PARTNER WEBINAR

Memfault

NORDICTECH WEBINARS

Building more reliable Bluetooth LE products with Memfault

Today's hosts

Heiko Behrens

Head of Product

Devon Yablonski

Partnerships

Ali Aljaani

Developer Marketing Manager

Memfault

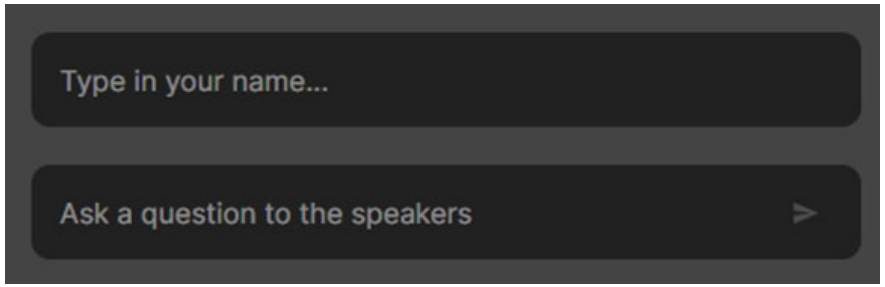
Memfault

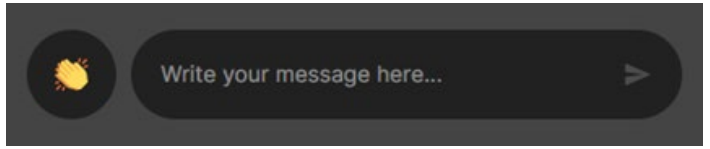
NORDIC SEMICONDUCTOR

© Nordic Semiconductor

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
  - We will answer them toward the end
- The chat is not anonymous and should not be used for questions
- If you have more questions:
  - Go to DevZone for Nordic-related questions
  - Go to https://memfault.com/contact/ for help with Memfault platform
- Recording of the webinar will be available together with the presentation at webinars.nordicsemi.com/on-demand





{ DevZone

© Nordic Semiconductor

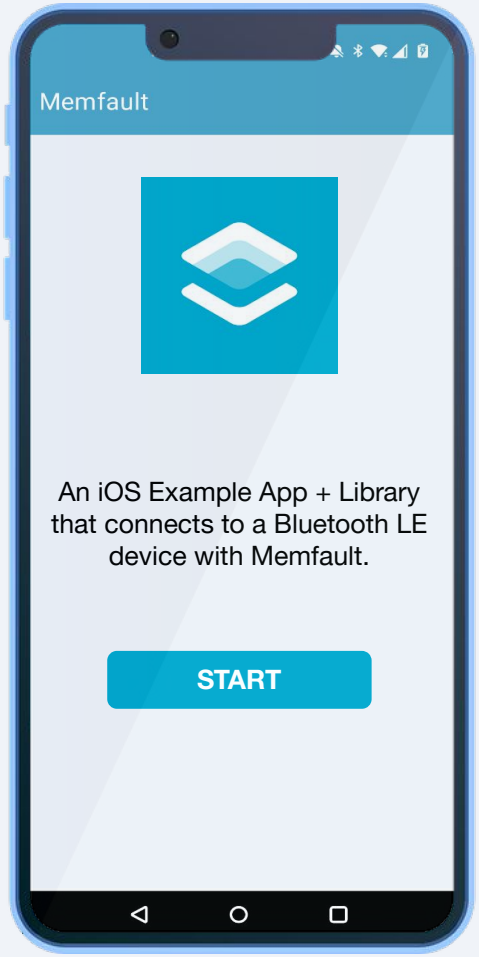
Memfault Partnership

- Enables our customers to ship devices with confidence.
- Deep insights into deployed devices' performance.
- Complete reliability platform
  - Monitor
  - Remote debug
  - Over-the-air updates
- nRF9160 SiP support added since nRF Connect SDK v1.6.0
- Now we have nRF52 and nRF53 Series support in nRF Connect SDK v2.1.0 (the focus of this webinar)

Memfault

NORDIC SEMICONDUCTOR SOLUTION PARTNER

Today's Presentation



nRF Connect SDK now with Memfault for Bluetooth LE!

What is Memfault?

