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SERIES Y: GLOBAL INFORMATION
INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS
AND NEXT-GENERATION NETWORKS

Next Generation Networks – Future networks

General technical architecture for public packet telecommunication data network

Recommendation ITU-T Y.2613



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Recommendation ITU-T Y.2613

General technical architecture for public packet telecommunication data network

Summary

Recommendation ITU-T Y.2613 specifies the technical architecture of a public packet telecommunication data network (PTDN) which can meet all the requirements described in Recommendation ITU-T Y.2601, including the format of the data link frame and network packet, as well as the OAM and interworking methods with other packet bearer networks.

History

Edition	Recommendation	Approval	Study Group
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Keywords

FPBN, interworking, link layer, network layer, OAM, PTDN, routing.

FOREWORD

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Recommendation ITU-T Y.2613

General technical architecture for public packet telecommunication data network

1 Scope

Public packet telecommunication data network (PTDN) is a packet data network designed for the NGN transport stratum, which should be secure, trustworthy, controllable, and manageable. It can meet all the requirements described in [ITU-T Y.2601]. This Recommendation defines the technical architecture of PTDN, including the format of the data link frame and network packet, as well as the OAM and interworking methods with other packet bearer networks.

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 I.432] Recommendation ITU-T I.432 (1993), *B-ISDN user-network interface – Physical layer specification*.
- [ITU-T Q.921] Recommendation ITU-T Q.921 (1997), *ISDN user-network interface – Data link layer specification*.
- [ITU-T Y.2601] Recommendation ITU-T Y.2601 (2006), *Fundamental characteristics and requirements of future packet based networks*.
- [IEEE 802.3] IEEE 802.3 (in force), *Information technology – Telecommunications and information exchange between systems – local and metropolitan area networks – Specific requirements – Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access method and Physical Layer Specifications*.

3 Definitions and terms

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

- 3.1.1 address** [ITU-T Y.2601]: An address is the identifier for a specific termination point and is used for routing to this termination point.
- 3.1.2 control plane** [b-ITU-T Y.2011]: The set of functions that controls the operation of entities in stratum or layer under consideration, plus the functions required to support this control.
- 3.1.3 data plane** [b-ITU-T Y.2011]: The set of functions used to transfer data in the stratum or layer under consideration.
- 3.1.4 identifier** [ITU-T Y.2601]: An identifier is a series of digits, characters and symbols or any other form of data used to identify subscriber(s), user(s), network element(s), function(s), network entity(ies) providing services/applications, or other entities (e.g., physical or logical objects).

NOTE – Identifiers can be used for registration or authorization. They can be either public to all networks, shared between a limited number of networks or private to a specific network (private identifiers are normally not disclosed to third parties).

3.1.5 management plane [b-ITU-T Y.2011]: The set of functions used to manage entities in the stratum or layer under consideration, plus the functions required to support this management.

3.1.6 name [b-ITU-T Y.2611]: A name is the identifier of an entity (e.g., subscriber, network element) that may be resolved/translated into an address.

3.1.7 user plane [ITU-T Y.2601]: A classification for objects whose principal function is to provide transfer of end-user information: user information may be user-to-user content, or private user-to-user data.

3.2 Terms defined in this Recommendation

This Recommendation defines the following term:

3.2.1 public packet telecommunication data network (PTDN): A packet data network designed for the NGN transport stratum, which should be secure, trustworthy, controllable, and manageable, can meet all the requirements described in [ITU-T Y.2601]. PTDN is a hierarchical network, which can be subdivided into several network layers.

4 Abbreviations

This Recommendation uses the following abbreviations:

BE CN	Backward Explicit Congestion Notification
DLCI	Data Link Connection Identifier
FDI	Forward Defect Indication
FECN	Forward Explicit Congestion Notification
GFP	Generic Framing Procedure
HDLC	High-level Data Link Control
IP	Internet Protocol
IWF	InterWorking Function
LCN	Logical Channel Number
LC-ID	Logical Channel ID
OAM	Operation, Administration and Maintenance
PDN	Public packet Data Network
PTDN	Public packet Telecommunication Data Network
QoS	Quality of Service
TE	Terminal Equipment
URL	Uniform Resource Locator
VC	Virtual Circuit/Virtual Connection

5 Reference model

The reference model of PTDN is shown in Figure 5-1.

