

# Developing Matter products using nRF Connect SDK

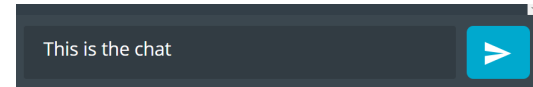
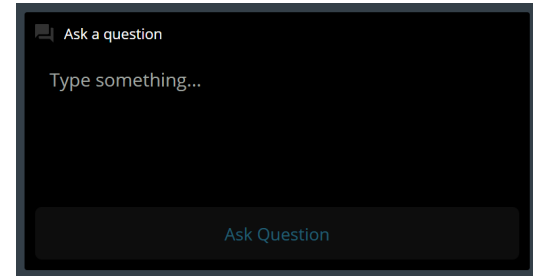
Nordic Tech Webinar

*Łukasz Duda / Senior Firmware Engineer*  
*Damian Królik / Senior Firmware Engineer*

*October 2021*

# Practicalities

- Duration: about 60 minutes
- Questions are encouraged!
  - Please type questions in the top of the right sidebar
  - All questions are anonymous
  - Try to keep them relevant to the topic
  - We will answer towards the end
- The chat is not anonymous, and do not use for questions
- Go to DevZone if you have more questions
- A recording of the webinar will be available together with the presentation at [webinars.nordicsemi.com](http://webinars.nordicsemi.com)



# Today's hosts

Łukasz Duda



Senior Firmware Engineer

R&D



Damian Królik



Senior Firmware Engineer

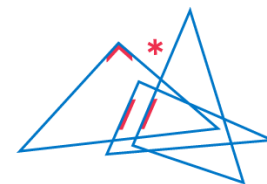
R&D



# Introduction to Matter

Available introductory webinar:

- Introduction to Matter  
*Krzysztof Loska*



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# Agenda

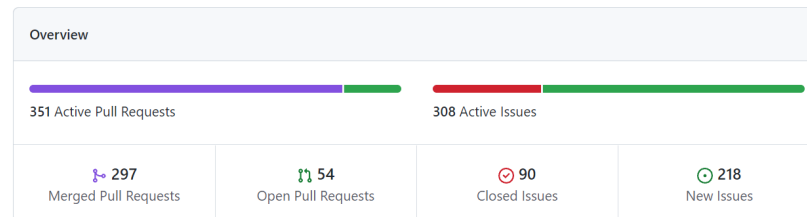
- **Introduction**
  - Introduction to software solution
  - Development tools
- **Getting started**
  - Setting up the environment
  - Building your first Matter application in nRF Connect SDK
  - Controlling accessory from PC
- **Creating Matter accessory**
  - Generating data model
  - Creating application business logic
- **Working with Mobile controller**
  - Controlling accessory from Android Phone
- **Q&A session**

# Introduction

Introduction to software solution

# Matter protocol implementation

- Open-source project available on GitHub  
[github.com/project-chip/connectedhomeip](https://github.com/project-chip/connectedhomeip)
- Implements Matters specification, for example:
  - Data and Interaction models
  - Security and commissioning
  - IP framing, transport management, and more..
- Built on market-proven technologies
- Implementation-first approach
- Platform independent implementation
- Reference Matter device examples
- Reference controller implementations both on PC and Mobile

