# Embedded World Experience

A view from a then student now hobbyist

Daniel Maslowski

`spring();`
`break;`

# Agenda

- How it started
- Embedded World 2012
- Embedded World 2022
- Embedded World 2023

spring();
break;

How it started

spring();
break;

When I was a student…

spring();
break;

# When I was a student…
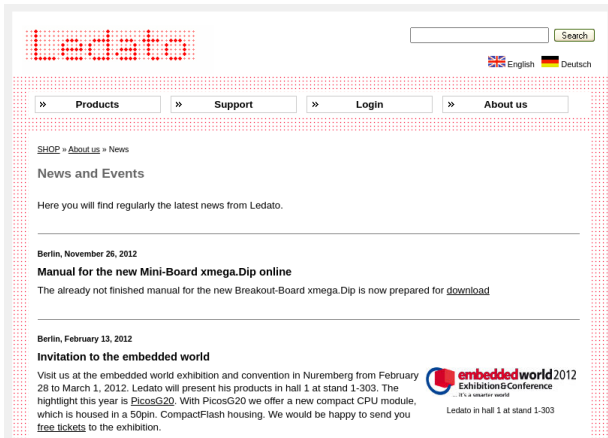
I bought a Ledato taskit embedded development board.

```
spring();
    break;
```

# When I was a student…

I bought a Ledato taskit embedded development board.

They emailed me, and gave out free tickets[1] to Embedded World:



spring();
break;

Embedded World 2012

spring();
break;

Travel and expense

```
spring();
 break;
```

# Travel and expense

Embedded World is a 3 day event taking place in Nuremberg, Germany.

In 2012, it was from February 28 to March 1.

spring();
break;

# Travel and expense

Embedded World is a 3 day event taking place in Nuremberg, Germany.

In 2012, it was from February 28 to March 1.

For one day, I took an early train to Nuremberg, and a late train back.

It cost about 40 Euros. Sparpreis ftw!

```
spring();
break;
```

# Prior research

spring();
break;

## Prior research

As a student, I learned a bit about operating systems.

```
spring();
   break;
```

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One famous book is Modern Operating Systems by Andrew Tanenbaum.

It describes the design of the MINIX 3 operating system.

```
spring();
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```

[2]https://blog.minix3.org/2012/01/10/minix-3-will-be-at-embedded-world-2012/

# Prior research

As a student, I learned a bit about operating systems.

One famous book is Modern Operating Systems by Andrew Tanenbaum.

It describes the design of the MINIX 3 operating system.

There was a MINIX booth[2]:



MINIX 3    Home    News    GSoC                              Subscribe

**NEWS**

# MINIX 3 will be at Embedded World 2012

**Minix Team**
Jan 10, 2012 · 1 min read

MINIX 3 will have a stand at the Embedded World 2012 trade show in Nuremberg, Germany, 28 Feb. 2012 to 1 March 2012. Come see us at stand 5-349. Click here for details.

spring();
break;

When I was there

```
spring();
break;
```

# When I was there

So I met Andrew Tanenbaum!

`spring();`
`break;`

# When I was there

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He offered me a branded MINIX CD with the mascot logo on it.

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I declined, saying I had already burned one myself. Stupid, heh!

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A video from 2013:



https://www.youtube.com/watch?v=vlOsy0PZZyc

What else I saw

spring();
break;

## What else I saw

Very overwhelmed, I forgot most of what I encountered.

`spring();`
`break;`

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They had their fancy mascot logo on pins. :)

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And I got some transistor samples from another booth.

```
spring();
break;
```

Embedded World 2022

spring();
break;

# Preparation

I made a list of booths to visit and people to meet.