Memfault for nRF52 & nRF53

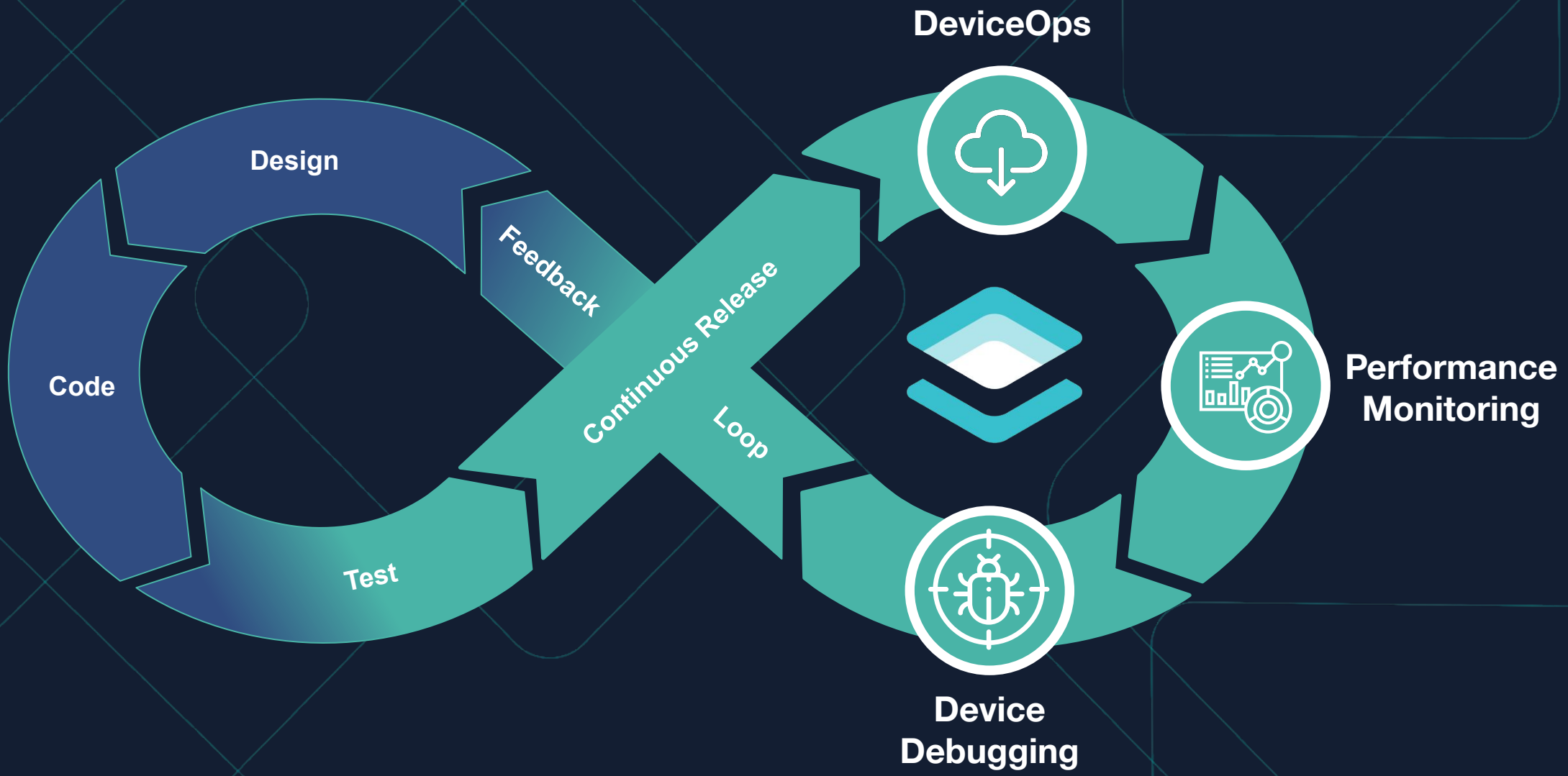
Live Demo

Q&A

We empower IoT device developers to build more reliable software

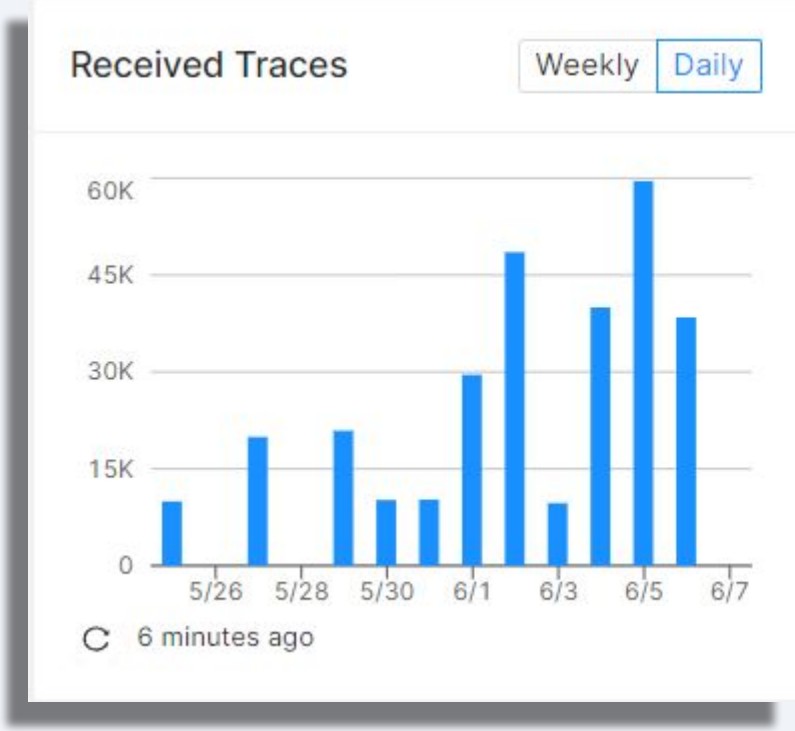
We believe that device reliability engineering gives developers a more scalable and sustainable process to transform the way they build and operate IoT and edge devices.

Memfault: Device Reliability Engineering



Issue Analysis At Scale

Detect problems



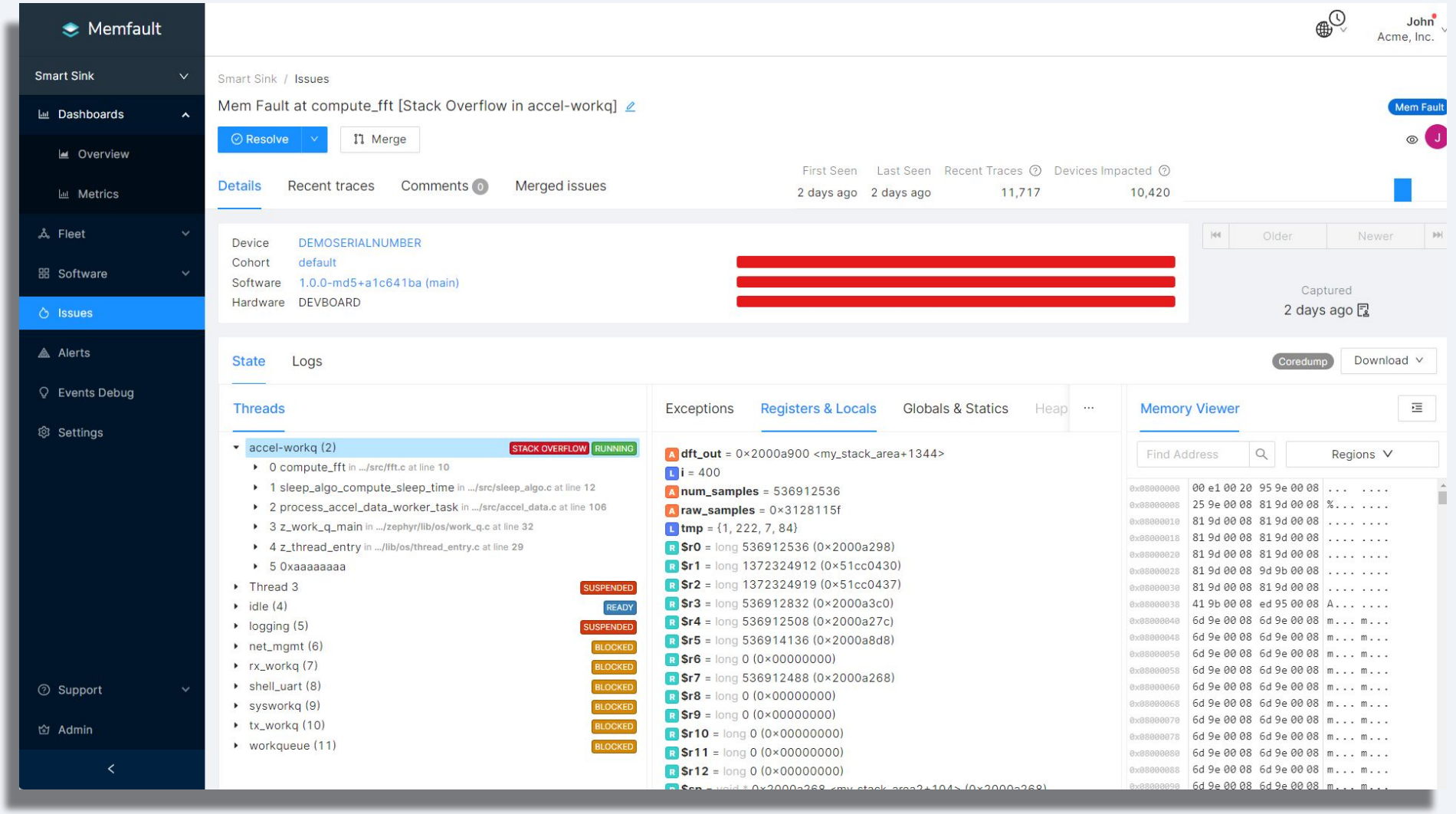
Automatically label and gain insights

Top Issues

	Issue	Devices	Traces
Assert	Assert at timeout_handler_exec	29556	
Assert	Assert at prv_recursive_crash	20404	
Hard Fault	Hard Fault at prv_crash_example	20672	
Assert	Assert at prv_check1	20852	
Assert	Assert at cli_execute	19712	