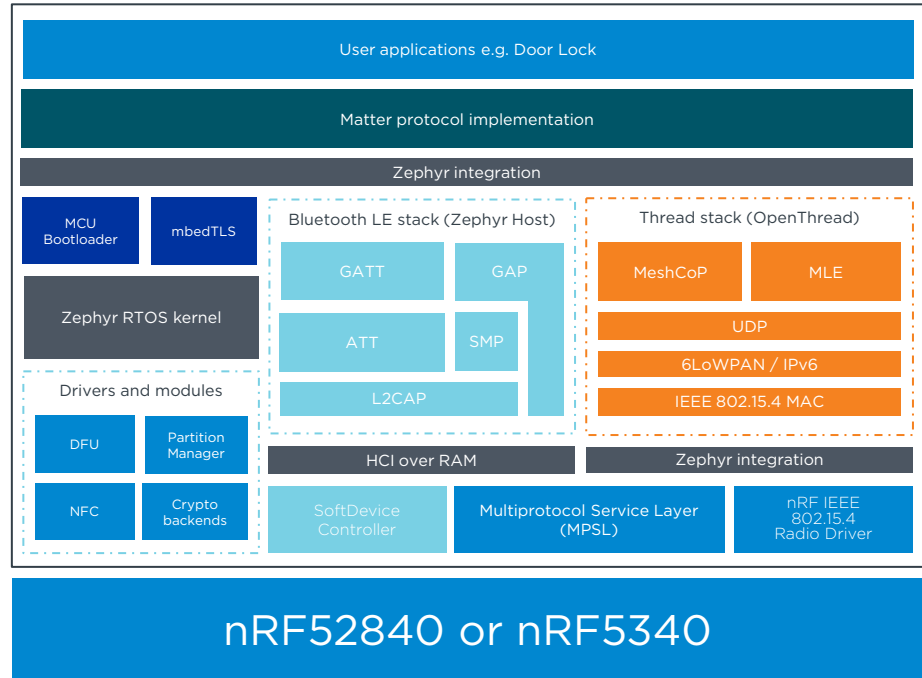


Contributions to master, excluding merge commits and bot accounts



# Matter in nRF Connect SDK

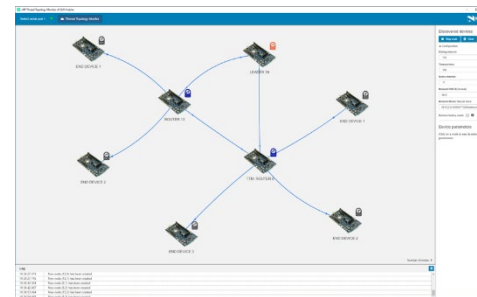
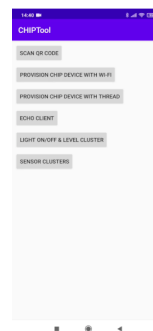
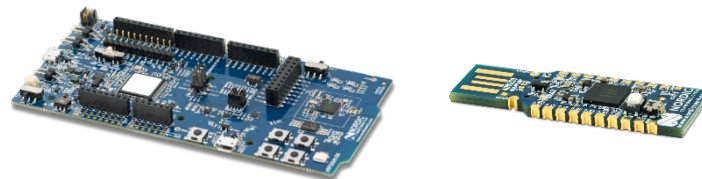
- Nordic's default SW platform for Matter (Project CHIP)
- Matter applications and samples
  - Door Lock
  - Light Bulb and Switch
  - Weather station
  - Template
- Certified OpenThread stack
- Certified Bluetooth Low Energy stack
- Support for multiprotocol operation of Thread and Bluetooth Low Energy
- Security components, bootloader, front end modules, NFC and more..





# Development tools

- Hardware Development Kits
- Segger Embedded Studio
- nRF Connect for VS Code
- Debugging tools: e.g. SEGGER Ozone, J-Link GDB
- nRF Thread Topology Monitor
- nRF Sniffer for 802.15.4 and Bluetooth LE
- Pre-compiled Matter controllers for Linux and Android



