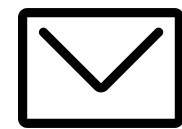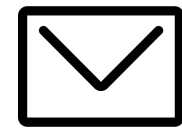# BSDCan 2019 - recap

Mariusz Zaborski

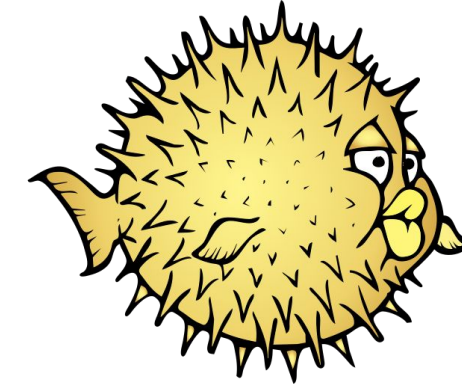✉ m.zaborski@fudosecurity.com

✉ oshogbo@FreeBSD.org

🌐 https://oshogbo.vexillium.org

🐦 @oshogbovx

Disclosure:

It's my opinion!

OpenBSD

T P
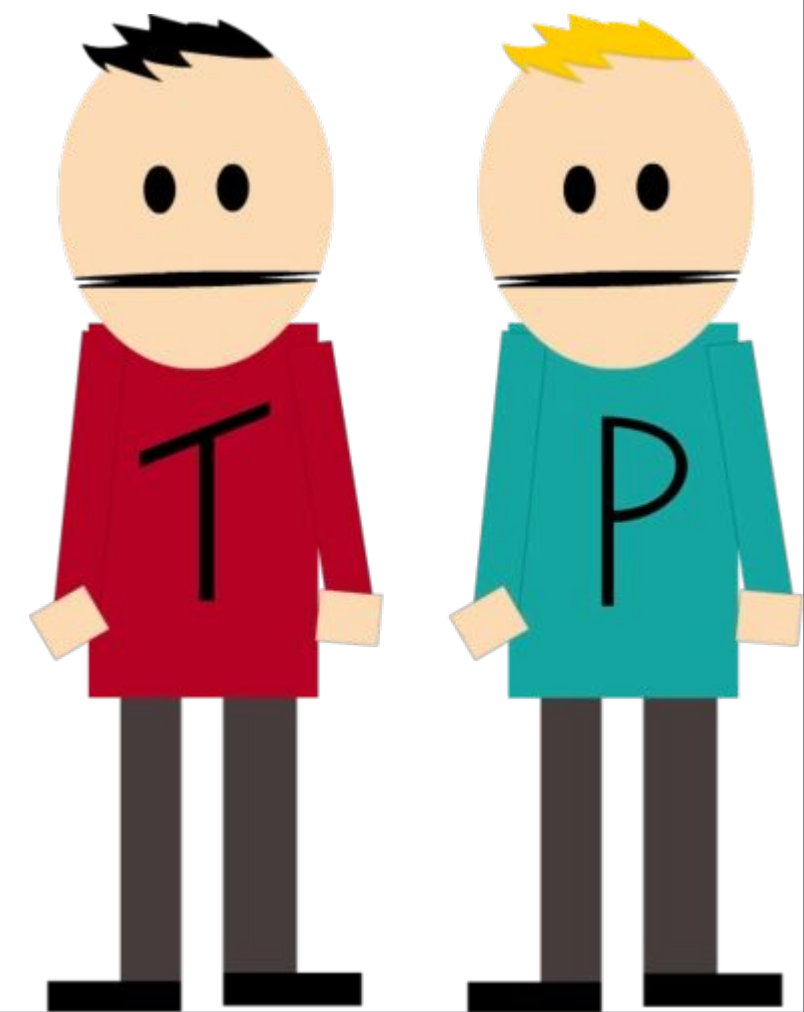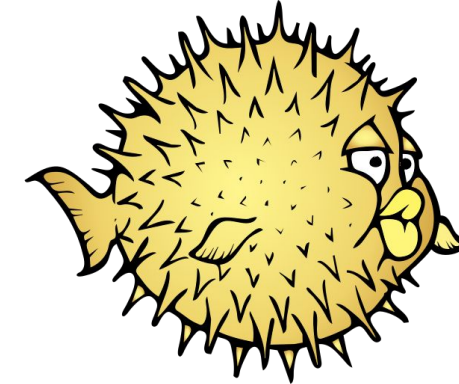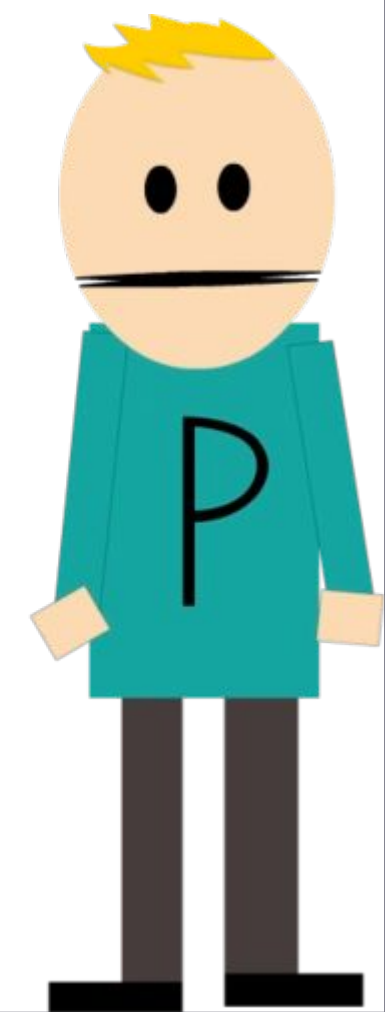
Timeline - May

| OpenBSD Hackathon | BhyveCon | FreeBSD DevSummit | BSDCan | FreeBSD Hackathon |
| | | Tutorials | | |