Memfault finds the bugs you care about

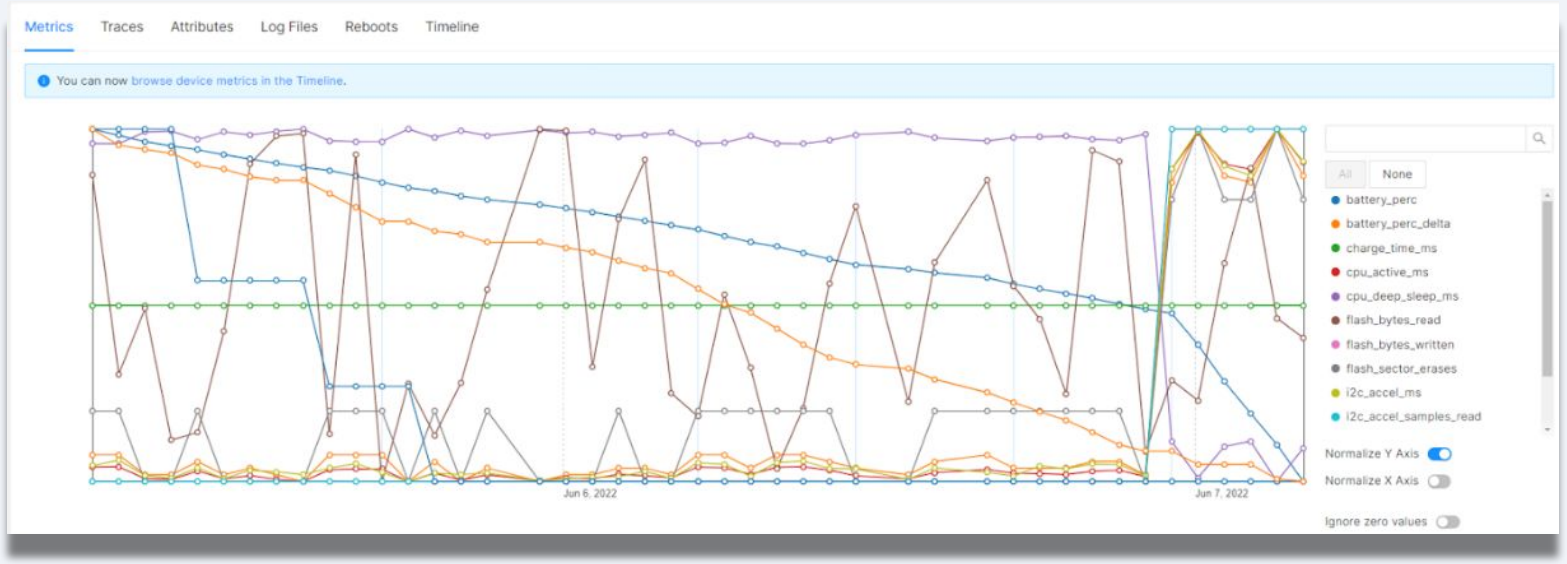
Debug Crashes 100% remotely



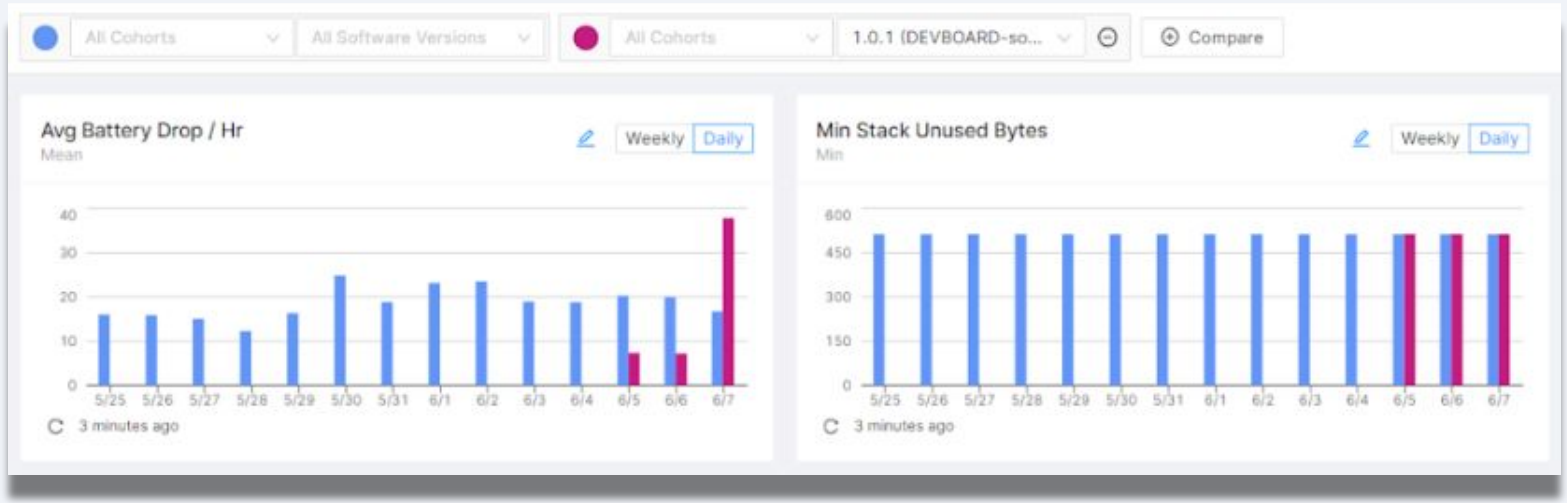
Memfault eliminates the need to recreate bugs

