

TinyOS 802.15.4 Frames

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Author: Jonathan Hui, Philip Levis, and David Moss
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Note

This memo documents a part of TinyOS for the TinyOS Community, and requests discussion and suggestions for improvements. Distribution of this memo is unlimited. This memo is in full compliance with TEP 1.

Abstract

This memo documents the frame format for 802.15.4 packets in TinyOS 2.0.

1. Introduction

802.15.4 is a data-link and physical packet format for low-power wireless networks that is used in many TinyOS platforms. The TinyOS 2.0 active message layer adds a packet field for higher-level protocol dispatch. This document describes the two TinyOS 2.0 frame format for 802.15.4 networks. The first format is for isolated TinyOS networks; the second format is for networks that share the spectrum with 6lowpan networks[1].

2. 802.15.4

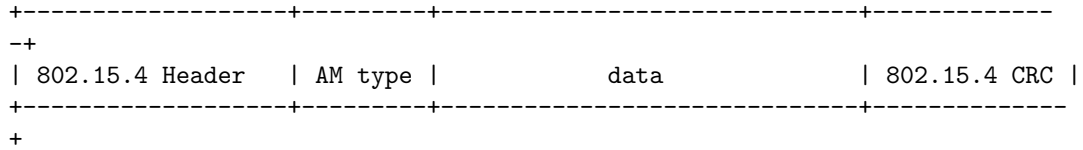
802.15.4 supports several different source and destination addressing modes, and so has a variable sized packet header.[2] A TinyOS device MUST support packet frames with 16-bit short source and destination addresses. A TinyOS device MAY support additional 802.15.4 frame formats.

3. Frame Format

TinyOS has two 802.15.4 frame formats. The first format, the T-Frame, is for TinyOS networks which do not share their channel with other wireless networking architectures. This frame format assumes

that TinyOS can use every bit of the packet and does not need to state that it is a TinyOS packet. T-Frame stands for “TinyOS Frame.”

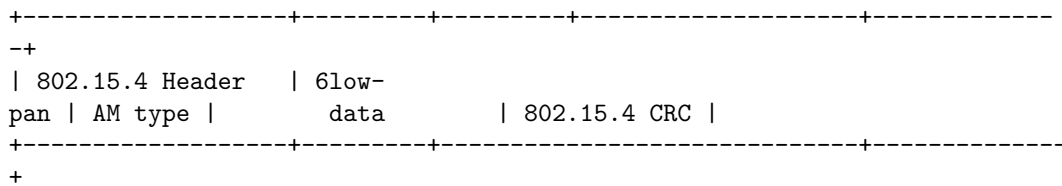
The TinyOS 802.15.4 T-frame format is as follows:



AM type is a single byte field which indicates which active message type the payload contains.

The second format, the I-Frame, is for TinyOS networks which share their channel with 6lowpan networks. 6lowpan reserves a series of codes for the first byte of the payload for non-6lowpan packets. In order to interoperate with 6lowpan networks, TinyOS I-Frames specify such a field. I-Frame stands for “Interoperable Frame.”

The TinyOS 802.15.4 I-frame format is as follows:



AM type is the same as in a T-frame. 6lowpan is the IANA-assigned code to identify this as a TinyOS packet. At this time, the exact value of this code has not been determined. To inform 6lowpan that this is not a 6lowpan packet, the code used MUST be in the range of 192-55.

The AM type 6lowpan is reserved. A TinyOS program MUST NOT use it.

4. Implementation

An implementation of the T-Frame can be found in `tinyos-2.x/tos/chips/cc2420`.

An implementation of the I-Frame will soon be found in `tinyos-2.x/tos/chips/cc2420`.

5. Author Addresses

Jonathan Hui
657 Mission St. Ste. 600
Arched Rock Corporation
San Francisco, CA 94105-4120

phone - +1 415 692 0828
email - jhui@archedrock.com

Philip Levis
358 Gates Hall
Stanford University
Stanford, CA 94305-9030

phone - +1 650 725 9046

email - pal@cs.stanford.edu

David Moss
Rincon Research