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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS  
Supplementary services for multimedia

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**Circuit maps within H.323 systems**

ITU-T Recommendation H.460.3

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## **ITU-T Recommendation H.460.3**

### **Circuit maps within H.323 systems**

#### **Summary**

This Recommendation specifies a mechanism that allows a PSTN – H.323 Gateway to report circuit service and usage status to a Gatekeeper using the circuit status map parameter. Individual PSTN circuits on the Gateway may be taken out-of-service by a provisioning command from service personnel or when an ISUP out-of-service or blocking message is received from the adjacent PSTN switch. In this case, the Gateway will be able to report the current circuit status to the Gatekeeper so that it may select only from available circuits for outgoing calls through that Gateway.

#### **Source**

ITU-T Recommendation H.460.3 was prepared by ITU-T Study Group 16 (2001-2004) and approved under the WTSA Resolution 1 procedure on 29 November 2002.

## FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. 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.

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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, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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# ITU-T Recommendation H.460.3

## Circuit maps within H.323 systems

### 1 Scope

H.323 provides the ability for a Gateway to report call capacity information in the callCapacity structure to a Gatekeeper to support routing of calls to that Gateway. The H.323 destinationCircuitId field as defined in ITU-T Rec. H.225.0 provided the means for a Gatekeeper to select a trunk group and circuit on a Gateway for the outgoing call through that Gateway.

However, the service state of individual PSTN circuits in trunk groups on a Gateway cannot be reported to the Gatekeeper. This means that the Gatekeeper cannot do proper circuit selection because it does not know the service state of circuits on the Gateway. Individual PSTN circuits on the gateway may be taken out-of-service by a provisioning command from service personnel, or when an ISUP out-of-service or blocking message is received from the adjacent PSTN switch. In this case, the Gatekeeper will route the call to the Gateway because it knows that circuits are available (from callCapacity) on that Gateway, but not which circuits are in-service. When this occurs, the call will be rejected by the Gateway. This consumes network resources unnecessarily and will potentially increase post-dial delay. To solve the problem, this Recommendation provides the means for a Gateway to send circuit service state and usage status to a Gatekeeper.

### 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.

- [1] ITU-T Recommendation H.323 (2000), *Packet-based multimedia communications systems*.
- [2] ITU-T Recommendation H.225.0 (2000), *Call signalling protocols and media stream packetization for packet-based multimedia communication systems*.
- [3] ITU-T Recommendation Q.931 (1998), *ISDN user-network interface layer 3 specification for basic call control*.

### 3 Abbreviations

This Recommendation uses the following abbreviations:

ISUP	ISDN User Part
PER	Packed Encoding Rules
RAS	Registration, Admission and Status
RCF	Registration Confirmation

#### 4 Capability advertisement

A Gatekeeper signals its support for the capability to accept circuit service and usage status notifications from a Gateway by advertising the capability in the **featureSet.supportedFeatures** field of the RCF message. The capability is indicated with the feature identifier shown in Table 1 as a **supportedFeatures** element and without **parameters**.

#### 5 Circuit Status report

A PSTN – H.323 Gateway may report circuit service and usage status to a Gatekeeper using the circuit status parameter. The circuit status may be reported when a Gateway registers with the Gatekeeper, when circuit service state changes occur as a result of maintenance actions on the part of operations personnel, or when an ISUP Blocking message is received.

A Gateway may report its circuit status to a Gatekeeper in H.225.0 RAS and call signalling messages.

The Circuit Status Map parameter is transported as follows in the H.225.0 RAS and call signalling (Q.931) messages using the generic extensibility framework:

- When sending the Circuit Status Map parameter in the call signalling messages, the CircuitStatus shall be coded in the genericData parameter in the H.225.0 H323-UU-PDU in the User-user Information Element.
- When sending the Circuit Status Map parameter in the RAS messages, the CircuitStatus shall be coded in the genericData parameter in the request parameter of the H.225.0 RasMessage.

The genericData parameter indicates the circuitStatus feature and contains a circuitStatus parameter.

If there are a large number of circuits on a Gateway the circuit status may be sent in several H.225.0 messages.

Table 1 defines the Circuit Status feature.

**Table 1/H.460.3 – Report of Circuit Status from a gateway to a gatekeeper**

Feature name:	Circuit Status
Feature Description:	This feature allows an H.323 Gateway to report circuit service and usage status to a Gatekeeper.
Feature identifier type:	Standard
Feature identifier value:	3

## 6 Circuit Status Map parameter

Table 2 defines the Circuit Status Map parameter.

**Table 2/H.460.3 – Circuit Status Map parameter**

Parameter name:	Circuit Status Map
Parameter description:	This is the data sent in H.225.0 RAS and Call Signalling messages to indicate circuit status. The content is a raw field consisting of the ASN.1 PER encoded CircuitStatusMap as specified in the ASN.1 below.
Parameter identifier type:	Standard
Parameter identifier value:	1
Parameter type:	Raw
Parameter cardinality:	Once and only once

## 7 Circuit Status Map ASN.1 definition

The Circuit Status Map definition used within the GenericData is shown below.

```
CIRCUIT-STATUS-MAP DEFINITIONS AUTOMATIC TAGS ::=
BEGIN

IMPORTS
    CircuitIdentifier
    FROM H323-MESSAGES;

CircuitStatus ::= SEQUENCE -- root for Circuit Status Map ASN.1
{
    circuitStatusMap          SEQUENCE OF CircuitStatusMap OPTIONAL,
    ...
}

CircuitStatusMap ::= SEQUENCE
{
    statusType                CircuitStatusType,
    baseCircuitID             CircuitIdentifier,
    range                     INTEGER (0..4095),
    status                    OCTET STRING,
    ...
}

CircuitStatusType ::= CHOICE
{
    serviceStatus             NULL,          -- status: 0 = out-of-service, 1 = in-service
    busyStatus                NULL,        -- status: 0 = free, 1 = in-use
    ...
}

END
```

## 8 Description of ASN.1 types and fields

**CircuitStatusMap** – The CircuitStatusMap consists of a statusType field, a baseCircuitId field, a range field and a status field:

a) *statusType*

This is the type of status represented by the following status field. This includes serviceStatus that indicates whether the circuit is available for service and busyStatus that indicates whether the circuit is currently being used for a connection.

b) *baseCircuitId*

This identifies the first circuit to which the range of status bits contained in the status field applies.

c) *range*

The number represented by the range code + 1 indicates the range of circuits affected by the CircuitStatusMap. This is in the range from 0 to 4095.

d) *status*

The status field contains from 0 to 4096 status bits numbered from 0 to 4095. Status bit 0 is located in the most significant bit position of the first status field octet. Other status bits follow in numerical order. The number of relevant status bits in a given status field is equal to range + 1.

Each status bit is associated with a circuit such that status bit n is associated with circuit m + n, where m is the circuit identified in the baseCircuitId field.

If the statusType indicates serviceStatus the circuit status bits are coded as follows:

- 0 out-of-service;
- 1 in-service.

If the statusType indicates busyStatus the circuit status bits are coded as follows:

- 0 free;
- 1 in-use.



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