Metrics with 2 Lines of Code

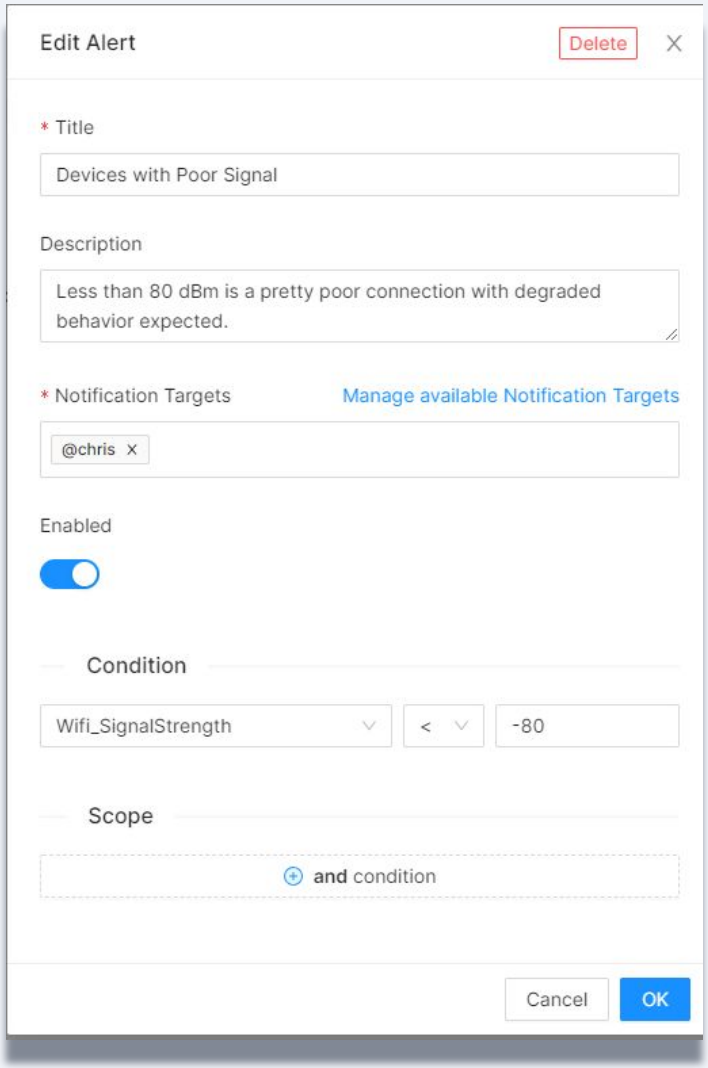
Device Time Series Metrics

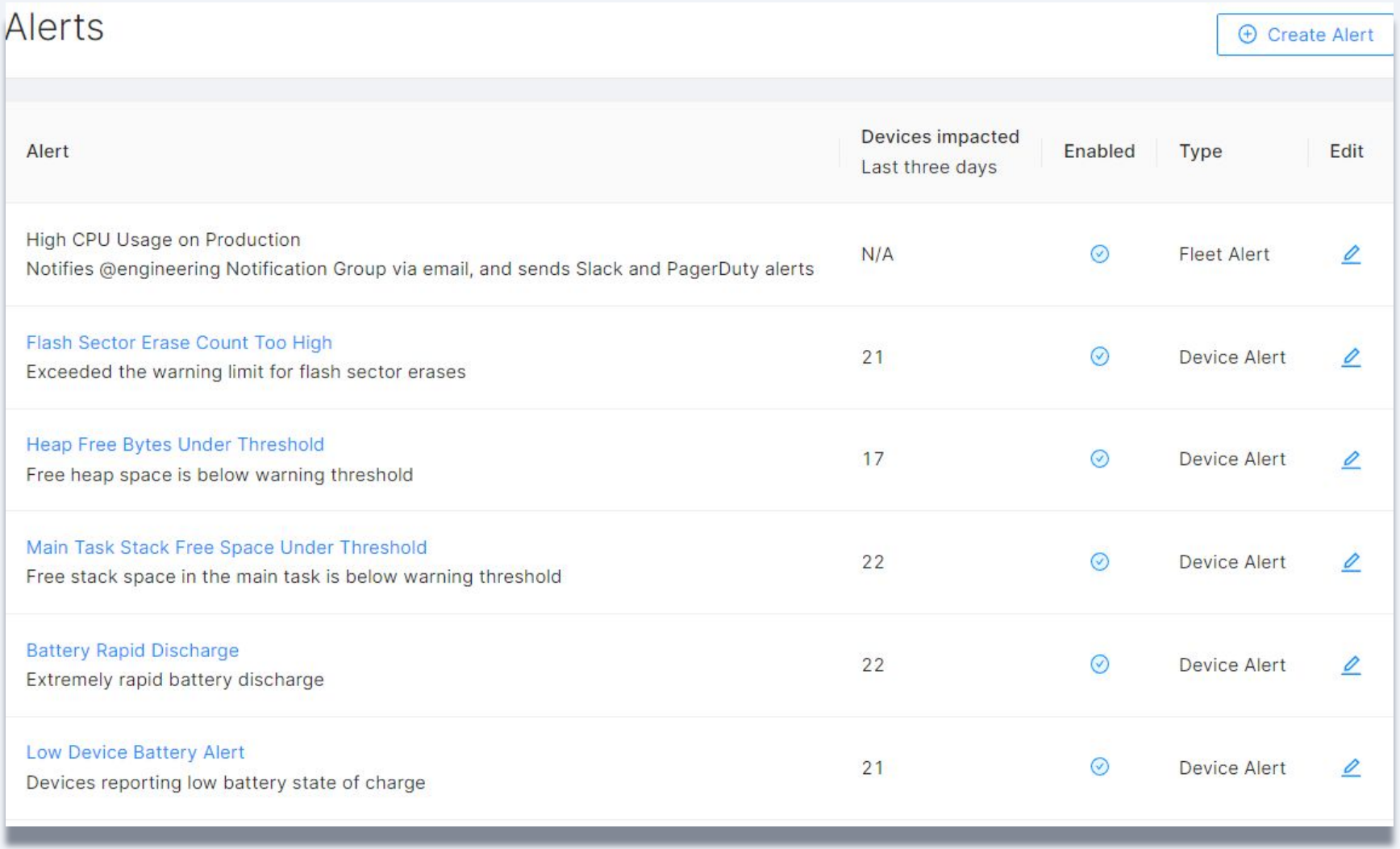


Fleet Aggregate Metrics with Version Comparisons

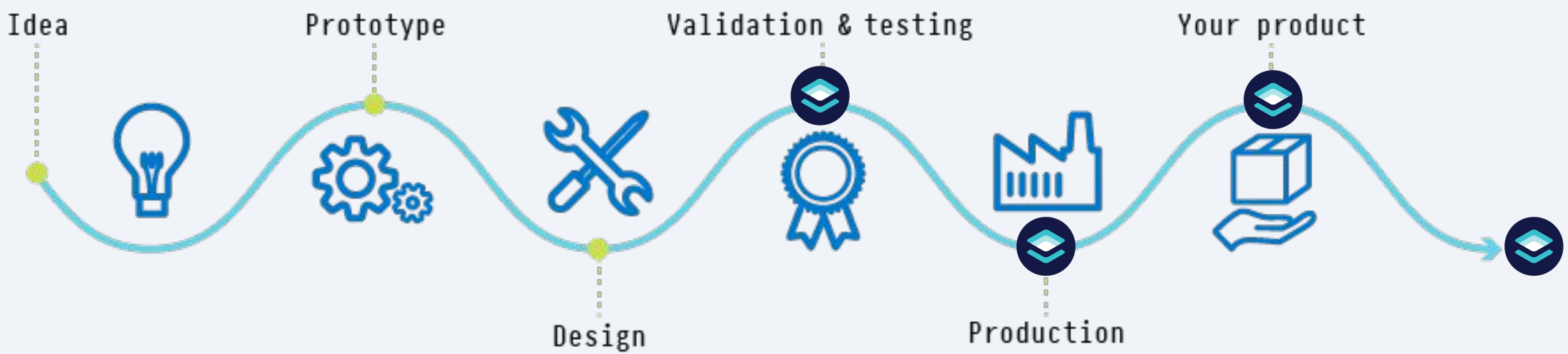


Proactive Issue Detection





Memfault - Nordic Solution Partner



Memfault is included for free in
nRF Connect SDK v1.6+ on any Nordic chipsets

The idea started with Bluetooth

Memfault for Bluetooth Device Reliability

Designed to work with Bluetooth Connected IoT

Associate Member of the Bluetooth SIG

Out-of-the-box support for nRF52 & nRF53 devices

“Integrating Memfault into our Nordic chipsets allowed our team to access high quality field diagnostics data from our wearable technology and improve product performance.”

Bill Diken, Director of Embedded Engineering at Whoop

Customers reduce the number of resets per device by 90%

Our Customers

How does it work?

Life of a coredump

1

Device experiences an issue

```
void foo(void) {
  void (*a_ptr)() = NULL;
  a_ptr();
}
```

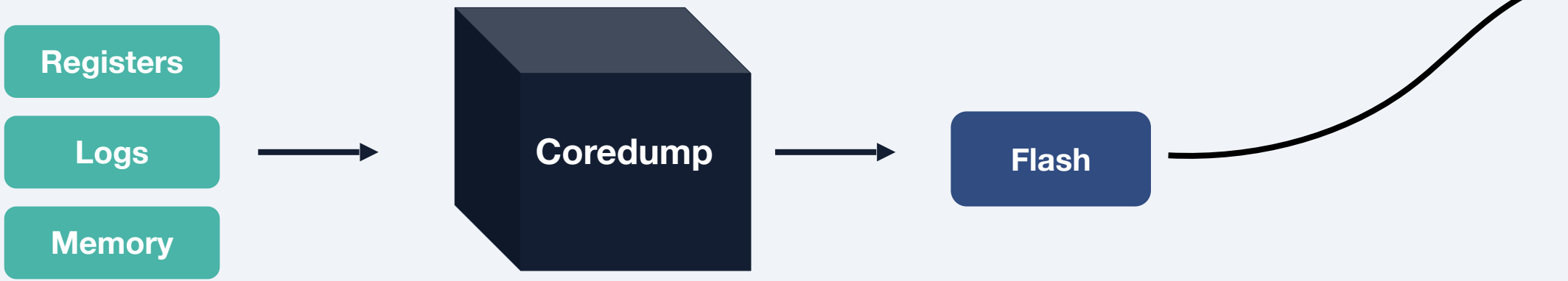
2

The Memfault SDK is invoked

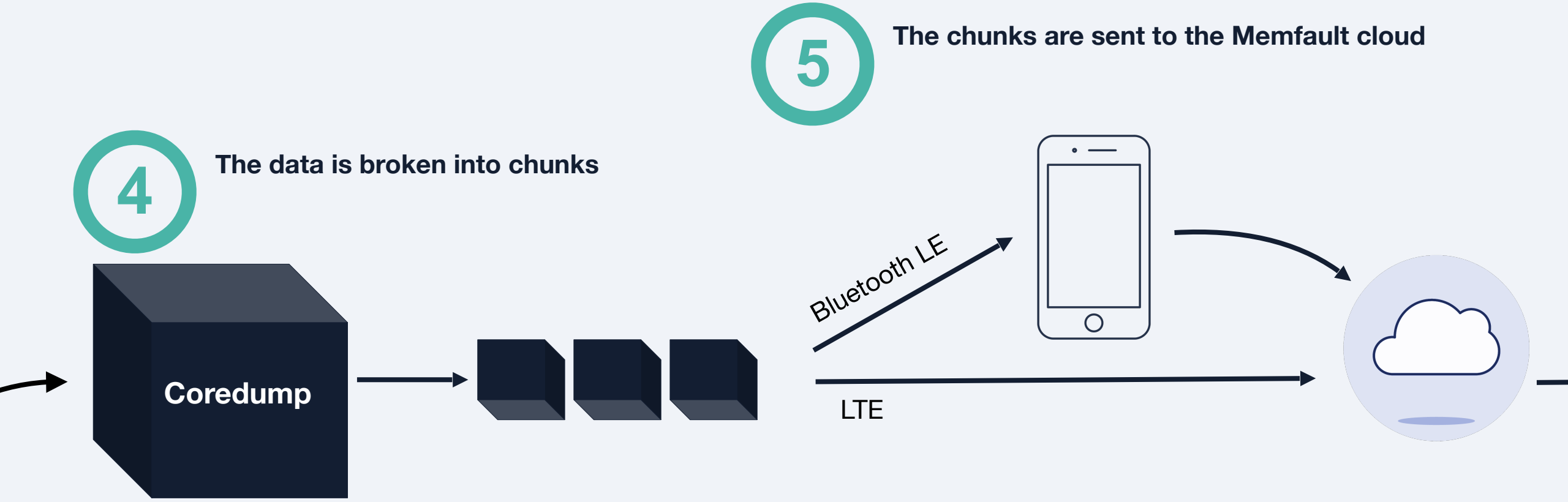
```
void Hardfault_Handler() {
  …
  memfault_fault_handler(regs, reason);
}
```

