Title: UTRAN Iu interface Layer 1, TS 25.411 version 2.0.1

Source: Rapporteur

Agenda Item
Document for: Approval

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1. Preamble

At the last RAN WG3 meeting, RAN3#4, UK, June 1-4, a minor editorial change to 25.411 has been requested: At the end of chapter 4.2, the words "at least" had to be deleted as follows:

The clock stability required shall be ~~at least~~ according to G.823 [7]: the clock extracted from the I_u may be used as UTRAN reference clock.

This is the only change from version 2.0.0 to 2.0.1.

The attachment of this Tdoc contains the updated specification 25.411 v.2.0.1 (as file 25411-201.doc).

TS 25.411 V2.0.1 1999-06

Technical Specification

3rd Generation Partnership Project (3GPP); Technical Specification Group (TSG) RAN; UTRAN Iu Interface Layer 1

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Contents

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Foreword

This Technical Specification has been produced by the 3GPP.

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of this TS, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

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y   the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z   the third digit is incremented when editorial only changes have been incorporated in the specification.

1 Scope

The present document specifies the standards allowed to implement Layer 1 on the I_u interface.

The specification of transmission delay requirements and O&M requirements are not in the scope of this document.

In the following 'Layer 1' and 'Physical Layer' are assumed to be synonymous.

2 References

[1]   ITU-T Rec. **I.432.2** (8/96) ISDN User-Network interfaces, Layer 1 Recommendations, 155 520 kbit/s and 622 080 kbit/s operation

[2]   ITU-T Rec. **I.432.3** (8/96) ISDN User-Network interfaces, Layer 1 Recommendations, 1544 kbit/s and 2048 kbit/s operation

[3]   ITU-T Rec. **G.703** (10/98) Physical/electrical characteristics of hierarchical digital interfaces

[4]   ITU-T Rec. **G.704** (10/98) Synchronous frame structures used at 1544, 6312, 2048, 8448 and 44 736 kbit/s hierarchical levels

[5]   ITU-T Rec. **G.957** (7/95)   Optical interfaces for equipments and systems relating to the synchronous digital hierarchy

[6]   ITU-T Rec. **I.432.1** (8/96) ISDN User-Network interfaces, Layer 1 Recommendations, General characteristics

[7]   ITU-T Rec. **G.823** (3/93)   The control of jitter and wander within digital networks which are based on the 2048 kbit/s hierarchy

[8]   ITU-T Rec. **G.826** (8/96)   Error performance parameters and objectives for international, constant bit rate digital paths at or above the primary rate

[9]   ITU-T rec. **I.361** (11/95)   B-ISDN ATM layer specification

[10]   ATM Forum AF-PHY-0016.000 (9/94), "DS1 Physical Layer Specification"

[11]   ATM Forum AF-PHY-0064.000 (9/96), "E1 Physical Layer Interface Specification"

[12]   ATM Forum AF-PHY-0086.001 (2/99), "Inverse Multiplexing for ATM (IMA) Specification Version 1.1"

[13]   ITU-T Rec. **G.751** (11/88) Digital multiplex equipments operating at the third order bit rate of 34 368 kbit/s and the fourth order bit rate of 139 264 kbit/s and using positive justification

3 Definitions, symbols and abbreviations

3.1 Definitions

3.2 Symbols

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ATM	Asynchronous Transfer Mode
BER	Bit Error Rate
IMA	Inverse Multiplexing on ATM
PDH	Plesiochronous Digital Hierarchy
PMD	Physical Media Dependent
SDH	Synchronous Digital Hierarchy
SDU	Service Data Unit
TC	Transmission Convergence

4 I$_u$ Layer 1

4.1 Introduction

The main functions of Layer 1 are summarised in the following:

- Interface to physical medium

- Cell delineation

- Line clock extraction capability

- Layer 1 alarms extraction and generation

- In-sequence delivery

- Transmission quality control

4.2 Layer 1 Description

Layer 1 reference configuration shall be according to ITU-T Recommendation I.432.1 [6].

The physical layer is divided into:

–   Physical Media Dependent (PMD) sublayer

– Transmission Convergence (TC) sublayer defined according to ITU-T Recommendation I.432.1 [6].

The PMD shall comply with at least one of the following standards:

- ETSI STM-4 (622 Mb/s) interface according to I.432.2 [1] with optical S-1.1 interface according to G.957 [5].

- SONET STS-12c (622 Mb/s) interface according to ANSI, T1.105-1995 with optical multimode.

- SONET STS-3c (155 Mb/s) interface according to ANSI, T1.105-1995 with optical multimode.

