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OTN transport of CPRI signals

ITU-T G-series Recommendations – Supplement 56



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Supplement 56 to ITU-T G-series Recommendations

OTN transport of CPRI signals

Summary

The nature of common public radio interface (CPRI) signals is such that they require special consideration when carried as a client signal over the ITU-T G.709 optical transport network (OTN). One consideration is the stringent frequency accuracy requirements for CPRI. Another consideration is that the native line coding of the CPRI signals can be transcoded into a more bandwidth efficient coding, which allows the carriage of additional CPRI client signals in some important applications. Supplement 56 to ITU-T G-series Recommendations describes alternatives for mapping and multiplexing CPRI client signals into the OTN. This Supplement relates to Recommendations ITU-T G.872, ITU-T G.709/Y.1331, ITU-T G.798 and ITU-T G.959.1.

History

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Supplement 56 to ITU-T G-series Recommendations

OTN transport of CPRI signals

1 Scope

This Supplement describes alternatives for mapping and multiplexing common public radio interface (CPRI) client signals into the optical transport network (OTN). Other viable means of carrying CPRI over OTN are known to exist and this Supplement is intended to give examples only. It is not intended to provide an exhaustive list of alternatives. The alternatives in this Supplement are for various applications and requirements. Some are based on new methods and others are to explain how to use standardized tools for carrying CPRI over OTN. The mappings in this Supplement include direct mappings for native CPRI client signals and mappings that apply transcoding in order to gain bandwidth efficiency. This Supplement relates to [ITU-T G.872], [ITU-T G.709], [ITU-T G.798] and [ITU-T G.959.1].

2 References

- [ITU-T G.709] Recommendation ITU-T G.709/Y.1331 (2012), *Interfaces for the optical transport network*.
- [ITU-T G.798] Recommendation ITU-T G.798 (2012), *Characteristics of optical transport network hierarchy equipment functional blocks*.
- [ITU-T G.806] Recommendation ITU-T G.806 (2012), *Characteristics of transport equipment – Description methodology and generic functionality*.
- [ITU-T G.872] Recommendation ITU-T G.872 (2012), *Architecture of optical transport networks*.
- [ITU-T G.959.1] Recommendation ITU-T G.959.1 (2016), *Optical transport network physical layer interfaces*.
- ITU-T G.7041] Recommendation ITU-T G.7041/Y.1303 (2016), *Generic framing procedure*.
- [CPRI] CPRI Specification V7.0 (2015), *Common public radio interface (CPRI), interface specification*.
<http://www.cpri.info/downloads/CPRI_v7_0_2015-10-09.pdf>

3 Definitions

None.

4 Abbreviations and acronyms

This Supplement uses the following abbreviations and acronyms:

AIS	Alarm Indication Signal
AMP	Asynchronous Mapping Procedure
BaFN	Basic Frame Number
BFP	Basic Frame Pointer
CBR	Constant Bit Rate
CID	Channel ID
CPRI	Common Public Radio Interface

CSF	Client Signal Fail
FEC	Forward Error Correction
GFP-T	Transparent Generic Framing Procedure
GMP	Generic Mapping Procedure
HO	High Order
LO	Low Order
NE	Network Element
ODU	Optical channel Data Unit
ODUk	Optical channel Data Unit-k
ODU2r	overclocked Optical channel Data Unit-2
OMFI	OPU2r Multiframe Identifier
OPU	Optical channel Payload Unit
OPUk	Optical channel Payload Unit-k
OTN	Optical Transport Network
PCS	Physical Coding Sublayer
PSI	Payload Structure Identifier
PT	Payload Type
RE	Remote Equipment
RRH	Remote Radio Head
UIpp	Unit Intervals peak-to-peak
UPI	User Payload Identifier

5 Conventions

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

6 Introduction

This Supplement first describes methods for mapping CPRI client signals into the OTN that make use of existing ITU-T Recommendations. CPRI signals are treated as a normal constant bit rate (CBR) client for the ITU-T G.709 OTN, but stringent frequency and clock tolerance requirements are specified for CPRI clients. Second, this Supplement describes a method that uses a combination of transcoding and multiplexing (interleaving) of multiple CPRI clients into an overclocked optical channel data unit-2 (ODU2), called the ODU2r, in order to optimize transport bandwidth efficiency in some important CPRI applications.

Note that OTN transport of CPRI is intended for use within an administrative domain. Users of this Supplement should not assume that the required performance for the CPRI client is met. It is the responsibility of the network operator to determine if the required performance can be met. For example, the OTN network should also be designed in order to meet the applicable symmetry requirements. Considerations for maintaining adequate frequency accuracy for CPRI clients are addressed in the respective clauses.