Memfault

Higher Quality, Better Performing IoT Devices with Embedded Observability

Presented By:

Devon Yablonski - Head of Strategic Partnerships, Memfault

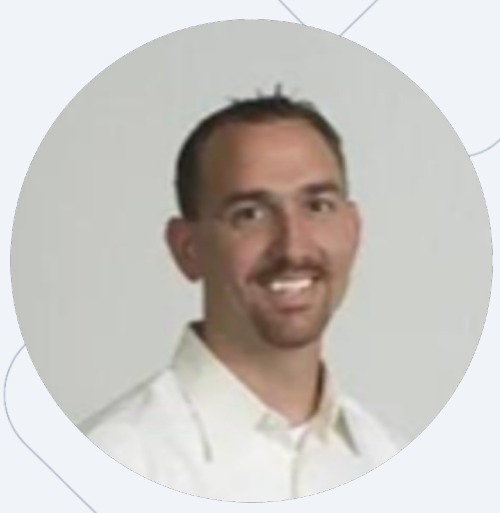
Kyle Dando - MCU Ecosystems, NXP Semiconductors

Today's Speakers

Devon Yablonski

Strategic Partnerships

Memfault



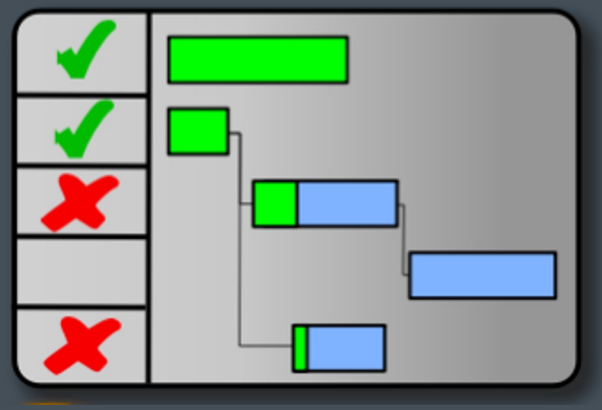
Kyle Dando

MCU Ecosystems

NXP

The embedded development process

Launches are Delayed



First Year = Fire Drill

Legacy Device Headaches

Memfault

Over 50% of R&D is invested in maintenance vs. NPI

NXP

Agenda

- Intro to Memfault & NXP
- Live Demonstrations
- Q & A

Memfault

POLL #1

What is your experience with NXP MCUs?

a. I am building my first product with NXP MCUs

a. I have released a product before with NXP MCUs

a. I have built devices with other vendor MCUs but not NXP

a. Other / I am just here to learn!

