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DIGITAL SYSTEMS AND NETWORKS

Digital networks – General aspects

ATM cell mapping into plesiochronous digital hierarchy (PDH)

ITU-T Recommendation G.804

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ITU-T Recommendation G.804

ATM cell mapping into plesiochronous digital hierarchy (PDH)

Summary

This Recommendation provides the mapping to be used for the transport of ATM cells over PDH at the various hierarchical bit rates defined in ITU-T Rec. G.702. These mappings cover both the 1544 kbit/s and 2048 kbit/s-based hierarchies and are used in conjunction with the frame structures defined in ITU-T Rec. G.832.

Source

ITU-T Recommendation G.804 was approved on 13 June 2004 by ITU-T Study Group 15 (2001-2004) under the ITU-T Recommendation A.8 procedure.

Keywords

AAL2, ATM, mapping, PDH.

FOREWORD

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ITU-T Recommendation G.804

ATM cell mapping into plesiochronous digital hierarchy (PDH)

1 Introduction

This Recommendation identifies the way of transporting ATM cells over PDH networks at different hierarchical bit rates.

1.1 Scope

Existing transmission networks are based on Plesiochronous Digital Hierarchy (PDH) as defined in ITU-T Rec. G.702. ATM is considered as the suitable technique to support B-ISDN. The Synchronous Digital Hierarchy (SDH) will form the basis of transport of the ATM cells.

During the transition period, there is a need to transport ATM cells using existing PDH transmission networks. This Recommendation provides the mapping to be used for this transport of ATM cells on the different PDH bit rates for both 1544 and 2048 kbit/s hierarchies.

1.2 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 Recommendation G.702 (1988), *Digital hierarchy bit rates*.
- ITU-T Recommendation G.704 (1998), *Synchronous frame structures used at 1544, 6312, 2048, 8448 and 44 736 kbit/s hierarchical levels*.
- ITU-T Recommendation G.706 (1991), *Frame alignment and cyclic redundancy check (CRC) procedures relating to basic frame structures defined in Recommendation G.704*.
- ITU-T Recommendation G.832 (1998), *Transport of SDH elements on PDH networks – Frame and multiplexing structures*.
- ITU-T Recommendation I.363.2 (2000), *B-ISDN ATM Adaptation Layer specification: Type 2 AAL*.
- ITU-T Recommendation I.432.1 (1999), *B-ISDN user-network interface – Physical layer specification: General characteristics*.

1.3 Definitions

This Recommendation defines the following terms:

1.3.1 idle cell: A cell which is inserted and extracted by the physical layer in order to adapt the cell flow rate at the boundary between the ATM layer and the physical layer to the available payload capacity of the transmission used.

1.3.2 valid cell: A cell whose header has no errors or has been modified by the cell Header Error Control (HEC) verification process.

1.3.3 nibble: A nibble is a group of four bits.

1.4 Abbreviations

This Recommendation uses the following abbreviations:

AAL	ATM Adaptation Layer
AAL2-CPS	AAL type 2 Common Part Sublayer
AIS	Alarm Indication Signal
ATM	Asynchronous Transfer Mode
BIP-8	Bit Interleaved Parity-8
B-ISDN	Broadband aspects of Integrated Services Digital Network
CID	Channel Identifier
CIF	Channel Identification Field
CRC	Cyclic Redundancy Check
FEAC	Far-End Alarm and Control
FEBE	Far-End Block Error
FERF	Far-End Receive Failure
HEC	Header Error Control
LCD	Loss of Cell Delineation
OAM	Operation, Administration and Maintenance
PDH	Plesiochronous Digital Hierarchy
PLCP	Physical Layer Convergence Protocol
POH	Path OverHead
POI	Path Overhead Identifier
RAI	Remote Alarm Indication
SDH	Synchronous Digital Hierarchy
SYF	Synchronization Field
TS	Time Slot

1.5 Conventions

The order of transmission of information in all diagrams in this Recommendation is first from left to right and then top to bottom. Within each byte the most significant bit is transmitted first. The most significant bit (bit 1) is illustrated at the left of all diagrams.

2 Mapping of ATM cells into 1544 kbit/s

2.1 Frame format

The multiframe structure for the 24-frame multiframe as described in ITU-T Rec. G.704 shall be used.

The ATM cell is mapped into bits 2 to 193 (i.e., time slots 1 to 24 described in ITU-T Rec. G.704) of the 1544 kbit/s frame with the octet structure of the cell aligned with the octet structure of the frame (see Figure 2-1).