# Elements of Matter over Thread setup

Matter controller

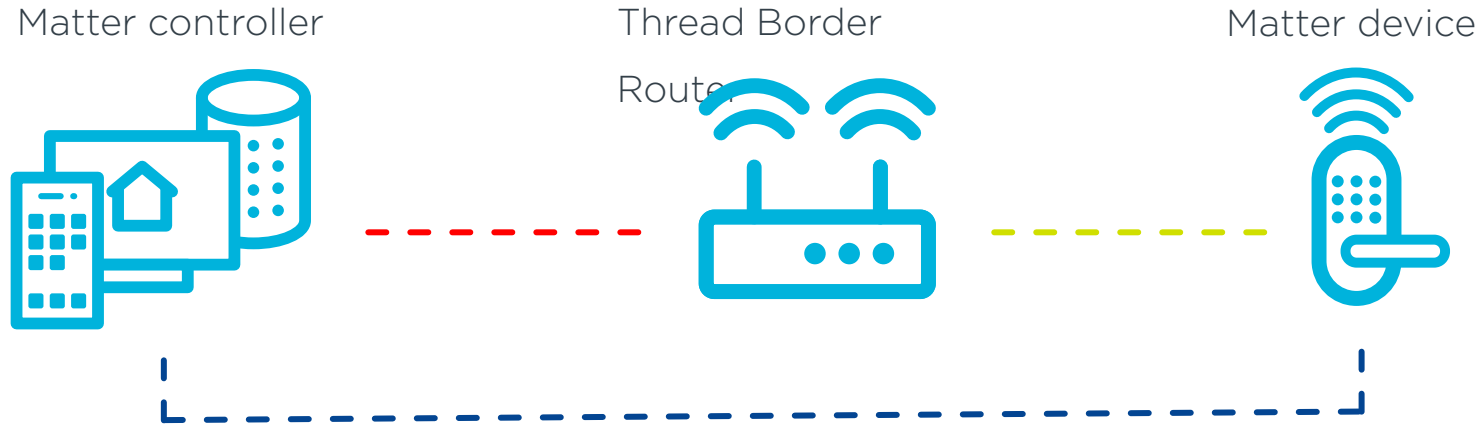


Matter device



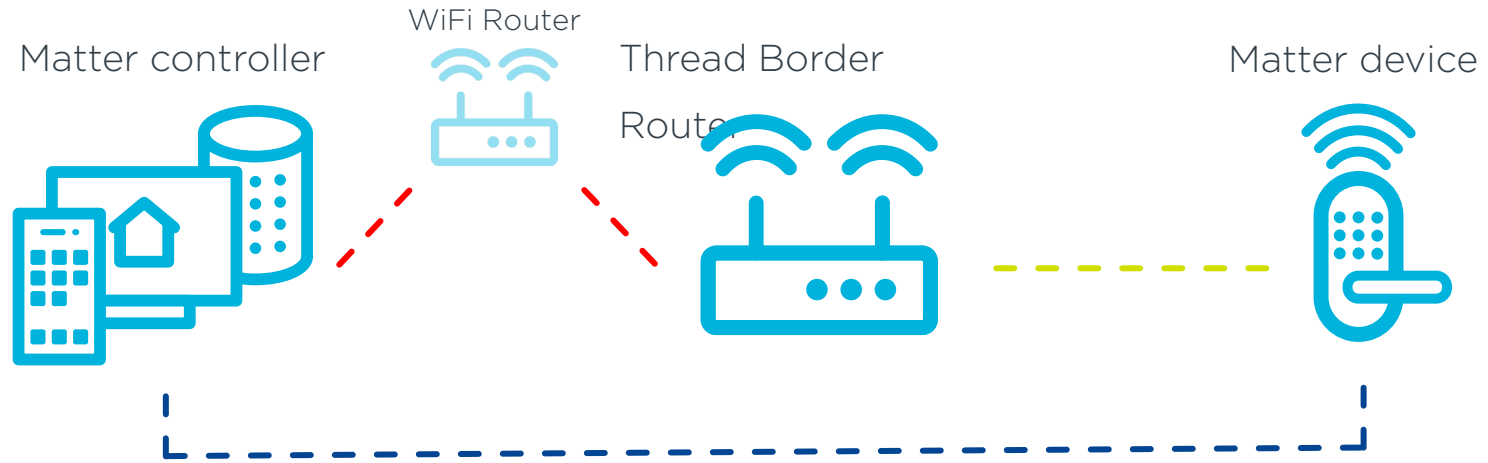
- Bluetooth
- Thread

# Elements of Matter over Thread setup



- Bluetooth
- Thread
- WiFi / Ethernet

# Elements of Matter over Thread setup

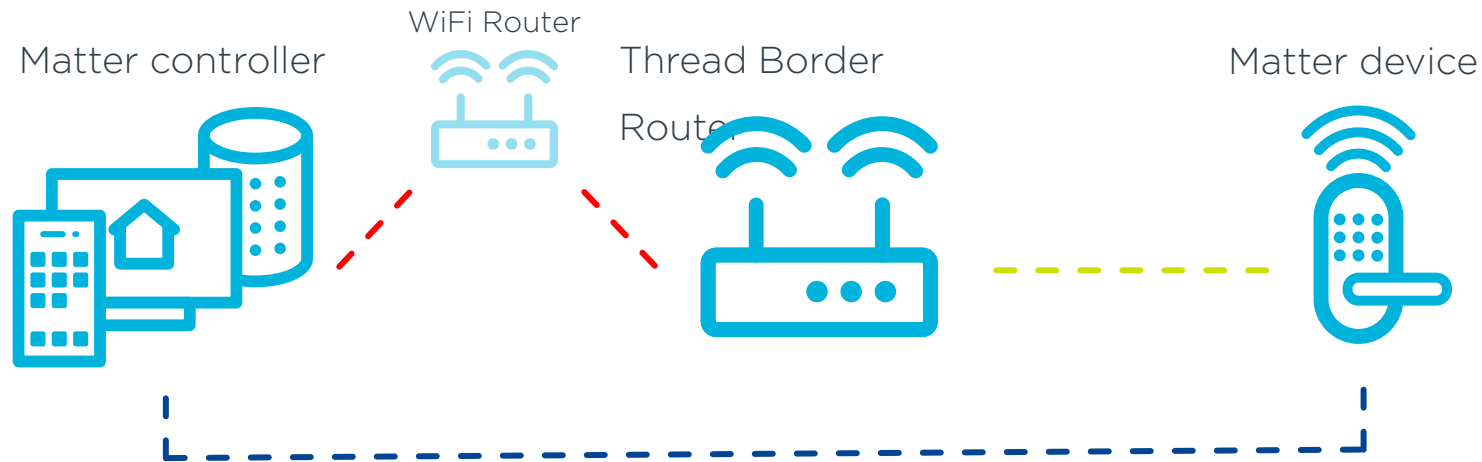


- Bluetooth
- Thread
- WiFi / Ethernet

# Matter in nRF Connect SDK

Getting started

# Wanted network topology



- Bluetooth
- Thread
- WiFi / Ethernet

# Matter device

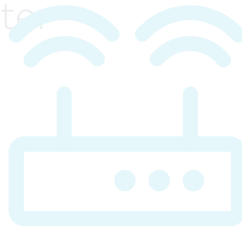
Matter controller



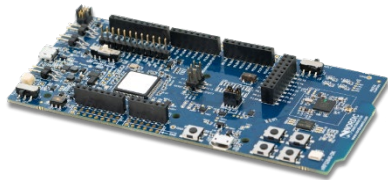
WiFi Router



Thread Border Router



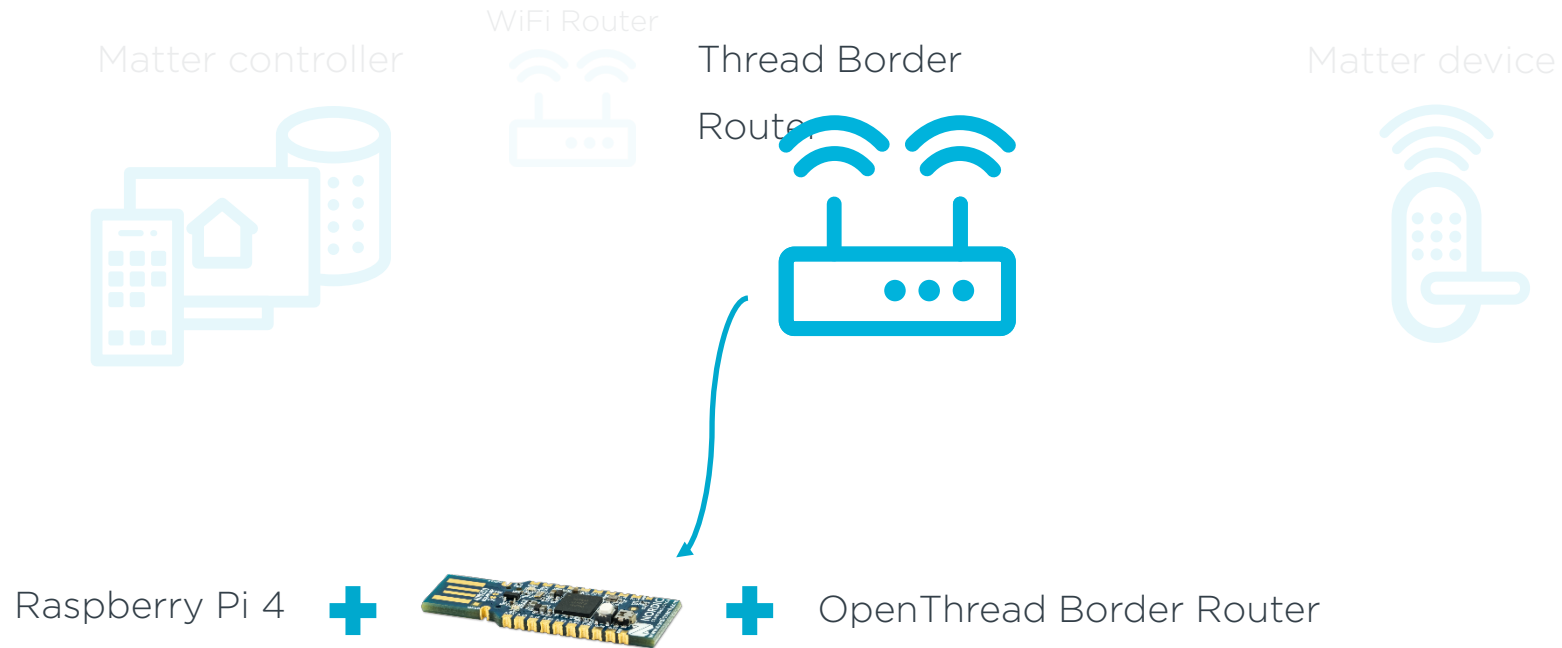
Matter device



Matter Lock sample



# Thread Border Router





# Matter controller

Matter controller



WiFi Router



