description: The reason for reporting the Maintenance Release event. Only returned if the Strict Transition parameter is set to "state".

Type: Boolean

Optional: Yes

Possible values: "True": The DCME state was already Maintenance Release when the Events Descriptor containing this event was activated.

"False": An actual state transition to Maintenance Release was detected.

Default: False

5.2.12 Out-of-Service

Event Name: Out-of-Service

Event ID: OoS (0x000C)

Description: Generated when a request from the DCME equipment is received to force the release of a busy termination and to prevent renewed seizure. DCME is for any reason unable to accept traffic. This event is used by the DCME maintenance signalling.

5.2.12.1 EventDescriptor parameters

5.2.12.1.1 Strict Transition

Parameter Name: Strict Transition

Parameter ID: strict (0x0001)

Description: Indicates how the OoS event is to be detected.

Type:	Enumeration
Optional:	Yes
Possible values:	"exact" (0x0000): Only an actual transition to OoS is to be recognized.
	"state" (0x0001): The event is to be recognized either if the DCME state transition is detected or if the DCME state is already OoS.
Default:	exact

5.2.12.2 ObservedEventsDescriptor parameters

5.2.12.2.1 OoS type

Parameter Name:	OoS Type
Parameter ID:	OoStype (0x0001)
Description:	May be used to report the out-of-service type (a,b,c,d) (Annex B of [ITU-T Q.50]).
Type:	Enumeration
Optional:	Yes
Possible values:	"A" (0x0001)
	"B" (0x0002)
	"C" (0x0003)
	"D" (0x0004)
Default:	Provisioned

5.2.12.2.2 Initial State

Parameter Name:	Initial State
Parameter ID:	init (0x0002)
Description:	The reason for reporting the OoS event. Only returned if the Strict Transition parameter is set to "state".
Type:	Boolean
Optional:	Yes
Possible values:	"True": The DCME state was already OoS when the Events Descriptor containing this event was activated.
	"False": An actual state transition to OoS was detected.
Default:	False

5.2.13 Back-in-Service

Event Name:	Back-in-Service
Event ID:	BiS (0x000D)
Description:	Generated when an indication from the DCME equipment is received for normal operation. This event is used by the DCME maintenance signalling.

5.2.13.1 EventDescriptor parameters

None.

5.2.13.2 ObservedEventsDescriptor parameters

5.2.13.2.1 BiS type

Parameter Name: BiS Type

Parameter ID: BiStype (0x0001)

Description: May be used to report the back-in-service type.

Type: Enumeration

Optional: Yes

Possible values: "64 kbit/s capacity available" (0x0001)

    "Trunk available" (0x0002)

Default: Provisioned

5.2.14 DCME failure

Event Name: DCME failure

Event ID: dcmef (0x000E)

Description: Reports DCME failures associated with this package.

5.2.14.1 EventDescriptor parameters

None.

5.2.14.2 ObservedEventsDescriptor parameters

5.2.14.2.1 Error code

Parameter Name: Error Code

Parameter ID: ec (0x0001)

Description: See clause 5.5.

Type: Enumeration

Optional: No

Possible values: "NROR" (0x0001) "No Response On Release"

    "SNOT" (0x0002) "Seizability NOT yet enabled"

    "DS" (0x0003) "Dual Seizure"

    "UKLS" (0x0004) "UnKnown Line State"

    "RDSD" (0x0005) "Remote DCME Signalling Disabled"

Default: None

5.2.14.2.2 Error additional information

Parameter Name: Error Additional Information

Parameter ID: eai (0x0002)

Description: This parameter should be used to carry any additional information such as the exact line states in case of error code UKLS.

Type: String

Optional: Yes

Possible values: Any text string.

Default: Provisioned

5.3   Signals

5.3.1   64 kbit/s availability acknowledgement

Signal Name: 64 kbit/s availability acknowledgement

Signal ID: kb64AvAck (0x0001)

Description: Sent under normal condition. This signal is used by the DCME transmission resource management (TRM).

Signal Type: Brief

Duration: Not applicable.

5.3.1.1   Additional parameters

None.

5.3.2   64 kbit/s unavailability acknowledgement

Signal Name: 64 kbit/s unavailability acknowledgement

Signal ID: kb64UnavAck (0x0002)

Description: This signal is used by the DCME transmission resource management (TRM).