3

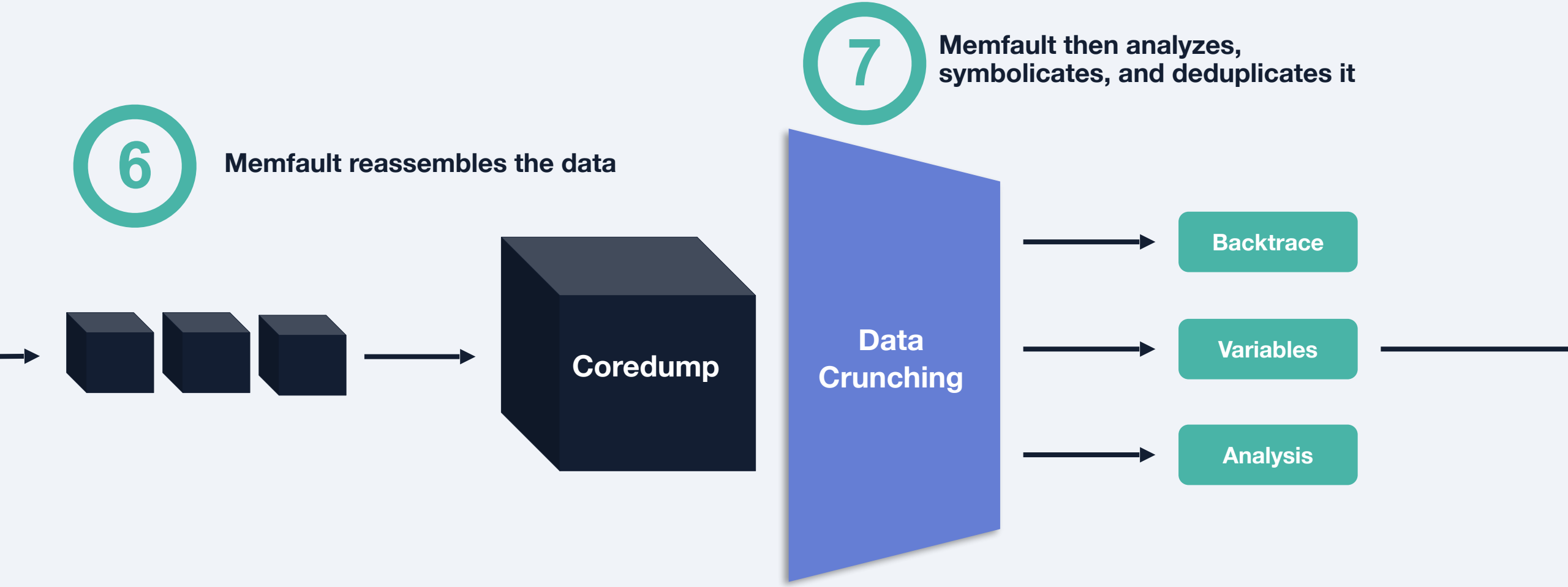
Memfault saves useful data to non-volatile storage



Life of a coredump (cont'd)



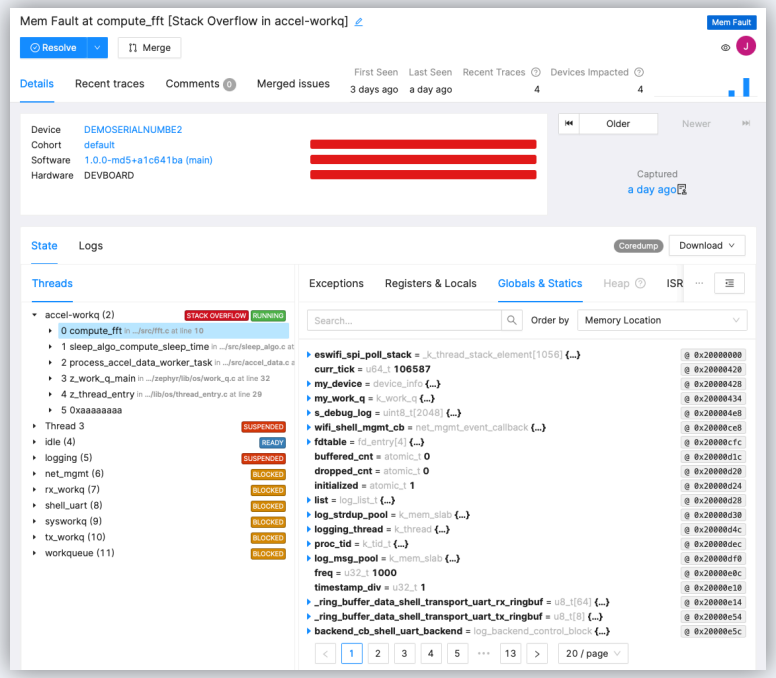
Life of a coredump (cont'd)

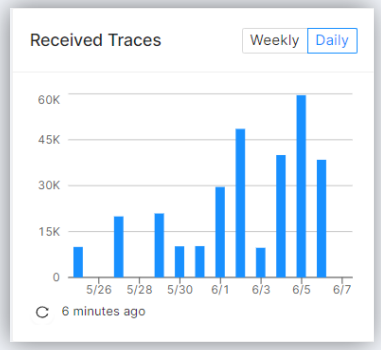


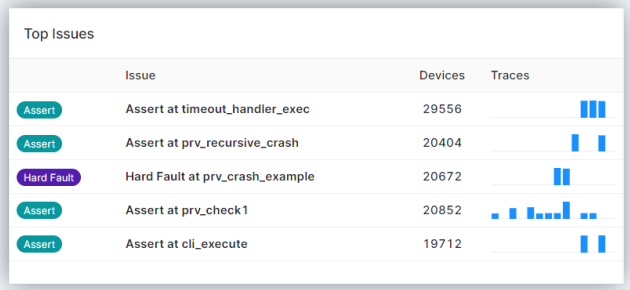
Life of a coredump (cont'd)

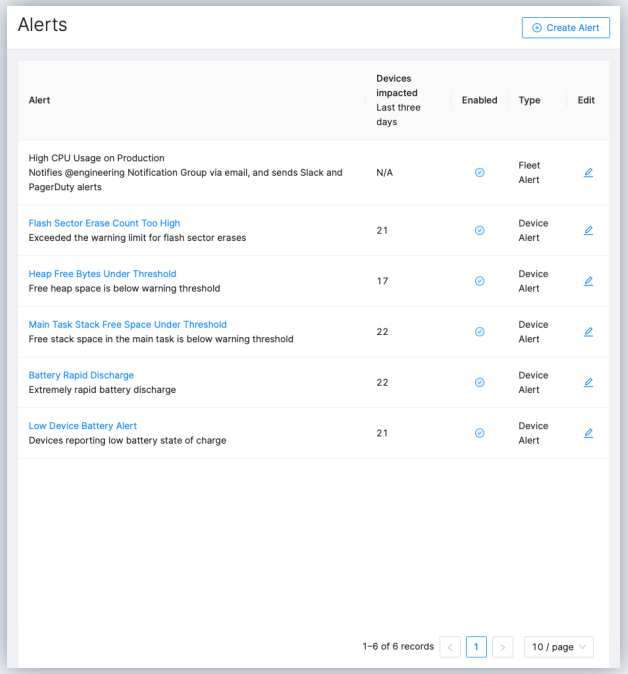
8

Memfault visualizes details, provides overviews, and enables monitoring via alerts