Thread Border  
Router



Matter device



Linux PC + Python CHIP Controller

# Linux PC prerequisites

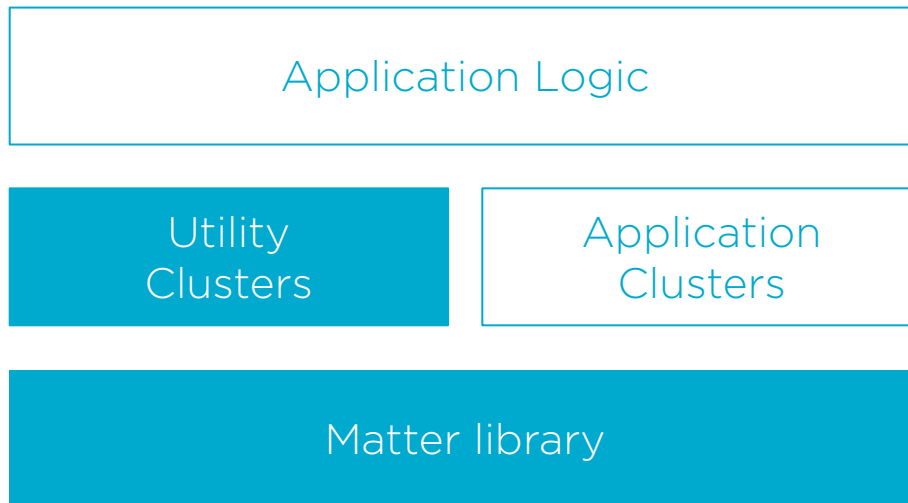


- nRF Connect SDK v1.7.0 + nRF Command-line tools  
[developer.nordicsemi.com/nRF\\_Connect\\_SDK/doc/latest/nrf/getting\\_started.html](https://developer.nordicsemi.com/nRF_Connect_SDK/doc/latest/nrf/getting_started.html)
- Visual Studio Code + nRF Connect Extension Pack for VS Code:  
[nordicsemi.com/Products/Development-tools/nRF-Connect-for-VS-Code/Tutorials](https://nordicsemi.com/Products/Development-tools/nRF-Connect-for-VS-Code/Tutorials)
- Bluetooth LE Adapter  
[developer.nordicsemi.com/nRF\\_Connect\\_SDK/doc/latest/zephyr/samples/bluetooth/hci\\_usb/README.html](https://developer.nordicsemi.com/nRF_Connect_SDK/doc/latest/zephyr/samples/bluetooth/hci_usb/README.html)
- MicroSD card reader + rpi-imager tool

# Matter in nRF Connect SDK

Creating Matter accessory

# Matter template sample



# Matter temperature sensor device

If OnOff.OnOff Then  
Update(TemperatureMeasurement)

Utility  
Clusters

Temperature,  
OnOff

Matter library

# Cluster

- Data model building block
- Commands
- Attributes (writable or read-only)
- Events
- Mandatory and optional features

```
chip-device-ctrl > zcl ? OnOff
Off
  <no arguments>
OffWithEffect
  effectId: int, effectVariant: int
On
  <no arguments>
OnWithRecallGlobalScene
  <no arguments>
OnWithTimedOff
  onOffControl: int, onTime: int, offWaitTime: int
Toggle
  <no arguments>
chip-device-ctrl > zclread ? OnOff
OnOff
GlobalSceneControl
OnTime
OffWaitTime
StartupOnOff
FeatureMap
ClusterRevision
chip-device-ctrl > █
```