7   14   15   16   18   22
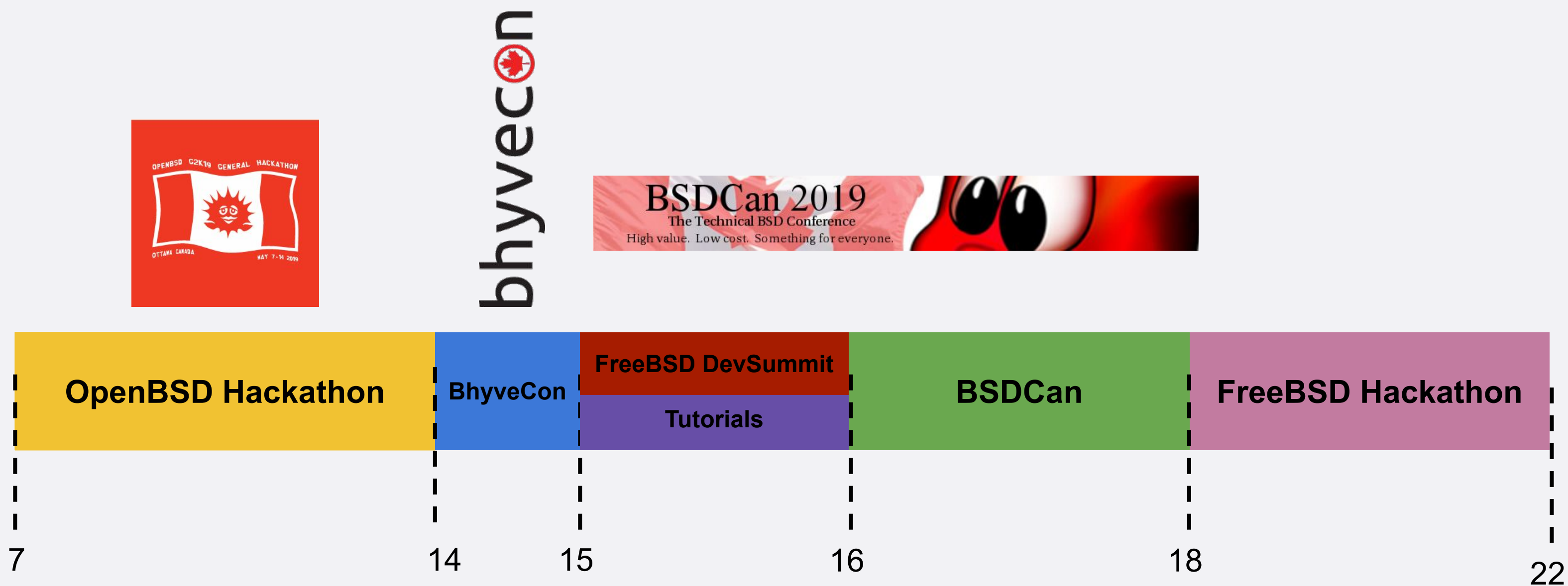
OpenBSD Hackathon

BhyveCon

FreeBSD DevSummit

Tutorials

BSDCan

FreeBSD Hackathon

OpenBSD Hackathon | BhyveCon | FreeBSD DevSummit Tutorials | BSDCan | FreeBSD Hackathon

bhyvecon

- May 14th

- One day conference

- BSD Hypervisors

bhyve

bhyvecon

- NetBSD nvmm

- OpenBSD vmm at bsd.network

- Porting bhyve to SmartOS

- NVMe: Emulation in bhyve

- bhyve VM_MAXCPUs

- edk2 UEFI firmware with HTTP network boot
  updaate

bhyve

OpenBSD
Hackathon

BhyveCon

FreeBSD DevSummit

Tutorials

BSDCan

FreeBSD
Hackathon

FreeBSD - DevSummit

- 2 days summit

- FreeBSD invite only event

- Around 55 committers

- And 30 invited ppl

- Discussing on the feature of FreeBSD

- Discussing some problems

- It's not a hackathon

FreeBSD - DevSummit - Day 1

Location	DMS 1160	DMS 1130	DMS 1140	L140
08:00-09:00	Setup / Badges			
09:00-09:15	Opening 🌐 slides			
09:15-09:30	FreeBSD Foundation 🌐 slides			
09:30-10:30	Intel 🌐 slides			
10:30-11:00	Break			
11:00-12:00	NetApp 🌐 slides			
12:00-13:00	Lunch			
13:00-14:30	Network / Transport	Failsafe Bootcode	Development Web Services	
14:30-15:00	Break			Hackathon
15:00-16:30	Network / Transport	Swap Space Management	Testing and CI	
16:30-18:00	Free Time			
18:00-20:00				Dinner

FUDO SECURITY

15

FreeBSD - DevSummit - Day 1

FreeBSD - DevSummit - Day 1

FreeBSD Foundation Board

Justin T. Gibbs
President and
Founder

Benedict
Reuschling,
Vice
President
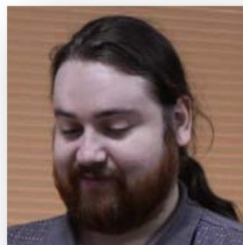
Philip Paeps,
Secretary