Memfault for Embedded Observability

We Help Hardware Teams Build Better Software

Memfault

NXP

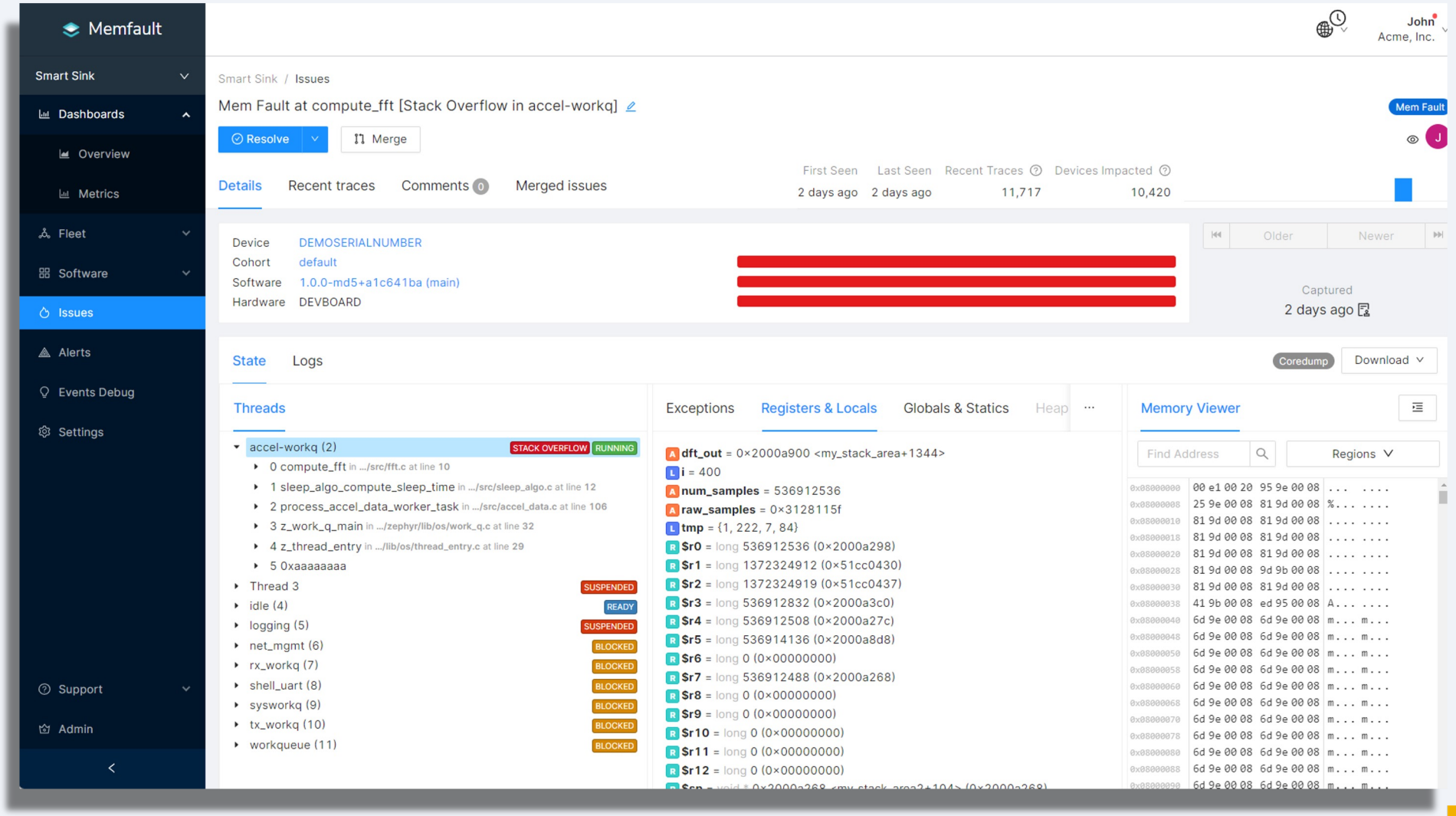
Data Required to Proactively Maintain Devices

Traces and Errors Device Behavior	Metrics Device Performance	Compact Logs Device Story	Delivery Releases
Hard Faults	CPU Utilization	Application	Rollout Control
Watchdogs	Battery Performance	System	Version Matrix
Stack Overflows	Heap Utilization	Peripheral	Adoption Rate
Memory Faults	Connectivity Statistics		Comparative Performance
Software Asserts	RTOS Statistics		Attributes
Connectivity Faults	Flash Statistics		
Bus Faults	Alerting		

