



Network WG

Charter: <https://github.com/tock/tock/tree/master/doc/wg/network>

TockWorld 7 | June 2024

Goals

The goals of the Network Tock Working Group (NWG) are to:

- Design a set of interfaces (traits) for networking
- Design the user land interfaces for networking
- Define how buffer management should be implemented
- Determine other kernel infrastructure useful for networking

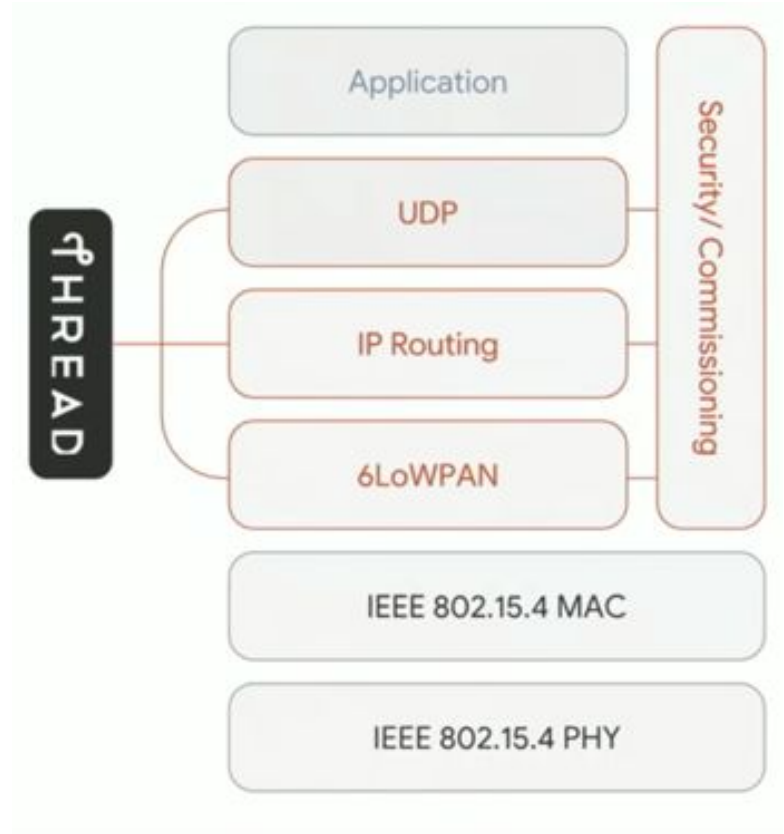
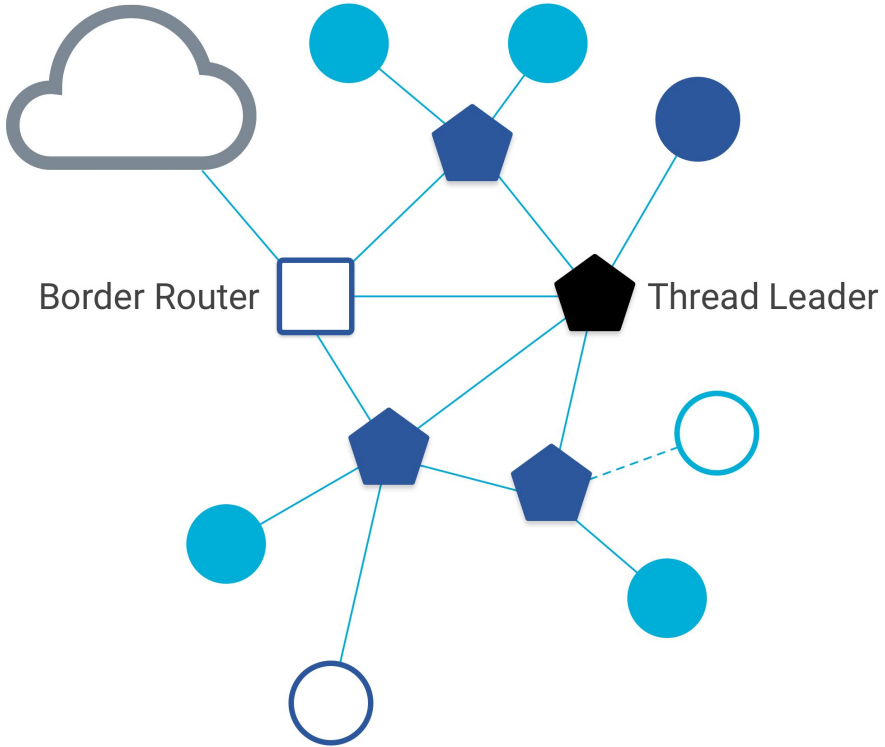
Members:

- Alexandru Radovici (Chair)
- Branden Ghena
- Leon Schuermann
- Tyler Potyondy
- Cristian Rusu
- Felix Mada

Value: small group development

- Usually 3-5 people discussing ideas
- Drawings and dives into code
- Focus allowed for entire group to be aware of development

OpenThread



OpenThread Support

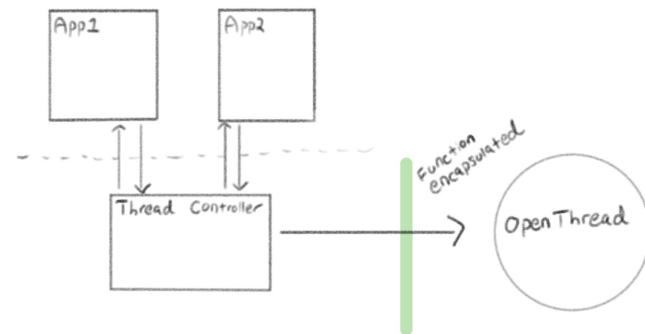
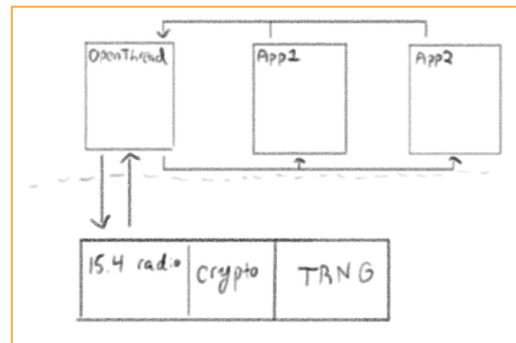
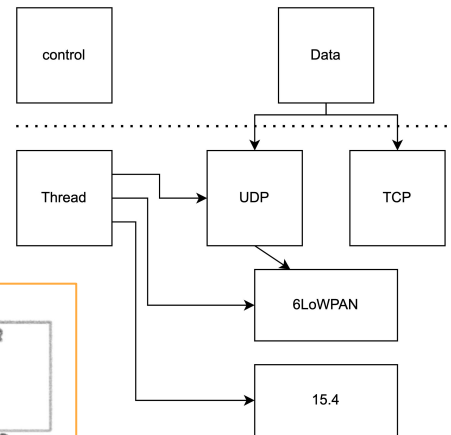
- OpenThread implemented as userspace service

- With syscall interface to 15.4 radio
- Tock [#3683](#) and Libtock-c [#380](#)
- With numerous updates since then

- Small group discussions in WG helped guide the design

- Functional OpenThread child device implementation

- Tutorial for Friday! [Thread Temperature Sensor](#)



PacketBuffer Design and Implementation

- Common problem: need to add header/footer bytes to data contents
 - Typical layered packet communication protocol
 - Communicating data to devices like displays or storage
 - Including metadata with print output
- Design goals
 - Zero-copy
 - Avoid run-time overhead
 - Check for sufficient space at compile-time
 - Tradeoffs discussed over multiple working-group meetings
 - Inspired by Linux `sk_buff`
- Initial proof-of-concept applied to console message multiplexing
 - Talk tomorrow by Amalia Camelia Simion!!

Ethernet

- Ethernet support under development in tock-ethernet branch
 - STM32F429 Ethernet support
 - QEMU VirtIO Ethernet
 - LiteX Ethernet
 - Ethernet over USB
- Plan to merge into main Tock as a large, but self-contained PR
 - Then work on developing and refining common interfaces
- IP interfaces will be a focus

The year ahead

- 15.4 stability
- PacketBuffer adoption
- WiFi support
 - Work in progress on Raspberry Pi Pico W (RP2040 + Infineon WiFi)
- Userland interface considerations
- USB? USB? USB?