Dr. Marshall
Kirk McKusick,
Treasurer

Deb Goodkin
Assistant
Secretary

Dr. Hiroki
Sato, Director

Dr. Robert
N.M. Watson,
Director

George
Neville-Neil,
Director

FreeBSD - DevSummit - Day 1

D Scott Phillips
FreeBSD Developer Summit, May, 2019

Intel update & bhyve UEFI

INTEL OPEN SOURCE TECHNOLOGY CENTER | 01.org

FreeBSD - DevSummit - Day 1

ONTAP
Continuous Integration/Testing

How a change becomes a product

Phil Ezolt
Netapp MTS 6 AERO/DevOps
FreeBSD Developer Summit, 5/15/19

FailSafe

- We have a safe way of upgrading operating system

  - Boot flags

  - Boot environments

- How to upgrade bootcode in safe way

  - GPT

  - UEFI

FreeBSD - DevSummit - Day 2

Location	DMS 1160	DMS 1130	DMS 1140
08:00-09:00	Setup / Breakfast / Badges		
09:00-10:00	core@ update 🜨 slides		
10:00-10:30	Break		
10:30-12:00	FreeBSD 13.0 🜨 hackmd 🜨 slides		
12:00-13:15	Lunch		
13:15-13:30	Group Photo		
13:30-15:00	Hackathon	Documentation Translation	Package Base
15:00-15:30	Break		
15:30-17:00	Hackathon	GSoC and Outreachy	Hackathon
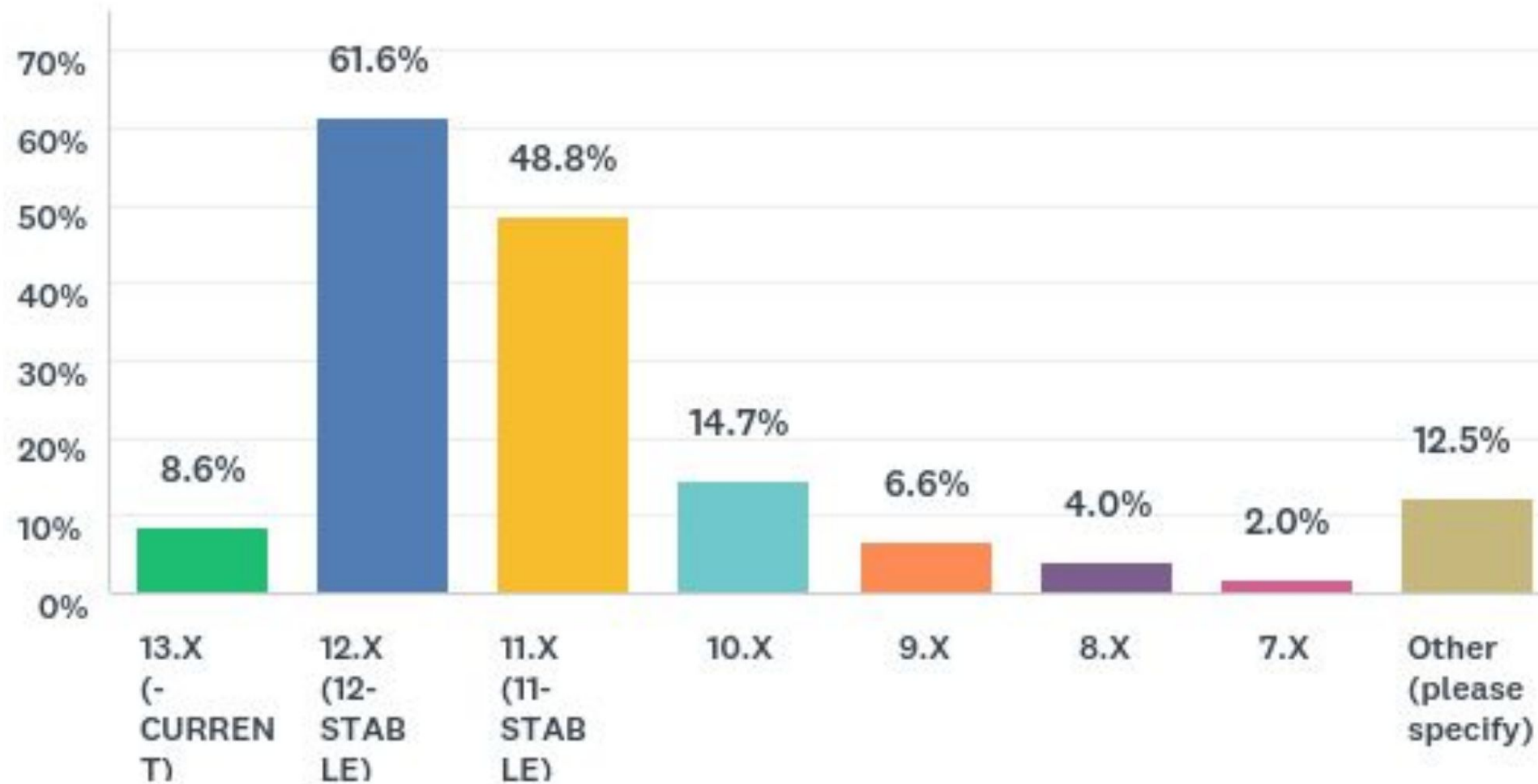
FreeBSD - DevSummit - Day 2

Git WG

1. Core has unanimously approved the creation of a working group to figure out the details of moving to `git`.

2. Core will begin setup of this WG, pulling members from relevant other groups to help steer the WG direction.

   Assuming the working group does not encounter intractable problems, the working group's recommendations, incorporating feedback from Core, will be approved and implemented.

ptrace (registers, TLS) for AR

New OpenZFS upstream

security-domain aware / co-sch

NAND file system (that works)

new security/OS update mechani

better epoch documentation

Thunderbolt 3

HID over i2c

ptrace getregset

suspend/resume for NVME device

live kernel dump

Failsafe ZFS bootcode

Import NVME improvements from

LLVM profile guided optimizati

MAC Framework Change

No test failures in qemu (slow

More documentation on writing

9pfs in bhyve

libvdisk

SDIO for rpi (wifi, audio)

Clang on PowerPC

Forcible unmount and continue

DRM for arm64

MAC module to grant privs by |

PC Card (not CardBus) removal

nvme-cli compat nvmecontrol

NUMA VM work

All test cases pass and no fla

intel hw p-state

remove obsolete NANDFS / NAND

wpa3

(post vn.

VPC networking

802.11ac/a+

100% coverage on boot loader c

BBRv1 (and likely v2) TCP `sta

in-kernel gdb remote stub for

nested jails with loopback wor

S0-ix

TCP stats, qmath, stats(3)

NUMA Network improvements

pam login access improvements

USB C TCPM (type c port manage

power-aware CPU scheduling

Tutorials

- Step-by-step of doing something

- During FreeBSD Dev Summit

- Paid extra

09:00		
09:15	**OpenBSD porting workshop - all day - AM**	**OpenSMTPD for the Real World**
09:30	*Become adept in the world of ports and packages!*	*Mail Server Tutorial*
09:45	**Brian Callahan**	**Aaron Poffenberger**
10:00	Track **Tutorial**	Track **Tutorial**
10:15		
10:30		
10:45		
11:00		
11:15		
11:30		
11:45		
12:00		
12:15		
12:30		
12:45		
13:00		
13:15	**OpenBSD porting workshop - all day - PM**	**Network Management with the OpenBSD Packet Filter Toolset**
13:30	*Become adept in the world of ports and packages!*	
13:45	**Brian Callahan**	**Massimiliano Stucchi** , **Peter Hansteen**
14:00	Track **Tutorial**	Track **Tutorial**
14:15		
14:30		
14:45		
15:00		
15:15		
15:30		
15:45		

	DMS 1110	DMS 1120
09:00		
09:15	**BGP for non-experts - all day - AM**	**LIbTLS Tutorial for TLS beginners**
09:30		*An interactive tutorial to give you the ability to use TLS in your own C programs*
09:45	**Peter Hessler** Track **Tutorial**	
10:00		**Bob Beck** Track **Tutorial**
10:15		
10:30		
10:45		
11:00		
11:15		
11:30		
11:45		
12:00		
12:15		
12:30		
12:45		
13:00		
13:15	**BGP for non-experts - all day - PM**	**System and Service Monitoring with Icinga and OpenSSH**
13:30		
13:45	**Peter Hessler** Track **Tutorial**	**Benedict Reuschling** Track **Tutorial**
14:00		
14:15		
14:30		
14:45		
15:00		
15:15		
15:30		
15:45		

