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SERIES Q: SWITCHING AND SIGNALLING

Technical Report TRQ.2003: Roadmap to the BICC protocol Recommendations, BICC interworking Recommendations, and BICC requirement Supplements

ITU-T Q-series Recommendations – Supplement 41

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

Supplement 41 to ITU-T Q-series Recommendations

Technical Report TRQ.2003: Roadmap to the BICC protocol Recommendations, BICC interworking Recommendations, and BICC requirement Supplements

Summary

This Supplement presents an overview of the ITU-T Recommendations and Supplements that have been produced in the context of the Bearer Independent Call Control (BICC) protocol. Included is an index of Recommendations, which provide the detailed protocol descriptions.

Source

Supplement 41 to ITU-T Q-series Recommendations was prepared by ITU-T Study Group 11 (2001-2004) and approved under ITU-T Recommendation A.13 (10/2000) procedure on 22 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 publication, 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 publication, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this publication. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

CONTENTS

Supplement 41 to ITU-T Q-series Recommendations

Technical Report TRQ.2003: Roadmap to the BICC protocol Recommendations, BICC interworking Recommendations, and BICC requirement Supplements

1 Scope

This Supplement provides a roadmap to the BICC-related protocol Recommendations, interworking Recommendations and requirement Supplements.

2 References

No references are included.

Note that Appendix I provides a bibliography of BICC and the BICC-related standards documents.

3 Abbreviations

This Supplement uses the following abbreviations:

AAL	ATM Adaptation Layer
AINI	ATM Inter-Network Interface
APM	Application Transport Mechanism (or Message)
ASE	Application Service Element
ATM	Asynchronous Transfer Mode
BAT	Bearer Association Transport
BCTP	Bearer Control Tunnelling Protocol
BICC	Bearer Independent Call Control
B-ISDN	Broadband ISDN
B-ISUP	Broadband ISDN User Part
CBC	Call Bearer Control protocol
CS	Capability Set
DSS1	Digital Subscriber System No. 1 (ISDN)
DSS2	Digital Subscriber System No. 2 (B-ISDN)
GIT	Generic Identifier Transport
IETF	Internet Engineering Task Force
INAP	Intelligent Network Application Protocol
IP	Internet Protocol
IPBCP	IP Bearer Control Protocol
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
MEGACO	Media Gateway Control protocol
MTP	Message Transfer Part

MTP3	Message Transfer Part level 3 (Narrowband)
MTP3b	Message Transfer Part level 3 (Broadband)
PNNI	Private Network-Network Interface
PSTN	Public Switched Telephone Network
RFC	Request For Comment
RTP	Real time Transport Protocol
SCTP	Stream Control Transmission Protocol
SDP	Session Description Protocol
SS7	Signalling System No. 7
SSCOP	Service Specific Connection Oriented Protocol
SSCOPMCE	SSCOP in a Multi-link or Connectionless Environment
STC	Signalling Transport Converter
TRQ	Technical Report to Q-series Recommendations
UNI	User Network Interface

Note that Appendix II provides an overview of abbreviations and terminology used in the BICC documents.

4 Introduction

Over the last few years, a lot of documentation has been produced on BICC. More than 35 new documents have been produced. These documents in turn are related to many more other standards documents. Because of this, it may be difficult for "newcomers" to dive into BICC, as they may find it difficult to understand how the various documents relate to each other.

This Supplement presents an overview of the BICC documentation. The purpose of this overview is to provide guidance for newcomers into the very modular BICC documentation.

Note that the arrows in the illustrations have various meanings, see Figure 1.

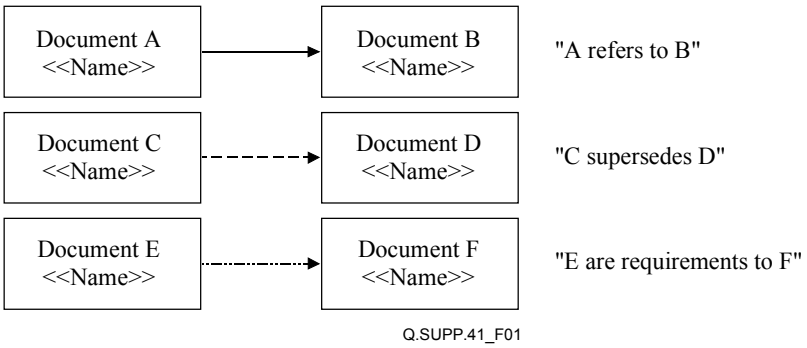

Figure 1 – Meanings of the arrows

5 BICC documentation

Figure 2 illustrates the BICC CS-1 and CS-2 documentation.

- BICC CS-1 has been documented mainly as an application (extension) to the existing ISUP codings and procedures.

- BICC CS-2 involves a complete re-documentation of ISUP and BICC with ISUP becoming a sub-set of BICC.
- Further BICC Capability Sets are expected to be documented in a similar manner as BICC CS-2.

