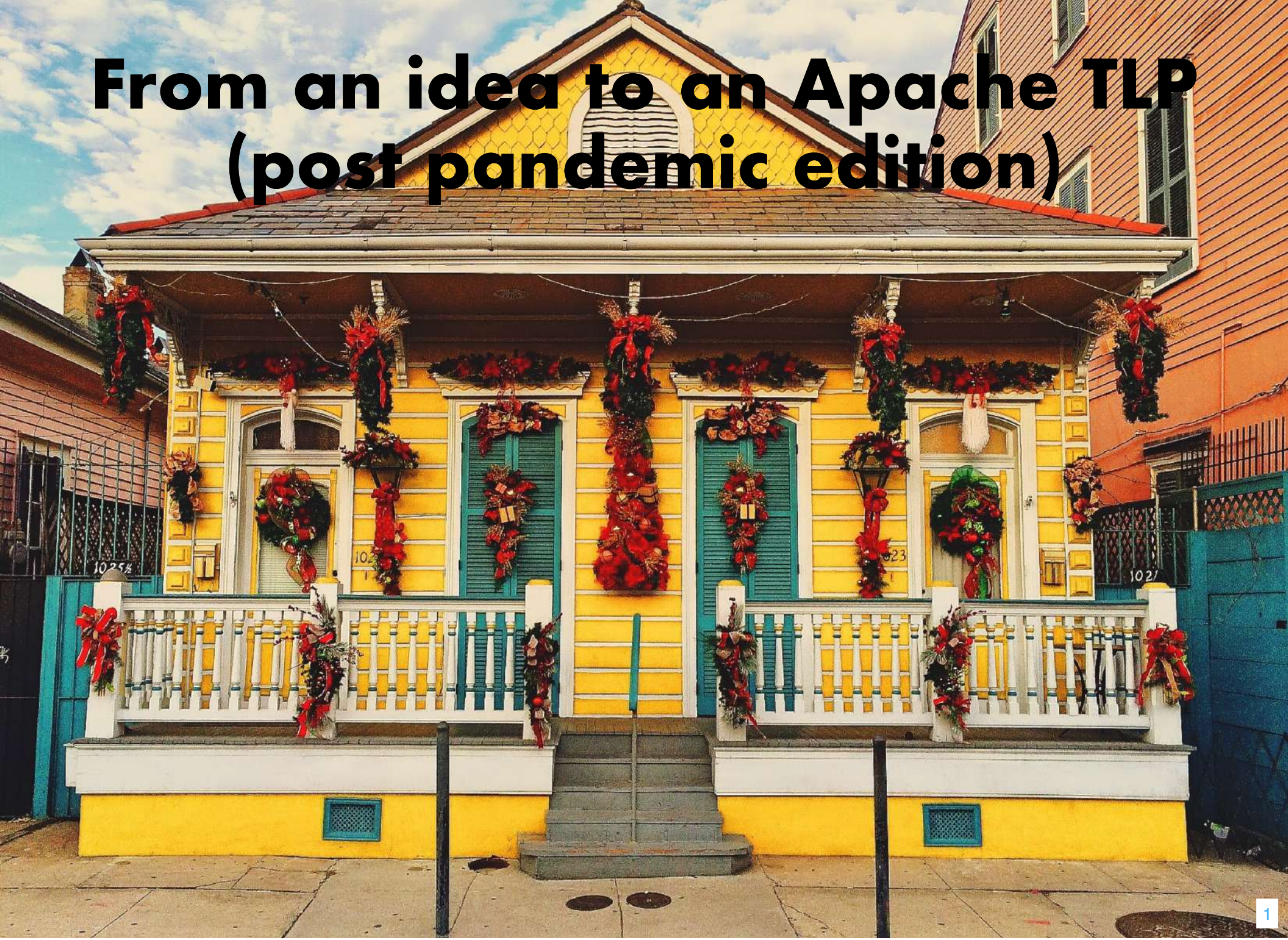
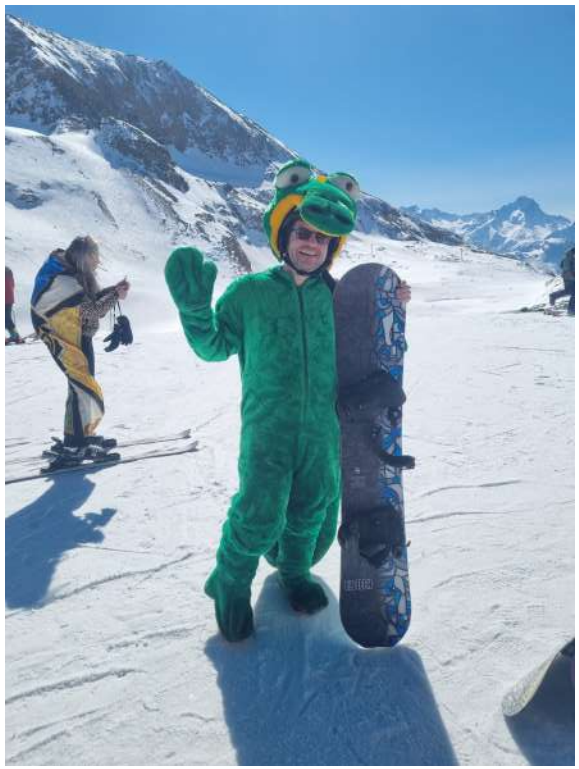
From an idea to an Apache TLP (post pandemic edition)



Who am I?

- Christofer Dutz
- Snr. Staff Software Engineer
- Rivian
- Committer of many Apache projects
- Member of the Apache Foundation
- VP of Apache PLC4X
- Member of the ASF Board of Directors
- Twitter: @ChristoferDutz
- LinkedIn: christofer-dutz



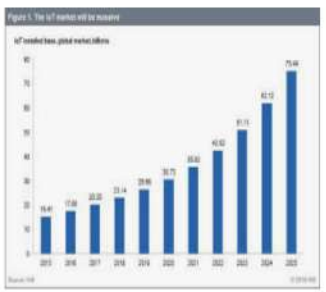
The initial idea (2012)

- Working as a freelancer
- Regular market was trending to "cheaper is better"
- Searching for ways to work on new market
- Idea building solutions for industrial use-cases
  - Closed Source
- Worked hard on first PROFINET driver
- Problem:
  - Enormous amount of effort it would have been

Reality caught up with that initial idea (2016)

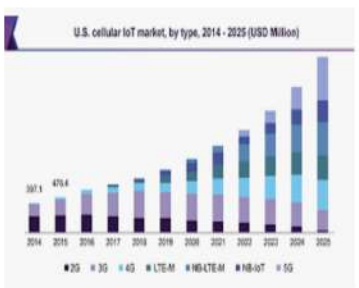
- Media all about "Industry 4.0"
- "Industry 4.0" all about:
  - Cloud
  - Big Data
  - Machine-Learning / AI
- Industry full of interesting opportunities
- I wanna do industry projects

