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Draft Standard for Radio over Ethernet Encapsulations and Mappings

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This introduction is not part of IEEE P1904.3/D0.x

This standard TBD …

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, Working Group Chair
, Editor

The following individuals submitted technical contributions or commented on the draft standard at various stages of the project development.

Name 14

The following members of the <individual/entity> balloting committee voted on this standard. Balloters may have voted for approval, disapproval, or abstention.

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Contents

1 Overview

1.1 Scope

This standard TBD ...

1.2 Purpose

The purpose of this standard is to TBD …

1.3 Coverage

This specification provides TBD ...

2 Normative references

The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, so each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

3 Definitions, acronyms, and abbreviations

3.1 Definitions

For the purposes of this document, the following terms and definitions apply. The IEEE Standards Dictionary Online should be consulted for terms not defined in this clause.[1]

TBD

3.2 Acronyms and abbreviations

CPRI – Common Public Radio Interface

IQ - Inphase and Quadrature

LAN – Local Access Network

RoE – Radio over Ethernet

VLAN – Virtual LAN

3.3 Special Terms

Term: Definition

3.4 Reserved field

Tbd.

3.5 Numerical values

3.5.1 Decimal notation

Tbd.

3.5.2 Hexadecimal notation

Numerical values designated by the 0x prefix indicate a hexadecimal notation of the corresponding number, with the least significant bit shown on the right. For example: 0x0F represents an 8-bit hexadecimal value of the decimal number 15; 0x00-00-00-00 represents a 32-bit hexadecimal value of the decimal number 0; 0x11-AB-11-AB represents a 32-bit hexadecimal value of the decimal number 296423851.

3.5.3 Binary notation

Numerical values designated by the 0b prefix indicate a binary notation of the corresponding number, with the least significant bit shown on the right. For example: 0b0001000 represents an 8-bit binary value of the decimal number 8.

[1] IEEE Standards Dictionary Online subscription is available at http://www.ieee.org/portal/innovate/products/standard/standards_dictionary.html.

3.6 Notation for state diagrams

All the state diagrams used in this standard meet the set of requirements included in the following subclauses.

3.6.1 General conventions

The operation of any protocol defined in this standard can be described by subdividing the protocol into a number of interrelated functions. The operation of the functions can be described by state diagrams. Each diagram represents the domain of a function and consists of a group of connected, mutually exclusive states. Only one state of a function is active at any given time (see Figure 3-1).

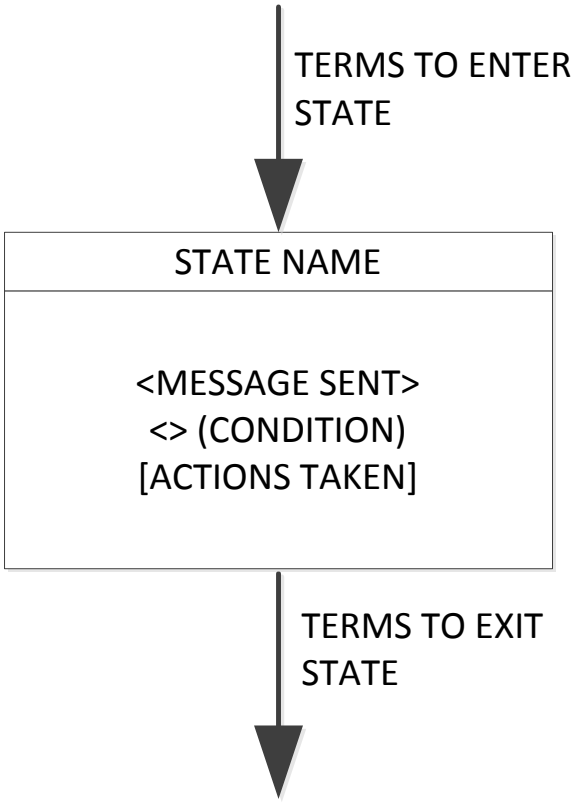

Figure 3-1—State diagram notation example

3.6.1.1 Representation of states

Each state that the function can assume is represented by a rectangle. These are divided into two parts by a horizontal line. In the upper part the state is identified by a name in capital letters. The lower part contains the body of the given state, containing description of the actions taken in this state, as defined in 3.6.3.

3.6.1.2 Transitions

All permissible transitions between the states of a function are represented graphically by arrows between them. A transition that is global in nature (for example, an exit condition from all states to the IDLE or RESET state) is indicated by an open arrow (an arrow with no source block). Global transitions are evaluated continuously whenever any state is evaluating its exit conditions. When the condition for a global

transition becomes true, it supersedes all other transitions, including Unconditional Transition (UCT), returning control to the block pointed to by the open arrow.

