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Open Radio equipment Interface (ORI); ORI Interface Specification; Part 2: Control and Management (Release 2)

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RGS/ORI-0015

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Foreword

This Group Specification (GS) has been produced by ETSI Industry Specification Group (ISG) Open Radio equipment Interface (ORI).

The present document is part 2 of a multi-part deliverable covering the ORI Interface Specification, as identified below:

Part 1: "Low Layers (Release 2)";

Part 2: "Control and Management (Release 2)".

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1 Scope

The present document aims to define Control and Management plane functions and protocols, addressing, message format and coding of the Open Radio equipment Interface (ORI) for Release 2.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are necessary for the application of the present document.

[1] "Common Public Radio Interface (CPRI); Interface Specification" V 4.2.

NOTE: Available at http://www.cpri.info/spec.html.

[2] ETSI GS ORI 001: "Open Radio equipment Interface (ORI); Requirements for Open Radio equipment Interface (ORI) (Release 2)".

[3] ETSI GS ORI 002-1: "Open Radio equipment Interface (ORI); ORI Interface Specification; Part 1: Low Layers (Release 2)".

[4] IEEE Std 802-2001: "IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture".

[5] W3C Recommendation 28 October 2004: "XML Schema" (part 0 to 2).

NOTE: Part 0: Primer Second Edition http://www.w3.org/TR/2004/REC-xmlschema-0-20041028/
Part 1: Structures Second Edition http://www.w3.org/TR/2004/REC-xmlschema-1-20041028/
Part 2: Datatypes Second Edition http://www.w3.org/TR/2004/REC-xmlschema-2-20041028/

[6] The Unicode Consortium: "The Unicode Standard V6.0.0"; edited by Julie D. Allen ... [et al.]. Version 6.0, February 2011, ISBN 978-1-936213-01-6.

NOTE: http://www.unicode.org/versions/Unicode6.0.0/.

[7] W3C Recommendation 26 November 2008: "The Extensible Markup Language (XML) 1.0" Fifth Edition.

NOTE: http://www.w3.org/TR/2008/REC-xml-20081126/.

[8] IETF RFC 2045 (1996): "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies".

NOTE: http://www.ietf.org/rfc/rfc2045.txt.

[9] ETSI TS 125 461 (V10.2.0): "Universal Mobile Telecommunications System (UMTS); UTRAN Iuant interface: Layer 1 (3GPP TS 25.461 version 10.2.0 Release 10)".

[10] ETSI TS 125 462 (V10.1.0): "Universal Mobile Telecommunications System (UMTS); UTRAN Iuant interface: Signalling transport (3GPP TS 25.462 version 10.1.0 Release 10)".

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[11] ETSI TS 125 466 (V10.3.0): "Universal Mobile Telecommunications System (UMTS); UTRAN Iuant interface: Application part (3GPP TS 25.466 version 10.3.0 Release 10)".

[12] Antenna Interface Standards Group, Standard No. AISG v2.0, 13th June 2006: "Control interfaces for antenna line devices".

NOTE: Available at www.aisg.org.uk.

[13] ETSI TS 125 215: "Universal Mobile Telecommunications System (UMTS); Physical layer; Measurements (FDD) (3GPP TS 25.215)".

[14] IETF RFC 959: "File Transfer Protocol".

[15] ISO/IEC 13239 (2002): "Information technology - Telecommunications and information exchange between systems - High-level data link control (HDLC) procedures".

[16] IETF RFC 2131: "Dynamic Host Configuration Protocol".

[17] IETF RFC 2132: "DHCP Options and BOOTP Vendor Extensions".

[18] IETF RFC 793: "Transmission Control Protocol".

[19] ETSI TS 125 104: "Universal Mobile Telecommunications System (UMTS); Base Station (BS) radio transmission and reception (FDD) (3GPP TS 25.104)".

[20] ETSI TS 136 104: "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) radio transmission and reception (3GPP TS 36.104)".

[21] IETF RFC 950: "Internet Standard Subnetting Procedure".

[22] ETSI TS 136 211: "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation (3GPP TS 36.211)".

[23] IETF RFC 826: "An Ethernet Address Resolution Protocol -- or -- Converting Network Protocol Addresses to 48.bit Ethernet Address for Transmission on Ethernet Hardware".

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2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] The Apache Software Foundation: "Apache log4cxx™ for C++".

NOTE: http://logging.apache.org/log4cxx/index.html

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

active link: See definition in [2].

active software image: software image that is currently being executed on the RE

Antenna Line Device (ALD): See definition in [12].

Antenna-Carrier (AxC): See clause 2.1 of [1].

DHCP client: See definition in [16].

DHCP server: See definition in [16].

FTP password: See definition in [14].

FTP server IP address: See definition in [14].

FTP username: See definition in [14].

universally unique MAC address: 48 bit universally administered, globally unique identifier in compliance with MAC-48/EUI-48 format assigned to a network interface, as defined in IEEE Std 802-2001 [4]

HDLC control octet: See definition in [15].

I-frame: See definition in [15].

networking RE: See definition in [2].

ORI line bit rate: See definition in [3].

ORI link: See definition in [2].

ORI port: See definition in [2].

passive link: See definition in [2].

passive software image: software image that is not currently being executed on the RE

radio standard: standardized radio access technology (e.g. UMTS, LTE, GSM)

Received Total Wideband Power (RTWP): See [13].

software image: software stored on the RE as a result of a successful software upgrade that is compatible with the RE hardware version

software upgrade package version identifier: information exchanged between the REC and the RE to identify the Software Upgrade Package

software upgrade package: unique set of (one or several) files provided by the RE vendor for the purpose of performing a software upgrade of one or more RE hardware versions provided by the same RE vendor, and associated with a maximum of one Software Image on the RE

NOTE 1: The RE vendor should provide flexibility for supporting Software Upgrade Packages containing software for multiple hardware versions and Software Upgrade Packages containing software for a single Hardware version.