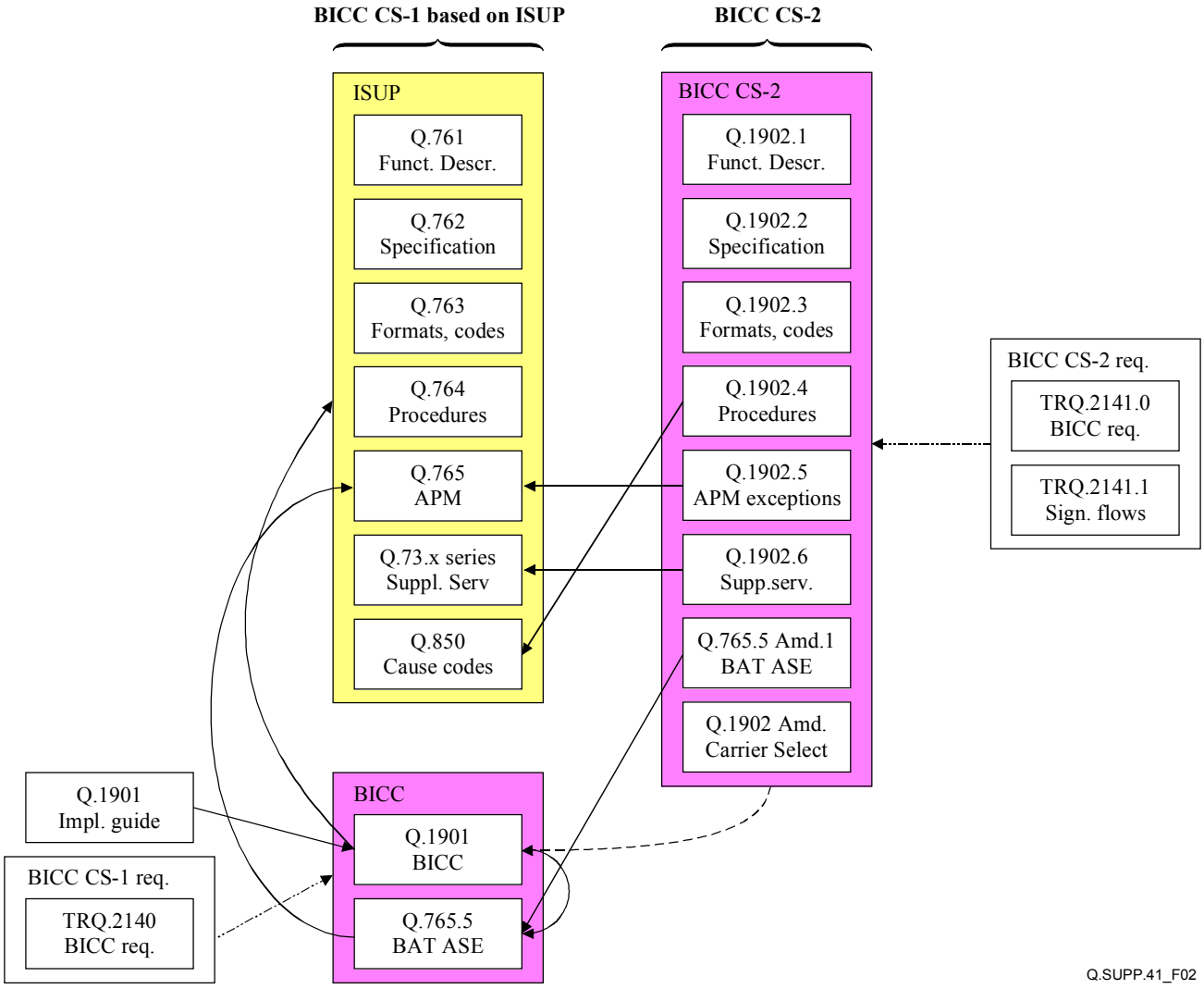

Figure 2 – BICC documentation

5.1 BICC CS-1

- The Q.76.x series describes ISUP basic call wherein Q.763 contains the ISUP formats and codes, and Q.764 contains the ISUP procedures. Q.765 is the Application Transport Mechanism (APM) of ISUP. The Q.73.x series describes ISUP generic procedures and the support of ISDN supplementary services.
- ITU-T Rec. Q.1901 describes the protocol for BICC CS-1. Q.1901 is written as a delta document to Q.761 to Q.764 and Q.765. That is, only the new formats, codes and procedures specific to BICC are described, additional to the ISUP Q.761 to Q.764 and Q.765 documentation.
- ITU-T Rec. Q.765.5 describes the coding of the BICC specific parameters transported via APM, the Bearer Association Transport ASE (BAT ASE).
- TRQ.2140 describes the requirements and the signalling flows of BICC CS-1.

- An implementors guide for ITU-T Rec. Q.1901 provides a compilation of reported defects, their resolutions and minor upgrades.

5.2 BICC CS-2

- The Q.1902.x series describes BICC CS-2. It supersedes the references to the Q.76.x series as applied in Q.1901 for BICC CS-1.
- Amendment 1 to ITU-T Rec. Q.765.5 describes additional coding of the BICC specific parameters in the BAT ASE for BICC CS-2.
- TRQ.2141.0 and TRQ.2141.1 describe the BICC CS-2 requirements and the signalling flows, respectively.

6 CBC documentation

Figure 3 illustrates the CBC documentation. The CBC protocol is based on H.248.1/MEGACO.