OpenBSD Hackathon

BhyveCon

FreeBSD DevSummit

Tutorials

BSDCan

FreeBSD Hackathon

BSDCan - Day 1

	DMS 1110	DMS 1120	DMS 1140	DMS 1160
09:15				
09:30				**The opening session**
09:45				Dan Langille Track **Plenary**
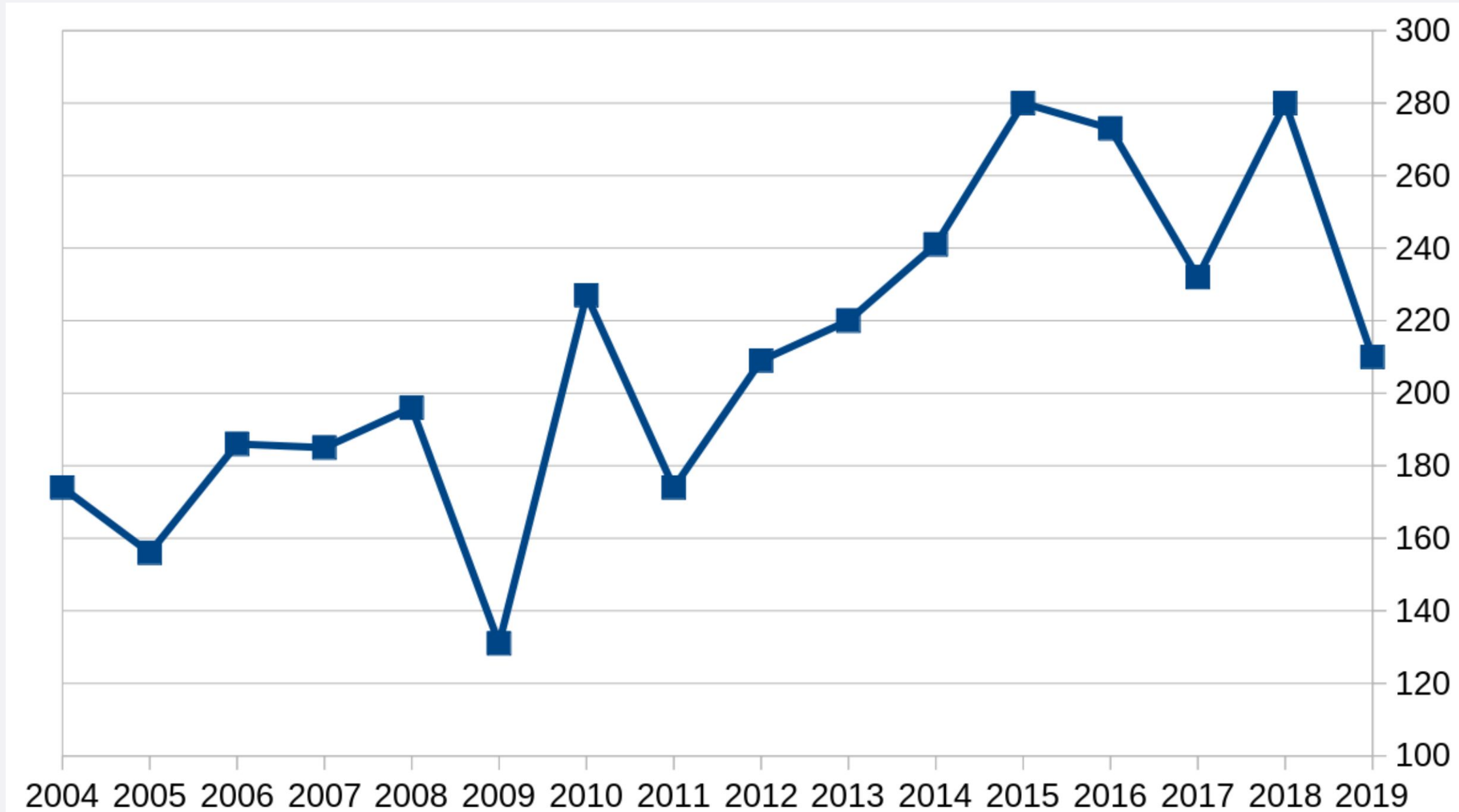
BSDCan - Day 1

BSDCan - Day 1

10:00	**Building an accessible OpenBSD laptop**	**Migrating a bhyve guest**	**How ZFS snapshots really work**	**Guesting BSD on the QNX Hypervisor**
10:15	*Enabling secure and functional computing for a person with severe disabilities.*	**Elena Mihailescu** Track **Hacking**	*And why they perform well (usually)*	**Quentin Garnier** Track **Hacking**
10:30			**Matt Ahrens** Track **Invited Talks**	
10:45	**Stefan Sperling** Track **Hacking**			

Snapshot Deletion ( )

- Iterate over sublists
- If mintxg > prev, free all BP's in sublist
- Merge target's deadlist into next's
  - Append sublist by reference -> O(1)

Born <S1: merge to A
Born (S1, S2]: merge to B
Born (S2, S3]: merge to C

A: Keep
B: Keep
C: Keep
Free

Snap 1   Deleted snap   Snap 3   Snap 4   Snap 5
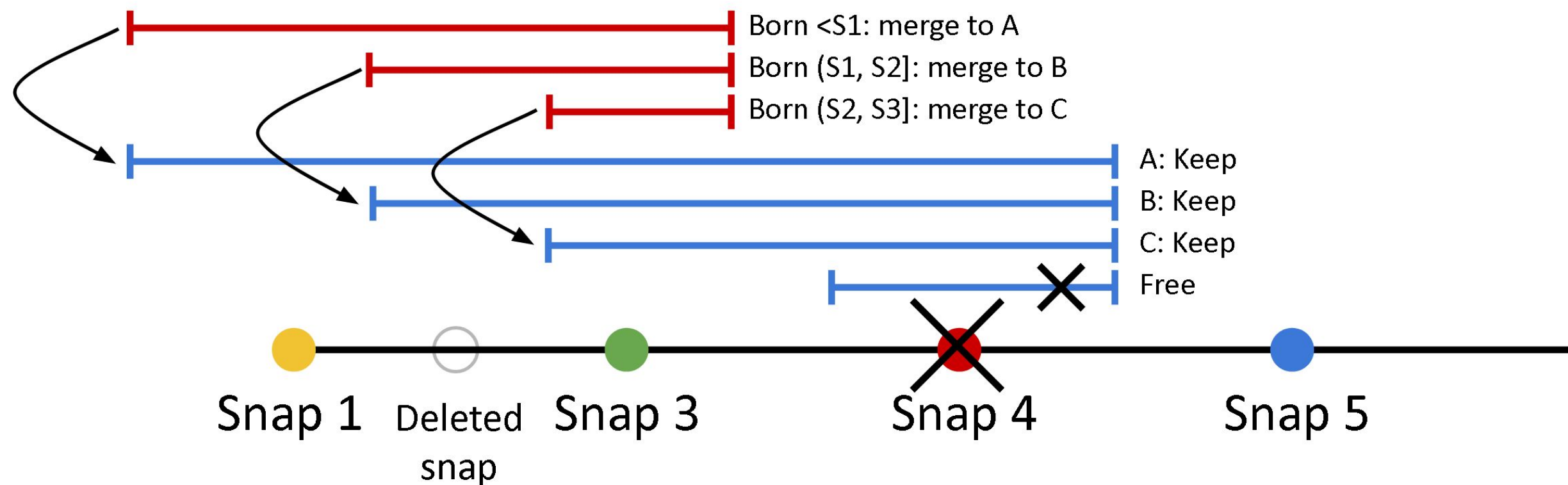
Building an accessible OpenBSD laptop

Enabling secure and functional computing for a person with severe disabilities.