NOTE 2: Even if one of the files of a set changes, a new software upgrade package is created.

TCP socket: See definition in [18].

transceiver module: module that may be used to connect the internal circuits of the RE to the Layer 1 (see GS ORI 002-1 [3]) of the ORI link

Uplink Automatic Gain Control (UL AGC): See definition in [3].

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3.2 Symbols

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

AxC	Antenna-Carrier
Rx	Receiver
Tc	UTRA FDD chip period (1/3,84 MHz)
T_{HCI}	Health Check Idle timer
T_{TLM}	TCP Link Monitoring Timer
Tx	Transmitter

3.3 Abbreviations

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

3GPP	3rd Generation Partnership Project
AGC	Automatic Gain Control
AISG	Antenna Interface Standards Group
ALD	Antenna Line Device
ARP	Address Resolution Protocol
ASCII	American Standard Code for Information Interchange
AST	Administrative State
AxC	Antenna-Carrier
C&M	Control & Management
CET	Central European Time
CPRI	Common Public Radio Interface
DHCP	Dynamic Host Control Protocol
DL	DownLink
EARFCN	E-UTRA Absolute Radio Frequency Channel Number
EBNF	Extended Backus-Naur Form
E-UTRA	Evolved-UMTS Terrestrial Radio Access
FCS	Frame Check Sequence
FDD	Frequency Division Duplex
FST	Functional STate
FTP	File Transfer Protocol
HDLC	High Level Data Link Control
HFN	Hyper Frame Number

NOTE: As defined in [1].

ID	Identifier
IE	Information Element
IETF	Internet Engineering Task Force
IP	Internet Protocol
IQ	In-phase data and Quadrature data
KPI	Key Performance Indicator
LAN	Local Area Network
LED	Light Emitting Diode
LOF	Loss Of Frame
LOS	Loss Of Signal
MAC	Media Access Control
MIMO	Multiple-Input Multiple-Output
MTU	Maximum Transmission Unit
O&M	Operations & Maintenance
OCP	ORI C&M Protocol
ORI	Open Radio Interface
OS	Operating System
PA	Power Amplifier
RAI	Remote Alarm Indication
RE	Radio Equipment
REC	Radio Equipment Controller
RF	Radio Frequency
RMS	Root Mean Square
RO	Read-Only
RTWP	Received Total Wideband Power
RW	Read Write
SAP	Service Access Point
SDI	SAP Defect Indication
SSH	Secure SHell
TCP	Transmission Connection Protocol
TMA	Tower-Mounted Amplifier
UARFCN	UTRA Absolute Radio Frequency Channel Number
UDP	User Datagram Protocol

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UID	Unique IDentifier
UL AGC	Uplink Automatic Gain Control
UL	UpLink
UTC	Coordinated Universal Time
UTF	Unicode Transformation Format
UTRA	UMTS Terrestrial Radio Access
VSWR	Voltage Standing Wave Ratio
XID	eXchange Identification

NOTE: As defined in [15].

XML	eXtensible Markup Language
XSD	XML Schema Definition

4 Introduction

The present document is a subset of the ORI Release 2 specifications.

5 C&M plane description

5.1 Protocol stack

The C&M plane protocol stack that shall be supported by REC and RE within the overall ORI protocol stack, is shown in figure 5.1-1 and complies with [1], clause 4.1.

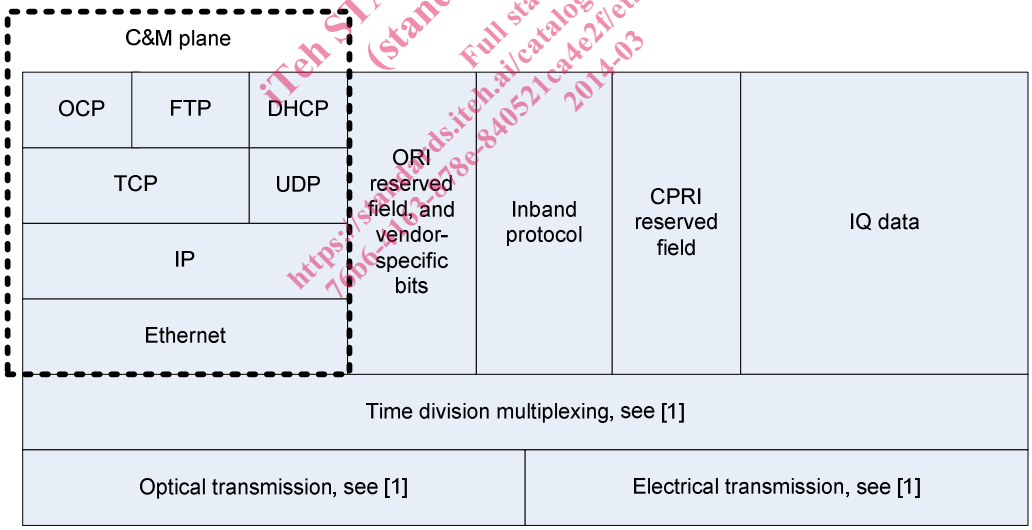

Figure 5.1-1: ORI protocol stack highlighting C&M plane

The IQ data, CPRI reserved field, Vendor-specific bits (a subset of which are used for the ORI reserved field), and Inband protocol, are as defined in [1]. The ORI reserved field itself is defined in [3].

The use of Ethernet, IP, TCP, DHCP, FTP and OCP (ORI C&M Protocol) within the C&M plane is described in clause 5.2.

Further details of OCP are defined in clauses 7, 8 and 10.

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