Memfault

NXP

Debug crashes 100% remotely

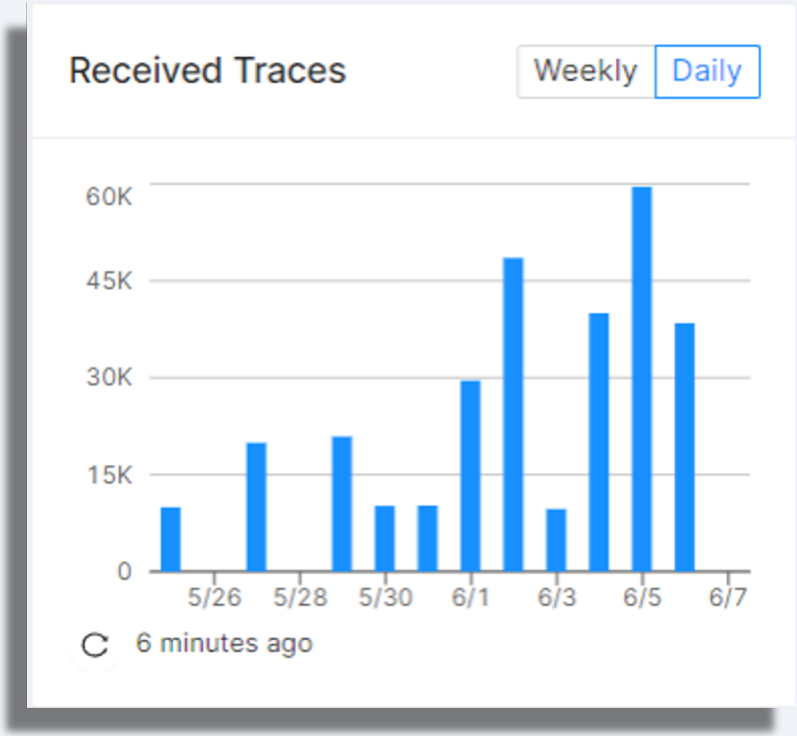


Memfault

NXP

Fleet-scale Trace Analysis

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 issues you care about

Memfault

NXP

POLL #2

How do you monitor and troubleshoot devices today?

a. I talk to the customer to recreate tests in the lab

a. I receive device logs and investigate root cause

a. I don’t really know if my devices have any issues

a. My devices never have issues

a. I don’t have devices today

NXP's MCUXpresso Ecosystem

Core Technologies from NXP

- MCUXpresso SDK
- MCUXpresso Config Tools
- For Arm® Cortex-M®
  - MCUXpresso IDE
  - MCUXpresso Secure Provisioning Tool

Enabling Software Technologies

- Run time software libraries and middleware
- Enable customers to focus on differentiation
- From NXP and partners