This talk presents the results of a use case study I performed together with my friend Maurice throughout the first quarter of 2019.

Maurice is an actor who survived a brain hemorrhage in 1996 and has since lived with severe physical and cognitive disabilities. His ability to use computers is restricted in many ways. For example, while Maurice can read text just fine, he is unable to fluently spell words and he can only use the fingers on one of his hands.

Computers Maurice has at his disposal are a PC and a netbook running Windows in standard configuration. He depends on friends and caretakers to perform basic tasks such as writing email messages. Security of these systems is of course on the lower end of the spectrum. Fooling Maurice into clicking a wrong button and installing malware is not hard.

Maurice is certainly not a typical OpenBSD user, but we wanted to find out to which degree we could shape an OpenBSD system towards his needs. We had to find suitable hardware with good device support, configure the base system, a desktop environment, typical desktop programs, system backup and restore, and allow for secure remote system administration. We also looked into porting accessibility software, such as open source speech-to-text systems, to OpenBSD. Any resulting changes and enhancements to both the base system and the ports tree were submitted back to the OpenBSD project. Maurice runs -current!

BSDCan - Day 1

Time				
11:15				
11:30	**unwind(8)** *A privilege-separated, validating DNS recursive nameserver for every laptop*	**Master & Minions or the Dream of BSD Automation** *Using Salt and Python to manage the a BSD Cloud*	**Adventure in DRMland** *Or how to write a drm driver for an arm64 SoC*	**Twenty Years in Jail** *FreeBSD's Jails, Then and Now*
11:45				
12:00	**Florian Obser** Track **Hacking**	**Calvin Hendryx-Parker** Track **System Administration**	**Emmanuel Vadot** Track **Embedded**	**Michael W. Lucas** Track **System Administration**
12:15				

FUDO SECURITY

BSDCan - Day 1

12:45			
	Networking for Systems Administrators: The BOF.	**Amateur Radio and SDR** *BoF*	**OpenZFS BoF** *Talk ZFS over Lunch*
13:00			
13:15	Ray Percival Track **BOF**	Aaron Poffenberger Track **BOF**	Allan Jude Track **BOF**

BSDCan - Day 1

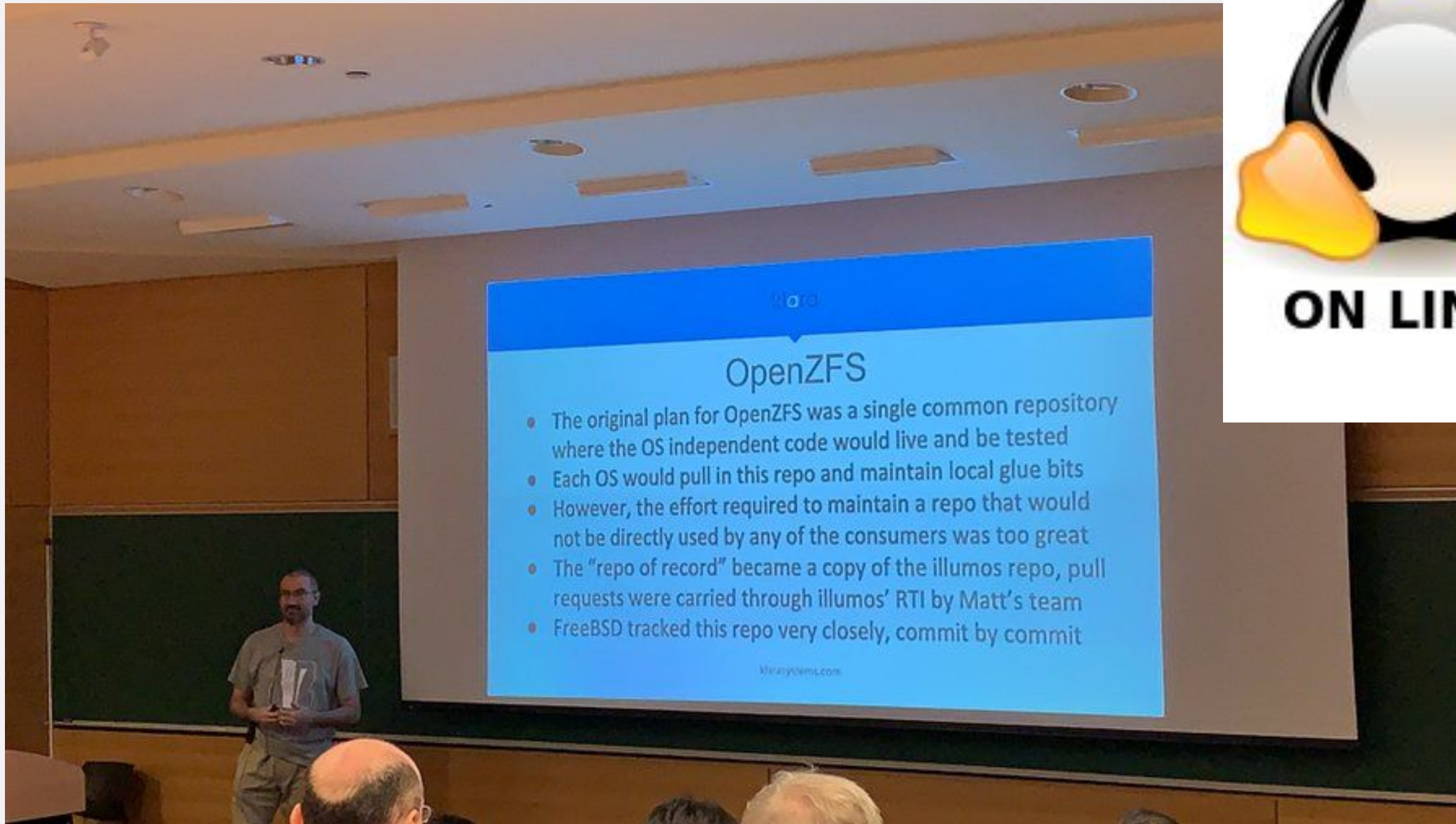|			
13:30	**Improving security of the FreeBSD boot process**	**Building a security appliance based on FreeBSD**	**Diving and OpenBSD**
13:45			
14:00			
14:15			

13:30	**Improving security of the FreeBSD boot process** *TPM and Secure Boot in FreeBSD* **Michal Stanek** Track **Security**	**Building a security appliance based on FreeBSD** **Mariusz Zaborski** Track **Hacking**

Diving and OpenBSD
puffy au naturel

Kristaps Dzonsons
Track **Hacking**

Netflix and FreeBSD
Reflections on Running FreeBSD Head in Production

Jonathan Looney
Track **Hacking**

BSDCan - Day 1

14:45	
15:00	**Do you remember legacy IP?** *What happened to FreeBSD's IPv6?*
15:15	**Björn Alexander Zeeb** Track **System Administration**
15:30	

Developing a FreeBSD driver using Test Driven Development
Could we develop a more maintainable driver with fewer bugs?