Signal Type: Brief

Duration: Not applicable.

5.3.2.1   Additional parameters

None.

5.3.3   Select 64 kbit/s

Signal Name: Select 64 kbit/s

Signal ID: kb64Select (0x0003)

Description: Sent when 64 kbit/s circuit is required via the DCME. This signal is used by the DCME bearer service selection.

Signal Type: Brief

Duration: Not applicable.

5.3.3.1   Additional parameters

None.

5.3.4   Release 64 kbit/s

Signal Name: Release 64 kbit/s

Signal ID: kb64Release (0x0004)

Description: Sent by the originating ISC to indicate that a 64 kbit/s circuit is not necessary thus indicating normal service requests for connection type speech and 3.1 kHz audio. This signal is used by the DCME bearer service selection.

Signal Type: Brief

Duration: Not applicable

5.3.4.1   Additional parameters

None.

5.3.5   3.1 kHz service or speech connection type select

Signal Name: 3.1 kHz service or speech connection type select

Signal ID: select (0x0005)

Description: Request to allocate data, 3.1 kHz or speech optimized facilities. This signal is used by the DCME bearer service selection.

Signal Type: Brief

Duration: Not applicable.

5.3.5.1   Additional parameters

None.

5.3.6   Release 3.1 kHz or speech connection type service

Signal Name: Release 3.1 kHz or speech connection type service

Signal ID: release (0x0006)

Description: Sent to indicate termination of the call. This signal is used by the DCME bearer service selection.

Signal Type: Brief

Duration: Not applicable.

5.3.6.1   Additional parameters

None.

5.3.7   Maintenance release acknowledgement

Signal Name: Maintenance release acknowledgement

Signal ID: maintRelAck (0x0007)

Description: Sent to acknowledge reception of maintenance release, ISC is waiting for the release of the trunk. This signal is used by the DCME maintenance signalling.

Signal Type: Brief

Duration: Not applicable.

5.3.7.1   Additional parameters

None.

5.3.8   CME clear of traffic signal

Signal Name: CME clear of traffic signal

Signal ID: cots (0x0008)

Description: Signal sent when this (all these) trunk(s) is (are) idle. The ISC prevents new seizures on these (this) trunk(s). This signal is used by the DCME maintenance signalling.

Signal Type: Brief

Duration: Not applicable.

5.3.8.1 Additional parameters

None.

5.3.9 Out-of-Service acknowledgement

Signal Name: Out-of-service acknowledgement

Signal ID: OoSAck (0x0009)

Description: Sent to acknowledge "out-of-service signal" used on a per-circuit basis. This signal is used by the DCME maintenance signalling.

Signal Type: Brief

Duration: Not applicable.

5.3.9.1 Additional parameters

None.

5.3.10 Back-in-Service acknowledgement

Signal Name: Back-in-service acknowledgement

Signal ID: BiSAck (0x000A)

Description: For DCME maintenance signalling, this signal is used on a per-circuit basis. For DCME TS16 based TRM, signalling this signal is used to signal ISC normal operation.

Signal Type: Brief

Duration: Not applicable.

5.3.10.1 Additional parameters

None.

5.4 Statistics

None.

5.5 Error codes

No additional error codes.

5.6 Procedures

5.6.1 Overview and PCM30 interface configuration

The DCME Package shall be applied in an environment as shown in Figure 1.

It has to be provisioned within the MG that a G.704 2048 kbit/s link is using time-slot 16 to carry channel associated signalling (CAS; according to clause 5.1.3.2 of [ITU-T G.704]). If so, this TDM Termination (TS16) has always to reside in the NULL Context. An H.248 Add Command related to this TDM Termination shall be rejected with error code #542 "Command is not allowed on this termination" [ITU-T H.248.8].

One difference between Annex A of [ITU-T Q.50] and Annex B of [ITU-T Q.50] is that time-slot 16 (TS16) is used differently to carry DCME signalling for:

• transmission resource management;

• maintenance signalling;

• bearer service select signalling.