Estimation on IIoT Market

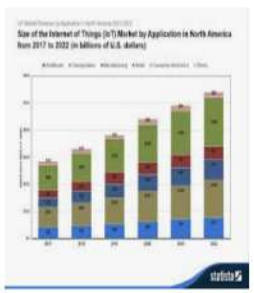


Roundup Of Internet Of Things Forecasts And M...
forbes.com

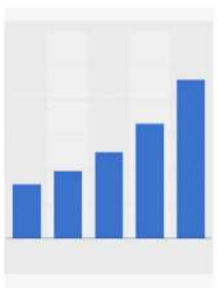
IoT Device Management Market Size, Trend | Industry...
grandviewresearch.com



Cellular IoT Market Size & Share | Industry Analysis R...
grandviewresearch.com

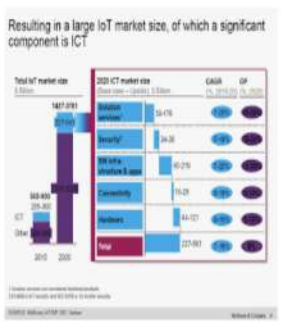


10 Charts That Will Challenge Your ...
forbes.com



IoT market size worldwide 201...
statista.com

Global IoT Analytics Marke...
finance.yahoo.com



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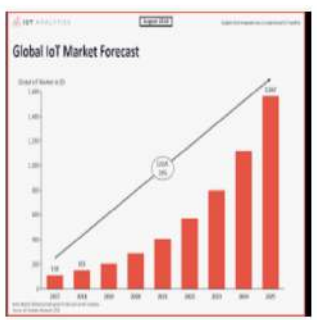
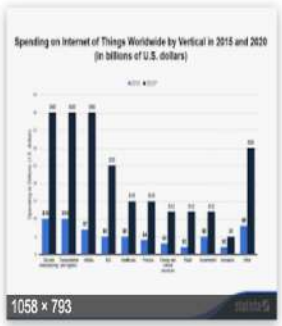


State of the IoT 2018: Number of IoT devices n...
iot-analytics.com



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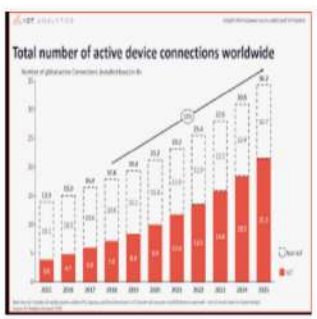

State of the IoT 2018: Number of IoT devices n...
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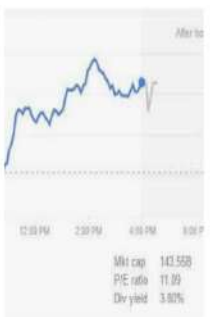
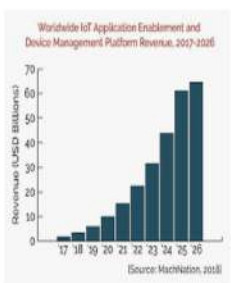
Narrowband IoT Market | Global Trends, Size,...
inkwoodresearch.com



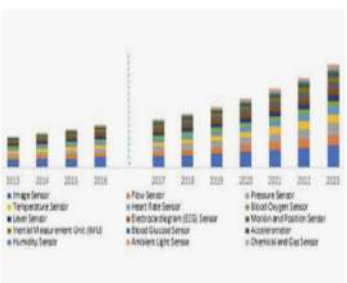
IoT Market Forecasts | Posts...
postscapes.com

Global Industrial IoT Gateway Market 2019-2023 ...
businesswire.com

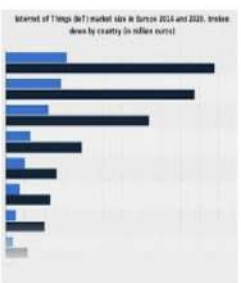


IoT platforms - IoT platform defini...
i-scoop.eu

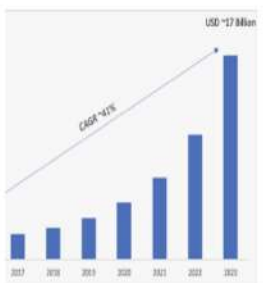
Consumer IoT Market Size, Growth, Tren...
marketsandmarkets.com



IoT Chip Market Size, Forecast to 2023 | P&S Intellig...
psmarketresearch.com

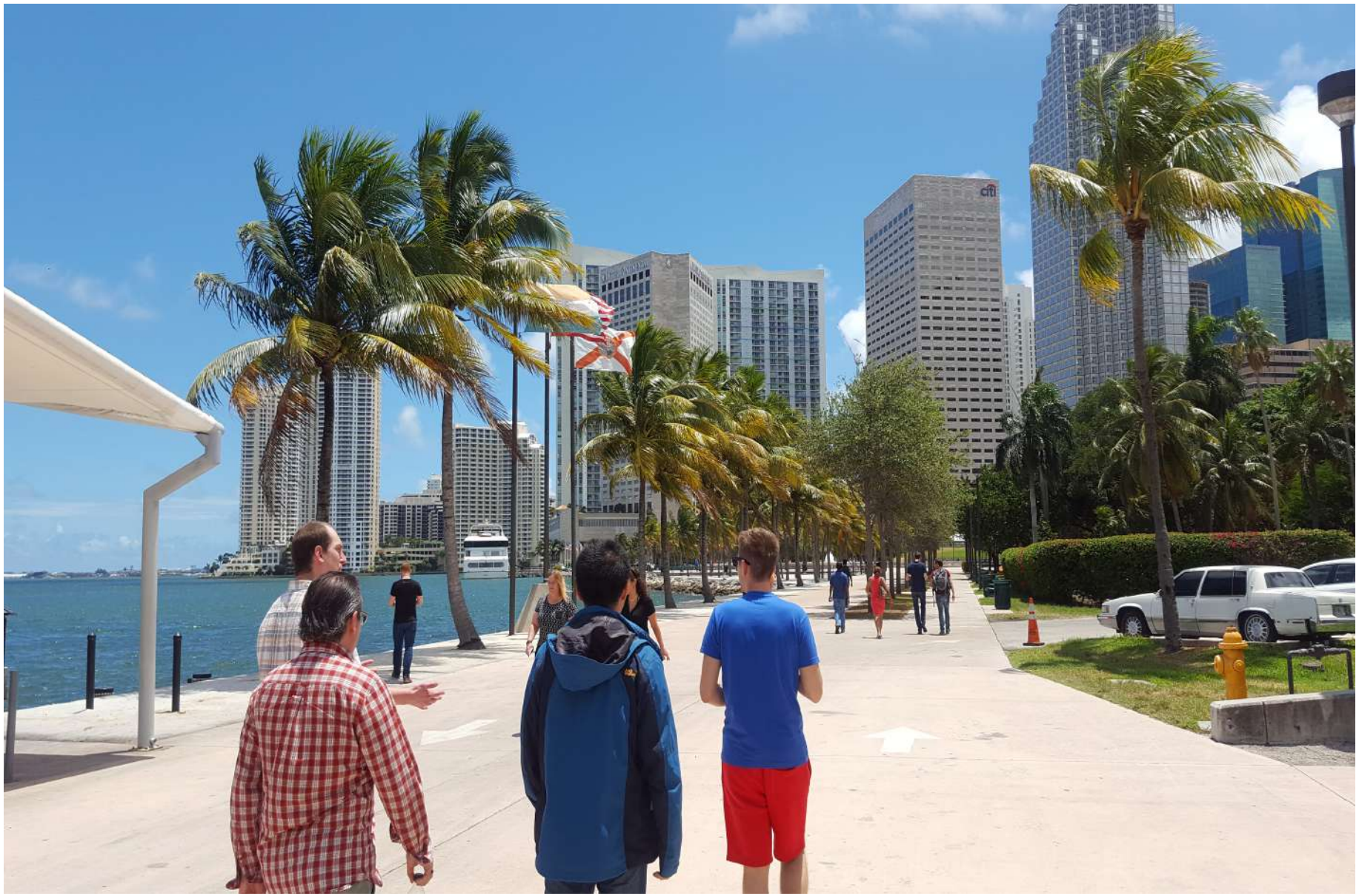


IoT market size by country in Europ...
statista.com



IOT Operating Systems Market 2018 ...
wfmj.com

Test: ApacheCon NA 2017 Miami



Test: ApacheCon NA 2017 Miami

- Presentation on "Building SCADA Systems with Apache"
- Full House
- Lots of positive responses

