NORDICTECH
TOUR

2026 Nagoya Zephyr Meetup

Nordic Semiconductor Presenation

John Kenney

Mar 27 2026

NORDIC SEMICONDUCTOR

Global leader in low power wireless connectivity solutions

We are Nordic

Simplifying lives through all things connected

Fabless semiconductor company

Founded in Norway, 1983

~1,350 employees

$511 MUSD revenue, CY 2024
OSEBX: NOD

ISO 9001 certified

Global presence

We are connecting a more sustainable world

Source: ESG highlights Nordic Semiconductor Annual Report 2022 & TIME Worlds Most Sustainable Companies 2024

Your complete low power wireless solution partner

- High performance, low power product portfolio
- Investing in 22nm process node
- World-class technical support
- Extensive ecosystem of HW, SW, tools and services
- Dual wafer sourcing strategy
- Proven customer satisfaction
- Supporting all world-leading wireless technologies
- End-to-end solution ownership
- Global network of distribution partners

Bluetooth matter THREAD LTE-M NB-IoT Wi Fi

NORDIC SEMICONDUCTOR

We enable our customers to focus on what they are best at

Product features

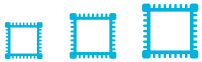
Application code

Apps and UX

Complete solution

Faster time-to-market

Next-gen hardware



ICs, SoCs, SiPs, PMICs

3rd party modules

Embedded SW stacks

Embedded software

nRF Connect SDK
Unified software

Mobile Apps

Extensive SW/HW development tools

World-class support

DevZone

Developer community

DevAcademy

Online hands-on trainings

NORDIC SOLUTION PARTNER · NORDIC DESIGN PARTNER · NORDIC MODULE PARTNER

Extensive technology partner program

Customer device

Consumer

Healthcare

Industrial

Cloud lifecycle services

nRF CLOUD
powered by Memfault

Device management

Embedded observability

Location services

Bluetooth · matter · THREAD · LTE-M · NB-IoT · GNSS · nfc · Wi Fi

Focus markets

Consumer

Staying connected at work, at home, and on the go

Healthcare

Connecting healthcare devices to improve accessibility and efficiency

Industrial

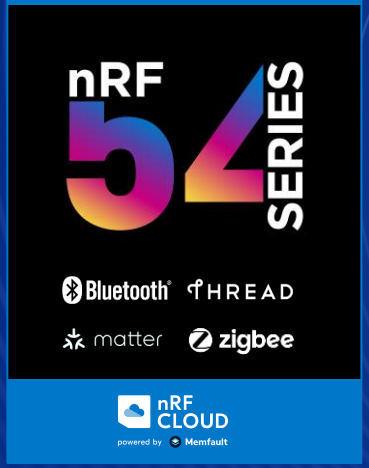
IoT enable machinery, sensors, and systems to enhance efficiency and productivity

NORDIC SEMICONDUCTOR

Nordic product overview

Cloud support across all our wireless connectivity solutions

Short-Range



Cellular IoT

Wi-Fi 6 IoT

Power Management

The market leader in Bluetooth LE

Product leadership

nRF 52 SERIES — 2014

nRF SERIES 53 — 2019

nRF 54 SERIES — 2024

Decade of leadership in low power and high performance SoCs

Best-in-class 2.4 GHz Radio

Recognized "industry standard" Bluetooth LE stack

Fast time-to-market with a complete solution

nRF Connect SDK comprehensive software

High-quality production-ready SW libraries

Easy-to-use development kits

3rd party pre-qualified and certified modules

World-class support

DevZone

DevAcademy

NORDICTECH TOUR

NORDICTECH WEBINARS

NORDIC SEMICONDUCTOR

Next generation wireless IoT

Based on 4th generation Nordic 2.4 GHz radio

nRF54 L SERIES

Bringing the market-leading nRF52 Series to the next level

- > 2x processing power & energy efficiency
- Advanced security
- Ultra-low power

nRF54 H SERIES

Revolutionary multiprotocol System-on-Chip

- New market standard on compute performance
- Strong platform for AI/ML at the edge
- State-of-the-art security

Bluetooth matter THREAD zigbee ANT+ 2.4 GHz

nRF 54 SERIES

NORDIC SEMICONDUCTOR

Short-range product roadmap

Aggressively expanding the product offering

Fit for purpose

- Low voltage
- Ultra-low power
- Size constraints

Mainstream

- Ultra-low power
- Radio performance
- Range of products

High performance

- Multicore MCU
- Ample memory
- Rich peripherals

NORDIC SEMICONDUCTOR

Cellular IoT made easy

Lowest power, smallest size

nRF 9 SERIES

SiP Modules with integrated ARM Application MCU

Mature and globally certified stack.

Private 5G NR+ stack option

Fast time-to-market with a complete solution

Globally certified SiP modules

Certified reference designs

NORDIC SEMICONDUCTOR DESIGN PARTNER

NORDIC SEMICONDUCTOR SOLUTION PARTNER

Design and connectivity services

nRF Connect SDK Comprehensive SW

nRF CLOUD powered by Memfault

Complete cloud lifecycle services

World-class support

DevZone

Developer community

DevAcademy

Online hands-on trainings

NORDICTECH TOUR

NORDICTECH WEBINARS

LTE-M | NB-IoT | GNSS | nRF+

nRF9151 sets new standards

Lowest power cellular IoT solution – Industry leading battery lifetime and performance

Smallest - Globally certified cellular IoT module in the industry

Global coverage and connectivity – Across telecom operators and Non-Terrestrial Networks

Ease-of-use and longevity – Flexible development options with open application MCU and nRF Cloud lifecycle services

LTE-M NB-IoT GNSS

Nordic Wi-Fi 6 IoT solutions

Low power, multiband and cloud connected

Low power
Enabling battery operated Wi-Fi 6 IoT applications

Multiband 2.4 and 5 GHz
Optimizing data throughput and coexistence

Robust Wi-Fi host stack
Robust and proven Wi-Fi interoperability driven by open-source strategy with broad developer adoption

Chip-to-cloud lifecycle services
Device provisioning, Firmware Over-The-Air (FOTA) and location services

Wi-Fi 6 product portfolio

Optimized for low power IoT applications

nRF7002
Companion IC

Full featured low power Wi-Fi 6 IoT solution

Wi Fi 6 CERTIFIED

nRF7001
Companion IC

Cost-optimized low power 2.4 GHz Wi-Fi 6 IoT solution

nRF7000
Companion IC

Low-power Wi-Fi 6 Location-based services solution

Next generation nRF71 Series SoCs

Ultra-low power highly integrated multiradio SoC with AI/ML accelerator

Coming 2026

The nPM Family

Integrated, flexible and easy-to-use

Highly integrated

Reduced system complexity, BOM and board space

Flexible

Configure the PMIC to match exactly your requirements

Easy-to-use

Seamless hardware and software integration enabling fast time-to-market

PMIC product portfolio

nPM1100

Ultra-compact
for battery charging with PCB footprint of just 23 mm^2

nPM1300

Highly integrated
with advanced battery management functionality

nPM1304

Coming soon

Highly integrated
and optimized for small batteries

nPM2100

High performance
with ultra-efficient boost regulator and fuel gauge for primary cell batteries