# Endpoint

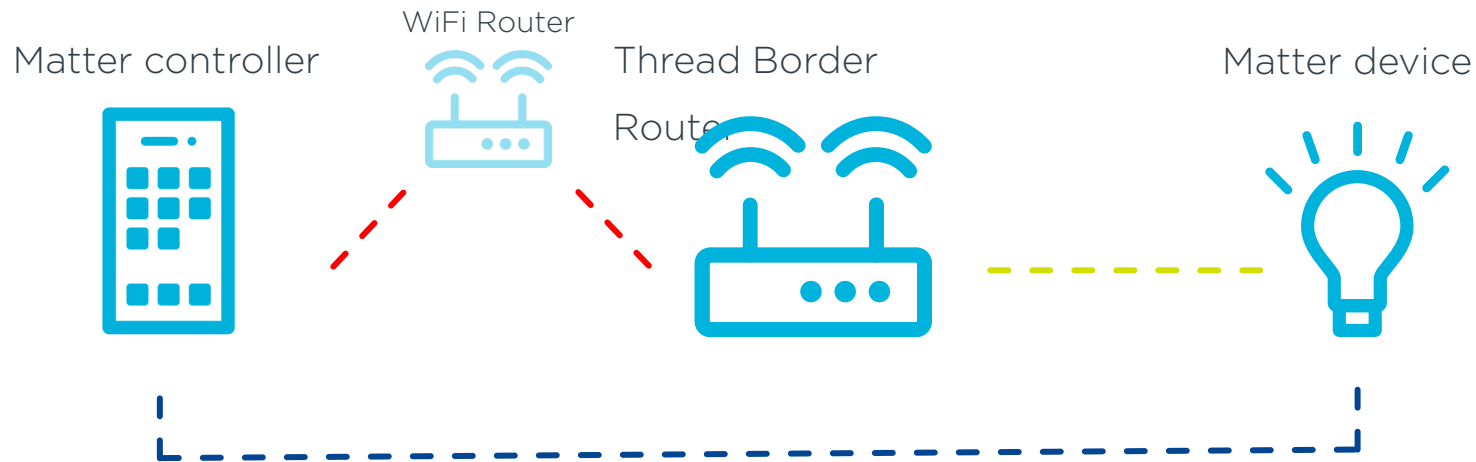
- Container for clusters
- Identified by endpoint ID
- Endpoint 0 reserved for Matter utility clusters
- Endpoint 1+ for application clusters
- 1 endpoint  $\Rightarrow$  1 device type

# Matter in nRF Connect SDK

Using mobile controller for Android



# Wanted network topology



- Bluetooth
- Thread
- WiFi / Ethernet

# Mobile phone controller

Matter controller



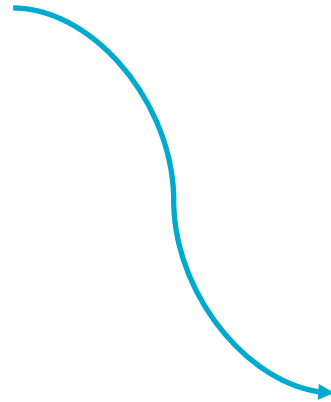
WiFi Router



Thread Border  
Router



Matter device



Android CHIP Controller

# Matter device

Matter controller



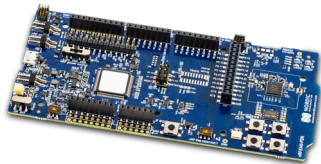
WiFi Router



Thread Border Router



Matter device

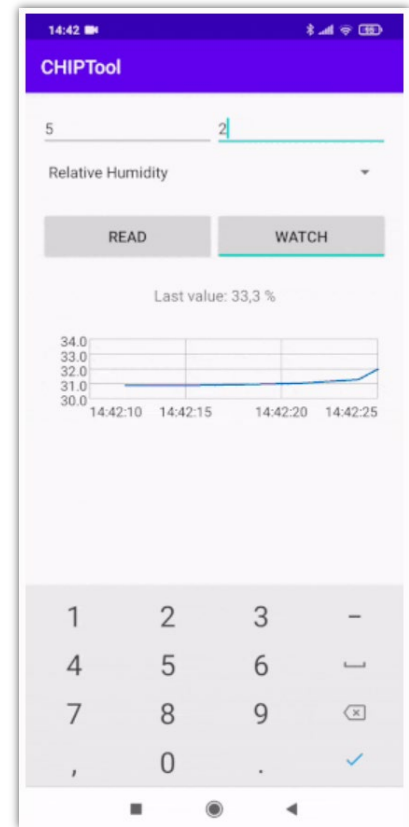


Matter Light Bulb sample



# Android CHIP Tool

- Supports commissioning Thread and WiFi devices over Bluetooth Low Energy
- Supports commissioning using QR code or NFC tag
- Supports multiple device types:
  - dimmable light bulb
  - door lock
  - temperature sensor
  - relative humidity sensor
  - pressure sensor
- Pre-compiled package available as a part of nRF Connect SDK



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Q&A