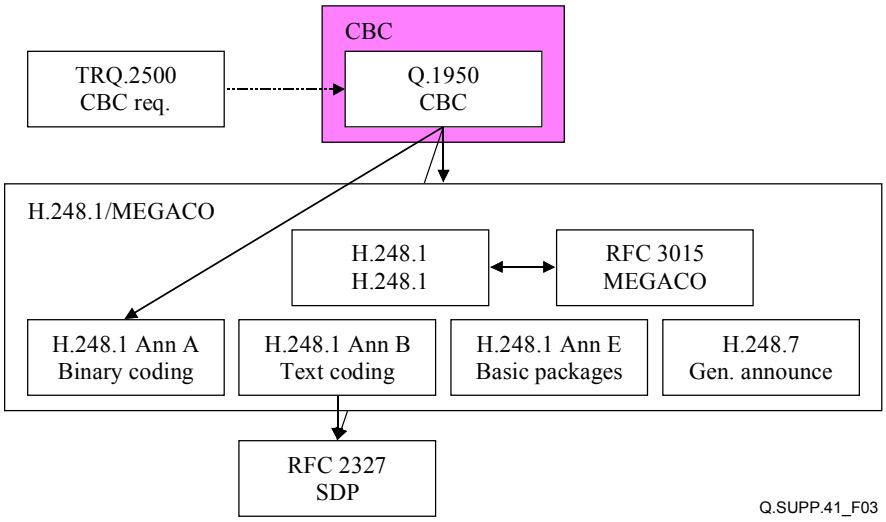

Figure 3 – CBC documentation

- H.248.1/MEGACO describes the vertical H.248.1/MEGACO interface. There are two types of coding used: binary and text. The text coding is based on SDP (RFC 2327). Applications of H.248.1/MEGACO are described in packages. Note that MEGACO is the IETF equivalent of ITU-T Rec. H.248.1.
- ITU-T Rec. Q.1950 describes the application of H.248.1/MEGACO for the CBC interface. It contains the following:
  - A description how specific parts of H.248.1/MEGACO should be used for CBC.
  - New codings for parameters that are not already described in H.248.1/MEGACO.
  - Procedures for the CBC interface.
- TRQ.2500 are the requirements and signalling flows of the CBC interface.

7 Interworking specifications

Figure 4 illustrates the interworking of BICC with other protocols.

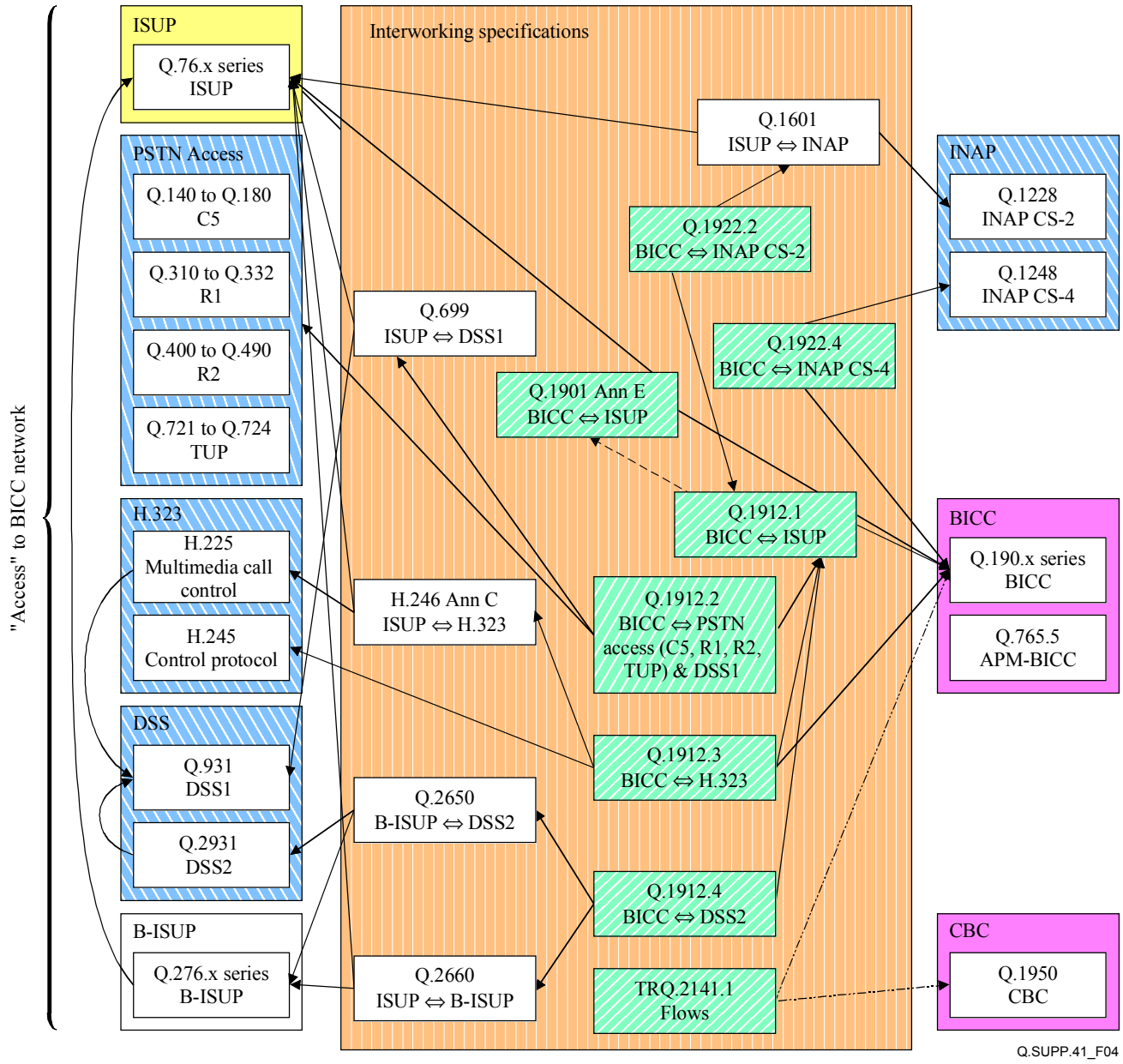

Figure 4 – Interworking specifications

7.1 BICC ⇔ ISUP interworking

- For BICC CS-1 the BICC ⇔ ISUP interworking is described in Annex E/Q.1901. With BICC CS-2 this interworking is described in ITU-T Rec. Q.1912.1 by which Annex E/Q.1901 is superseded.