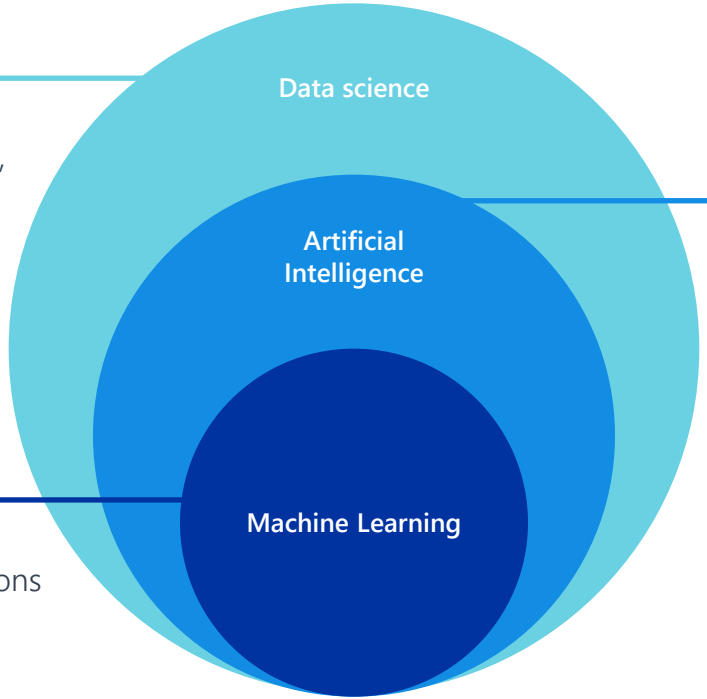
nPM6001

Advanced multi-rail
with six independently controlled voltage regulators

Nordic Edge AI

What is AI and what is ML

Data Science
- Extracts insights from data
- Involves data cleaning, analysis, and visualization
- Used for data-driven decision-making



Artificial Intelligence
- Aims for human-like intelligence in machines
- Encompasses various technologies like NLP, computer vision
- Enables reasoning and adaptation

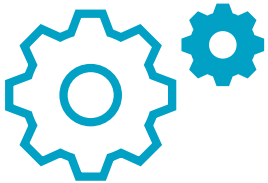
Machine Learning
- A subset of AI
- Trains models to make predictions
- Utilized in image recognition, recommendation systems, etc.

ML and neural networks

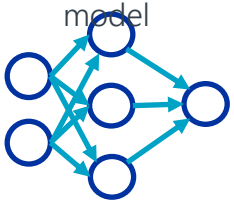
Training

Training data

Neural network framework



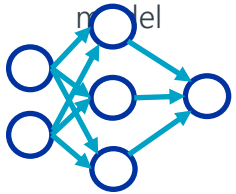
Chihuahua or muffin model



Inference

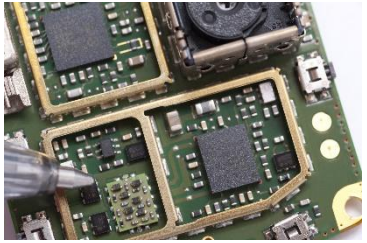
Input data

Chihuahua or muffin model



Chihuahua

(87,5%)



Benefits of edge AI

Across various devices

Latency

Real-time or near-real-time responsiveness may be crucial in some applications

Bandwidth

Edge computing conserves bandwidth and reduces reliance on continuous network connectivity

Privacy

Local processing and storage minimize potential security breaches

Energy efficiency

On-device processing is less energy consuming than large data transfers

Nordic Edge AI

Industry-leading energy efficiency across the broadest range of customer needs

Nordic-unique approach

Two complementary ultra-low-power edge AI technologies.

CPU-run models

Neuton

10x smaller, faster, and more efficient. For any Nordic wireless SoC.

Integrated NPU

Axon

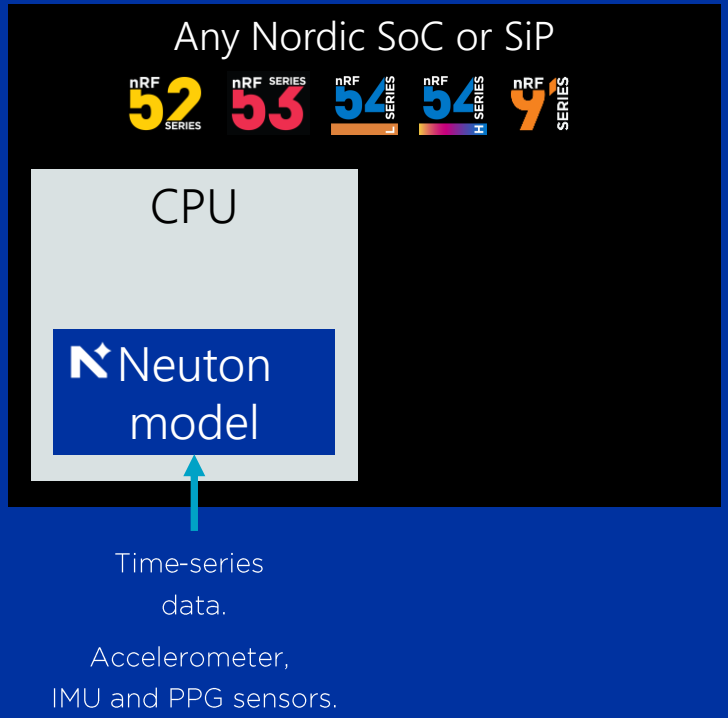
Ultra-efficient AI accelerator. Integrated in selected SoCs - nRF54LM20B.

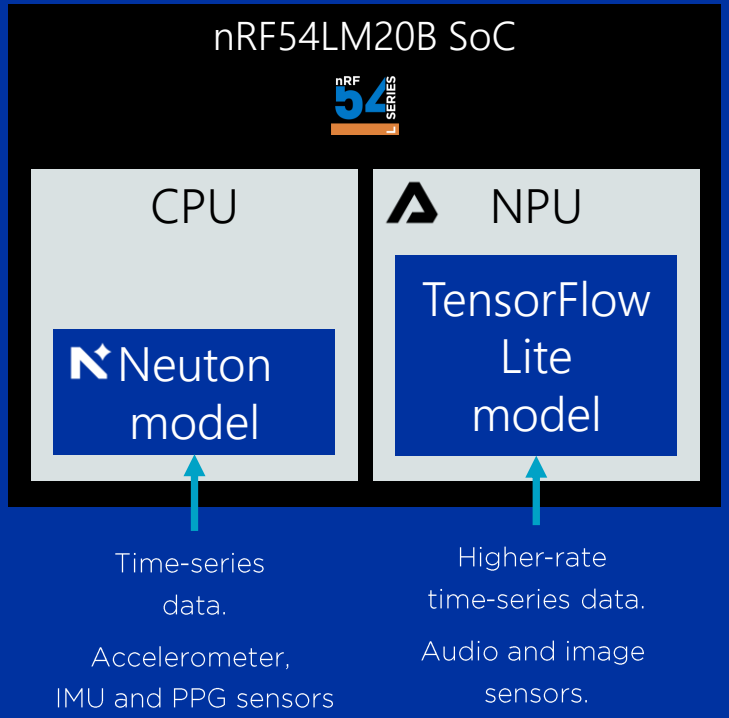
Made for developers

Nordic Edge AI Lab. Edge AI Add-On for nRF Connect SDK integration.

