INTERNATIONAL TELECOMMUNICATION UNION

ITU-T Q.2150.0

(05/2001)

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

SERIES Q: SWITCHING AND SIGNALLING

Broadband ISDN – Signalling ATM adaptation layer (SAAL)

Generic Signalling Transport Service

ITU-T Recommendation Q.2150.0

(Formerly CCITT Recommendation)

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ITU-T Recommendation Q.2150.0

Generic Signalling Transport Service

Summary

This Recommendation specifies the Generic Signalling Transport Service that allows the development of signalling specifications without considerations of the idiosyncrasies of the underlying signalling transport mechanisms.

Source

ITU-T Recommendation Q.2150.0 was prepared by ITU-T Study Group 11 (2001-2004) and approved under the WTSA Resolution 1 procedure on 15 May 2001.

Keywords

Asynchronous Transfer Mode (ATM), ATM Adaptation Layer (AAL), Bearer Independent Call Control (BICC), Broadband Integrated Services Network (B-ISDN), Message Transfer Part (MTP), Signalling AAL (SAAL), Signalling Transport Converter (STC).

FOREWORD

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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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ITU-T Recommendation Q.2150.0

Generic Signalling Transport Service

1 Scope

This Recommendation describes the Generic Signalling Transport Service. It allows the definition of signalling specifications without considerations of the idiosyncrasies of the underlying signalling transport mechanisms.

This Recommendation also describes the interface states and the definition of the service by a number of primitives. The Generic Signalling Transport Service can be deployed by means of Signalling Transport Converters over a range of signalling transport protocol stacks.

NOTE – Signalling Transport Converters are defined, for example, in ITU-T Q.2150.1 [6], ITU-T Q.2150.2 [7], or ITU-T Q.2150.3 [8].

This Recommendation is based on the requirements defined in ITU-T Q-series Supplement 8 (1999), Technical Report TRQ.2400 [3] "Transport control signalling requirements – Signalling requirements for AAL type 2 link control capability set 1", in ITU-T Q-series Supplement 33 (2000), Technical Report TRQ.2401 [4] "Signalling requirements for Q.AAL2 capability set 2", and in ITU-T Q-series Supplement 38 (2001), Technical Report TRQ.2600 [5] "BICC signalling transport requirements, capability set 1".

2 References

2.1 Normative 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 currently valid ITU-T Recommendations is regularly published.

[1] ITU-T X.200 (1994), *Information technology – Open Systems Interconnection – Basic Reference Model: The basic model*.

[2] ITU-T X.210 (1993), *Information technology – Open Systems Interconnection – Basic Reference Model: Conventions for the definition of OSI services*.

2.2 Bibliography

The following ITU-T Recommendations and other documents contain information that may be useful to understanding the usage of this Recommendation. There are no additional provisions of this Recommendation derived from these documents.

[3] ITU-T Q-series Supplement 8 (1999), *Technical Report TRQ.2400*: *Transport control signalling requirements – Signalling requirements for AAL type 2 link control capability set 1*.

[4] ITU-T Q-series Supplement 33 (2000), *Technical Report TRQ.2401*: *Signalling requirements for Q.AAL2 capability set 2*.

[5] ITU-T Q-series Supplement 38 (2001), *Technical Report TRQ.2600*: *BICC signalling requirements, capability set 1*.

[6] ITU-T Q.2150.1 (2001), *Signalling transport converter on MTP3 and MTP3b*.

[7] ITU-T Q.2150.2 (2001), *Signalling transport converter on SSCOP and SSCOPMCE*.

[8] ITU-T Q.2150.3 (2001), *Signalling transport converter on SCTP*.

[9] ITU-T Q.704 (1996), *Signalling network functions and messages*.

[10] ITU-T Q.2210 (1996), *Message transfer part level 3 functions and messages using the services of ITU-T Recommendation Q.2140*.

[11] ITU-T Q.2110 (1994), *B-ISDN ATM adaptation layer – Service specific connection oriented protocol (SSCOP)*.