7.2 BICC ⇔ access interworking

- BICC ⇔ DSS1 (ISDN) interworking is described in ITU-T Rec. Q.1912.2. This Recommendation describes the BICC ⇔ DSS1 as a concatenation of BICC ⇔ ISUP (ITU-T Rec. Q.1912.1) and the ISUP ⇔ DSS1 (ITU-T Rec. Q.699) interworking.
- BICC ⇔ PSTN interworking is described in ITU-T Rec. Q.1912.2 in a similar way as the BICC ⇔ DSS1 interworking.
- BICC ⇔ H.323 interworking is described in ITU-T Rec. Q.1912.3. H.225 is the call control part of H.323, where ITU-T Rec. H.245 is the bearer control part with open logical channels (e.g. voice) in ITU-T Rec. H.323. ITU-T Rec. Q.1912.3 describes the

BICC ⇔ H.225 interworking as a concatenation of BICC ⇔ ISUP (ITU-T Rec. Q.1912.1) and ISUP ⇔ H.323 (Annex C/H.246) interworking. Interworking procedures related to codecs are directly between BICC and H.245.

- BICC ⇔ DSS2 (B-ISDN) interworking is described in ITU-T Rec. Q.1912.4. This Recommendation describes the BICC ⇔ DSS2 as a concatenation of BICC ⇔ ISUP (ITU-T Rec. Q.1912.1), ISUP ⇔ B-ISUP (ITU-T Rec. Q.2660) and B-ISUP-DSS2 (ITU-T Rec. Q.2650) interworking.

7.3 BICC ⇔ INAP interworking

- BICC ⇔ INAP CS-2 interworking is described in ITU-T Rec. Q.1922.2. This Recommendation describes the BICC ⇔ INAP CS-2 as a concatenation of BICC ⇔ ISUP (ITU-T Rec. Q.1912.1) and ISUP ⇔ INAP (ITU-T Rec. Q.1601) interworking.
- BICC ⇔ INAP CS-4 interworking will be described in ITU-T Rec. Q.1922.4 as part of BICC CS-2.

7.4 BICC ⇔ CBC interworking

There is no formal document describing the BICC-CBC interworking yet. However, the protocol flows of TRQ.2141.1 provide a good impression. Work is in progress to have this interworking described and will be documented in a future new annex to Q.1902.4.

8 Bearer networks and tunnelling

8.1 Bearer networks

Figure 5 illustrates the various bearer networks to BICC with other protocols. Four types of bearer networks have been specified for BICC so far:

- AAL type 1 (ATM);
- AAL type 2;
- Structured AAL 1;
- IP/RTP.

The mapping of BICC parameters, like addresses, binding information and cause codes, to the various bearer control protocols is defined in protocol Supplements.