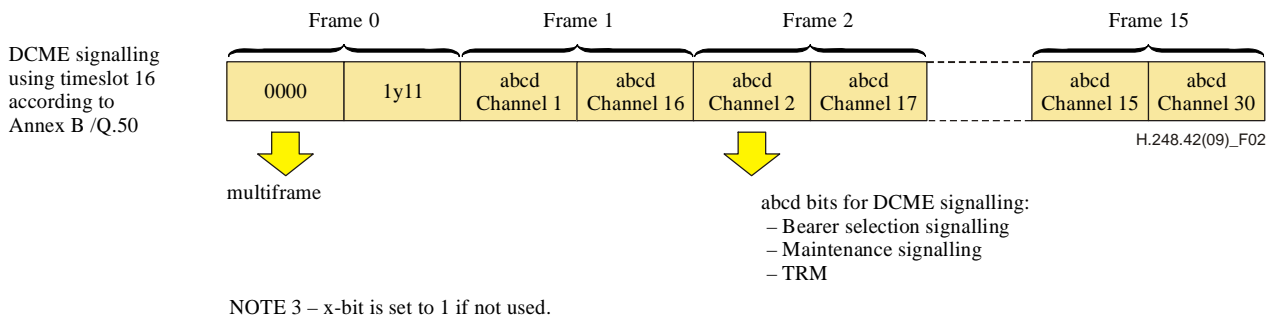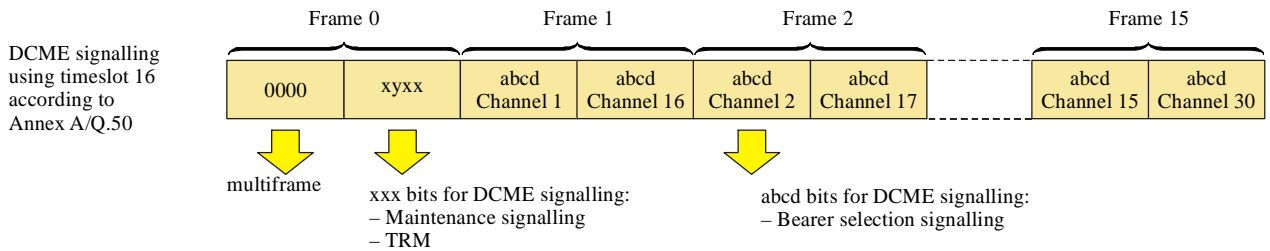More details on TS16 usage are given in Figure 2.

Figure 2 – Time-slot 16 usage in PCM30 system

Upon reception of a CAS line state, which is not defined according to [ITU-T Q.50], the MG shall generate a **dcme/dcmef** event with error code "UnKnown Line State" and optionally the line state using the parameter: error additional information. Note that within the MG, the criteria for the detection of unknown line states differs depending on the provisioned [ITU-T Q.50] Annex (A or B) within the MG.

In case of Annex A of [ITU-T Q.50], the MG shall generate a **dcme/dcmef** event with error code "Remote DCME Signalling Disabled" in case the CAS signalling bits "xxx" of frame 0 are set to "111". According to Table 14, Note 4 of [ITU-T G.704], "111" is used to indicate "not used".

5.6.2   Maintenance and TRM procedures

Annex A of [ITU-T Q.50] uses some spare bits (frame0) within multiframed time-slot 16 to signal maintenance and resource management information between the ISC and the DCME equipment, whereas in the case of Annex B of [ITU-T Q.50], maintenance and resource management signalling is done by circuit-related means (frames 1 to 15). This means that MGC has to be aware of which annex is used by the MG, as applying signals as well as events subscription has to be done differently:

•   Annex A of [ITU-T Q.50]: The MGC has to apply signals/subscribe for events for maintenance and resource management on the TDM Termination representing time-slot 16 of the 2 Mbit/s interface. As an option, in case the MG receives a Maintenance release signal from the DCME equipment, the MG may autonomously send a Maintenance release acknowledgement signal back to the DCME equipment.

•   Annex B of [ITU-T Q.50]: The MGC has to apply signals/subscribe for events for maintenance and resource management on the particular TDM Termination. As an option, in case the MG receives a Maintenance release signal and/or out-of-service signal from the DCME equipment, the MG may autonomously send a Maintenance release

acknowledgement and/or out-of-service acknowledgement signal back to the DCME equipment.