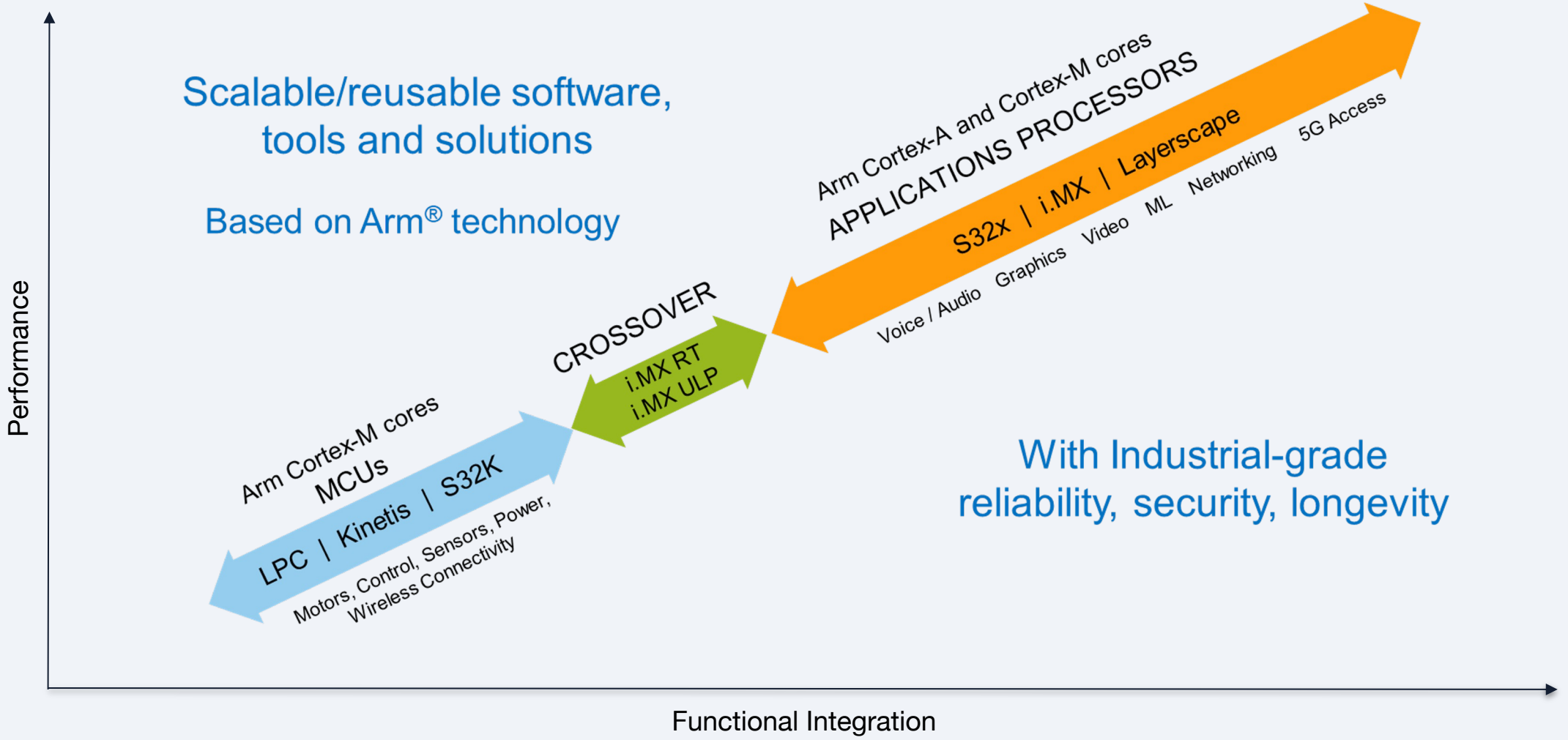
Enabling Tools Technologies

- Partner IDEs
- Debug Probes
- Development Boards
- From NXP and partners

Memfault

NXP

NXP's Scalable Edge Processing



Memfault

NXP

Getting Started with the i.MX RT1060

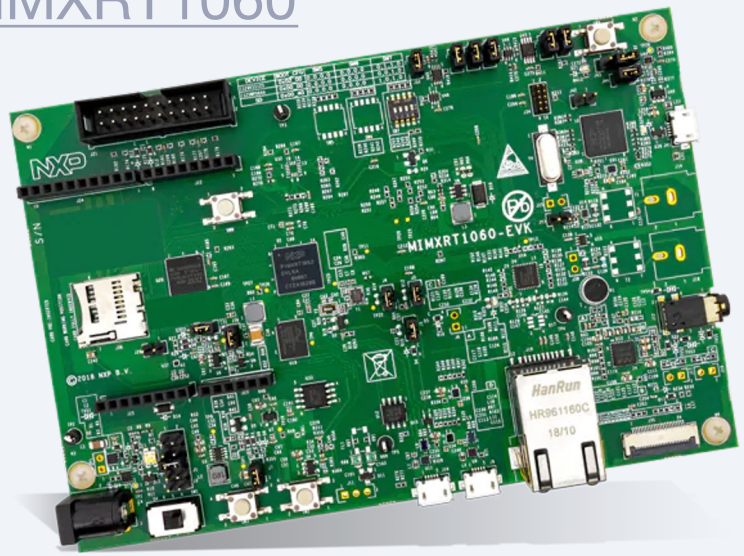
Memfault

NXP

How Can I Evaluate this Solution?

- Getting Started with Memfault and NXP
  https://docs.memfault.com/docs/mcu/arm-nxp-mcuxpresso-guide

- i.MX RT1060 Evaluation Kit
  https://www.nxp.com/iMXRT1060



Memfault

NXP

Web Application
MCU Guides
Introduction
Getting Started Guides
ARM Cortex-M
nRF Connect SDK
Laird Pinnacle™ 100
ESP32 ESP-IDF
ESP8266 RTOS SDK
Dialog DA1469x
NXP MCUXpresso SDK for i.MX RT
Subsystem Guides
User Guides
Design Docs
Test Utilities

NXP MCUXpresso Getting Started Guide for ARM

LIVE DEMO

This tutorial will go over integrating the Memfault Firmware SDK into an NXP i.MX RT1060 project using NXP's MCUXpresso IDE.