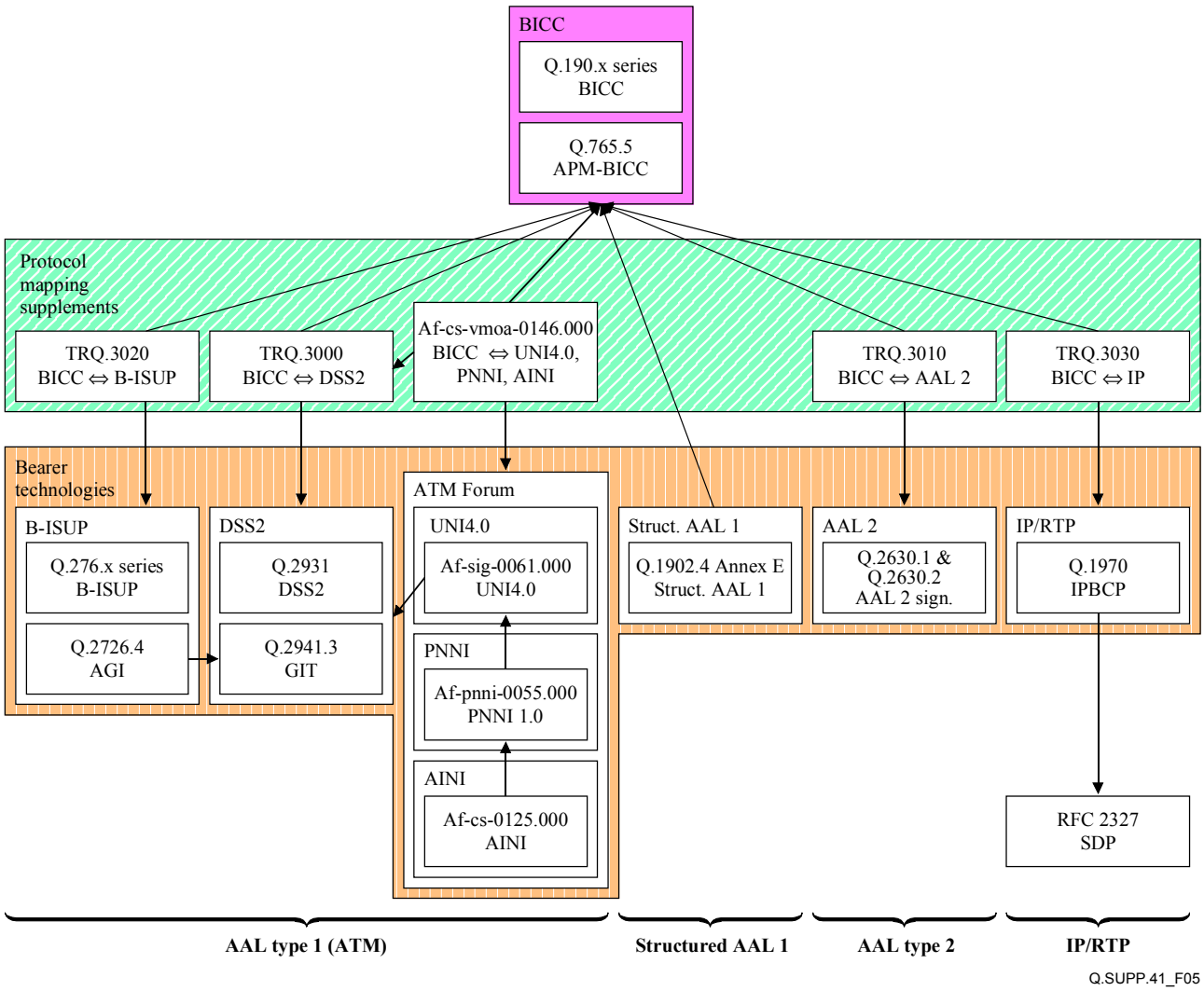

Figure 5 – Bearer networks

8.1.1 AAL type 1 (ATM)

- TRQ.3000 describes the mapping between BICC and the DSS2 bearer control protocol (ITU-T Rec. Q.2931). DSS2 ITU-T Rec. Q.2941.3 has been updated in order to carry the BICC binding information.
- TRQ.3020 describes the mapping between BICC and the B-ISUP bearer control protocol (ITU-T Rec. Q.276.x series). B-ISUP ITU-T Rec. Q.2726.4 describes the carrying of Q.2941.3 information, including the BICC binding information.
- ATM Forum document Af-cs-vmoa-0146.000 describes the mapping between BICC and three ATM Forum protocols based on DSS2: UNI4.0 (Af-sig-0061.000), PNNI 1.0 (Af-pnni-0055.000) and AINI (Af-cs-0125.000)

8.1.2 AAL type 2

- TRQ.3010 describes the mapping between BICC and the AAL 2 signalling protocol (ITU-T Recs Q.2630.1 and Q.2630.2).

NOTE – The functionality in Q.2630.2, Q.1902.1-4, Q.1950 and Amd.1/Q.765.5 does not change the requirements or affect the applicability of TRQ.3010 even though it does not reference these Recommendations.

8.1.3 Structured AAL 1

- Annex E/Q.1902.4 describes the procedures for use of structured AAL 1 bearers.

8.1.4 IP/RTP

- The IPBCP protocol Q.1970 has been defined as bearer control protocol for an IP-based bearer network.
- TRQ.3030 describes the mapping between BICC and the IPBCP protocol (ITU-T Rec. Q.1970).

8.2 Tunnelling

Figure 6 illustrates the tunnelling mechanism defined to tunnel a bearer control protocol through BICC and CBC.

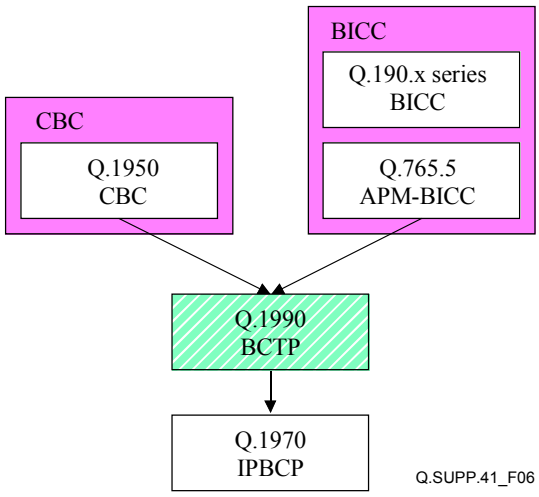

Figure 6 – Tunnelling

- ITU-T Rec. Q.1990 describes the Bearer Control Tunnelling protocol. Q.1990 is carried by both BICC and CBC. So far, the only bearer control protocol tunnelled by BCTP is the IPBCP (ITU-T Rec. Q.1970) protocol.

9 Signalling transport

Figure 7 illustrates the various signalling transports for the BICC protocol.