Eric Joyner , **Jacob Keller**
Track **FreeBSD Developers Summit**

OpenBSD network booted Workstations
How to fearlessly introduce OpenBSD on your company Workstations

Jan Klemkow
Track **System Administration**

The Future of OpenZFS and FreeBSD

Allan Jude
Track **System Administration**

FUDO SECURITY

BSDCan - Day 1

BSDCan - Day 1

16:00	**Hack the Puffy**	**Visualization of Regression and Performance**	**Porting NetBSD to the RISC-V**	**Fuzzing the kernel**
16:15	*OpenBSD advocacy through CTF*	*Know when something went wrong*	**Zachary McGrew**	*Porting the Clang Sanitizers to FreeBSD*
16:30	**Jason Testart**		Track **Hacking**	
16:45	Track **Security**	**Alexander Bluhm** Track **Hacking**		**Andrew Turner** Track **Hacking**

FUDO SECURITY

Day 2

BSDCan - Day 2

10:00				
10:15	**CheriABI: Hardware enforced memory safety for FreeBSD**	**Modern BSD Computing for Fun on a VAX!**	**mac_grantbylabel**	**Unveil in OpenBSD**
10:30		*Trying to use a VAX in today's world*	*Securely controlled privilege escalations via maclabel*	*The Unveil system call, it's use in Programs, and new semantics for it*
	Brooks Davis Track **Security**	**Jeff Armstrong**	**Simon Gerraty** Track **Security**	**Bob Beck**
10:45		Track **System Administration**		Track **Hacking**

BSDCan - Day 2

Architectural CHERI capabilities

1-bit tag: v

256-bit capability:
- permissions (31 bits)
- length (64 bits)
- address (64 bits)
- base (64 bits)
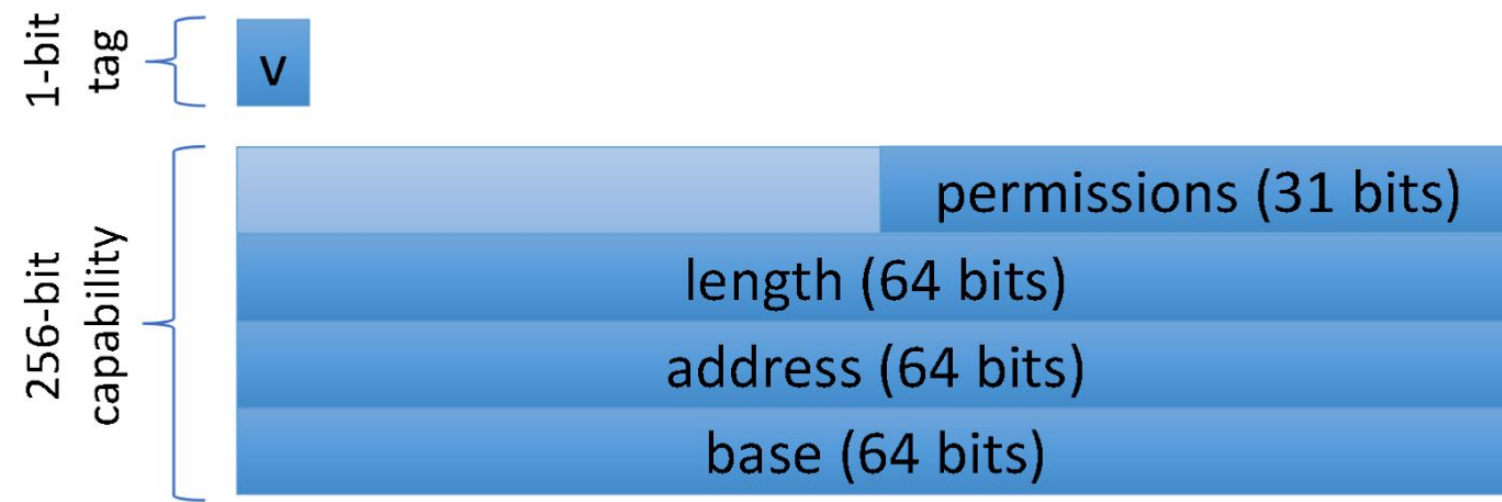
Architectural **CHERI capabilities** extend pointers with:

- **Tags** protect capabilities in registers and memory

- **Bounds** limit range of address space accessible via a pointer

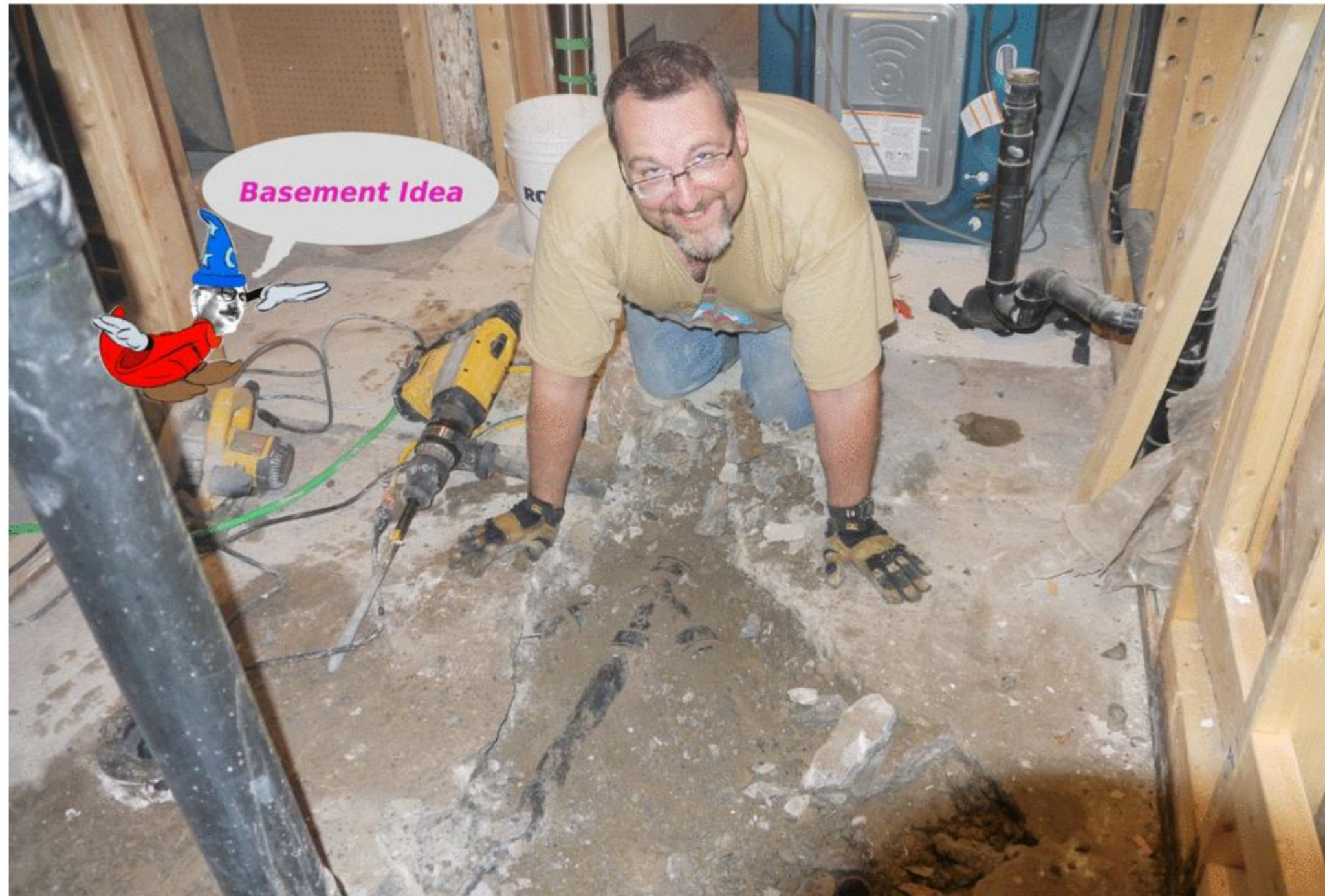- **Permissions** limit operations – e.g., load, store, instruction fetch
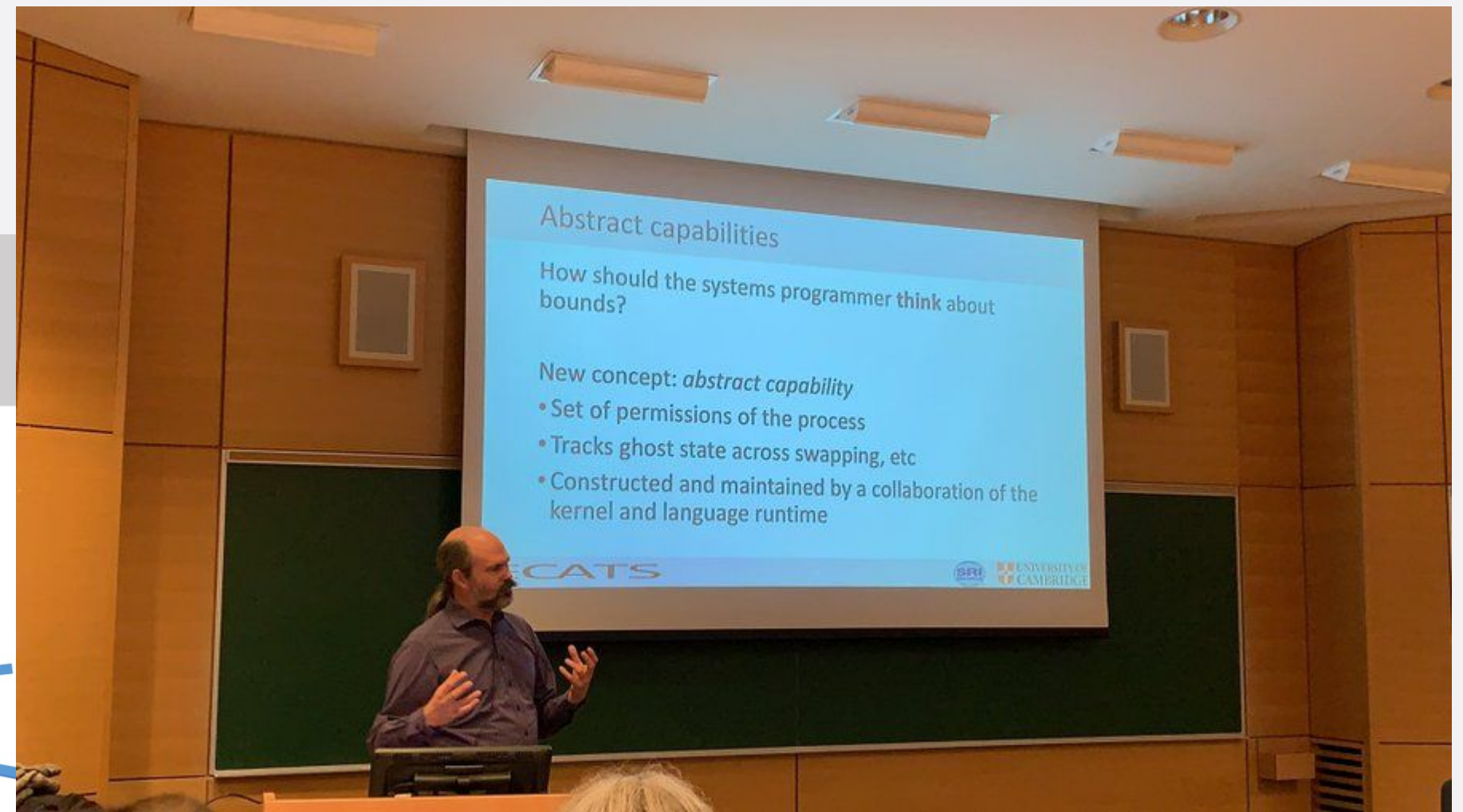
Allocation

Virtual address space

ECATS

SRI International

UNIVERSITY OF CAMBRIDGE

4

Abstract capabilities

How should the systems programmer **think** about bounds?

