

# Wireless IPv6 Networking with Thread

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IAB Open Meeting, IETF 119 Brisbane, March 2024

# Agenda

Thread Architecture & Technology

Thread Uses

Thread Organization

Thread and the IETF

Thread at IETF 120 Hackathon

# Thread Overview

Wireless — IEEE 802.15.4, 2.4 GHz, Single worldwide SKU

Low power — Eve Door & Window sensor lasts 1 yr on ER14250 (1/2 AA) battery

Low cost — Developer boards from \$10 USD

Moderate rate — 250 kb/s

Moderate range — 30 m

Strong security

# Thread Architecture

Thread Routing	IPv6 routing protocol IPv6 packet forwarding
IETF 6LoWPAN	RFC 4944, RFC 6282
IEEE 802.15.4	2.4 GHz, Single worldwide SKU

Powered Thread devices serve as “range extenders” for the mesh  
Avoids requiring additional dedicated satellite repeater devices

# Thread Technology

Self-configuring IPv6 mesh

Border Router interfaces to adjacent infrastructure links (e.g, Ethernet or Wi-Fi)

- Analogous to Wi-Fi Access Point
- IPv6 routing
- Not NAT — need bidirectional connectivity
- Not link-layer bridging
- Has to be self-configuring for residential customers

Commissioning for headless devices

# Thread Uses

Thread is an IPv6 link layer

- Most moderate-rate uses of IPv6 could potentially work over Thread

Currently used by

- Apple HomeKit (home automation)
- CSA Matter (home automation)
- DALI+ (Digital Addressable Lighting Interface for commercial buildings)
- Other products in development — KNX, BACnet, etc.
- Your next project... ?

# Thread Organization

Membership-based industry alliance

- <https://www.threadgroup.org/>
- <https://www.threadgroup.org/thread-group#board&officers>



President  
Vividh Siddha  
Apple



Vice President of Technology  
Jonathan Hui  
Google

# Thread Organization

## Three main areas

- Technical specification
- Certification program
- Marketing



Some engineering work done internally within Thread Technical Committee

Some engineering work done in partnership with IETF



# Thread and the IETF

## Service Registration Protocol (SRP)

- Efficient service advertising and discovery (DNSSD WG)

## IPv6 routing, not link-layer bridging

- Stub Network Auto Configuration for IPv6 (SNAC WG)

## Beneficial for all

- Thread Group engineers get benefit of IETF wisdom
- Developed technology can be used outside of Thread

# Thread at IETF 120 Hackathon

20-21 July 2024, Vancouver, Canada

Hands-on assistance with developer tools

Let us know if you want to participate

Let us know if you have project ideas

- sshd for OpenThread
- General OTA (over-the-air) firmware update mechanism