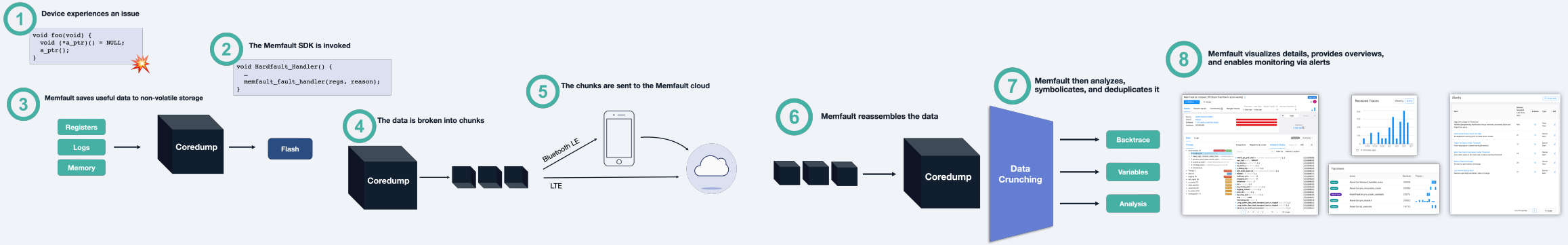






Memfault's Data Path

...and what's new in nRF Connect SDK v2.1.0



Memfault + nRF Connect SDK | Connectivity | Memfault Platform

- Memfault Diagnostic Service (MDS)
- Nordic nRF Memfault App

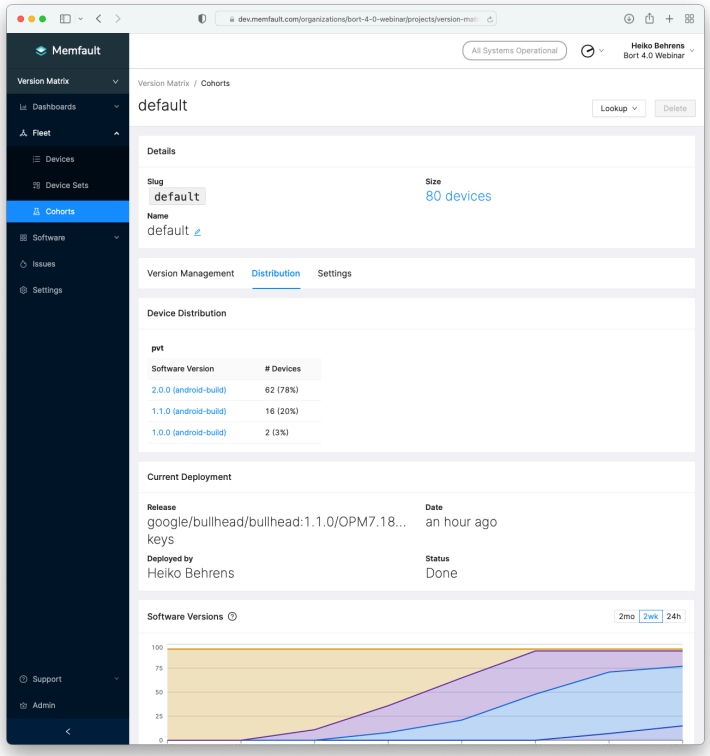
Live Demo

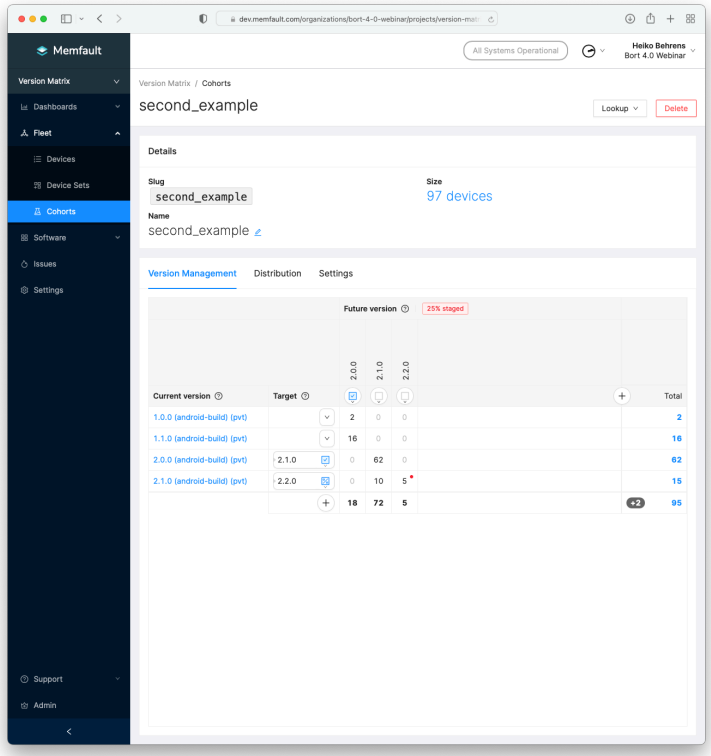
Resources to get started on your own:

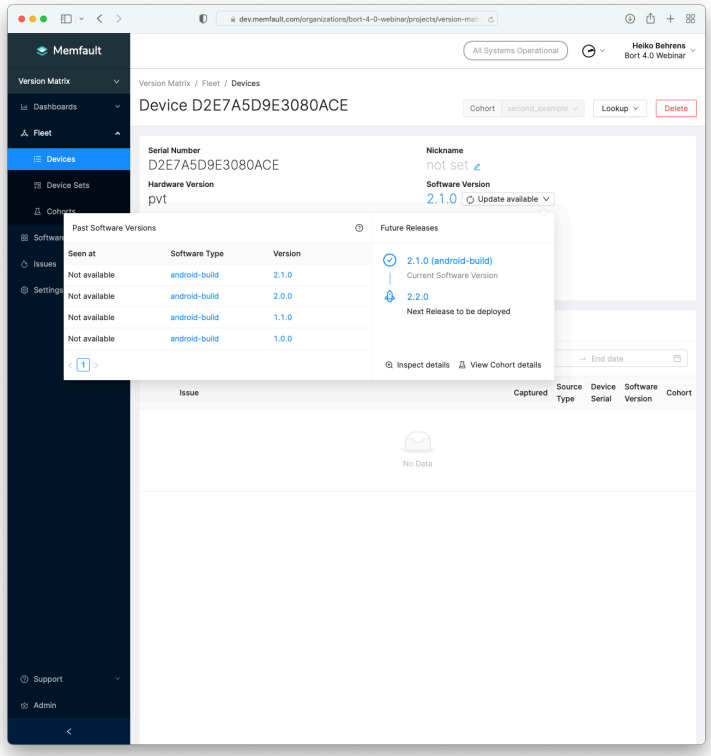
- Create Memfault Account for up to 100 Devices Free
- Memfault nRF Connect SDK Integration Guide
- Sample from nRF Connect SDK v2.1.2 nRF