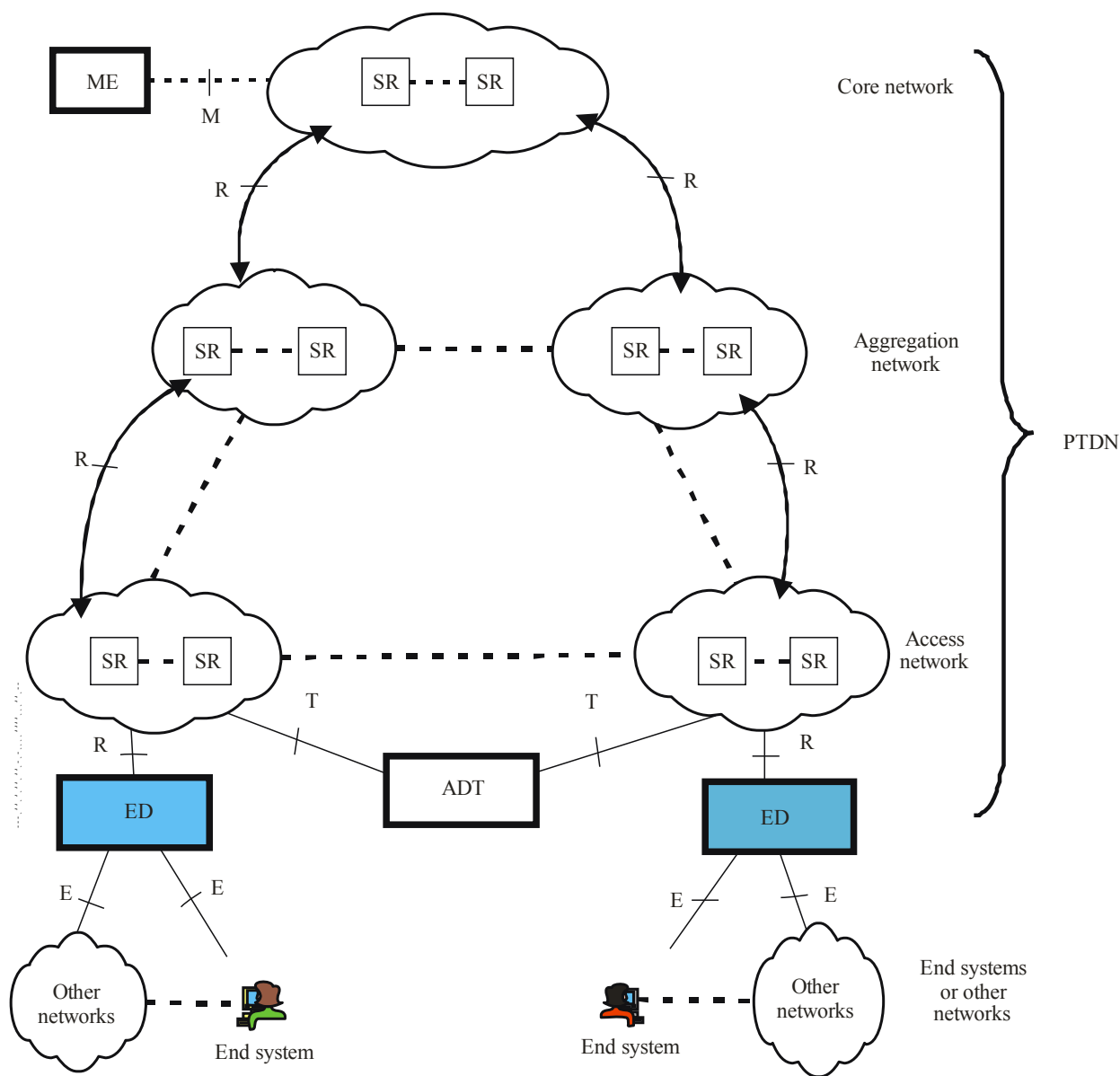


Figure 5-1 – Reference model of PTDN

PTDN is a hierarchical network, which consists of access network, aggregation network, and core network. Moreover, access network, aggregation network and core network are hierarchical networks too, which can be subdivided into several network layers.

SRs (PTDN nodes) connect each other by Interface R.

MEs (management elements) connect to the SRs by Interface M.