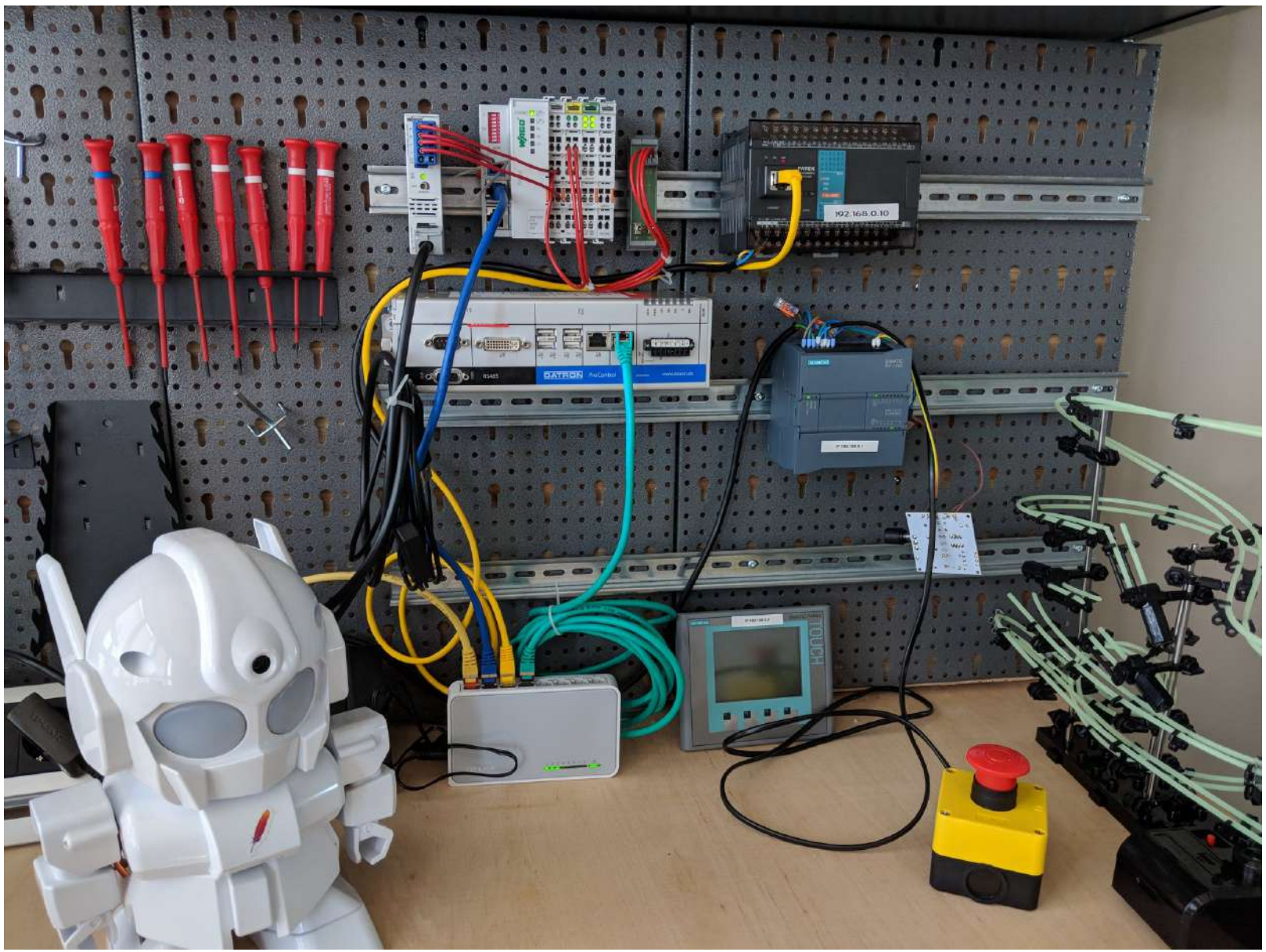
First steps

- Convinced the codecentric board to fund an `innovation project`
- Idea: Build a library for communicating with industrial hardware
- This time as `open-source`
- Initially got 6 months for initiation of the project
- Started working on it in October 2017