[12] ITU-T Q.2111 (1999), *B-ISDN ATM adaptation layer – Service specific connection oriented protocol in a multi-link and connectionless environment (SSCOPMCE)*.

[13] IETF RFC 2960 (2000), *Stream Control Transmission Protocol*.

3 Definitions

This Recommendation is based upon the concepts developed in ITU-T X.200 [1] and ITU-T X.210 [2].

In addition, for the purpose of this Recommendation, the following definitions apply:

3.1 generic signalling transport service: The function that enables a signalling entity to communicate with a peer signalling entity independently of the underlying signalling transport.

3.2 signalling transport: A signalling link or network that connects two signalling entities.

3.3 signalling transport converter: A function that converts the services provided by a particular Signalling Transport to the services required by the Generic Signalling Transport Service.

4 Abbreviations

This Recommendation uses the following abbreviations:

AAL	ATM Adaptation Layer
GST	Generic Signalling Transport
LM	Layer Management
MTP3	Message Transfer Part level 3
MTP3b	Message Transfer Part level 3 using Q.2140
SAAL	Signalling ATM Adaptation Layer
SAP	Service Access Point
SAR	Segmentation and Reassembly (Sublayer)
SCTP	Stream Control Transmission Protocol
SSCOP	Service Specific Connection Oriented Protocol
SSCOPMCE	Service Specific Connection Oriented Protocol in a Multilink and Connectionless Environment
SSCS	Service Specific Convergence Sublayer

STC	Signalling Transport Converter
SVC	Switched Virtual Channel
TED	Transmission Error Detection
VCC	Virtual Channel Connection
VPC	Virtual Path Connection

5 Framework of the Generic Signalling Transport Service

5.1 General framework

A signalling protocol entity makes use of the Generic Signalling Transport service which is provided by the Signalling Transport Converter (for example, see ITU-T Q.2150.1 [6], ITU-T Q.2150.2 [7], or ITU-T Q.2150.3 [8]). The Generic Signalling Transport enables a signalling entity to communicate with a peer signalling entity independently of the underlying signalling transports.

This framework is illustrated in Figure 5-1.

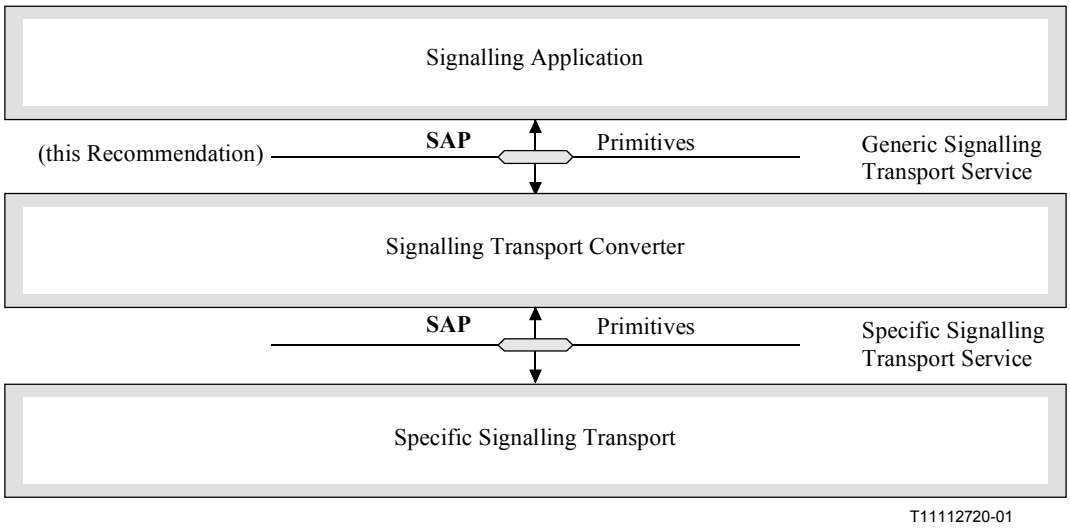

Figure 5-1/Q.2150.0 – Framework for the Generic Signalling Transport Service

Signalling protocols can be deployed over a range of signalling transport protocol stacks. Two peer signalling entities rely on the Generic Signalling Transport service to provide assured data transfer between them and service availability indications; i.e., signalling messages are exchanged between peer protocol entities using the Generic Signalling Transport Service.