EDs (edge devices) are located on the boundary of PTDN. Through Interface E, an ED can serve as an adapter between the end systems or other networks (e.g., IP network, ATM network) and PTDN network. Thus above the EDs, there are the trustable network domains. EDs can also support the mobility of end systems or other networks.

ADTs (address translators) are responsible for the mapping or translation of IP addresses (or other network addresses) to PTDN addresses. ADTs cooperate with EDs to achieve the activities of address mapping/translation by Interface T.

PTDN supports connection-oriented mode and connectionless mode.

5.1 Connection-oriented mode

5.1.1 Control flow in connection-oriented mode

In connection-oriented mode, the control flow can set up or tear down the virtual circuit for the data plane, as shown in Figure 5-2.

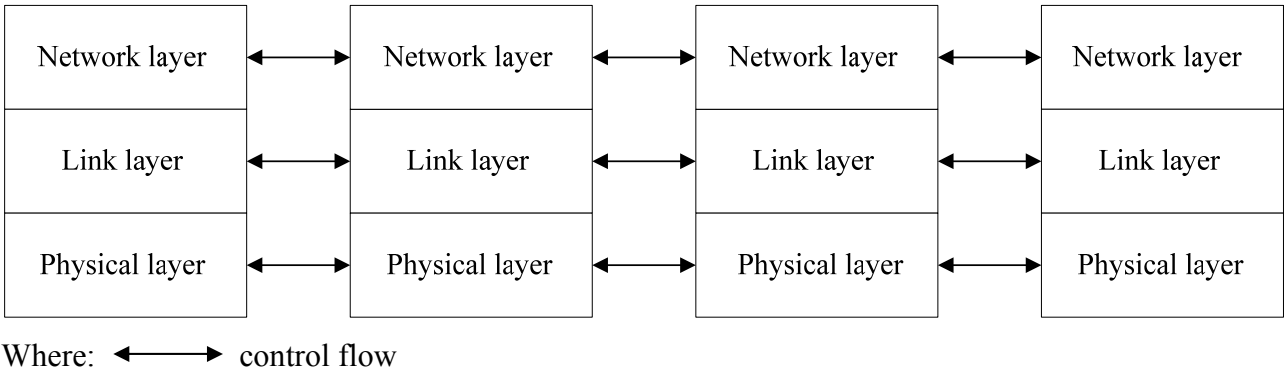


Figure 5-2 – Control flow transportation in connection-oriented mode

5.1.2 Data flow in connection-oriented mode

In connection-oriented mode, the data flows are forwarded in a logic channel in the link layer, as shown in Figure 5-3.

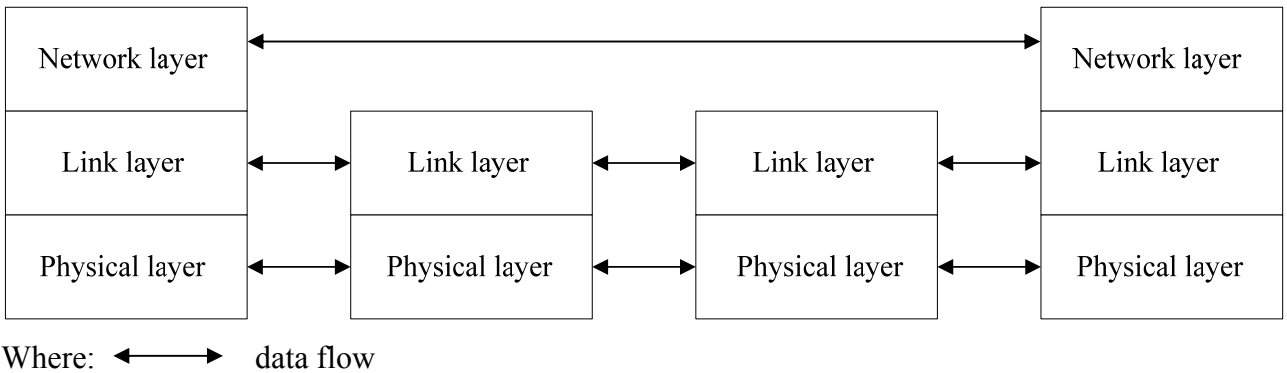


Figure 5-3 – Data flow transportation in connection-oriented mode