10.2017: Name-Games

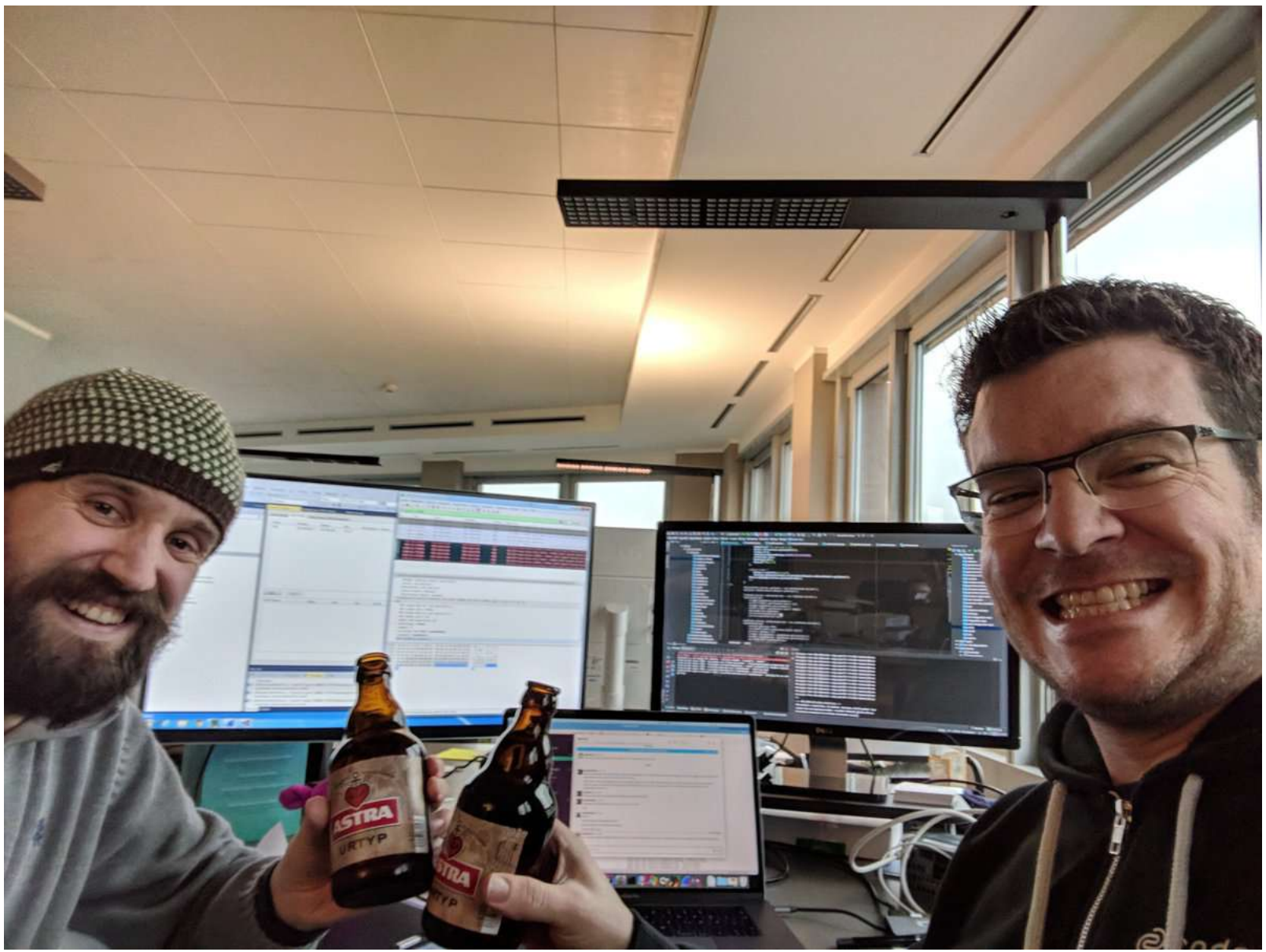
~~PLCLink~~					~~Seems a french company has a product "plclink" which is an iOS app for visualizing PLC data on iphones (http://pautex.fr/plclink/de/index.php). It also seems to be a Portugiese company with that name (http://www.plclink.pt/).~~			~~none~~	~~none~~
PLCConn	none	none	none	none	nothing usable (Seems to be used a popular variable name for a plc connection instance)	none	none (Same as Google)	none	none
PLConn	none	none	none	none	nothing usable (seems to be the short form of a mining company and "con" means "with" in Spanish)	none	none (Same as Google)	none	none
PLCCoupler	none	none	none	none	Seems a lot of hardware to connect PLCs are called PLC couplers			none	none
PLCoupler	none	none	none	none	Seems a lot of hardware to connect PLCs are called PLC couplers			none	none
PLCNexus	none	none	none	none	Seems there is a Tschech company that created a Hardware product named "safety PLC Nexus" (https://www.1sig.cz/en/safety-plc) But only found one hit to that. And there seems to be a company called "Nexus Autoation" that produes PLCs (https://www.indiamart.com/nexusautomation/)	Seems there is a company called Nexus PLC in the US, UK, Australia and China (http://www.nexusplc.com)	Seems there is a company called Nexus PLC in the US, UK, Australia and China (http://www.nexusplc.com)	none	none
PLCWeld	none	none	none	none	Seems there are welding robots that have PLCs	Only shows me results of "PC Welt" Magazine	Similar to Google and Bing	none	none
PLCControl	none	none	none	none	Seems there is a Polish company called PLCControl (http://www.plccontrol.pl/) and there seems to be a product from "Krauss Maffei" called PLC Control (http://www.kraussmaffei.com/automation-en/plc-control.html)			none	none
PLControl	one empty repo	none	none	none	There seem to be a lot of companies named PL Control in the area of industrial PLCs and related Software			none	none
PLC Lib	3 Github repos	none	none	none	A lot of hits usually refering to a library to communicate with a PLC ... no Product besides one Github project I could find named that way	see google	see google	none	none
LibPLC	none	none	none	none	A lot of hits ... no Product I could find named that way. Nothing really to "LibPLC" (written without a space though)	see google	see google	none	none

10.2017: Setting up the IoT Lab



Creating the project logo

10.2017: First working S7 Driver



Bringing PLC4X to the ASF

- Legal protection
- Ideal for building community
- Projects (almost) never go directly to top level
- Entry as `Podling` in the `Incubator`
- There project learns to be an Apache Project

Preparing for Incubation

- Find at least 3 Mentors
- Find one of the Mentors willing to act as `Champion`
- Prepare the incubation proposal
- Discuss the proposal in the Incubator mailing list
- `VOTE` on the Incubator maling list

12.2017: Entering Incubation

- Entered Incubation 2017-12-18
- Champion:
  - One Mentor that "requests the stuff"
  - Justin McLean
- Mentors:
  - Greg Trasuk
  - Justin McLean
  - Luciano Resende
  - Stefan Bodewig

12.2017: Moving to Apache

- Having codecentric file a `CCLA`
- Having codecentric sign the `software grant`
- Having all participants file `ICLAs`
- Move the git repo to Apache
- Migrate the CI from GitLab to Jenkins
- Do the `podling-namesearch`
- Get a first version of the Website online
- Move discussions to the list

2018: Unexpected challenges

- Getting all PPMC members to register on the mailing-lists
- Getting my non-Apache colleagues to communicate on list
  - Discussing things in real life and not on list
- In the end I simply:
  - Stopped responding to their questions
  - Told them, I will only answer questions asked on the list

01-06.2018: Working on my own

- Coding
- Writing emails
- Responding to my own emails
- Talking about PLC4X at meetups
- Talking about PLC4X on conferences
- Talking about PLC4X at companies
- Talking about PLC4X at industrial fairs
- Writing articles
- Coding