Two complementary technologies

For ultra-low-power edge AI



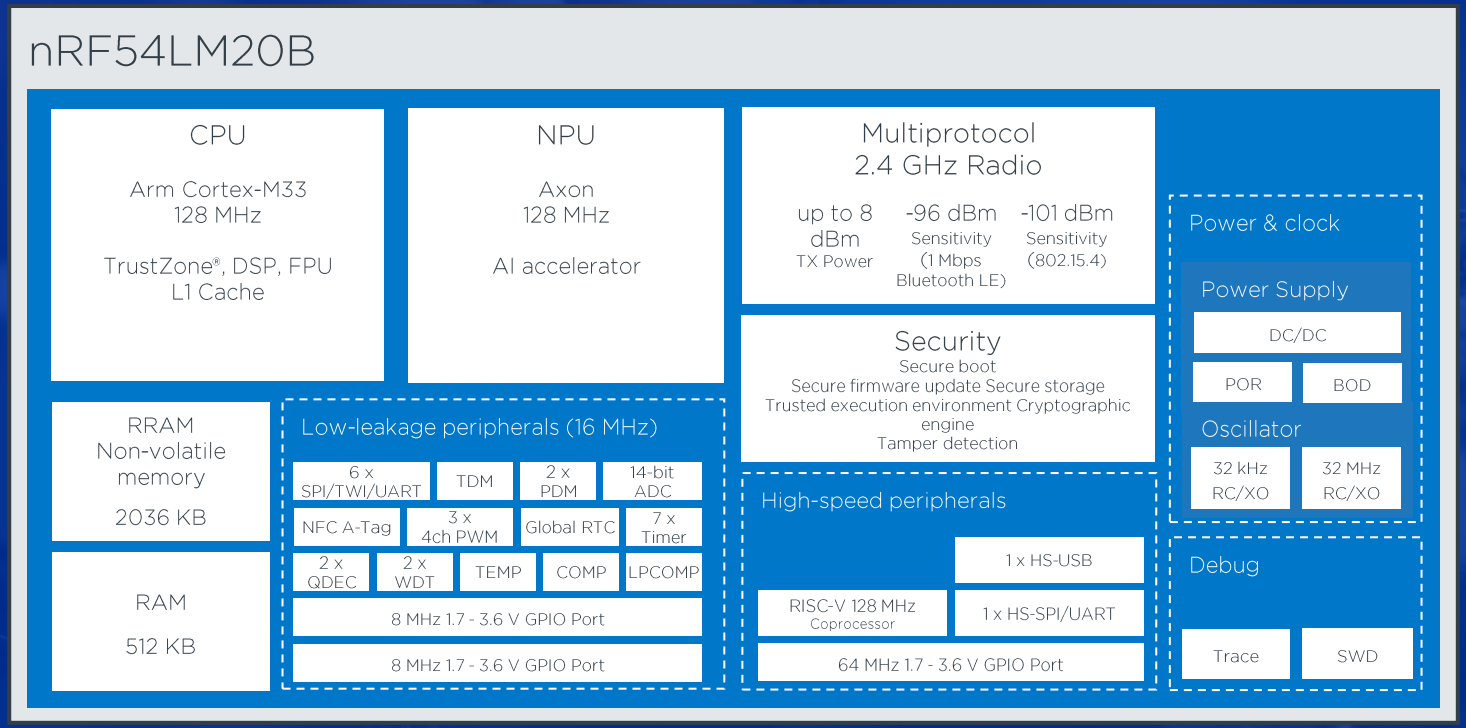


Axon NPU

Integrated AI accelerator

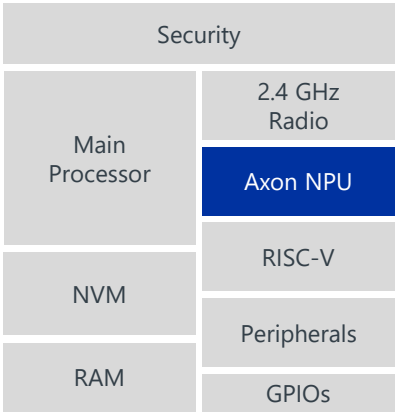
nRF54LM20B

Our first product featuring the Axon NPU



Axon NPU - AI accelerator

For ultra-low-power edge AI



Axon NPU is designed to increase the speed and efficiency of TensorFlow Lite models

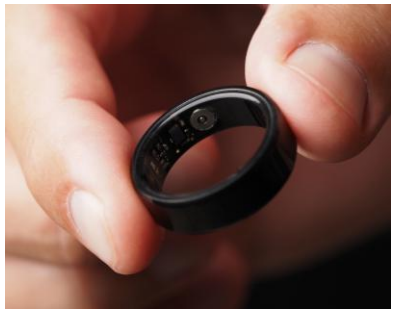
Highlights	▪ Can handle both feature extraction/preprocessing and inference ▪ Can perform most operations in a single cycle ▪ Execution independent from CPU ▪ TCM to reduce access to the main memory ▪ Dual Smart DMAs for managing data access
Two Compute Units	▪ Optimized for int8/16 quantized operation ▪ Efficient execution of most of inference networks e.g., CNN, DNN ▪ Acceleration for common feature extraction functions such as FFT, LOG, SQRT
Performance	▪ Up to 15x Faster and more energy efficient than the CPU running the same TensorFlow Lite model ▪ Up to 8x more energy efficient and up to 7x faster inference compared to the closest competing product

Custom Neuton models

Ultra-tiny AI models based on your data, from your device, for your application

Exceptionally Tiny Models without Loss of Accuracy

For wearable, smart home, industrial and controllers



Typically

5 KB

or less
NVM footprint

Up to

10x

smaller
NVM footprint

Up to

10x

faster
inference

As little as

1/10

of the
energy

Comparing to CPU-run Tensorflow Lite models

Main options for time-series data on CPU

Open frameworks

Available on any hardware

Optimized/compressed version of a TF model

requires expertise to both make and optimize

Size, efficiency and accuracy highly depend on how good the optimization is

Nordic proprietary

Available on any Nordic hardware

Optimized by default, automatically grown to the smallest possible size and highest accuracy