Product Updates

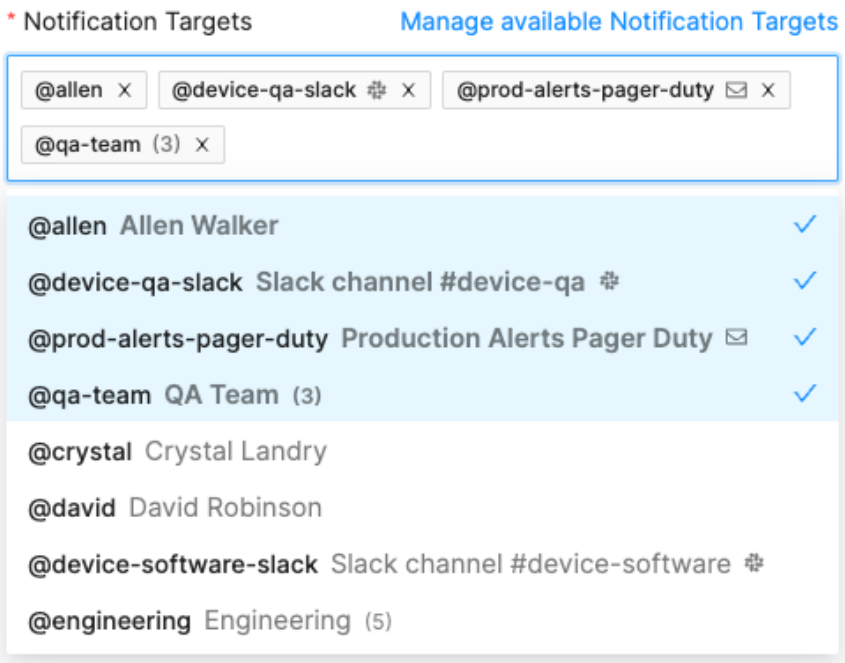
Incremental System Updates via Memfault



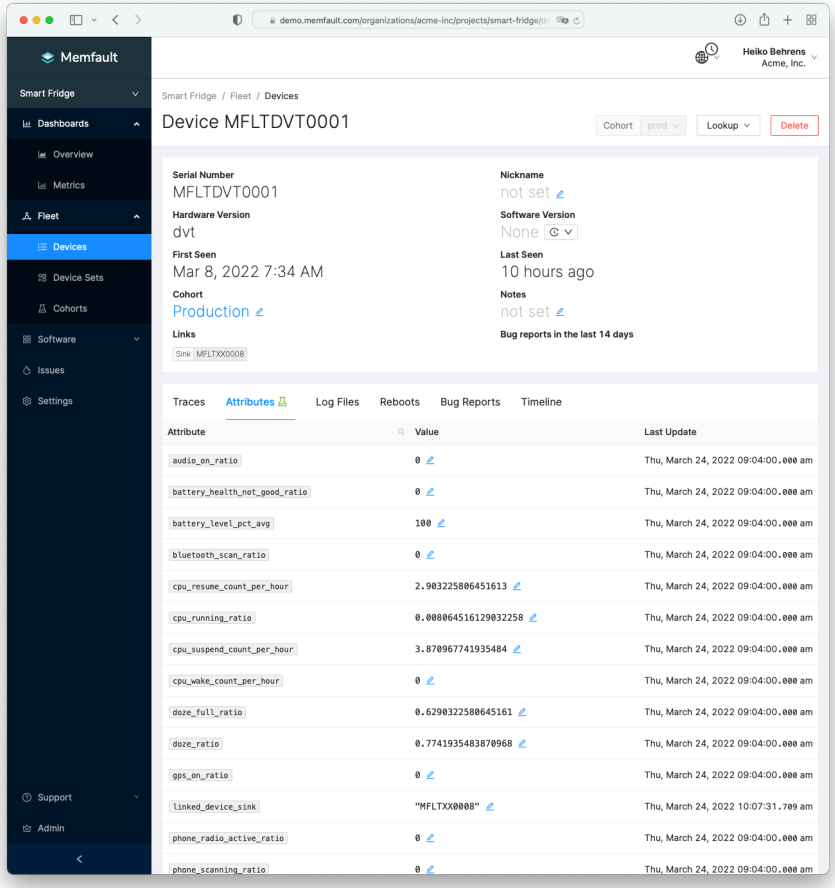


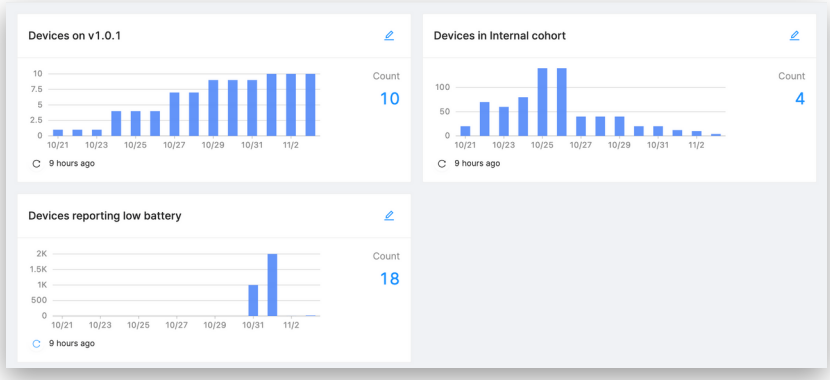


Notify Groups and External Systems via Memfault

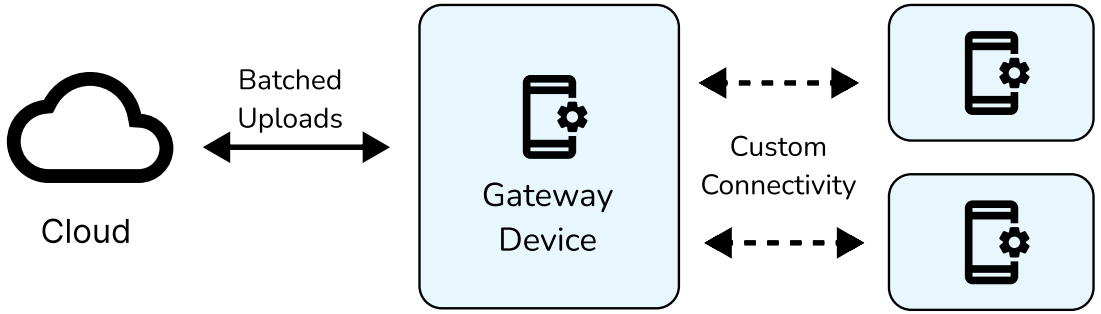


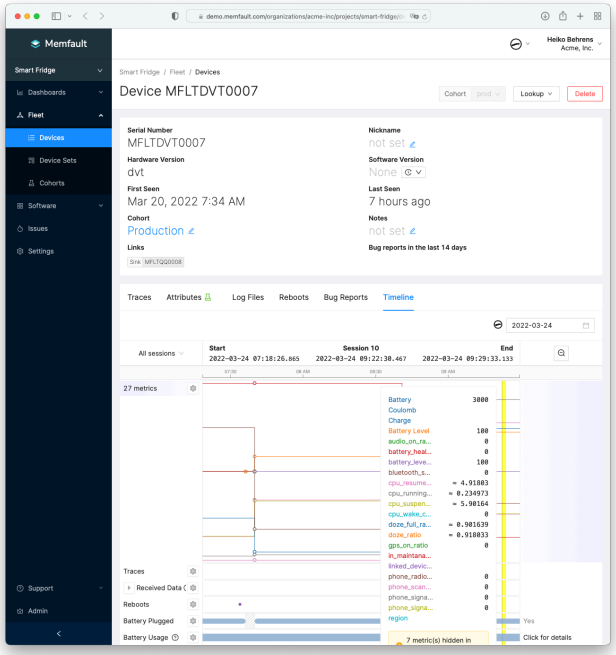
Device Attributes in Memfault

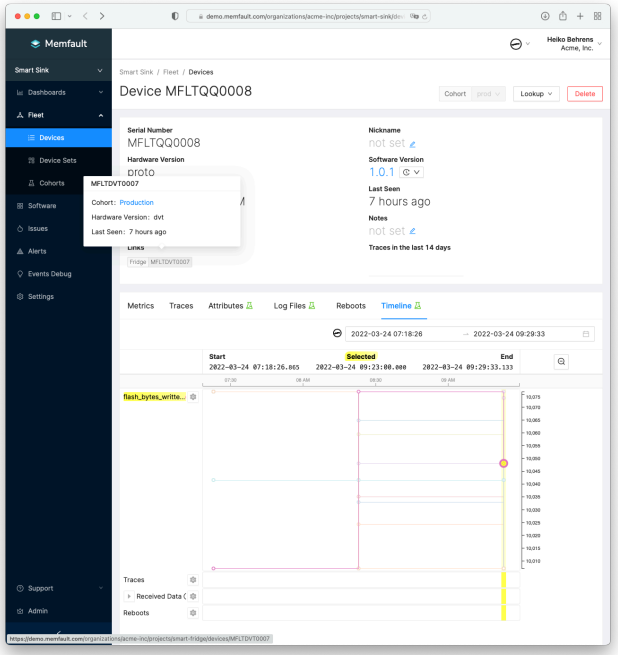




Linked Devices







Memfault Diagnostic Service (MDS)

Memfault Diagnostic Service (MDS)

The Bluetooth® LE GATT Memfault Diagnostic Service is a custom service that forwards diagnostic data collected by firmware through a Bluetooth gateway. The diagnostic data is collected by the Memfault SDK integrated with the nRF Connect SDK. For more details, see Memfault.