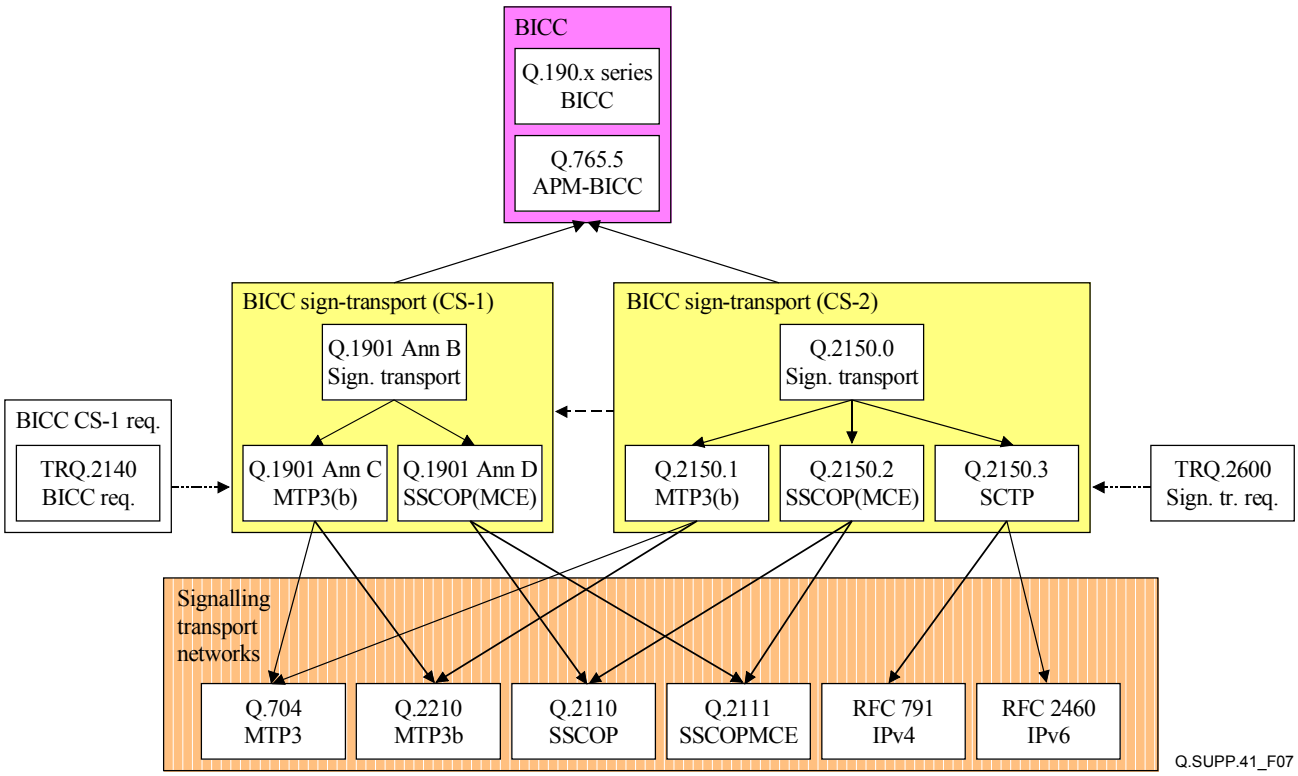

Figure 7 – Signalling transport

9.1 BICC CS-1

- Annex B/Q.1901 introduces the concept of a Signalling Transport Converter (STC).
- Annex C/Q.1901 describes the STC for MTP3 and MTP3b, for the SS7-based signalling networks.
- Annex D/Q.1901 describes the STC for SSCOP and SSCOPMCE, for the ATM-based signalling networks.

9.2 BICC CS-2

- The Q.2150.x series supersedes Annexes B-D/Q.1901. It contains the following:
  - ITU-T Rec. Q.2150.0 describes the concept of a Signalling Transport Converter (STC).
  - ITU-T Rec. Q.2150.1 with the STC for MTP3 and MTP3b, for the SS7-based signalling networks.
  - ITU-T Rec. Q.2150.2 with the STC for SSCOP and SSCOPMCE, for the ATM-based signalling networks.
  - ITU-T Rec. Q.2150.3 with the STC on SCTP, for IP-based signalling networks.

Appendix I

Bibliography of BICC and BICC-related standards documents

BICC Recommendations online, see: http://ties.itu.int/publications/online/index.html.

I.1 Protocol

I.1.1 ISUP

- Q.761 – *Signalling System No. 7 – ISDN user part functional description.*
- Q.762 – *Signalling System No. 7 – ISDN user part general functions of messages and signals.*
- Q.763 – *Signalling System No. 7 – ISDN user part formats and codes.*
- Q.764 – *Signalling System No. 7 – ISDN user part signalling procedures.*
- Q.765 – *Signalling System No. 7 – Application transport mechanism.*
- Q.73.x – *ISDN user part supplementary services.*
- Q.850 – *Usage of cause and location in the Digital Subscriber Signalling System No. 1 and the Signalling System No. 7 ISDN User Part.*

I.1.2 BICC Capability Set 1 (CS-1)

- Q.1901 – *Bearer Independent Call Control protocol.*
- Q.765.5 – *Signalling System No. 7 – Application transport mechanism: Bearer Independent Call Control* (BICC).

I.1.3 BICC Capability Set 2 (CS-2)

- Q.1902.1 – *Bearer Independent Call Control protocol (Capability Set 2): Function description.*
- Q.1902.2 – *Bearer Independent Call Control protocol (Capability Set 2) and Signalling System No. 7 ISDN user part: General functions of messages and parameters.*
- Q.1902.3 – *Bearer Independent Call Control protocol (Capability Set 2) and Signalling System No. 7 ISDN user part: Formats and codes.*
- Q.1902.4 – *Bearer Independent Call Control protocol (Capability Set 2): Basic call procedures.*
- Q.1902.5 – *Bearer Independent Call Control protocol (Capability Set 2): Exceptions to the application transport mechanism in the context of BICC.*
- Q.1902.6 – *Bearer Independent Call Control protocol (Capability Set 2): Generic signalling procedures for the support of ISDN user part supplementary services and for bearer redirection.*
- Q.1912.1 – *Interworking between Signalling System No. 7 ISDN user part and Bearer Independent Call Control protocol.*
- Q.1912.2 – *Interworking between selected signalling systems (PSTN access, DSS1, C5, R1, R2, TUP) and the Bearer Independent Call Control protocol.*
- Q.1912.3 – *Interworking between H.323 and the Bearer Independent Call Control protocol.*
- Q.1912.4 – *Interworking between Digital Subscriber Signalling System No. 2 and the Bearer Independent Call Control protocol.*
- Q.1922.2 – *Interaction between the Intelligent Network Application Protocol Capability Set 2 and the Bearer Independent Call Control protocol.*
- Q.1950 – *Bearer independent call bearer control protocol.*
- Q.1970 – *BICC IP Bearer control protocol.*
- Q.1990 – *BICC Bearer Control Tunnelling Protocol.*
- Q.765.5 Amendment 1 (2001), *Bearer independent Call Control Capability Set 2.*

- Q.2150.0 – *Generic signalling transport service.*
- Q.2150.1 – *Signalling transport converter on MTP3 and MTP3b.*
- Q.2150.2 – *Signalling transport converter on SSCOP and SSCOPMCE.*
- Q.2150.3 – *Signalling transport converter on STCP.*

I.2 BICC protocol and N-ISUP 2000 – Impact and relationship

- Q.762 (1999), Addendum 1 (1999).
- Q.763 (1999), Addendum 1 (2000).
- Q.765 – *Signalling System No. 7 – Application transport mechanism.*

I.3 Protocol supplements, implementor's guides and roadmaps for BICC

- TRQ.3000 – *Operation of the bearer independent call control (BICC) protocol with digital subscriber signalling system No. 2 (DSS2).*
- TRQ.3010 – *Operation of the bearer independent call control (BICC) protocol with AAL Type 2 signalling protocol (CS-1)* (Q.2630.1) + (Q.2630.2).
- TRQ.3020 – *Operation of the bearer independent call control (BICC) protocol with broadband integrated services digital network user part for AAL type 1 adaptation.*
- TRQ.3030 – *Operation of the bearer independent call control (BICC) protocol (CS-2) with IP bearer control protocol (IPBCP).*
- Implementors' Guide for Q.1901.
- TRQ.2000 – *Roadmap for the TRQ.2.xxx series technical reports.*
- TRQ.2003 – *Roadmap to the BICC protocol Recommendations, BICC interworking Recommendations, and BICC requirement Supplements* (this Supplement).