Example protocol stacks are shown in Figure 5-2.

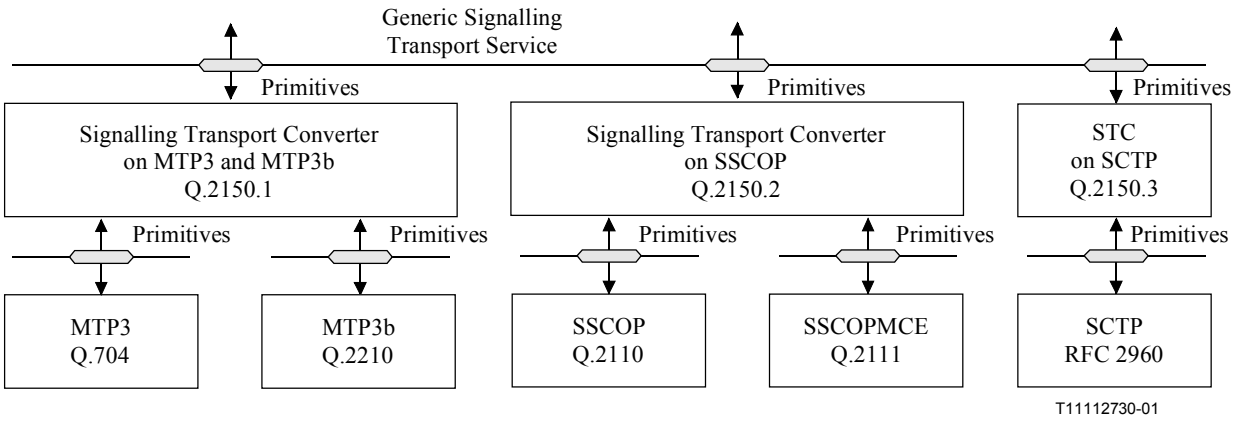

Figure 5-2/Q.2150.0 – Example protocol stacks for the Generic Signalling Transport Service

5.2 Conventions

This Recommendation specifies the information flow across the Signalling Transport Converter – signalling entity boundary. Conceptually, there exists one Signalling Transport Converter entity per signalling association. A signalling entity transfers or receives signalling messages on a particular signalling association by utilizing a particular SAP.

6 Service definition

6.1 Primitives between signalling entities and the Generic Signalling Transport

The services are provided through the transfer of primitives that are summarized in Table 6-1, and are defined as follows:

a) **IN-SERVICE.indication**

This primitive indicates that the signalling transport is able to exchange signalling messages with the peer entity. This indication shall be provided without the signalling entity requesting any service across the SAP.

b) **OUT-OF-SERVICE.indication**

This primitive indicates that the signalling transport is unable to exchange signalling messages with the peer entity. This indication shall be provided without the signalling entity requesting any service across the SAP.

c) **TRANSFER.request**

This primitive is used by the signalling entity to convey a signalling message to its peer entity.

d) **TRANSFER.indication**

This primitive provides a signalling message from the peer entity to the signalling entity.

e) **CONGESTION.indication**

This primitive is used to convey information concerning signalling network congestion.

NOTE – Some Signalling Transport services may not issue the CONGESTION.indication primitive.

f) **START-INFO.indication**

This primitive indicates at start-up to the signalling entity the maximum length of an SDU that the Signalling Transport Converter can transfer and whether this signalling entity is the controlling node of the call association.