Low memory footprint and lower energy consumption due to lower inference times

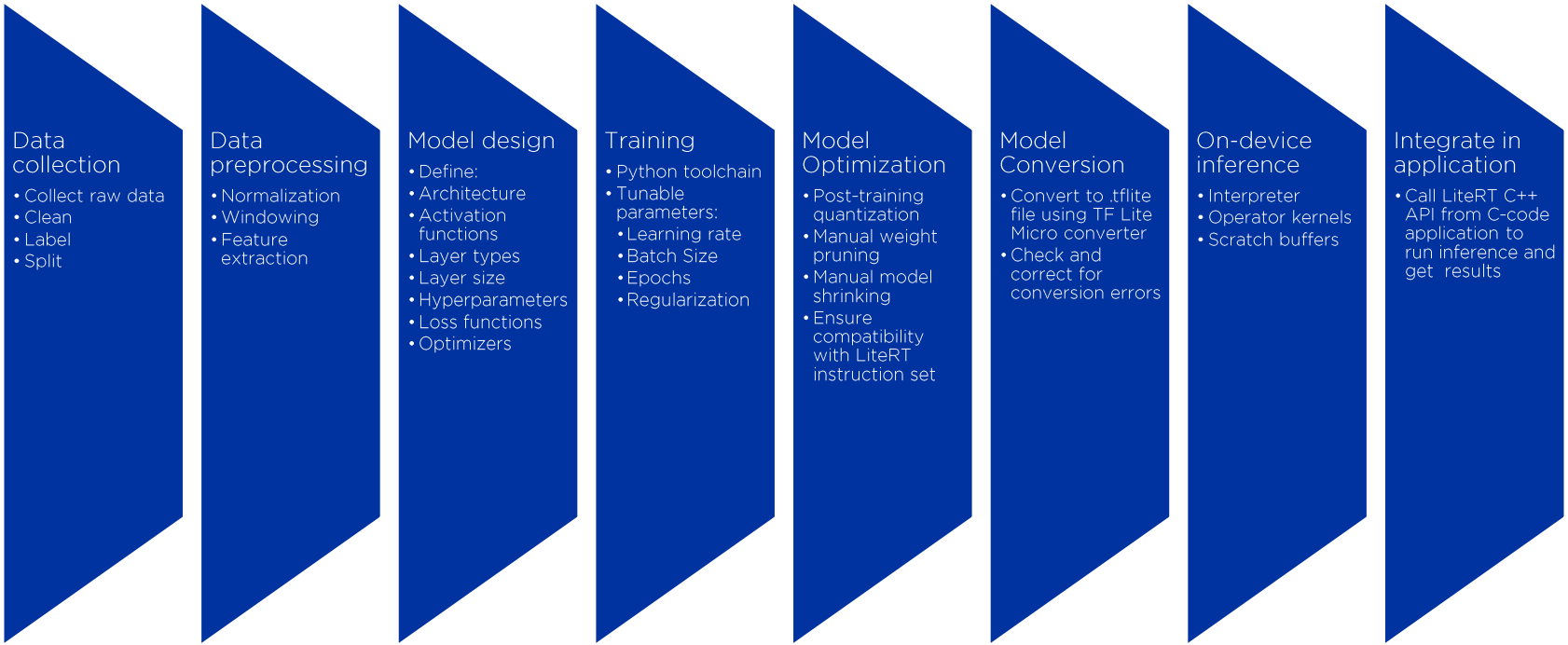
NORDIC SEMICONDUCTOR

Nordic Edge AI Lab

Automatically build custom Neuton models in the cloud

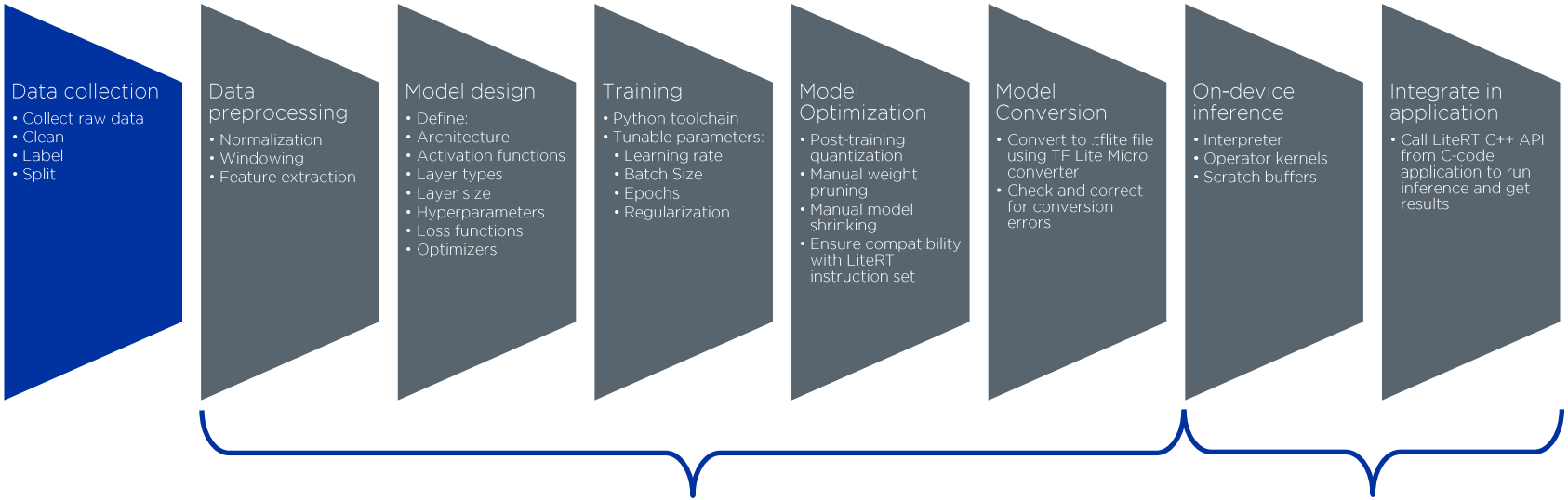
Comparing Edge AI workflows

Conventional workflow with TensorFlow Lite



Comparing Edge AI workflows

Conventional workflow with TensorFlow Lite



Nordic Edge AI Lab

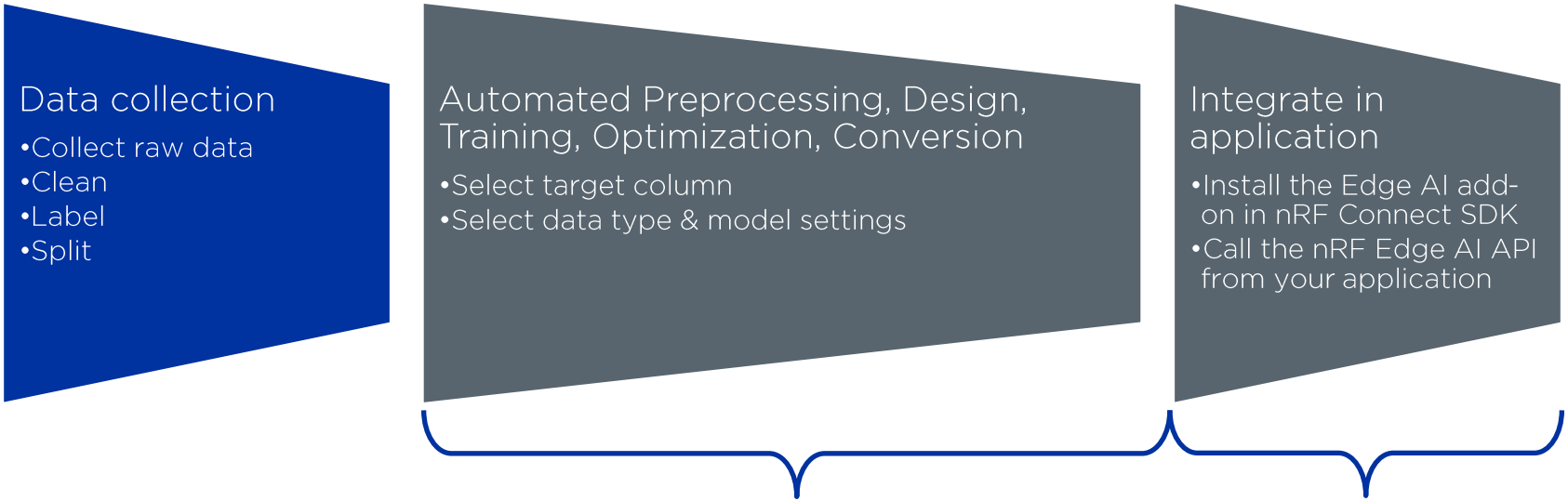
Automatically extracts features, builds the model and provides a small C library