> NOTE – Autonomous sending of acknowledgements can be enabled on the MG by means of provisioning. The MGC may initiate this behaviour as well by means of an embedded Signals Descriptor in the Events Descriptor.

In case the MG receives a back-in-service signal from the DCME equipment, the MG shall report dcme/BiS event (if an event subscription is in place). Due to the fact that some national DCME variants have specified more than one BiS line signal, the optional ObservedEventsDescriptor parameter 'BiS Type' may be used to report the particular back-in-service type.

5.6.3   Bearer service select procedures

Annex A of [ITU-T Q.50]: Under the condition that the signal dcme/kb64Select has been applied to the termination, a detected line state transition to circuit out-of-service/unavailability is mapped to the **dcme/kb64NegAck** event. Under the condition that the signal dcme/kb64Release has been applied to the termination, a detected line state transition to circuit out-of-service/unavailability is mapped to the **dcme/OoS** event.

Annex A of [ITU-T Q.50]: Under the condition that a termination has notified a DCME circuit being out-of-service, a detected line state transition to normal service is mapped to the **dcme/BiS** event. Under the condition that a termination has been requested to release a seized 64 kbit/s circuit, a detected line state transition to normal service is mapped to the **dcme/kb64RelPosAck** event.

Annex B of [ITU-T Q.50] does not specify explicit line signal states for negative acknowledgements. Therefore the MG has to monitor on missing positive acknowledgement and after timeout ([ITU-T Q.50]:   150 ms)   generate   a   (64 kbit/s)   negative   acknowledgement   event (**dcme/kb64NegAck**; **dcme/NegAck**).

Annex B of [ITU-T Q.50]: In the event that MGC renews the seizure of a released circuit, the MG has to monitor that a time of 150 ms is between the applied signals. In case this timeline is violated, the MG shall generate a **dcme/dcmef** event with error code "*Seizability NOT yet enabled*".

Annex B of [ITU-T Q.50]: In case the MGC releases a given circuit by applying a release signal on the corresponding physical termination, the MG shall monitor timer based on the line state for the expected availability indication sent by the DCME equipment. The timer value shall be provisioned within the MG. In case of time out, the MG shall generate a **dcme/dcmef** event with error code "*No Response On Release*".

In case the MG receives a signal to seize a circuit, it must check on the current line state. If the circuit is already seized, the MG shall generate a **dcme/dcmef** event with error code "*Dual Seizure*".

5.6.4   Signal procedures

A channel associated signalling (CAS) signal must always be present on a CAS interface. This rule applies for all CAS conveyed via time-slot 16 independent of the frame number (G.704 2048 kbit/s multiframing with 16 frames). Therefore, the DCME signals shall be considered to be state changes in the CAS state, rather than as persistent signals in themselves. The state change shall be considered to be completed instantaneously by the MG. Consequently, there is no active signal to be terminated by any subsequent event detection (see clause 7.1.9 of [ITU-T H.248.1]). The MG shall maintain the existing DCME signal state on a CAS interface until such time as the MGC sends a new DCME signal to the MG to change state.

5.6.5 Event procedure

The MG should provide the capability to provision an event subscription for the **dcme/dcmef** event. The returned RequestIdentifier within the event notification should be provisioned in the MG as well. The MGC should send the **dcme/dcmef** event in each subsequent events descriptor to ensure that the event remains active.

5.6.6 Signal/Event mapping for Annex A of [ITU-T Q.50]

The transmission resource management of Annex A of [ITU-T Q.50] is given in Table 1.

Table 1 – Transmission resource management (Annex A of [ITU-T Q.50])

Switching centre → DCME	H.248.42 DCME package
Switching centre normal	Signal: dcme/AvAck
DCME → Switching centre	**H.248.42 DCME package**
No trunk(s) available for 3.1 kHz audio or speech	Event: dcme/tunav
No channel(s) available for 3.1 kHz	Event: dcme/cunav
No 64 kbit/s capacity available	Event: dcme/kb64Unav
DCME normal	Event: dcme/kb64Av

The maintenance signalling of Annex A of [ITU-T Q.50] is given in Table 2.