Table 6-1/Q.2150.0 – Primitives and parameters of the Generic Signalling Transport sublayer

Primitive Generic Name	Type			
	Request	**Indication**	**Response**	**Confirm**
START-INFO	–	Max_Length CIC_Control	–	–
IN-SERVICE	–	Level	–	–
OUT-OF-SERVICE	–	(Note 1)	–	–
CONGESTION	–	Level	–	–
TRANSFER	Sequence Control STC User Data Priority (Note 2)	STC User Data Priority (Note 2)	–	–

– This primitive is not defined.

NOTE 1 – This primitive has no parameters.

NOTE 2 – This parameter is a national option (and the use of this parameter is not supported by all signalling transports).

6.2 Parameters

a) **CIC_Control**

This parameter indicates to the signalling entity whether it serves as the controlling entity on this signalling association.

b) **Level**

This parameter indicates the level of congestion. This variable can hold the values from a level indicating "no congestion" through to a level indicating "maximum congestion" in increments.

NOTE – The values for indication "no congestion" and "maximum congestion" as well as the number of steps of congestion level and/or amount of increase/decrease are considered to be network implementation dependent.

c) **Max_Length**

This parameter indicates the maximum length of signalling messages that can be transported on this signalling association.

NOTE 1 – The length indicated is a characterization of the underlying signalling transport's length limitations and – in case of MTP transport – includes the MTP header (see ITU-T Q.704 [9] and ITU-T Q.2210 [10]). In particular:

- the value "272" is used to indicate interworking with MTP3 signalling transports (see ITU-T Q.704 [9]);
- the value "4096" is used to indicate interworking with MTP3b signalling transports (see ITU-T Q.2210 [10]); and
- the value "65 328" is used to indicate interworking with SSCOP signalling transports (see ITU-T Q.2110 [11] and ITU-T Q.2111 [12]).

NOTE 2 – The signalling transport based on the Stream Control Transmission Protocol (SCTP, see RFC 2960 [13]) has no length limitations.

d) **Priority**

This parameter indicates the priority of the signalling message.

NOTE 3 – This parameter is a national option.

e) **Sequence Control**

This parameter indicates to the Signalling Transport Converter a value that can be used by the underlying signalling transport for load sharing and/or in-sequence delivery. Signalling messages accompanied by the same Sequence Control value shall be delivered in-sequence.

f) **STC User Data**

This parameter contains a complete signalling message; it represents the STC SDU.

6.3 Establishment

On the establishment of a signalling transport and the associated Signalling Transport Converter entity, for example at power-up, the initial conditions are the same as if an OUT-OF-SERVICE.indication had been conveyed across this SAP. Also at this time the START-INFO.indication is sent to the signalling entity.

6.4 State transition diagram for sequences of primitives of the Generic Signalling Transport service

This clause defines the constraints on the sequences in which the primitives may occur at the layer boundaries of the Generic Signalling Transport service. The sequences are related to the states at one Generic Signalling Transport endpoint between the Generic Signalling Transport service provider and its user. The possible overall sequences of primitives are shown in the state transition diagram, Figure 6-1.

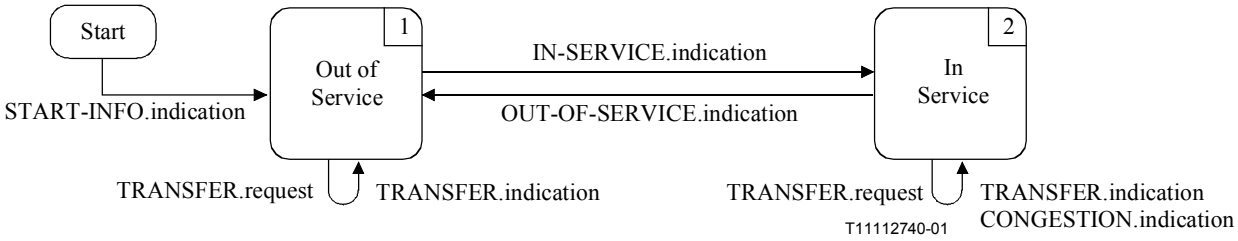

Figure 6-1/Q.2150.0 – State transition diagram for sequences of primitives

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Geneva, 2001