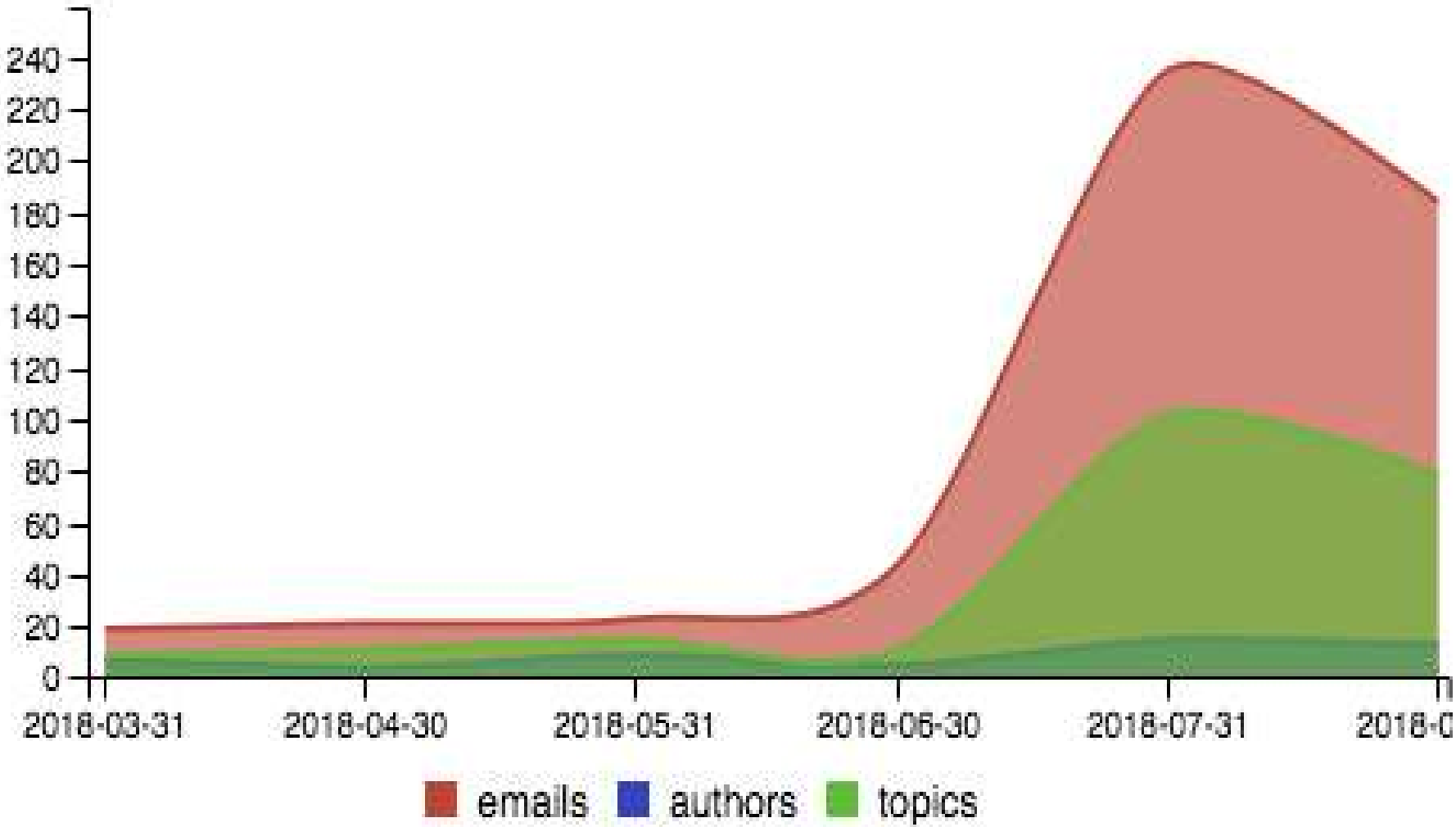
03.2018: On the cover of a magazine

03.2018: On the cover of a magazine

Making a "real" Toddy

"real" Toddy and his Friend

07.2018: Then all of a sudden

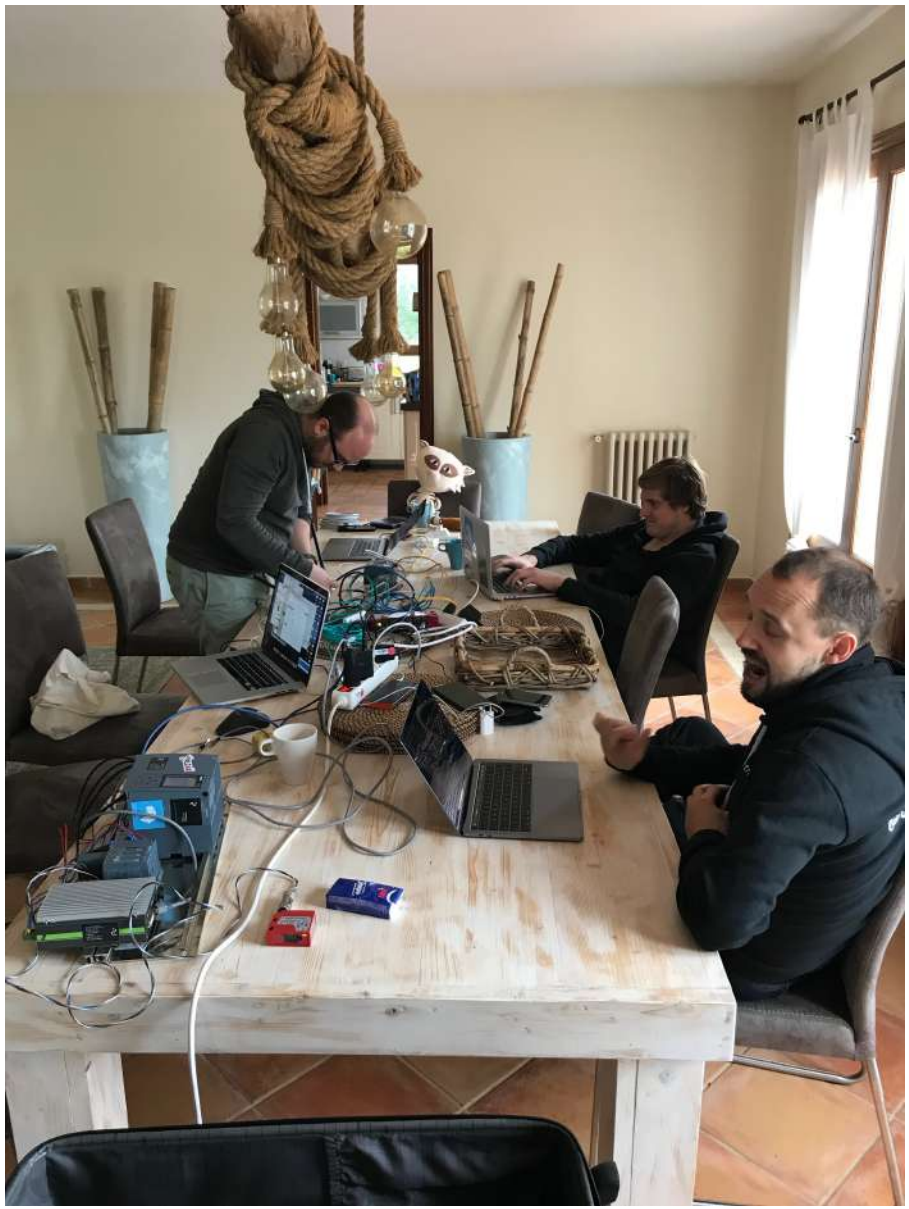


07.2018: Then all of a sudden

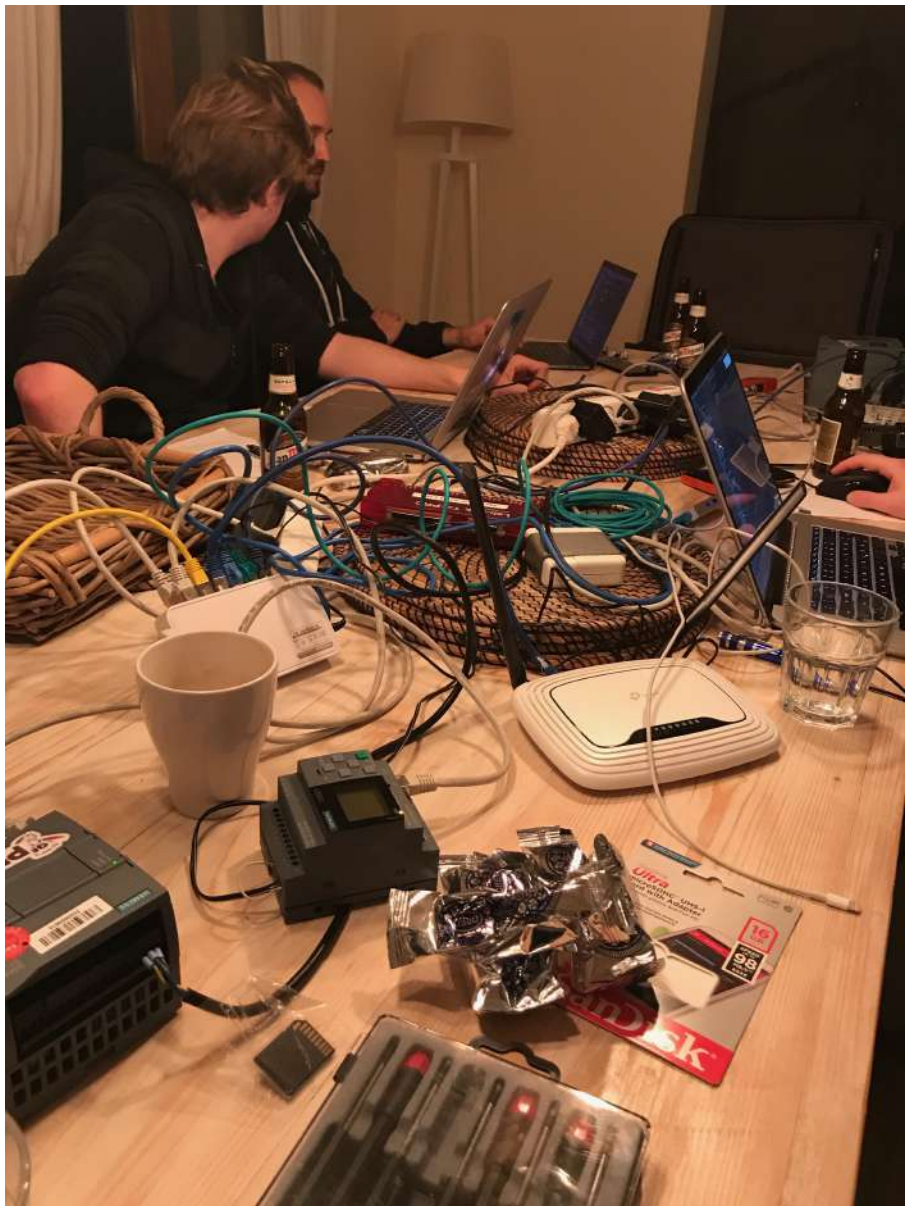
- First people started showing up on the list
- First people started submitting bug reports
- First people started submitting pull-requests
- First people started using PLC4X
- 24th September 2018: voting in first new PPMC member

