Exciting new features in nRF Connect SDK v1.7
Today’s hosts

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Short-range wireless

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Cellular IoT
Practicalities

- Duration: 45 min presentation, 15 min Q&A
- 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 them towards the end
- The chat is not anonymous, and should not be used 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/on-demand
Agenda

- Intro to the nRF Connect SDK and basic terminology (15 min, Bjørn)
- Short-range updates in nRF Connect SDK v1.7 (15 min, Pål)
- Cellular IoT updates in nRF Connect SDK v1.7 (15 min, Joakim)
- Q&A (15 min)
Communities

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Nordic Developer Zone

Nordic tech support center & online community
29k+ users, 60k+ Posts Q&A
3 million page visits last 6 months

devzone.nordicsemi.com

Nordic GitHub

121 Repos, C/C++
Python, Javascript
github.com/NordicSemiconductor
nRF Connect SDK intro
and basic terminology
nRF Connect SDK

- All in one place
- One code base and toolchain for nRF91, nRF53, nRF52 and nRF21 series
  - Optional for nRF52 Series (>= v1.3.0)
- Includes Bluetooth Low Energy, Bluetooth mesh, Thread/Zigbee and LTE-M/NB-IoT/GPS
nRF52 Series SDK Support

- **nRF5 SDK**
  - Good if you do not require an RTOS
  - If you are used to this SDK and do not require newer features after Bluetooth 5.0, Bluetooth mesh 1.0.1, Thread 1.1 or Zigbee 3.0 (R22)

- **nRF Connect SDK support optional**
  - Will support newer features after Bluetooth 5.0, Bluetooth mesh 1.0.1, Thread 1.1 or Zigbee 3.0 (R22)
  - Optional for the nRF52 Series

- See [this statement](#) for more info
Code Base

- Contains app code, connectivity protocols, wireless stacks and peripheral drivers
- Code is organized in 4 main repositories (Nordic and Open Source (OS) code):
  - nRF – Application & Connectivity Protocols
  - nrfxlib – Peripheral Drivers and Stacks
  - Zephyr – RTOS & Board configuration (OS)
  - MCUBoot – Secure Bootloader (OS)
nRF Connect SDK Basic Terminology

- **Git**
  - An open source distributed version-control system for managing source code changes

- **West**
  - Command line tool for multi-repository management and building and flashing examples

- **Repository**
  - A version-controlled project folder e.g. nrf, zephyr
  - Every code commit creates a repository “version” with unique SHA identifier
nRF Connect SDK Basic Terminology

- **Tag**
  - Points to a specific commit SHA identifier, immutable
  - A human readable version reference
  - Nordic product development support is available

- **Master branch**
  - Points to the most recent commit SHA, mutable
  - Start testing newest features earlier
Manage Source Code and Configurations

West
Multi-repository management tool

Clone / update

Configure features

Configure target

Kconfig
Source module / feature configuration for compile

Device Tree
Target Board / Device description

*nKconfig

*.dts

Code Base

Application 1
Application 2
Application ...

nRF Connect SDK
nrf
nrfxlib
MCUboot
Zephyr

Your Code

nRF Connect
SDK
west.yml

Your Code

Your Code
Release Cycles

- Regular releases (e.g. quarterly)
- Publicly hosted on GitHub
- Fixes released as needed
  - Long term supported releases can have fixes applied and delivered after new releases
- Latest development version available
- Version control management with Git:
  - manage new version and fix adoption
  - tool supported merging
Supported for Development and Production

Features “supported for Development” may be used for development, but not recommended for volume production.

- Technical support is available
- Reported bugs may not be resolved until supported for Production
- Implementation may be partial
- APIs may change going to production
- Incomplete verification
- Suitable for prototype / evaluation

Features “supported for Production” will be maintained and are suitable for product development.