I.4 BICC requirements

I.4.1 BICC CS-1 requirements

- TRQ.2140 – *Signalling requirements for the support of narrowband services via broadband transport technologies.*

I.4.2 BICC CS-2 requirements

- TRQ.2141.0 – *Signalling requirements for the support of narrow-band services over broadband transport technologies – Capability Set 2 (CS-2).*
- TRQ.2141.1 – *Signalling requirements for the support of narrow-band services via broadband transport technologies – CS-2 signalling flows.*
- TRQ.2410 – *Signalling requirements Capability Set 1 for the support of IP Bearer Control in BICC networks.*
- TRQ.2500 – *Signalling requirements for the support of the call bearer control interface (CS-1).*
- TRQ.2600 – *BICC signalling transport requirements – Capability Set 1.*

I.5 Other references

- Q.931 – *ISDN user-network interface layer 3 specification for basic call control.*
- Q.140-Q.180 – *Specifications of Signalling System No. 5.*
- Q.310-Q.332 – *Specifications of Signalling System R1.*
- Q.400-Q.490 – *Specifications of Signalling System R2.*

- Q.699 – *Interworking between ISDN access and non-ISDN access over ISDN User Part of Signalling System No. 7.*
- Q.704 – *Signalling network functions and messages.*
- Q.721-Q.724 – *Specifications of the Signalling System No. 7 Telephone User Part (TUP).*
- Q.1601 – *Signalling System No. 7 – Interaction between N-ISDN and INAP CS-2.*
- Q.2110 – *B-ISDN ATM adaptation layer – Service specific connection oriented protocol (SSCOP).*
- Q.2111 – *B-ISDN ATM adaptation layer – Service specific connection oriented protocol in a multi-link and connectionless environment (SSCOPMCE).*
- Q.2210 – *Message transfer part level 3 functions and messages using the services of ITU-T Recommendation Q.2140.*
- Q.2630.1 – *AAL type 2 signalling protocol – Capability Set 1.*
- Q.2630.2 – *AAL type 2 signalling protocol – Capability Set 2.*
- Q.2650 – *Interworking between signalling system No. 7 broadband ISDN user part (B-ISUP) and digital subscriber signalling system No. 2 (DSS2).*
- Q.2660 – *Interworking between signalling system No. 7 broadband ISDN user part (B-ISUP) and narrow-band ISDN user part (N-ISUP).*
- Q.276.x – *Broadband ISDN – B-ISDN application protocols for the network signalling.*
- Q.2726.4 – *Extensions to the B-ISDN user part – Application generated identifiers.*
- Q.2931 – *Digital Subscriber Signalling System No. 2 – User-Network Interface (UNI) layer 3 specification for basic call/connection control.*
- Q.2941.3 – *Digital Subscriber Signalling System No. 2 – Generic identifier transport extension for support of BICC.*
- H.225.0 – *Call signalling protocols and media stream packetization for packet-based multimedia communication systems.*
- H.245 – *Control protocol for multimedia communication.*
- H.246 Annex C – *ISDN User Part Function – H.225.0 Interworking.*
- H.323 – *Packet-based multimedia communications systems.*
- Af-sig-0061.000 – *ATM User-Network Interface (UNI) Signalling Specification Version 4.0 (ATM Forum).*
- Af-pnni-0055.000 – *Private Network-Network Interface Specification Version 1.0 (ATM Forum).*
- Af-cs-0125.000 – *ATM Inter-Network Interface (AINI) Specification (ATM Forum).*
- Af-cs-vmoa-0146-000 – *Operation of the Bearer Independent Call Control (BICC) Protocol with SIG 4.0 / PNNI 1.0 / AINI (ATM Forum).*
- RFC 2327 – *SDP: Session Description Protocol.*
- RFC 3015 – *Megaco Protocol Version 1.0.*
- RFC 2960 – *Stream Control Transmission Protocol.*
- RFC 791 – *Internet Protocol (IPv4).*
- RFC 2460 – *Internet Protocol Version 6 (IPv6) Specification.*

Appendix II

Abbreviations and terminology used in the BICC documents

3PTY	Three-Party Service
AAL	ATM Adaptation Layer
ACM	Address Complete Message
AE	Application Entity
AEI	Application Entity Invocation
AESA	ATM End System Address
AGI	Application Generated Identifiers
AINI	ATM Inter-Network Interface
AP	Application Process
APM	Application Transport Mechanism (or Message)
APM-user	Application Transport Mechanism User Application
APP	Application Transport Parameter
ASE	Application Service Element
ASN.1	Abstract Syntax Notation One
ATII	Application Transport Instruction Indicators
ATM	Asynchronous Transfer Mode
ATP	Access Transport Parameter
BAT	Bearer Association Transport
BCD	Binary Coded Decimal
BCF	Bearer Control Function
BCF-G	Bearer Control Gateway Function
BCF-N	Bearer Control Nodal Function
BCF-T	Bearer Control Transit Function
BCP	Bearer Control Protocol
BCTP	Bearer Control Tunnelling Protocol
BCU	Bearer Control Unit
BCU-ID	Bearer Control Unit Identifier
BICC	Bearer Independent Call Control
B-ISDN	Broadband ISDN
B-ISUP	Broadband ISDN User Part
BIT	Bearer Information Transport
BIWF	Bearer Interworking Function
BNC	Backbone Network Connection