NOTE

Note: these instructions were written using `mcuxpressoide-11.4.0_6224.x86_64` on ubuntu 22.04, using the MIMXRT1060-EVKB

The full example project can be found here: https://github.com/memfault/mcuxpresso-rt1060-example

These instructions should also apply to other NXP RT family boards (ex: MIMXRT1020-EVK), though there may be adjustments needed to the reset logic or linker script.

Overview
Part 1: Setup and Verify LwIP Sample Application
Part 2: Integrate the Memfault SDK
Add the Memfault Sources and Build Flags
Add GNU Build ID
Enable HTTPS Client and Test
Additional Notes
Data Cache

Memfault Demonstration

Memfault

NXP

Case Study

Memfault

NXP

Use Case: geo

As a trusted and innovative smart energy specialist geo (Green Energy Options) leverages NXP and Memfault technologies

- NXP's i.MX RT MCUs - efficient performance
  - Advanced multimedia and Wi-Fi connectivity
  - Industry's lowest dynamic power
  - Comprehensive MCUXpresso SDK, IDE and tools

- Memfault - ensuring reliability
  - Debugging and health metrics in near real-time
  - Firmware dev & test acceleration
  - Product quality assurance in the field

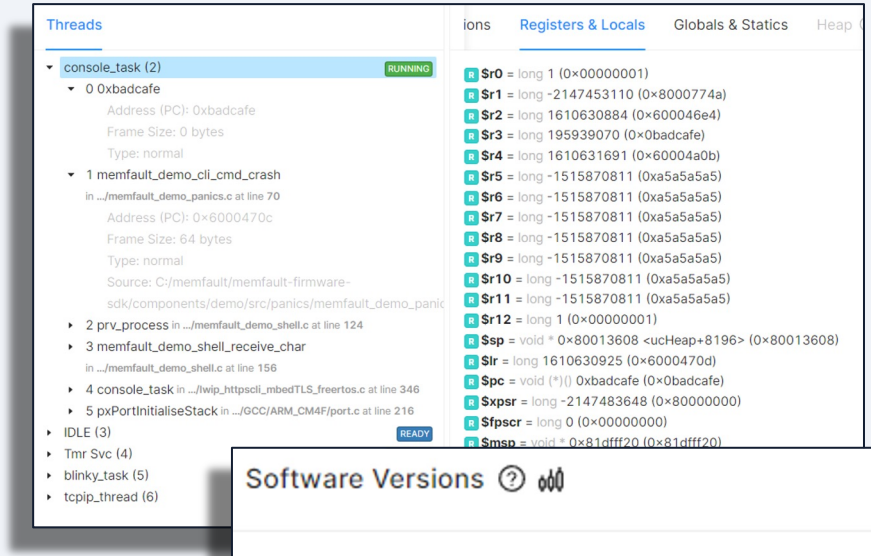
geo
smarter energy

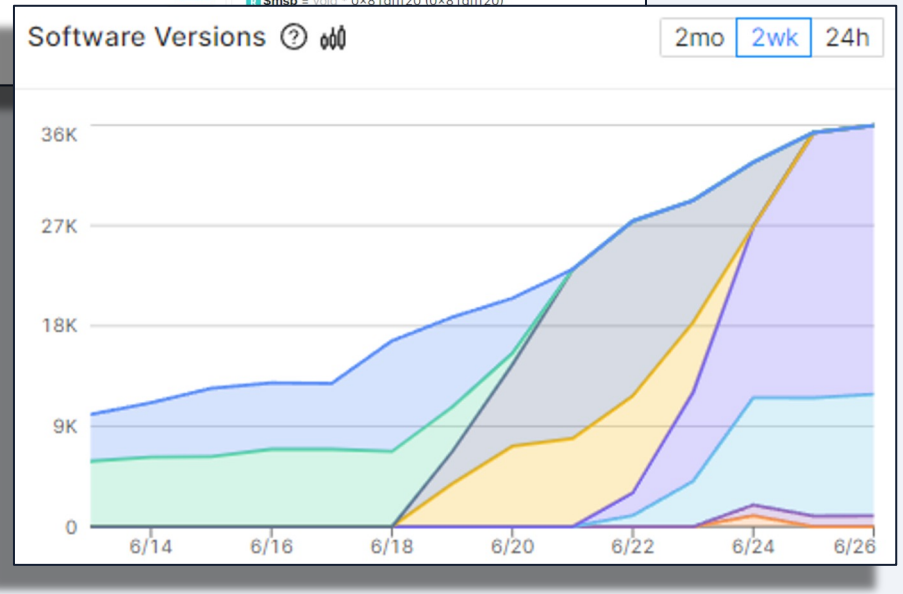
The embedded observability transformation

Logs

to

Reports





OTAs

to

RMAs

Memfault

NXP

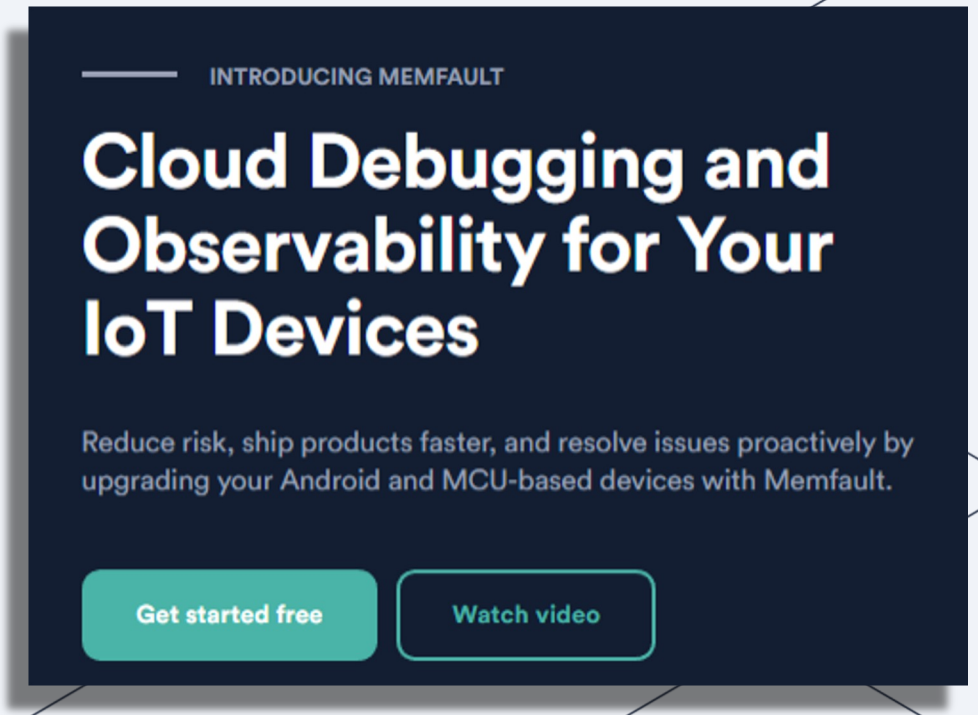
How to get started

Memfault

NXP

Resources

- Learn more at www.memfault.com and www.nxp.com
  - Memfault SDK source code and documentation
  - Integration guide for the NXP i.MX RT1060
  - NXP RT1060 product page
  - Other NXP MCU support via Memfault
- Licensing
  - NXP users get free self-service Memfault for up to 100 devices: https://memfault.com/register/nxp
  - Ask Memfault or your NXP sales representative for commercial support
- Embedded engineering community & blog at https://interrupt.memfault.com



Memfault

NXP

Questions?

Memfault

NXP

Thank You

Memfault