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SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE
AND INTERNET PROTOCOL ASPECTS

Global information infrastructure – General

Global Information Infrastructure (GII): Reference points for interconnection framework

ITU-T Recommendation Y.140

(Formerly CCITT Recommendation)

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Global Information Infrastructure (GII): Reference points for interconnection framework

Summary

This Recommendation sets the scene for interconnection within the framework of the GII, a multi-operator, multi-provider and multi-vendor telecommunications environment. The significance of interconnection in particular scenarios is dealt with in Annexes A, B, C, D and E. These include PSTN/ISDN, PSTN/ISDN access network, gateway architectures, service provider access and management systems/TMN. The annexes, Appendix I and the bibliography list interconnection related Recommendations and also standards developed by other organizations cooperating with ITU.

Source

ITU-T Recommendation Y.140 was prepared by ITU-T Study Group 13 (2001-2004) and approved under the WTSA Resolution 1 procedure on 24 November 2000.

Keywords

Framework, global information infrastructure, interconnection, interconnection interfaces, reference points for interconnection.

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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ITU-T Recommendation Y.140

Global Information Infrastructure (GII): reference points for interconnection framework

1 Scope and purpose

This Recommendation provides a pictorial overview of the role of key ITU-T Recommendations in the field of interconnection as part of the Global Information Infrastructure (GII).

In the context of this Recommendation, the term "interconnection" is used only from the technical viewpoint to describe the technical relationship between the players in the enterprise model. It is recognized that the term interconnection also has regulatory implications and may in that context have a different scope (see e.g. [1] and [2]).

This Recommendation is intended to be open-ended, in order to keep pace with the ongoing standards development process within the ITU.

This Recommendation is intended to help those involved in developing the GII to discover which ITU-T Recommendations are applicable to practical cases and realistic business contexts. This Recommendation is particularly a tool to give guidance for the standardization of general network aspects and service requirements. This tool would be a basis to meet requirements for interconnection interfaces.

It is envisaged that, among others, this Recommendation will be useful to:

- a) equipment manufacturers;
- b) network operators;
- c) organizations involved in GII related work;
- d) regulatory authorities;
- e) service providers.

2 Terms and Definitions

In this Recommendation, the following terms and definitions from ITU-T Y.110 are used:

- broker;
- domain;
- player;
- role;
- segment.

3 Abbreviations

This Recommendation uses the following abbreviations:

AN	Access Network
ANSI	American National Standards Institute
BES	Back End Services
CAMEL	Customized Applications for Mobile (Network) Enhanced Logic
CCF	Call Control Function (IN)



CN	Customer Network
CORBA	Common Object Request Broker Architecture
DSS(1,2)	Digital Subscriber Signalling System (No. 1, 2)
ETSI	European Telecommunications Standards Institute
FAS	Frame Alignment Signal
GII	Global Information Infrastructure
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
IETF	Internet Engineering Task Force
IN	Intelligent Network
INAP	Intelligent Network Application Part (SS7)
INTI	Interconnection Interface
IP	Internet Protocol
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part (in SS7)
LDN	Long Distance Network
LN	Local Network
MAP	Mobile Application Part
MDTP	Multi-network Datagram Transmission Protocol
MEGACO	Media Gateway Control (IETF Working Group)
MG	Media Gateway
MGC	Media Gateway Controller
MGCP	Media Gateway Control Protocol
MT	Mobile Terminal
NFAS	Non-Frame Alignment Signal
NNI	Network-(Network) Node Interface
PCM	Pulse Code Modulation
PLMN	Public Land Mobile Network
PSTN	Public Switched Telephone Network
PTN(O)	Public Telecommunication Network (Operator)
QoS	Quality of Service
RAS	Registration, Admission and Status
RPI	Reference Point for Interconnection
RPI-N	Reference Point for Interconnection (Network)
RPI-S	Reference Point for Interconnection (Service)
RTP	Real-time Transport Protocol
SCF	Service Control Function (IN)

SCGF	Service Control Gateway Function (IN)
SCN	Switched Circuit Network
SDF	Service Data Function (IN)
SDO	Standards Development Organization
SDP	Session Description Protocol
SG	Signalling Gateway
SIGTRAN	Signalling Transport (IETF Working Group)
SIP	Session Initiation Protocol (SIP)
SP	Service Provider
SPA(I)	Service Provider Access (Interface)
SSF	Service Switching Function (IN)
SS7	Signalling System No. 7
TMN	Telecommunications Management Network
TUP	Telephone User Part (in SS7)
UNI	User-Network Interface

4 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.

- ITU-T Y.101 (2000), *Global Information Infrastructure terminology: Terms and definitions*.
- ITU-T Y.110 (1998), *Global Information Infrastructure principles and framework architecture*.
- ITU-T Y.120 (1998), *Global Information Infrastructure scenario methodology*.

References particularly relevant to Annexes A, B, C, D and E, and Appendix can be found in the annexes and the appendix themselves.

5 The scene – background and relationship with the GII

One of the statements of ITU-T Y.110, which is key to this Recommendation, says that the GII is based upon a seamless federation of interconnected, interoperable communication networks and information processing equipment, databases and terminals (i.e. interconnection plays an important role within the context of GII).

It is essential that all parties who need interface standards can easily determine whether there is already one available to meet their needs. It is desirable that proprietary solutions are not invented simply because of lack of awareness of the existence of standards-based solutions.