- Technical support is available
- Reported critical bugs will be resolved in both Master and latest Tag version of nRF Connect SDK.
- Complete implementations
- Verified for product development
- Suitable for integration in end-products
nRF Connect SDK documentation

- **Documentation link**
- Click on arrow in top left to choose documentation tag
  - 1.7.99 refers to master branch
  - Latest tag is 1.7.0
- Click on arrow in bottom left to switch to nrfxlib, Zephyr, MCUboot or other documentation
3rd Party Integration

nRF Connect SDK
Memfault: Connected Device Observability Platform for nRF Connect SDK devices

- **Continuous Monitoring** - View device and fleet-level metrics like battery health and connectivity in real-time dashboards with customized charts and alerts for Nordic.

- **Remote Debugging** - Resolve issues more efficiently with automatic detection, deduplication, and actionable insights sent via the cloud.

- **OTA Firmware Updates** - Once bugs are fixed, deploy updates directly to customer devices in the field for quick issue resolution.

- Native integration via the nRF Connect SDK gives [Nordic developers access to Memfault on 100 devices free](#). Setup takes 5 minutes.
Short-range updates

nRF Connect SDK v1.7
nRF21540 overview

- RF front end module (FEM)
- Supports
  - Bluetooth LE, Bluetooth mesh
  - Thread/Zigbee
- Configurable output power up to +21 dBm
- +13 dB receive gain, 2.5 dB NF
  - Up to 5 dB improvement in RX sensitivity
nRF21540 overview

- Interfaces and control
  - GPIO control, SPI control or a combination
  - Gain control, antenna switching and power modes
- Antenna diversity support (Thread/Zigbee)
nRF21540 support

- Pin control of nRF21540 supported in nRF Connect SDK 1.7.0
  - No SPI support
- Support for Bluetooth LE, Bluetooth mesh, Thread and Zigbee
- Support provided through Multi Protocol Service Layer (MPSL)
  - MPSL_FEM must be configured to support Front End Modules
nRF21540-DB support

nRF21540-DK

- Development kit with nRF52840 and nRF21540
  - Similar to nRF52840-DK but without QSPI flash
- Supported as build target in nRF Connect SDK
- Will automatically add MPSL support for Front End Modules
  - For Bluetooth only supported with Nordic SoftDevice controller
- Direct Test Mode and Radio Test example support
nRF21540-DB support

nRF21540-EK

- Evaluation kit with nRF21540
  - Shield form factor for nRF52 and nRF53 Series DKs
- Supported as shield in nRF Connect SDK
- Will automatically add MPSL support for Front-End Modules when added to project
  - For Bluetooth only supported with Nordic SoftDevice controller
- Can be used as template for adding nRF21540 support to custom PCBs
Cellular IoT updates
nRF Connect SDK v1.7
Complete low power cellular IoT solution

**nRF9160**
- Dedicated application processor and memory
- Multimode LTE-M / NB-IoT modem with integrated RFFE and GPS support
- Ultra Low Power

**nRF Connect**
- nRF Connect SDK
- nRF Connect for Desktop
- nRF Cloud
- nRF Connect for Mobile

**nRF9160 DK**
- Standalone development kit for the nRF9160 SiP
- eSIM from iBasis
- nRF52840 board controller with Bluetooth LE
- LTE, GPS, and 2.4 GHz antennas
nRF Connect SDK overview
Modem library v1.3.0

- New API for [AT commands](#)
- [AT Commands Reference Guide](#)
- New API for [modem delta firmware update](#)
- For more details see [changelog](#)
nRF Cloud Location Services

- Launched nRF Cloud Location Services
- Guide
  - Using nRF Cloud with the nRF Connect SDK
- nRF Cloud library
  - Assisted & predicted GPS
  - Cellular positioning
- Applications and samples
  - nRF9160: Asset Tracker v2
  - nRF9160: A-GPS
  - nRF9160: Multicell location
  - nRF9160: Serial LTE modem
Supported Modem firmware

- mfw_nrf9160 v1.3.0
- Compatibility matrix
- nRF9160 Certification web page
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Q&A