Edge AI Add-on

Samples and API built-in nRF Connect SDK

Comparing Edge AI workflows

Neuton models complete workflow



Nordic Edge AI Lab

Automatically extracts features, builds the model and provides a small C library

Edge AI Add-on

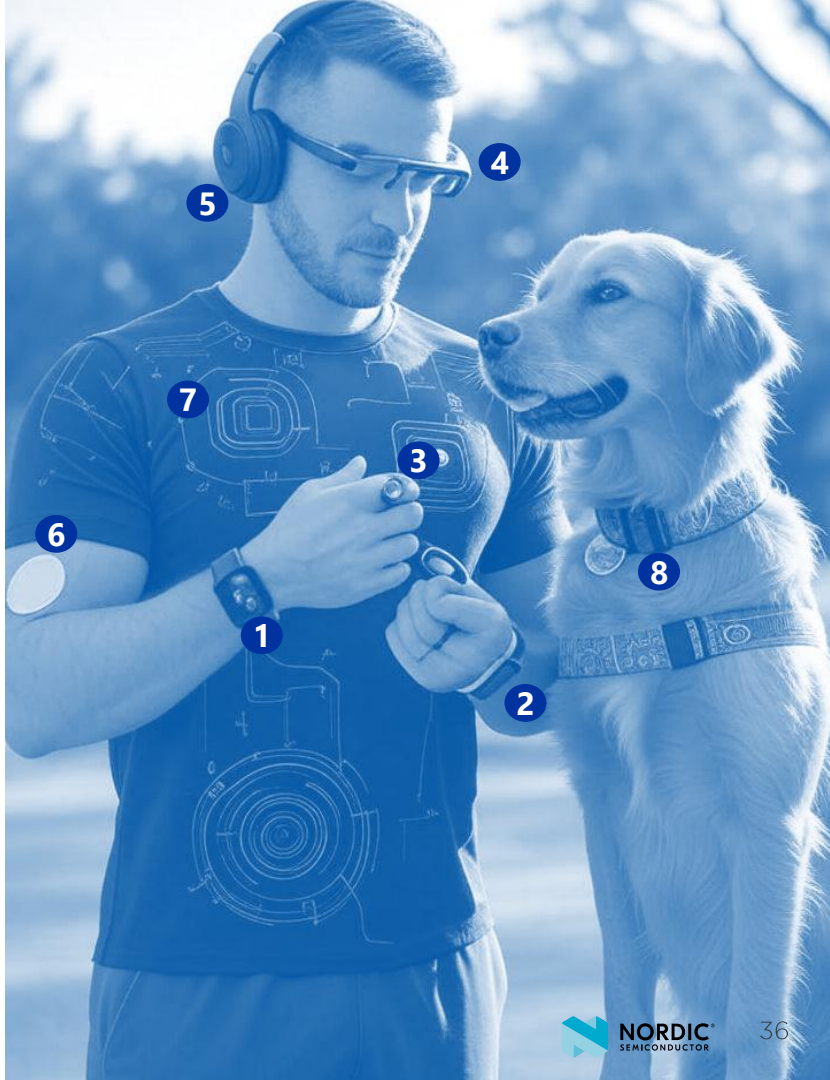
Samples and API built-in nRF Connect SDK

Use Cases

Wearables & Health

1. Smartwatches
2. Fitness Bands
3. Smart Rings
4. Smart glasses
5. Hearables
6. Medical Devices
7. Smart Clothing
8. Pet Trackers

Activity Recognition	Walking, running, sleep, fitness activities, falls, daily routine, handwashing .
Gesture Recognition	Double Pinch, Double Clench, Wrist Twist/Flick, Wrist Raise/Lower, Double Tap (thumb–index), Swipe
Vital signs monitoring	HR, HRV, SpO_2, respiration, stress, fatigue, hydration, etc.



Smart Living & Industry

1. Laptops
2. Smart Home
3. Home Appliances
4. Asset Tracking
5. Industrial IoT
6. Agriculture

User context detection	Laptop in bag/on desk, human presence, etc.
Smart control & automation	Gesture-controlled lamps/TVs, appliance use detection
Asset monitoring	Theft prevention, shock/impact detection
Energy optimization	Battery use, load balancing in home appliances, etc.
Anomaly Detection	Predictive maintenance Power outages, HVAC/gas leak

Smart Activity & Gesture Recognition

Smart Glasses: Head Gesture Control

TOTAL FOOTPRINT 4 KB

Smart Ring: Hand Gesture Control

TOTAL FOOTPRINT 6 KB

Smartwatch: Hand Gesture Control

TOTAL FOOTPRINT 4 KB

Gesture-Based Remote Control

TOTAL FOOTPRINT 5 KB

Sleep/awake Detection for a Smart Ring

TOTAL FOOTPRINT 3.8 KB

Daily Activity Recognition

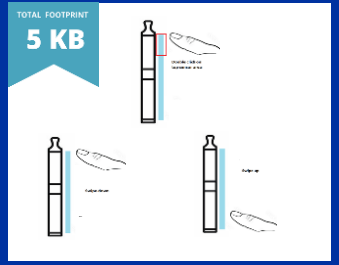
TOTAL FOOTPRINT 5 KB

Smart Ring as a Fitness Tracker

TOTAL FOOTPRINT 7 KB

Parental Control VAPE Touch Sensor

TOTAL FOOTPRINT 5 KB



Healthcare & Vital Signs

Type of Arrhythmia Diagnosis

Atrial Fibrillation V/S Normal Sinus Rhythm Classification

Heart Rate Detection

Toothbrushing Tracking

HRV (Heart Rate Variability)

Step Counting

Calories Burned Estimation

Package Event Tracking

Edge AI Benchmarks

Comparisons with other solutions in the market today

Activity Recognition Benchmarks

Data	Neuton				EDGE IMPULSE				SensiML				TDK Qeexo				NANOEDGE AI STUDIO			
	Acc	FLASH	RAM	ms	Acc	FLASH	RAM	ms	Acc	FLASH	RAM	ms	Acc	FLASH	RAM	ms	Acc	FLASH	RAM	ms
PAMAP2	0.84	5.85	18.5	18	0.57	66.4	12.1	147	Error				0.36	139	4	35	3 days training – didn't finish			
WISDM	0.91	6.8	1	1.3	0.34	57.5	4.4	46	0.76	6.8	0.9	3.8	0.95	47	3.3	19	0.94	249.6	3.4	24
Ku-har	0.91	23.5	5.7	6.5	0.72	69.7	8.5	116	0.36	10.4	3.4	18.9	0.15	313	2.7	88	0.85	245	4.1	32
HASC	0.47	19.6	1.3	3.3	0.53	59.4	3.5	32	0.52	30.9	0.9	4.14	0.48	207	3.5	57.8	0.48	93.9	2.5	26

*Acc – accuracy, FLASH/RAM footprint is measured in KB, latency (ms) is measured in milliseconds
** March 2024 benchmarking data

PAMAP2

Physical Activity Monitoring

UCI ML repository dataset

<u>18 human activities:</u>
- Walking
- Cycling
- Playing football, etc.

WISDM

Human Movement Activity Recognition

Fordham university dataset

<u>6 Classes:</u>
- Walking
- Jogging
- Upstairs
- Downstairs
- Sitting
- Standing

Ku-har

Human Activity Recognition

Open-source dataset

<u>18 Classes:</u>
- Push-Up
- Sit-Up
- Walk-circle
- Run
- Table tennis, etc.

HASC

Human Activity Recognition

Open-source dataset

<u>7 Classes:</u>
- Stay
- Walk
- Job
- Skip
- Stair up
- Stair down
- Sequence

Nordic's Ultra-low-power edge AI Solutions

Two complementary technologies to cover different targets and use cases

Neuton models

- CPU-run edge AI → All SoCs/SiPs
- 10x smaller, faster, and more efficient with higher accuracy than TF Lite
- Nordic proprietary technology, licensed for Nordic SoCs/SiPs
- Suitable for time-series sensor data like from accelerometers, IMU, environmental, biometric sensors, etc.

Axon NPU

- Ultra-efficient AI accelerator
- Increasing the speed and efficiency of TensorFlow Lite models
- 7x faster, 8x more efficient than closest competing product
- Suitable for higher rate time-series data, audio and image recognition
- Available in the nRF54LM20B SoC

nRF CLOUD

powered by Memfault

Enabling device makers to launch and support highly reliable products, fast.