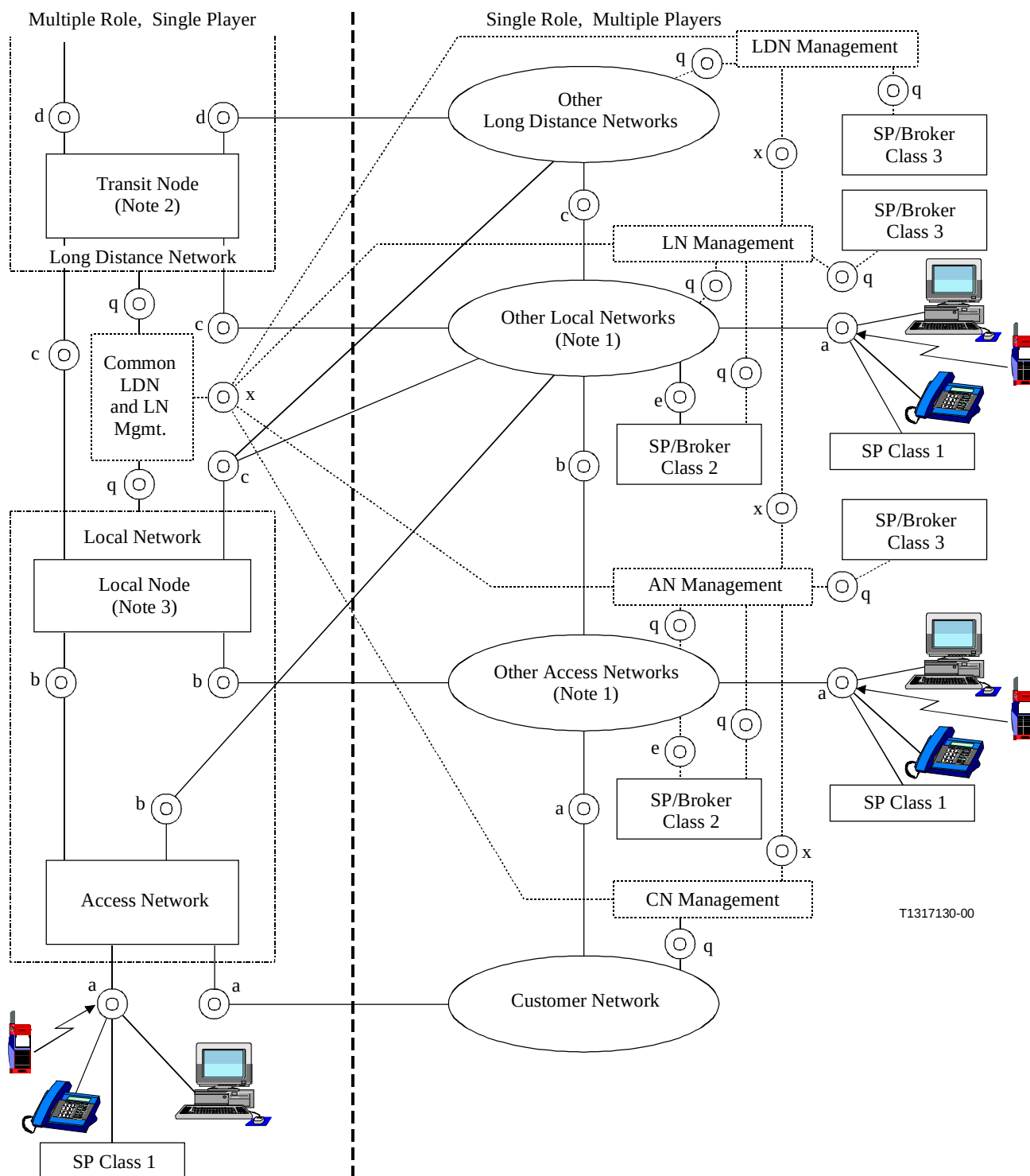
The GII is a wide ranging concept involving many players (network operators, service providers, manufacturers, etc.). Inevitably, components belonging to different organizations are required to be interconnected. This interconnection takes place at a *Reference Point for Interconnection* (RPI). *Reference Point* is a well-defined term in the ISDN context to separate functional groups

(ITU-T I.411). To realize an interconnection at an RPI an *Interconnection Interface* is implemented. At one and the same RPI different types of interfaces may be possible.

ITU-T Y.110 – GII principles and framework architecture – describes and formalizes many situations where such interfaces may arise. ITU-T Y.110 also describes the concepts of segments, roles, players, domains, etc. in terms of the telecommunications market place.

With reference to ITU-T Y.110, Figure 1 gives an overview of the telecommunications market place that illustrates the diversity of players, roles and domains, in which *Reference Points for Interconnection* may occur.

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— carry user plane and control plane information

----- carry management plane information

○ Conceptual Reference Point for Interconnection (CRPI)

NOTE 1 – This could use, e.g. twisted pair, coaxial cable, wireless and support ATM, FR, IP, etc.

NOTE 2 – Transit Switch and/or Router.

NOTE 3 – Initial point of attachment (Service Node/Local Switch).

CRPI a Point of connection of a customer to a public network
 CRPI b Initial point of connection to a switched network, i.e. to gain access to switched services
 CRPI c Point to connect an SN to other SNs or to services of the Transit Network
 CRPI d Point of interconnecting Transit Nodes
 CRPI e Point to connect an SP/broker class 2 to a (transport) network
 CRPI q Point to connect a network to its management system/TMN
 CRPI x Point to interconnect Management Systems/TMNs

Figure 1/Y.140 – Illustrative examples of Reference Points for Interconnection