BNC-ID	Backbone Network Connection Identifier
C5	Signalling System No. 5
CBC	Call Bearer Control protocol
CCBS	Completion of Calls to Busy Subscriber
CCNR	Completion of Calls on No Reply
CCSS	Call Completion Service Set-up
CCU	Call Control Unit
CD	Call Deflection
CFB	Call Forwarding Busy
CFNR	Call Forwarding No Reply
CFU	Call Forwarding Unconditional
CIC	Circuit Identification Code (ISUP) or Call Instance Code (BICC)
CMN	Call Mediation Node
CON	Connect message
CONF	Conference Calling
COT	Continuity message
CPG	Call Progress message
CS	Capability Set
CSF	Call Service Function
CSF-C	Call Service Coordination Function
CSF-G	Call Service Gateway Function
CSF-N	Call Service Nodal Function
CSF-T	Call Service Transit Function
CSM	Call State Machine
CUG	Closed User Group
DME	Digital Multiplexing Equipment
DNIC	Data Network Identification Code
DPC	Destination Point Code
DSL	Digital Subscriber Line
DSS1	Digital Subscriber System No. 1 (ISDN)
DSS2	Digital Subscriber System No. 2 (B-ISDN)
DTMF	Dual Tone Multi-Frequency
ECT	Explicit Call Transfer
EH	Errors Handling
ext.	Extension bit
FDM	Frequency Division Multiplex
GAT	Generic Addressing and Transport

GIT	Generic Identifier Transport
GRS	Group Reset message
GSN	Gateway Serving Node
GUG	GVNS User Group
GVNS	Global Virtual Network Service
HTR	Hard-To-Reach
IA5	International Alphabet No. 5
IAM	Initial Address Message
I-BIWF	Initiating BIWF
ID	Identifier
IETF	Internet Engineering Task Force
IN	Intelligent Network
INAP	Intelligent Network Application Protocol
INN	Internal Network Number
IP	Internet Protocol
IPBCP	IP Bearer Control Protocol
ISC	International Switching Centre
ISDN	Integrated Services Digital Network
ISN	Interface Serving Node
ISUP	ISDN User Part
ITCC	International Telecommunication Charge Card
ITU-T	International Telecommunication Union – Telecommunication Standardization Sector
Kbit/s	kilobits per second
LE	Local Exchange
LFB	Look-ahead for Busy (from MLPP Supplementary Service)
LSB	Least Significant Bit
M/O	Mandatory/Optional
MACF	Multiple Association Control Function
MCF	Media Control Function
MCID	Malicious Call Identification
MEGACO	Media Gateway Control protocol
MG	Media Gateway
MGC	Media Gateway Controller
MLPP	Multilevel Precedence and Preemption
MMSF	Media Mapping/Switching Function
MNIC	Mobile Network Identification Code

MOD	Modify
MOV	Move
MSB	Most Significant Bit
MTP	Message Transfer Part
MTP3	Message Transfer Part level 3 (Narrowband)
MTP3b	Message Transfer Part level 3 (Broadband)
NI	Network Indicator (in SIO), or Network Interface (in specification model)
NI	Number Incomplete
N-ISUP	Narrowband ISDN User Part
NNI	Network Node Interface
NOT	Notify
NRN	Network Routing Number
O/E	Odd/Even
O-BIWF	Originating Bearer Interworking Function
OPC	Originating Point Code
OPSP	Origination Participation Service Provider
PAN	Public Addressed Node
PCI	Protocol Control Indicator
PDU	Protocol Data Unit
PEI	Protocol Error Indicator
PIN	Public Initiating Node
PISN	Private ISDN
PLMN	Public Land Mobile Network
PNNI	Private Network-Network Interface
PSTN	Public Switched Telephone Network
QoR	Query on Release
R1	Signalling System R1
R2	Signalling System R2
R-BIWF	Receiving BIWF
REL	Release message
RFC	Request For Comment
RLC	Release Complete message
ROA	Recognized Operating Agency
ROER	Remote Operation Error
ROIV	Remote Operation Invoke
RORJ	Remote Operation Reject
RORS	Remote Operation Result

ROSE	Remote Operations Service Element
RSC	Reset CIC (or Circuit) message
RTA	Reviewer Test Acronym
RTP	Real time Transport Protocol
SACF	Single Association Control Function
SAM	Subsequent Address Message
SAO	Single Association Object
SCCP	Signalling Connection Control Part
SCF	Service Control Function
SCN	Switched Circuit Network
SCTP	Stream Control Transmission Protocol
SDL	Specification and Description Language
SDP	Session Description Protocol
SI	Service Indicator
SIO	Service Information Octet
SLR	Segmentation Local Reference
SLS	Signalling Link Selection
SN	Serving Node
SS7	Signalling System No. 7
SSCOP	Service Specific Connection Oriented Protocol
SSCOPMCE	SSCOP in a Multi-link or Connectionless Environment
SSP	Service Switching Point
ST	End of pulsing signal (Stop Sending)
STC	Signalling Transport Converter
STL	Signalling Transport Layers
SUB	Subtract
SWN	Switching Node
TAR	Temporary Alternative Routing
T-BIWF	Terminating Bearer Interworking Function
TC	Transaction Capability
TCC	Telephony Country Code
TDM	Time Division Multiplex
TE	Terminal Equipment
TE	Transit Exchange
TMR	Transmission Medium Requirement
TNRN	Terminating Network Routing Number
TRQ	Technical Report to Q series Recommendations

TSN	Transit Serving Node
TUP	Telephone User Part
UDP	User Datagram Protocol
UID	User Interactive Dialogue
UNI	User Network Interface
USI	User Service Information
V5	Family of V-interfaces for connection of ANs to the LE, e.g. V5.1 and V5.2
VEI	Version Error Indicator
VPN	Virtual Private Network
WGS-84	World Geodetic System 1984

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