```
spring();
break;
```

# Lots of Pi Pico

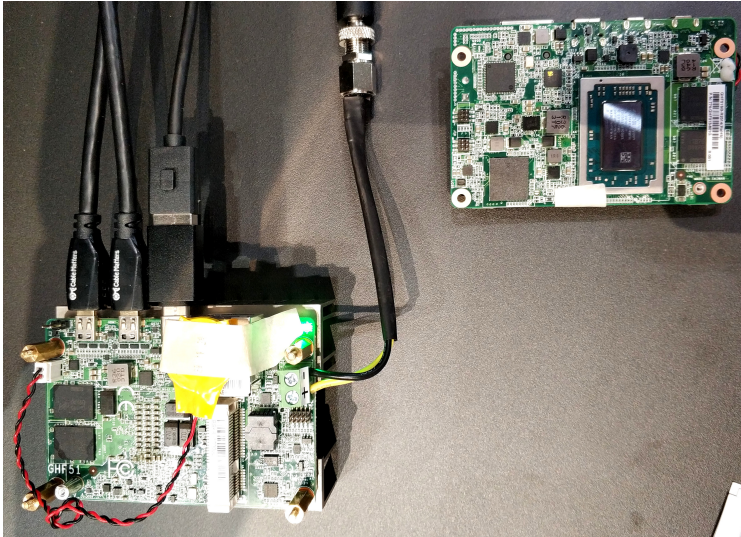# Getting lost



spring();
break;

# RISC-V International

Here I met Heinrich Schuchardt (Canonical) for a chat. :-)



`spring();`
`break;`

# AMD embedded boards

I asked for manuals and documentation. Never heard back from them.



```
spring();
    break;
```

# Firmware vendors

Guess who…

`spring();`
`break;`

# Firmware vendors

## Guess who…



spring();
break;

# Firmware vendors

## Guess who…



Hint: They are part of the problem in their sales pitch.

spring();
break;

# Yes, AMI



Take the emergency exit!

spring();
break;

Embedded World 2023

spring();
break;

# Preparation

I made a list of booths to visit and people to meet again.

```
spring();
    break;
```

Back again… what the…?



The make Nvidia Jetson based AI IP cameras. Yuck.

`spring();`
`break;`

I talked to some OEMs…

spring();
break;

# I talked to some OEMs…

… they have no idea regarding security.

`spring();`
`break;`

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Recommendation: Only buy what you fully own and provision yourself.

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`break;`

# I talked to some OEMs…

… they have no idea regarding security.

Recommendation: Only buy what you fully own and provision yourself.

Problem: Noone offers ownership. Nothing is auditable.

```
spring();
  break;
```

Hey again, fancy gadget!



Note: Tektagon is a Zephyr dump with no active development[3]. `spring();`
`break;`

[3]https://github.com/opencomputeproject/Tektagon-OpenEdition/issues/1

# Development boards again…



Tinker V
Single Board Computer

- Integrated 64-bit RISC-V processor
- Supports Linux Yocto and Debian
- Supports dual gigabit LAN
- Wide temperature range: -20-60°C
- Pico-ITX single-board computer with Renesas RZ/Five processor
- Great expandability with 2 x COM and 2 x CAN bus

ASUS IoT
IN SEARCH OF INCREDIBLE

spring();
break;

## … Rust?!
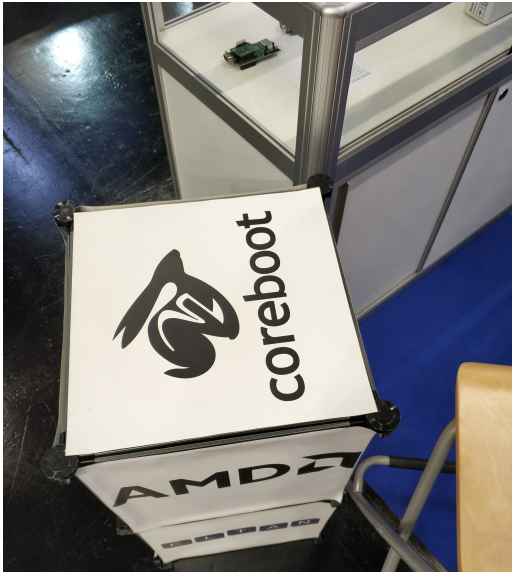


spring();
break;

# Rust has reached the (proprietary) industry



spring();
break;

# More firmware vendors



spring();
break;

# L4Re



We had a lengthy chat here. :-)

spring();
break;

Goodbye!



https://metaspora.org/embedded-world-experience.pdf

`spring();`
`break;`

Thank you!

spring();
break;