Optimized and advanced lifecycle services

Enhanced device performance

Embedded observability

Memfault

Fix defects before your customer finds them

Device management

Securely connect your devices and deploy firmware updates instantly

Location services

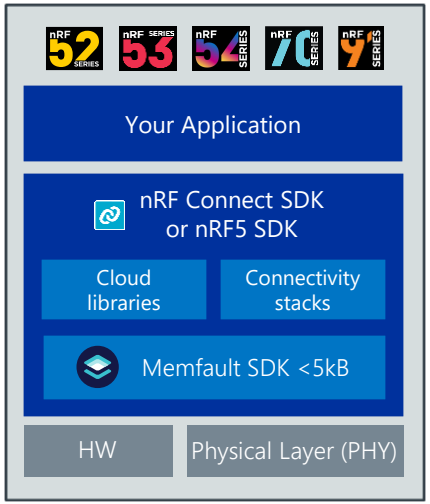
Versatile location services tracking your devices wherever they are

NORDIC SEMICONDUCTOR

nRF Cloud is embedded in NCS

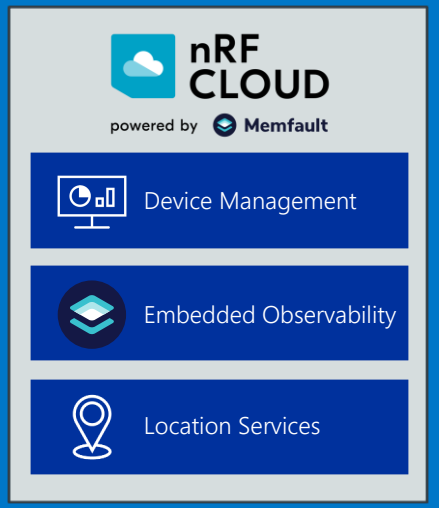
Integrate, connect and operate over any connectivity path

01



02

03



Device Vitals

Out-of-the-box insights critical for reliability

Battery Life

How long is the battery life under real-world conditions across various configurations?

Stability

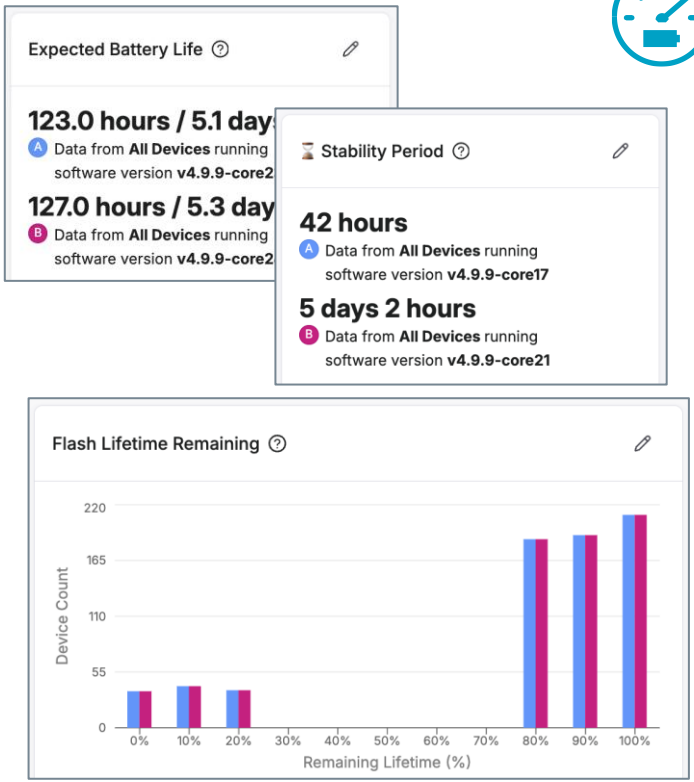
How often does the firmware crash?

Connectivity

How reliable is BLE, Wi-Fi, and LTE?

Flash Wear

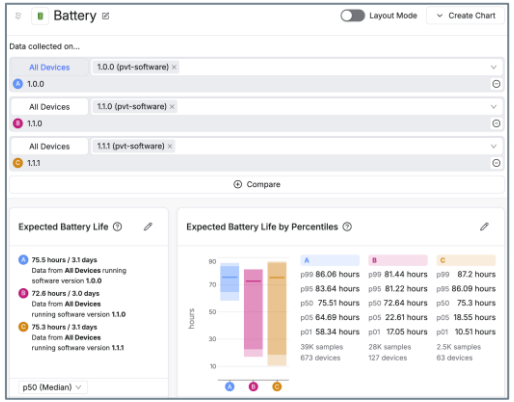
What is the lifespan of the non-volatile storage chip under current write & erase conditions?



Compare Device Vitals between Software Versions to prevent regressions

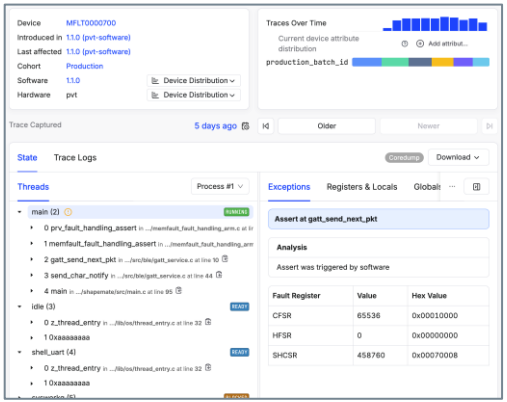
Memfault's Observability Features

Fleet Health Monitoring



Improve fleetwide quality and reliability by analyzing connectivity, power, firmware stability, flash wear and more.

Remote Debugging



Root cause issues in minutes with coredumps, traces, reboots, logs, and metrics for every device in one place.

Logging & Alerting

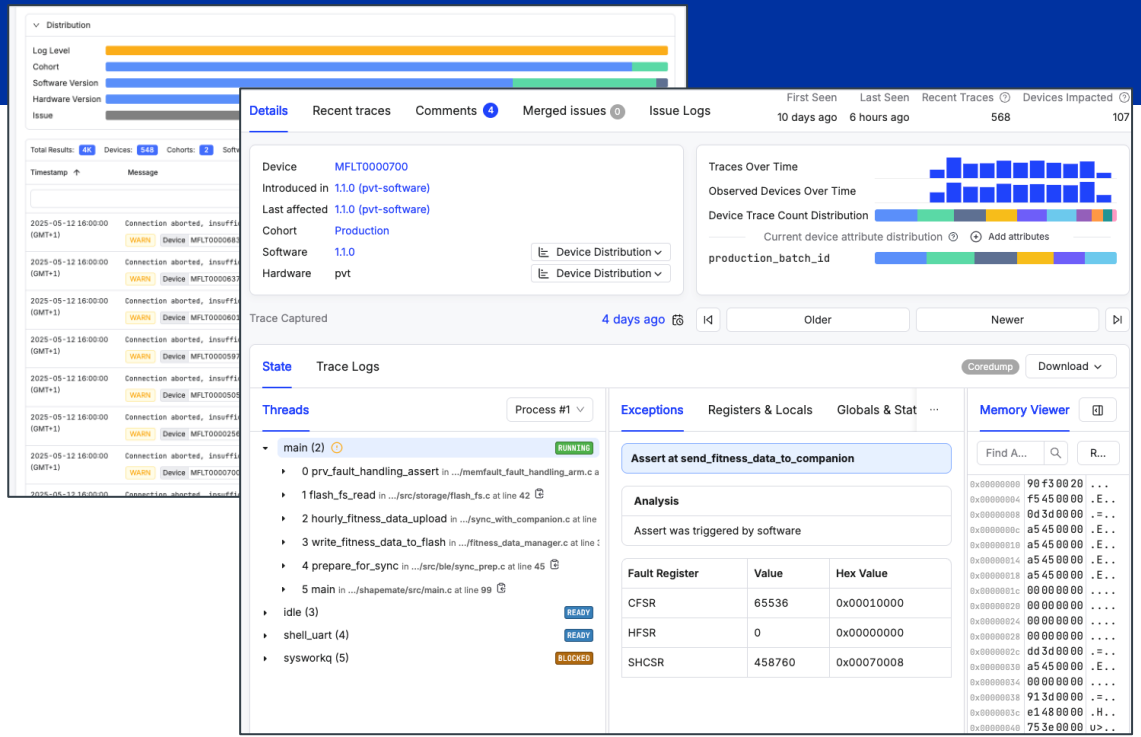
Search device logs across your entire fleet and **receive alerts at the first signs of trouble**.