Labels on transitions are qualifiers that are required to be fulfilled before the transition is taken. The label UCT designates an unconditional transition. Qualifiers described by short phrases are enclosed in parentheses.

The following terms are valid transition qualifiers:

- Boolean expressions
- An event such as the expiration of a timer: timer_done
- An event such as the reception of a message: MAC_DATA.indication
- An unconditional transition: UCT
- A branch taken when other exit conditions are not satisfied: ELSE

State transitions occur instantaneously. No transition in the state diagram can cross another transition. When possible, any two transitions with different logical conditions are not joined together into a single transition line.

3.6.2 State diagrams and accompanying text

State diagrams take precedence over text.

3.6.3 Actions inside state blocks

The actions inside a state block execute instantaneously. Actions inside state blocks are atomic (i.e., uninterruptible).

After performing all the actions listed in a state block one time, the state diagram then continuously evaluates exit conditions for the given state block until one is satisfied, at which point control passes through a transition arrow to the next block. While the state awaits fulfillment of one of its exit conditions, the actions inside do not implicitly repeat.

Valid state actions may include generation of *indication* and *request* primitives.

No actions are taken outside of any blocks of the state diagram.

3.6.4 State diagram variables

Once set, variables retain their values as long as succeeding blocks contain no references to them.

Setting the parameter of a formal interface message assures that, on the next transmission of that message, the last parameter value set is transmitted.

Testing the parameter of a formal interface message tests the value of that message parameter that was received on the last transmission of said message. Message parameters may be assigned default values that persist until the first reception of the relevant message.

3.6.5 Operators

The state diagram operators are shown in Table 3-1.

Table 3-1—State diagram operators

Character	Meaning
AND	Boolean AND
OR	Boolean OR
XOR	Boolean XOR
!	Boolean NOT
<	Less than
>	More than
≤	Less than or equal to
≥	More than or equal to
==	Equals (a test of equality)
!=	Not equals
()	Indicates precedence
=	Assignment operator
|	Concatenation operation that combines several sub-fields or parameters into a single aggregated field or parameter
else	No other state condition is satisfied
true	Designation of a Boolean value of TRUE
false	Designation of a Boolean value of FALSE

3.6.6 Timers

Some of the state diagrams use timers for various purposes, e.g., measurement of time, and confirmation of activity. All timers operate in the same fashion.

A timer is reset and starts counting upon entering a state where [start x_timer, x_timer_value] is asserted. Time "x" after the timer has been started, "x_timer_done" is asserted and remains asserted until the timer is reset. At all other times, "x_timer_not_done" is asserted.

When entering a state where [start x_timer, x_timer_value] is asserted, the timer is reset and restarted even if the entered state is the same as the exited state.

Any timer can be stopped at any time upon entering a state where [stop x_timer] is asserted, which aborts the operation of the "x_timer" asserting "x_timer_not_done" indication until the timer is restarted again.

4 Radio over Ethernet (RoE) base protocol

Editorial Note: this Clause will describe the native RoE encapsulation transport format. The following sub-Clauses will also describe the overall RoE architecture, showing encapsulation and decapsulation function locations, and the mapper function locations. This Clause also lists the underlying assumptions a RoE enabled architecture has.

4.1 Overview

Tbd.

4.1.1 Network assumptions

Tbd.

4.1.2 Encapsulation and decapsulation functions

Tbd.

4.1.3 Mapper function

Tbd.

4.2 RoE Ethernet Type

Tbd.

4.3 RoE encapsulation common frame format

Tbd.

4.4 RoE control frame

Tbd.

4.4.1 Control Type Value Pairs (TLV)

Tbd.

4.5 RoE subtype xx format

Tbd.

4.6 RoE subtype xx format

Tbd.

4.7 RoE subtype xx format

Tbd.

4.8 Timing and synchronization considerations

Editors note: This Clause lists for example reference time assumptions, and how the synchronization is realized in general.

4.8.1 General assumptions

Tbd.

4.8.2 RoE Presentation time

Tbd.

4.8.3 RoE sequence number

Tbd.

4.8.4 Time measurement points

Tbd.

5 RoE mappers

Editor's note: this Clause defines one or more mappers to/from existing radio framing formats to/from RoE native transport encapsulation format.

5.1 Overview

Tbd.

5.2 CPRI mapper

Editor's note: this sub-Clause defines a mapper to/from CPRI v6.1 framing to/from RoE native encapsulation format.

Annex A. Header examples

Tbd.