The MDS is used in the Bluetooth: Peripheral Memfault Diagnostic Service (MDS) sample.

- Service UUID
- Characteristics
- Configuration
- Implementation details
- Restricting access
  - Bluetooth privacy
- API documentation

Service UUID

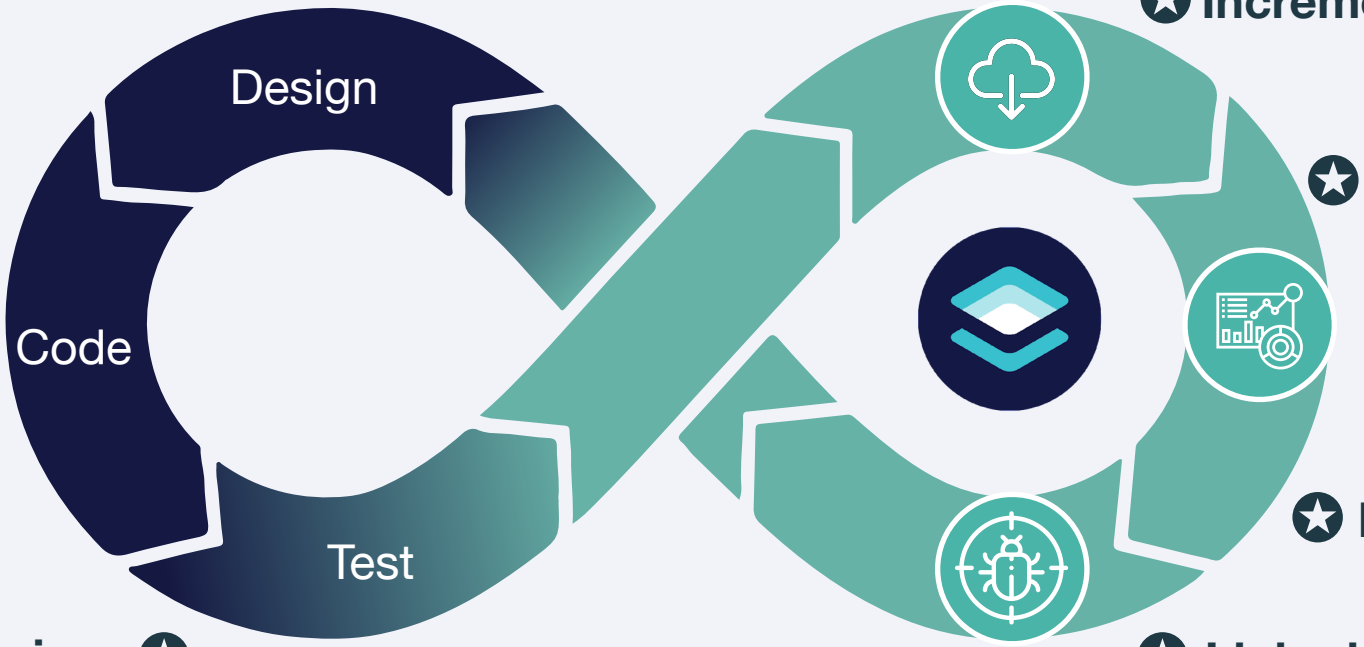
The 128-bit service UUID is **54220000-f6a5-4007-a371-722f4ebd8436**

Characteristics

The MDS characteristics are described in detail in the Memfault Diagnostic GATT Service documentation. The service implementation available in the nRF Connect SDK follows these requirements.

Memfault: Device Reliability Engineering

...selected highlights introduced since nRF Connect SDK 1.6



DeviceOps

Incremental OTA

Device Attributes

Performance Monitoring

Notification Groups

Linked Devices

Device Debugging

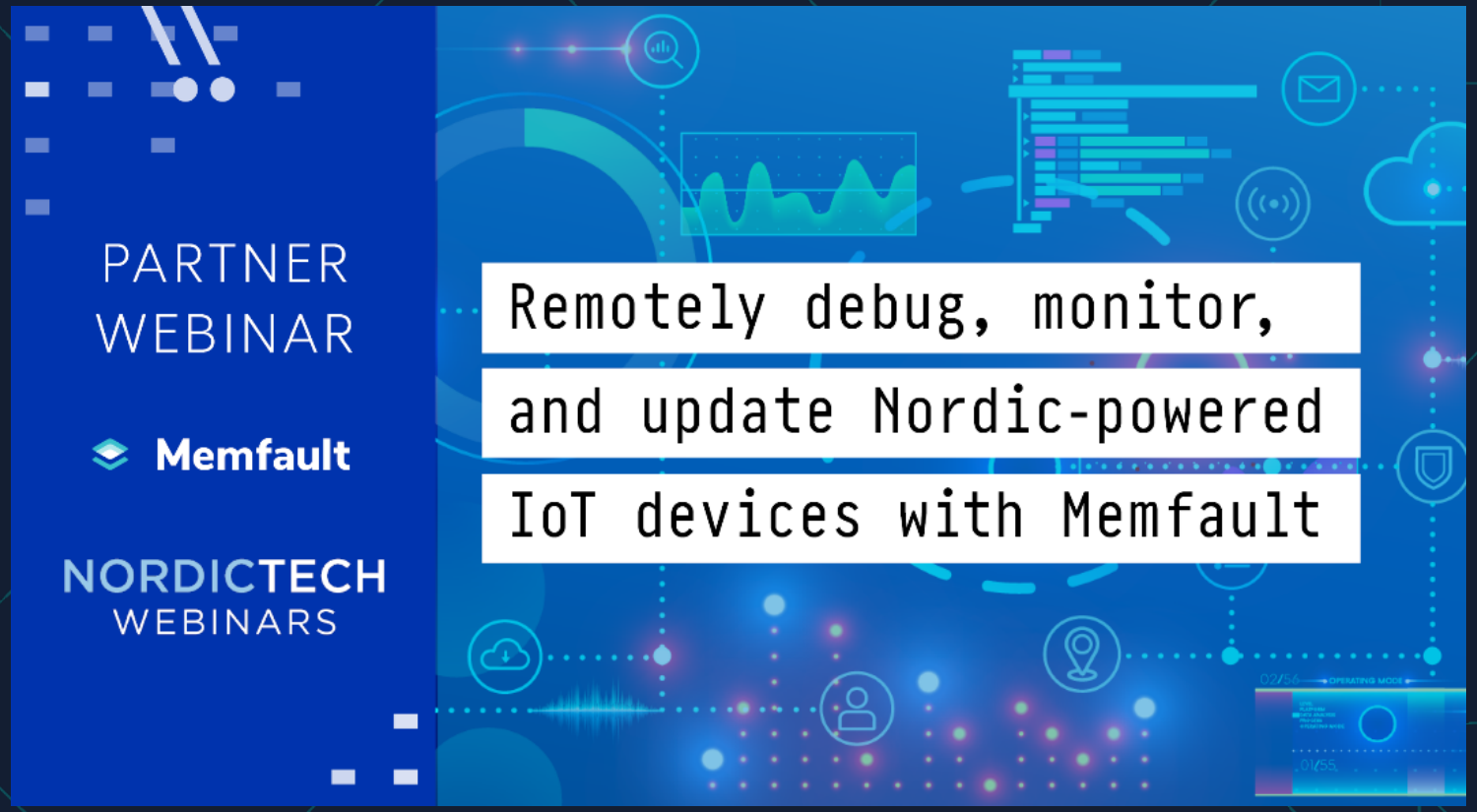
Memfault Diagnostic Service

Get Started Today

Where do I start?

- Sign up for free at: https://memfault.com/register/nrf
- Nordic nRF Connect SDK Memfault bluetooth sample: https://developer.nordicsemi.com/nRF_Connect_SDK/doc/latest/nrf/samples/bluetooth/peripheral_mds/README.html
- Memfault docs: https://docs.memfault.com/docs/mcu/nrf-connect-sdk-guide
- Memfault SDK: https://github.com/memfault/memfault-firmware-sdk
- Contact us at support@memfault.com and sales@memfault.com
- Join the Interrupt Slack: https://interrupt-slack.herokuapp.com/

Memfault Supports nRF9160



Q&A

Register for upcoming Nordic Tech Webinars

www.nordicsemi.com/webinars