Root cause issues without reproducing

Solve complex problems with production data from the field

Capture logs, metrics and coredumps from internal or production devices in the field.

Available for any Nordic MCU running on nRF Connect SDK or nRF5 SDK



Firmware over-the-air update

Optimized, automated and low-risk at scale

Delta updates

Supporting delta updates our FOTA is optimized for preserving power consumption and connectivity usage

Automated rollout management

Our solution is highly automated and flexible by allowing you to create custom groups of devices and deploy staged rollouts by group

Managed Security & Compliance

nRF Cloud provides advanced security features including Audit Logs and Approval Workflows and is penetration tested annually.

Every company needs OTA

In 2026, it is no longer optional

1

Fix bugs and security flaws

Ship critical patches after your product is already in the field

2

Comply with the law

Meet regulatory mandates like the EU Cyber Resilience Act (CRA)

3

Delight your customers

Continuously improve the product experience with new features

NORDIC SEMICONDUCTOR

Chip-to-cloud FOTA solution

Production ready out-of-the-box

nRF CLOUD powered by Memfault

Accelerate time-to-market

Production-ready scalable chip-to-cloud FOTA solution from day 1

Reduce lifecycle costs

No ongoing maintenance and support costs

Simplify update management

Simple, automated rollout management

Enhanced security and reliability

EU Cyber Resilience Act compliant and proven on millions of devices in the field

NORDIC SEMICONDUCTOR

EU Cyber Resilience Act (CRA) requirements

Nordics FOTA solution is purpose-built for CRA compliance

nRF CLOUD powered by Memfault

Vulnerability handling period

The support period for which the manufacturer ensures the effective handling of vulnerabilities should be **no less than five years**, unless the lifetime of the product with digital elements is less than five years…Where the time the product with digital elements is reasonably expected to be in use is longer than five years…manufacturers should accordingly **ensure longer support periods**.

Section 60

Automatic security updates

Ensure that vulnerabilities can be addressed through security updates, including, where applicable, **through automatic security updates** that are installed within an appropriate timeframe

Annex 1 – Part I, (2)(c)

Secure updates distribution

Provide for mechanisms to securely distribute updates for products with digital elements to ensure that vulnerabilities are fixed or mitigated in a timely manner and, where applicable for security updates, in an automatic manner

Annex 1 – Part II, (7)

NORDIC SEMICONDUCTOR

Chip-to-cloud solution

A complete FOTA solution right out of the box

Device side done for you

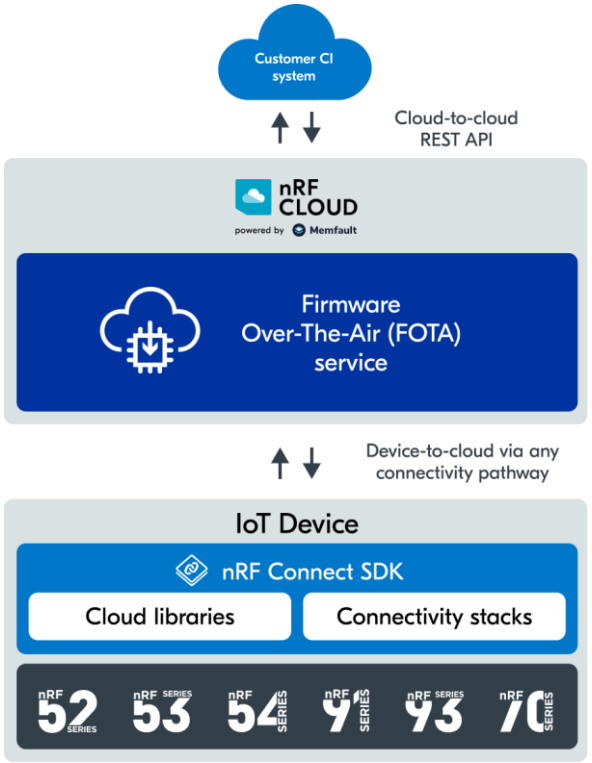
nRF Connect SDK includes everything you need to update devices with no re-engineering required

Integrate cloud in minutes

Connect your device seamlessly to nRF Cloud infrastructure with a few K-configs

Production-ready from day 1

Instant access to a system tried and tested on millions of devices already in the field



FOTA simplified

Controlled, low risk update workflows at scale

nRF CLOUD
powered by Memfault

Automated rollout management

Highly automated and flexible by allowing you to create custom groups of devices and deploy staged rollouts by group

One-click abort

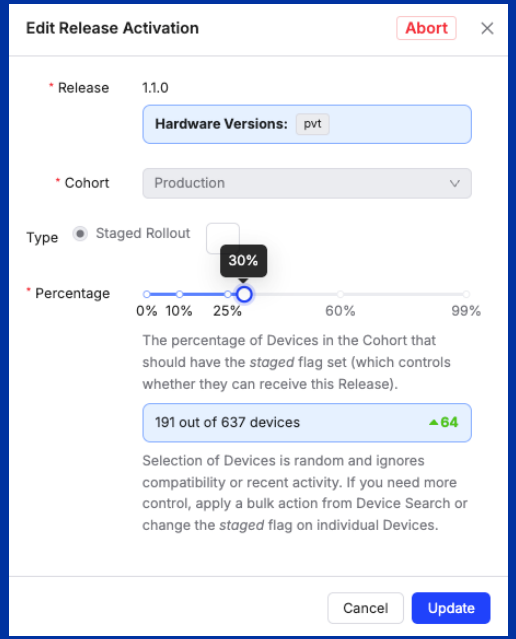
Should the unforeseen happen we help you mitigate risk by providing “one-click” abort during device update operation

Version control and rollback

Enables version checking and controlled rollback of firmware versions minimizing downtime and maintaining operational continuity

Scale to millions of devices

Our FOTA solution is being successfully used by companies everything from pilot deployments to millions of connected devices