Table 2 – Maintenance signalling (Annex A of [ITU-T Q.50])

Switching centre → DCME	H.248.42 DCME package
Maintenance release request acknowledgement	Signal: dcme/maintRelAck
DCME clear of traffic	Signal: dcme/cots
DCME → Switching centre	**H.248.42 DCME package**
Maintenance release request	Event: dcme/MaintRel

The bearer service select signalling of Annex A of [ITU-T Q.50] is given in Table 3.

Table 3 – Bearer service select signalling (Annex A of [ITU-T Q.50])

Switching centre → DCME	H.248.42 DCME package
64 kbit/s request	Signal: dcme/kb64Select
3.1 kHz request	Signal: dcme/select
Normal service available	Signal: dcme/kb64Release
DCME → Switching centre	**H.248.42 DCME package**
Channel out-of-service/unavailable	Event: dcme/kb64NegAck (unavailable)
	Event: dcme/OoS (Out-of-service)
Special service acknowledgement	Event: dcme/kb64PosAck
Normal service available	Event: dcme/kb64RelPosAck (available)
	Event: dcme/BiS (Back-in-service)

5.6.7   Signal/Event mapping for Annex B of [ITU-T Q.50]

The transmission resource management of Annex B of [ITU-T Q.50] is given in Table 4.

Table 4 – Transmission resource management (Annex B of [ITU-T Q.50])

DCME → Switching centre	H.248.42 DCME package
Circuit available for 64 kbit/s	Event: dcme/kb64Av
Circuit available for 3.1 kHz data, speech	Event: dcme/tav
Circuit not available	Event: dcme/tunav

The maintenance signalling of Annex B of [ITU-T Q.50] is given in Table 5.

Table 5 – Maintenance signalling (Annex B of [ITU-T Q.50])

Switching centre → DCME	H.248.42 DCME package
Maintenance release acknowledgement	Signal: dcme/maintRelAck
CME clear of traffic	Signal: dcme/cots
Out-of-service acknowledgement	Signal: dcme/OoSAck
DCME → Switching centre	**H.248.42 DCME package**
Maintenance release signal (after 3.1 kHz, speech seizure)	Event: dcme/MaintRel
Maintenance release signal (after 64 kbit/s seizure)	Event: dcme/MaintRel
Out-of-service	Event: dcme/OoS
Back-in-service	Event: dcme/BiS

The bearer service select signalling of Annex B of [ITU-T Q.50] is given in Table 6.

Table 6 – Bearer service select signalling (Annex B of [ITU-T Q.50])

Switching centre → DCME	H.248.42 DCME package
64 kbit/s seizure	Signal: dcme/kb64Select
3.1 kHz/speech seizure	Signal: dcme/select
Release 64 kbit/s	Signal: dcme/kb64Release
Release 3.1 kHz/speech	Signal: dcme/release
DCME → Switching centre	**H.248.42 DCME package**
64 kbit/s positive acknowledgment	Event: dcme/kb64PosAck
3.1 kHz/speech positive acknowledgement	Event: dcme/PosAck

Bibliography

[b-ITU-T G.726]   Recommendation ITU-T G.726 (1990), 40, 32, 24, 16 kbit/s *Adaptive Differential Pulse Code Modulation (ADPCM)*.

[b-ITU-T G.763]   Recommendation ITU-T G.763 (1998), *Digital circuit multiplication equipment using G.726 ADPCM and digital speech interpolation*.

[b-ITU-T G.765]   Recommendation ITU-T G.765 (1992), *Packet circuit multiplication equipment*.

[b-ITU-T G.767]   Recommendation ITU-T G.767 (1998), *Digital circuit multiplication equipment using 16 kbit/s LD-CELP, digital speech interpolation and facsimile demodulation/remodulation*.

[b-ITU-T G.768]   Recommendation ITU-T G.768 (2001), *Digital circuit multiplication equipment using 8 kbit/s CS-ACELP*.

[b-ITU-T G.769]   Recommendation ITU-T G.769/Y.1242 (2004), *Circuit multiplication equipment optimized for IP-based networks*.

[b-ITU-T Q.50.1]   Recommendation ITU-T Q.50.1 (2001), *Signalling between International Switching Centres (ISC) and Digital Circuit Multiplication Equipment (DCME) including the control of compression/decompression*.

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	Terminals and subjective and objective assessment methods
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