09.2018: First community meetup

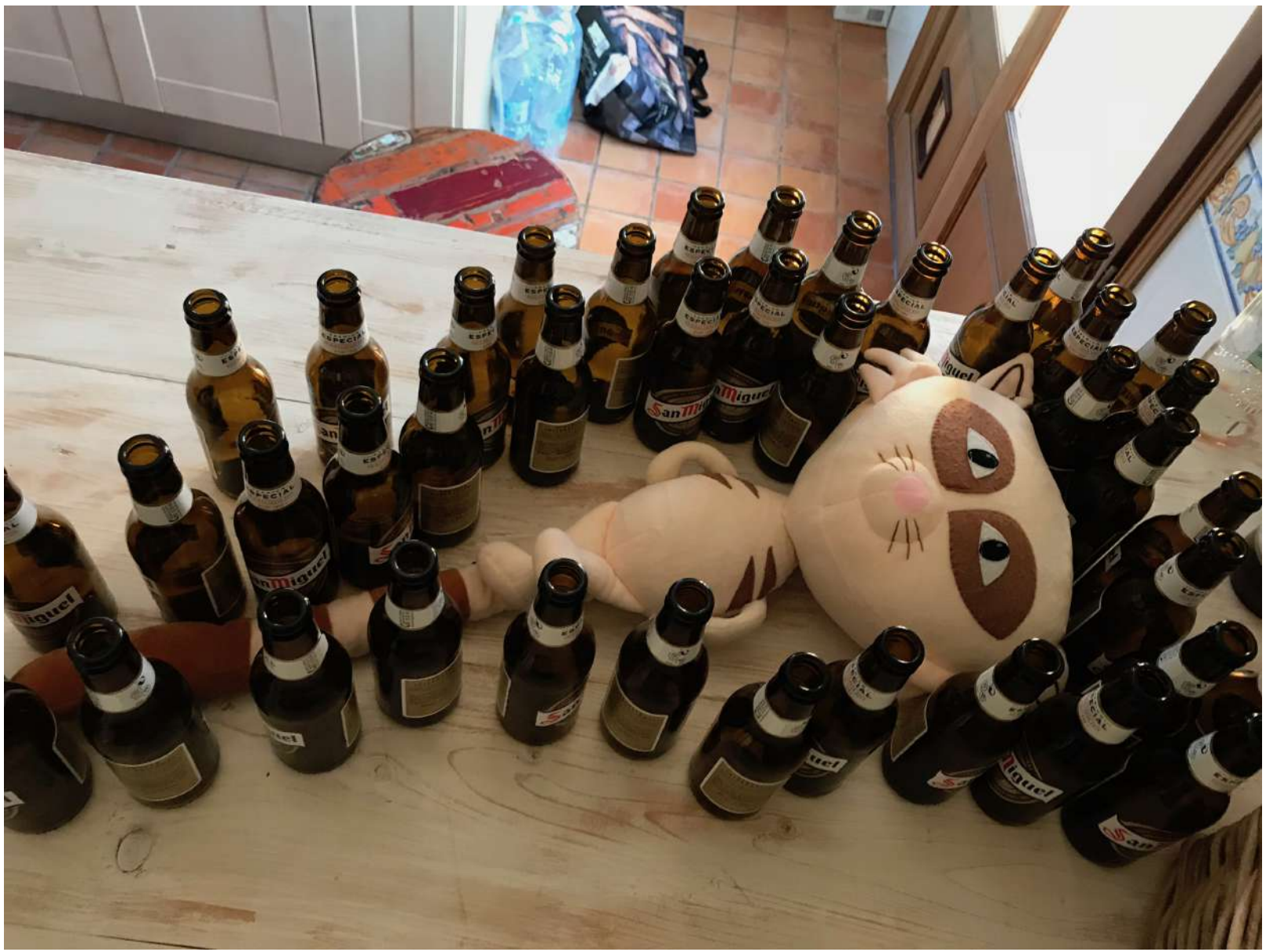
10.2018: First code retreat



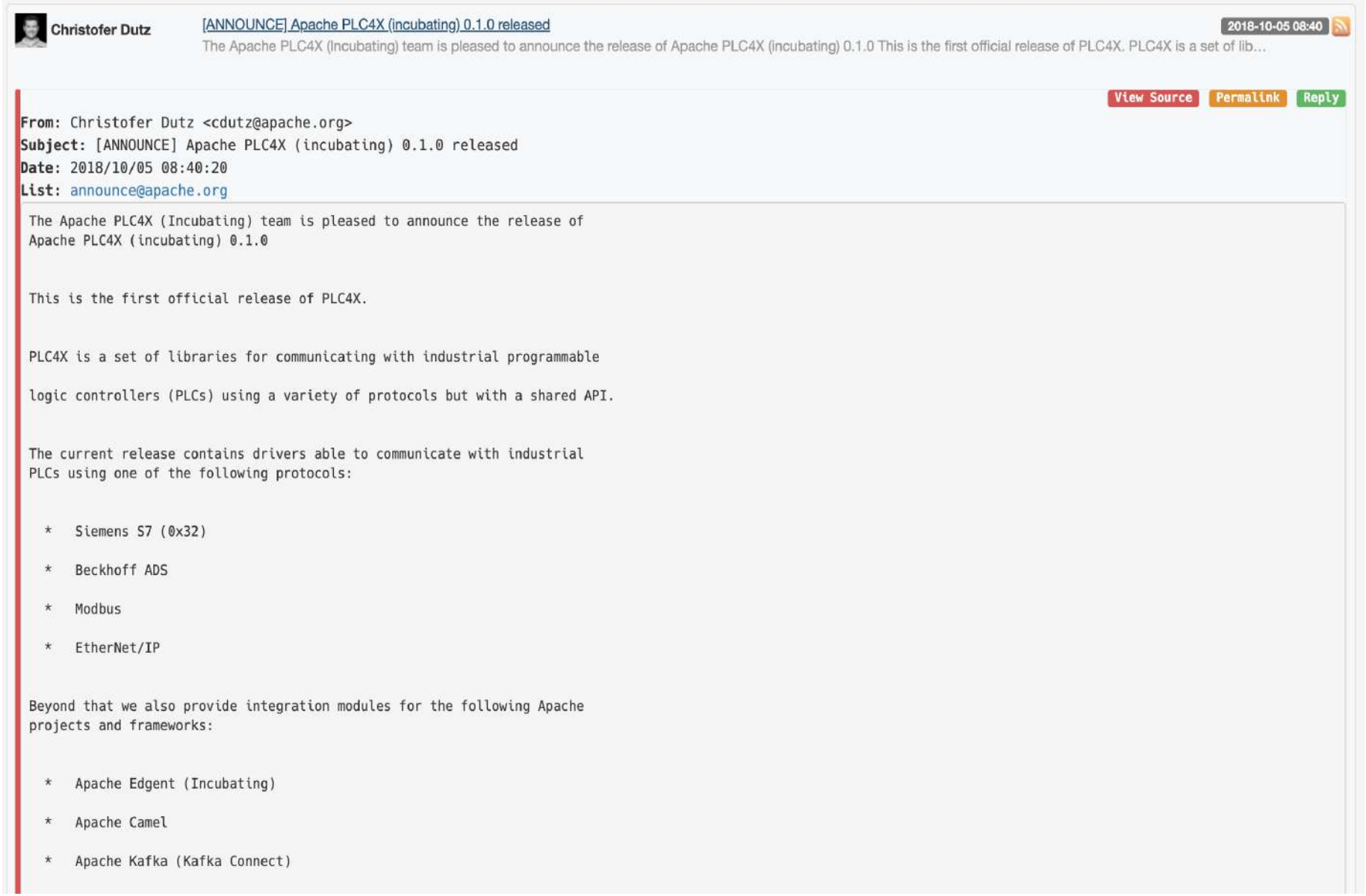
10.2018: First code retreat



10.2018: First code retreat



10.2018: First Release 0.1.0



Christofer Dutz

[ANNOUNCE] Apache PLC4X (incubating) 0.1.0 released

2018-10-05 08:40

The Apache PLC4X (Incubating) team is pleased to announce the release of Apache PLC4X (incubating) 0.1.0 This is the first official release of PLC4X. PLC4X is a set of lib...

View Source Permalink Reply

From: Christofer Dutz <cdutz@apache.org>
Subject: [ANNOUNCE] Apache PLC4X (incubating) 0.1.0 released
Date: 2018/10/05 08:40:20
List: announce@apache.org

The Apache PLC4X (Incubating) team is pleased to announce the release of
Apache PLC4X (incubating) 0.1.0

This is the first official release of PLC4X.