FOTA dashboard

Track and monitor firmware rollouts with ease

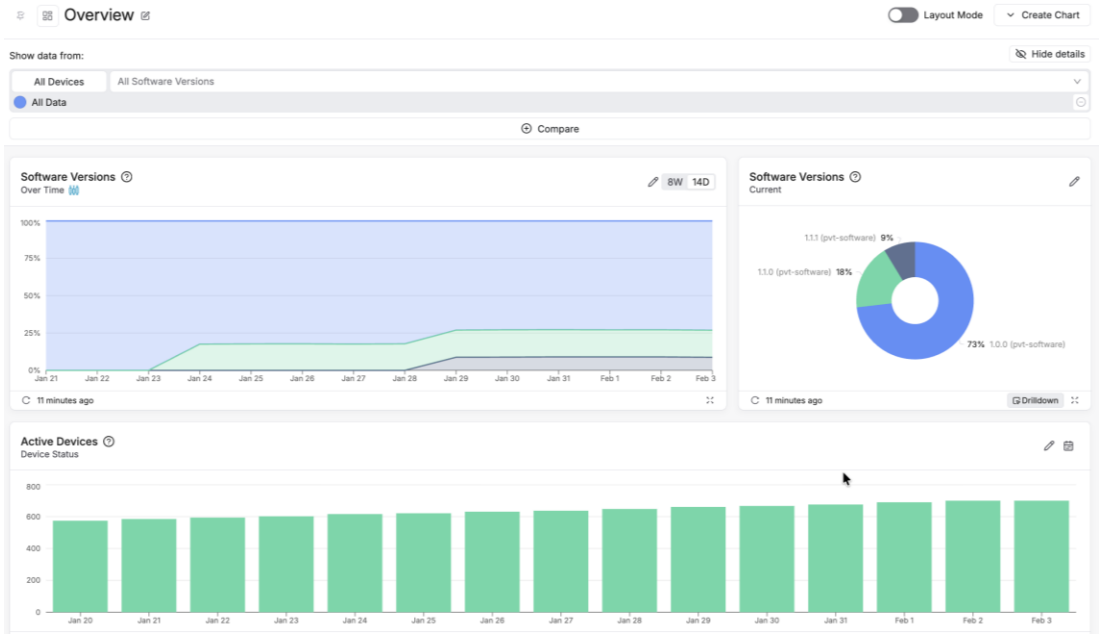
nRF CLOUD powered by Memfault

Track

Easily gain comprehensive insights into the update status of your fleet through ready-to-use visualizations, including firmware version distribution, version adoption, and additional metrics

Monitor

Monitor update rollout in real time, access detailed campaign progress data, and receive automatic alerts in the event of any issues



NORDIC SEMICONDUCTOR

Device Locationing

Power efficient location technology

Why are location services needed?

- Location information is critical and vital for multiple types of devices
- Multiple verticals where the same challenged can be solved
  - Asset tracking, Wearables, Smart & Connected Appliances, Point-of-Sale/Payment terminals etc.
- By selecting the right technology + feature companies can increase their revenue and decrease costs

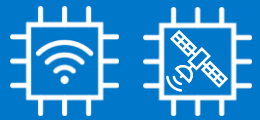
- Accuracy level defined by the use case
- Better battery life / power savings
- Fast method to get assistance/location
- Switching technology based on the use case / required accuracy

Location Services

Key considerations

Multiple verticals utilize location services

Asset tracking, Wearables, Smart & Connected Appliances, Point-of-Sale/Payment terminals etc.



Combine several technologies to optimize each use case.

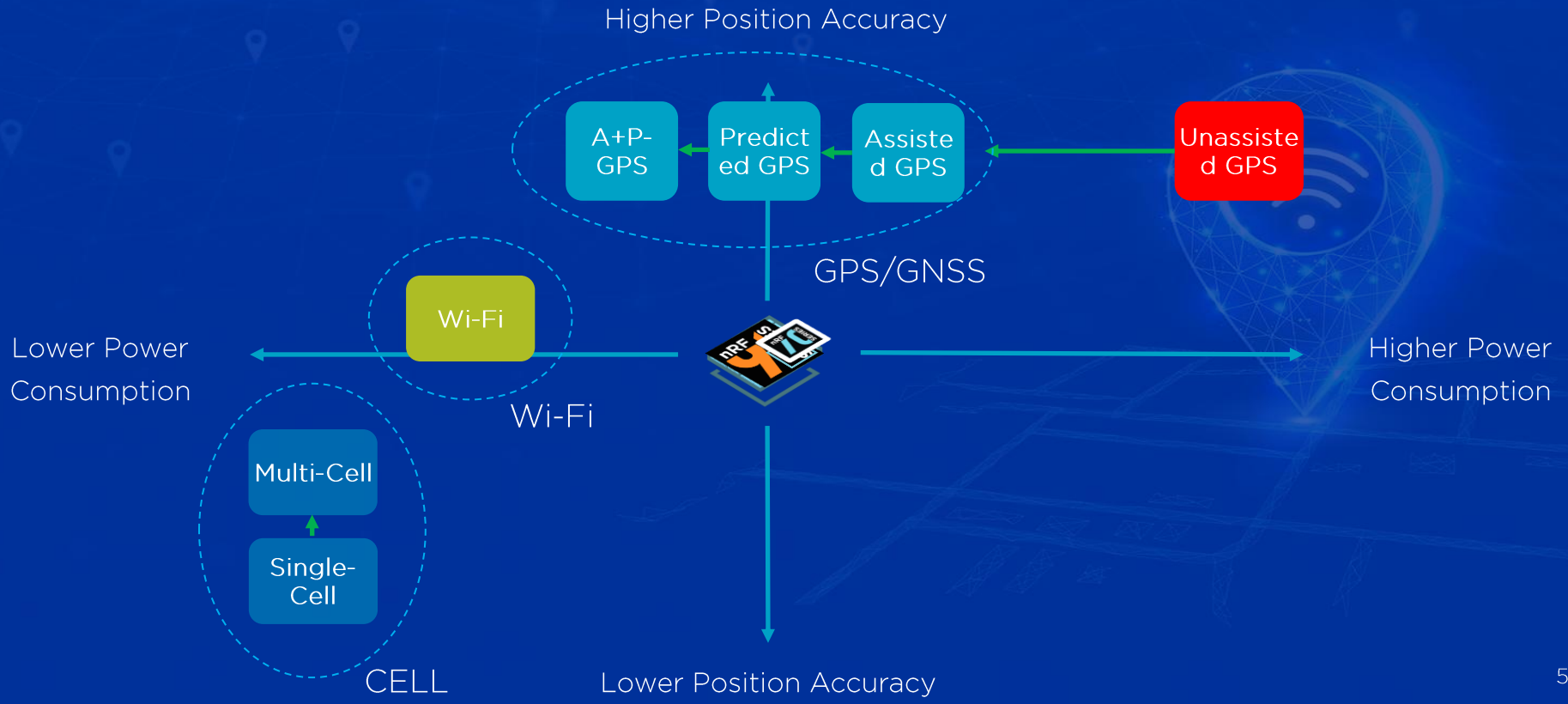
Utilize sensors to detect motion etc.

City level, street level, house level vs m-level accuracy.

Accuracy Indoors vs outdoors

Select technology and frequency of location requests to optimize power consumption.

What location service fits my use-case?



Wi-Fi location services with nRF Cloud

Power friendly. Fast. Accurate. Working indoors.

Wi-Fi Database

nRF Cloud

4 Cloud can send position to device or it can be used elsewhere

Response

```
{
  "lat": 45.524098,
  "lon": -122.688408,
  "uncertainty": 30
}
```

2 Device connects and sends Wi-Fi details to cloud

3 Cloud calculates position of device

Request

```
{
  "macAddress": "string",
  "ssid": "string",
  "signalStrength": -42,
  "frequency": 2412
}
```

1 Device inquiries its Wi-Fi network surround

nRF Cloud plans

A solution for all needs

nRF CLOUD powered by Memfault

Developer

Free trial

With the Developer plan you get instant free, hands-on experience with nRF Cloud

Pro

Pay-as-you-go

Flexible to your business needs - pay only for what you use, with no upfront costs or commitments

Fully supported by an easy-to-use self-service platform

Enterprise

Fixed rate

Predictable, fixed-rate pricing tailored to your needs, based on a term commitment

NORDIC SEMICONDUCTOR

Your low power wireless connectivity solutions partner