- ETSI STM-1 (155 Mb/s) interface according to I.432.2 [1] with electrical interface (CMI) to G.703 [3].

- ETSI STM-1 (155 Mb/s) interface according to I.432.2 [1] with optical S-1.1 interface according to G.957 [5].

- ITU STS-1 (51 Mb/s) interface according to ANSI, T1.105-1995 with electrical interface.

- ITU STM-0 (51 Mb/s) interface according to ETSI/TTC with electrical interface.

- ITU STM-0 (51 Mb/s) interface according to ETSI/TTC with optical S-1.1 interface according G.957 [5].

- J2, 6.3 Mb/s interface according to Japanese standard JT-G.703 [3] and JT-G.704 [4] (75 Ohm).

Note: J2 requires that the ATM cells be mapped into the physical layer according to HEC based mapping in G.804.

- E2, 8Mb/s according to ETSI/ITU G.703 [3] and G.704 [4] (75 Ohm).

- E3, 34 Mb/s interface according to ETSI/ITU G.751 [13] (75 Ohm).

- T3, 45 Mb/s interface according to ANSI/ITU G.703 [3] and G.704 [4] (75 Ohm).

- E1, 2Mb/s interface balanced 120 Ohm symmetrical according to ETS 300 420, ITU-T G.704 [4] and TBR 013 (G.703) [3], and AF-PHY-0064.000 [11]

- E1, 2Mb/s according to ETSI/ITU G.703 [3] and G.704 [4] (75 Ohm), and AF-PHY-0064.000 [11].

- J1, 1.5 Mb/s interface according to Jt-431-a (100 Ohm).

- J1, 1.5 Mb/s interface according to JT-G.703 [3] and JT-G.704 [4] (110 Ohm).

- T1, 1.5 Mb/s interface according to AF-PHY-0016.000 [10] and ANSI/ITU G.703 [3] and G.704 [4] (100 Ohm).

Services provided to the upper layer shall be independent from the used underlying technology.

The support of intervening transport networks - like PDH or SDH terrestrial links, Point-to-point or Point-to-Multipoint radio links - shall not be prevented.

Fractional use of the physical medium to terminate a multiple of n time slots shall not be prevented, in order to allow coexistence of this interface with other interfaces on the same physical medium.

It shall be possible to use inverse multiplexing, IMA [12], with a number of all the physical ports on the ET.

The clock stability required shall be according to G.823 [7]: the clock extracted from the I$_u$ may be used as UTRAN reference clock.

Transmission quality control shall be provided according to ITU-T Recommendation G.826 [8].

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4.3 Requirements from higher layer

No specific requirements beyond the ones listed in the introduction have been identified.

4.4 Services Provided by Layer 1

The physical layer provides services to the upper layer via the Physical Service Access Point (PHY-SAP) according to ITU-T I.361 [9], as described in the following figure:
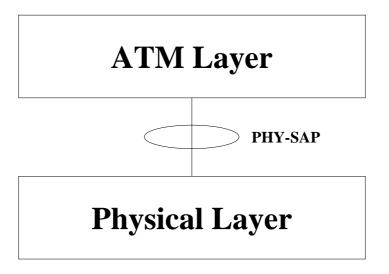

Figure 1: SAP between Physical Layer and ATM Layer

According to ITU-T I.361 [9], chapter 3.2, the following primitives are provided over PHY-SAP:

– PHY-DATA request (PHY-SDU);

– PHY-DATA indication (PHY-SDU).

The parameter PHY-SDU contains one ATM cell as defined in ITU-T I.361 [9] received or to be transferred over the physical medium.

4.5 Interface to Management Plane

The description of the interface towards Management Plane is out of scope of this document, anyhow at least the following O&M functions should be foreseen:

– Performance Monitoring Functions

– Alarm Status Reporting Functions

– Synchronisation Source Management

History

<table>
<tr><td colspan="3" align="center">Document history</td></tr>
<tr><td>V0.0.1</td><td>28 April 1999</td><td>First draft</td></tr>
<tr><td>V0.0.2</td><td>29 April 1999</td><td>Merging of 25.411,421,431 into 411; STM-4 added in ch. 4.2</td></tr>
<tr><td>V2.0.0</td><td>04 May 1999</td><td>Changes according decision at RAN3#3: References added; ch. 4 applies to all the L1 specifications 25.411, 25.421, 25.431.</td></tr>
<tr><td>V2.0.1</td><td>09 June 1999</td><td>Minor editorial change in ch. 4.2 according RAN3#4.</td></tr>
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