PLC4X is a set of libraries for communicating with industrial programmable

logic controllers (PLCs) using a variety of protocols but with a shared API.

The current release contains drivers able to communicate with industrial
PLCs using one of the following protocols:

* Siemens S7 (0x32)

* Beckhoff ADS

* Modbus

* EtherNet/IP

Beyond that we also provide integration modules for the following Apache
projects and frameworks:

* Apache Edgent (Incubating)

* Apache Camel

* Apache Kafka (Kafka Connect)

10.2018: First Major POCs

11.2018: Seeing first logos on laptops

The Year 2018 in total

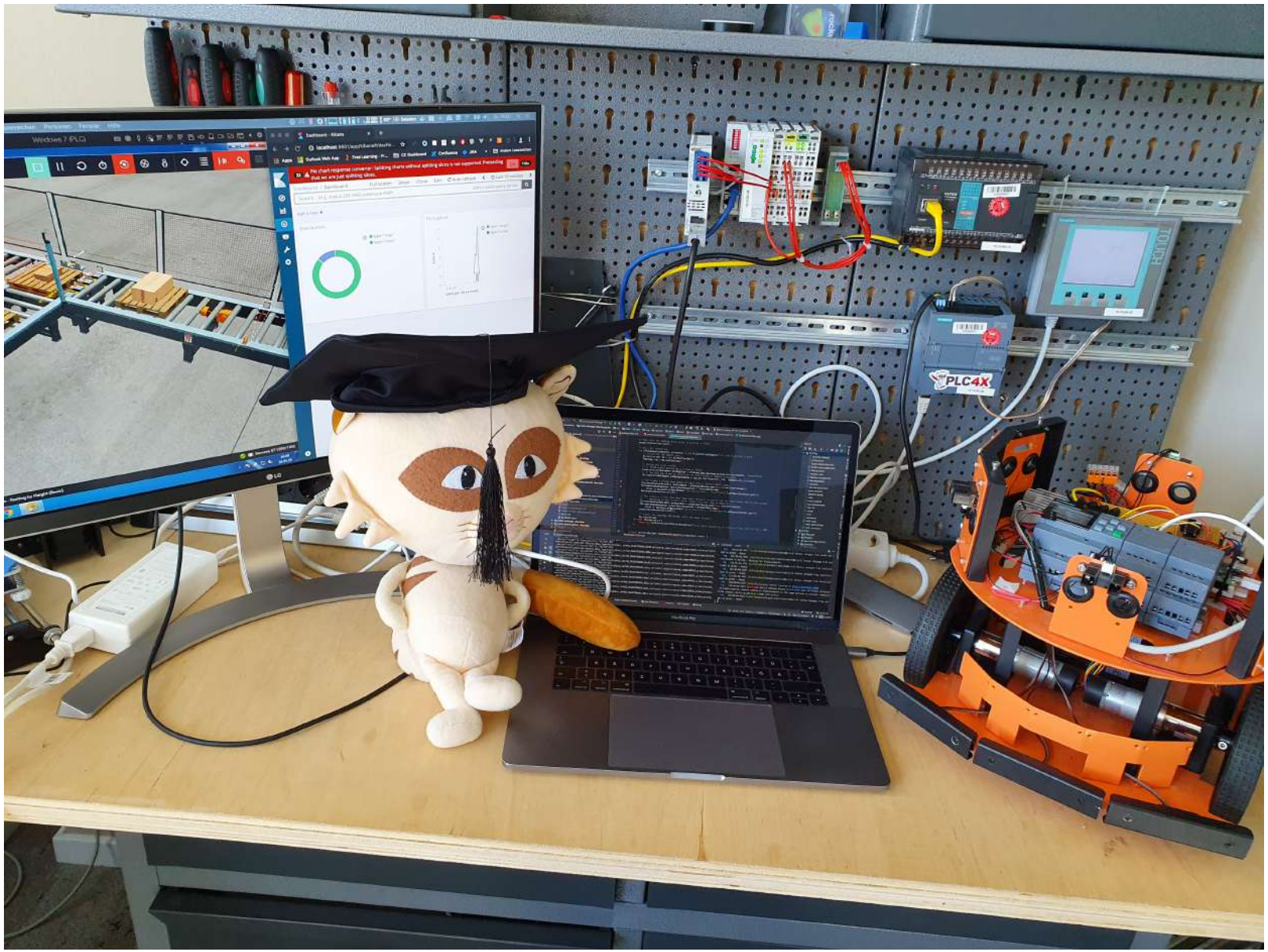
- 17 Talks at conferences and meetups
- 4 Industrial fairs
- 2 Articles in IT magazines
- 3 Blog articles
- Formed a great team
- Found lots of new friends

01-04.2019

- C++ Drivers
- Python Drivers
- C#/.NET Drivers
- Driver Generation
- Graduation preparation work

01-04.2019: Pre Graduation work

Graduation to TLP (2019-04-17)

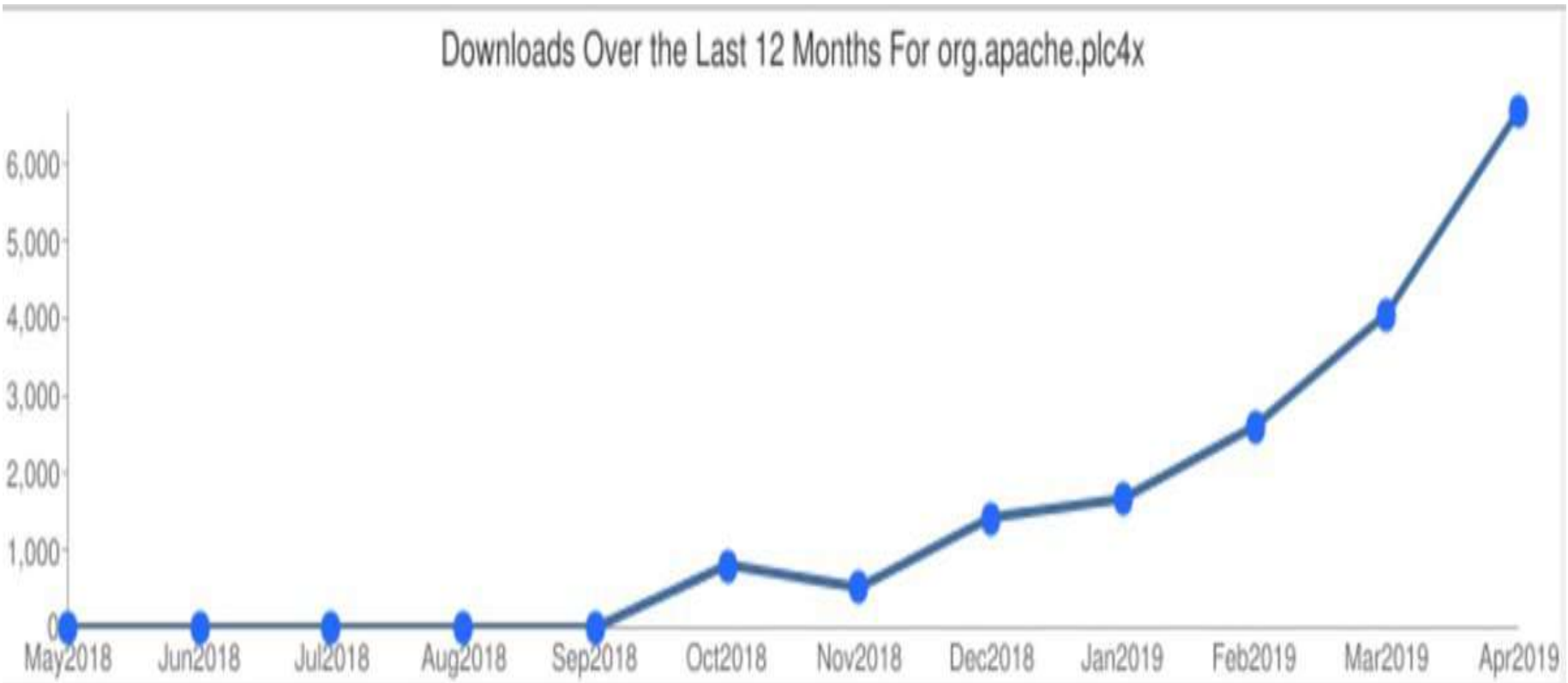


04.2019: EU Fossa2 Brussels

04.2019: EU Fossa2 Brussels

May 24th 2019: First TLP Release

Download Stats



My summary on incubation

- A LOT of hard work
- Building Community is harder than building code
- Building Community is more rewarding than building code
- Going through incubation together tightens community
- Got to know a lot of new people
- Most of these I now regard being friends
- Incubation can be fun

Some suggestions

- Invest in `community building`
- Don’t put up too many rules up front
- Invite people early
- Don’t do things like the `big-ones` … you are not!
- Accept advice from your Mentors

What happened then: 2019?

- 2019 was an amazing year
- Outstanding community growth and activity
- 26 talks at conferences and meetups

What happened then: 2020?

- 3.2020 I started working on `PLC4C`
  - Focussing on part which only one other PMC/Committer was (passively) interested in
  - Paused pushing normal initiatives
- COVID 19 → No personal meetups
- 6 talks at virtual events

What happened then (QT4 2020 - end 2021)?

- October 2020: I joined Mapped
- New initiatives with more interest in the community: `PLC4Go`
- Restarted trying to motivate people to contribute
- Identify and point out low-hanging fruit
- Switched from fixing stuff to helping other fix stuff
- Result → More community activity and initiatives
- 9 talks at virtual events

What happened then: 2022?

- Decided to stop providing fee community support for Apache PLC4X
  - No longer instantly fixing bugs being reported
  - No longer implemented features someone might want
- Blog post February 2022
  - Caused huge waves (At leas in my perspective)
- Focussed on what I needed for my work at Mapped
- Focussed on what I wanted

What did that cause?

- Everyone knowing I won’t fix everything
- Got many in the community engaged again
- Brought us many new contributors

Lessons learned (Summary)

- Make contributing as simple as possible
  - Tooling for helping ensure correct configuration
  - Don’t put up too many hoops for contributors zu jump though
- Invest in enabling people to scratch their own itches
- Prepare and maintain lists of Low-Hanging-Fruit
- Offer to help newcomers with their contributions
- Don’t be over-engaged

What's to come?

- Continuing to grow the community
- Continue adding new languages
- Continue adding new protocols
- Working together with other projects
- Going back to in-person events
- Even if "virtual" might be convenient, it only helps with spreading the "information"
- Only in-person events really help keep a community functional

Thanks for listening

RIVIAN