New concept: *abstract capability*
- Set of permissions of the process
- Tracks ghost state across swapping, etc
- Constructed and maintained by a collaboration of the kernel and language runtime

FUDO SECURITY

BSDCan - Day 2

BSDCan - Day 2

11:15	
11:30	**MQTT for system administrators (and for the IoT)**
11:45	
12:00	**Jan-Piet Mens** Track **Plenary**

Frankenstein's Disk Drive

Chuck Tuffli
Track **Hacking**

qemu with hardware acceleration on NetBSD
Intel HAXM as a VTx backend on NetBSD

Kamil Rytarowski
Track **Hacking**

Testing firewalls
Why vimage is awesome

Kristof Provost
Track **Hacking**

46

Your **things** speak **MQTT**

BSDCan - Day 2

12:45			
	BUG BoF	**FreeBSD on Power9 BoF**	
13:00	*BSD User Group (BUG) BoF*	**Albert Dengg**	
		Track **BOF**	
13:15			
	Track **BOF**		

BSDCan - Day 2

13:30	**MirageOS: minimizing the attack surface and vectors of network services**	**syspatch(8)**	**FreeBSD from a Linux developer's perspective**	**Design and verification of the TLS 1.3 handshake state machine in LibreSSL**
13:45		*The Boring Healing Potion*	*It's not all bad!*	
14:00	*How to reduce complexity in services, and enable laymen to run their infrastructure*	**Antoine Jacoutot** Track **Hacking**	**D Scott Phillips** Track **Social**	**Theo Buehler** Track **Hacking**
14:15	**Hannes Mehnert** Track **Security**			

BSDCan - Day 2

14:45	**Heart ticking for a guest running on FreeBSD ARM hypervisor**	**OpenBSD: add VMM to 'packer' (porting Go software)**	**QCOW2 in VMD**	**Managing Jails with Ansible**
15:00		*The red pill taken to develop a Go "plugin" for packer.io to be able to create VM images on OpenBSD for VMM and many other virtualizers.*	*Snapshots 'Til the Cows Come Home*	*A showcase for building a container infrastructure on FreeBSD*
15:15	**Mihai Carabas** Track **Embedded**		**Ori Bernstein** Track **Hacking**	**Albert Dengg** Track **System Administration**
15:30		**Philipp Buehler** Track **Hacking**		

BSDCan - Day 2

Time				
16:00				
16:15	**Road Warrior Disaster Recovery** *Secure, Synchronized, and Backed-up*	**Porting Go to netbsd/arm64**	**Cross-Platform Parallel Regression and Performance Testing of, and with OpenZFS, FreeBSD and bhyve**	**bhyvearm64** *CPU and Memory Virtualization on Armv8.0-A*
16:30		**Maya Rashish** Track **Hacking**		
16:45	**Aaron Poffenberger** Track **Security**		**Michael Dexter** Track **System Administration**	**Alexandru Elisei** Track **Invited Talks**

Road Warrior Disaster Recovery

Secure, Synchronized, and Backed-up

Aaron Poffenberger

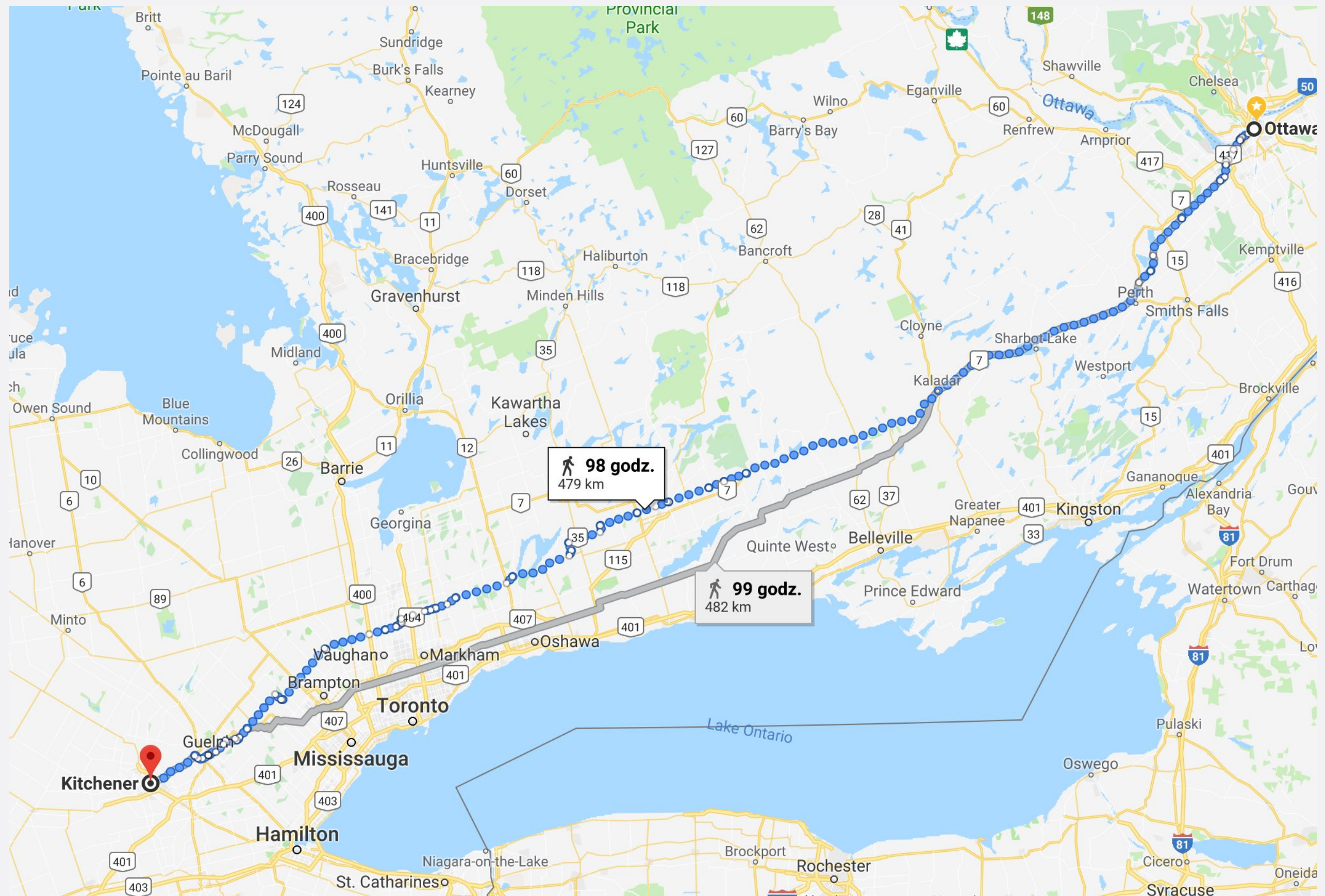akp@hypernote.com

2019-05-18T20:00:00Z

Closing session

OpenBSD Hackathon

BhyveCon

FreeBSD DevSummit

Tutorials

BSDCan

FreeBSD Hackathon

FreeBSD - Hackathon

- 3 days

- Focused more on the code

- Around 16 ppl

FreeBSD - Hackathon

- WiFI

- Capsicum

- Debugging

- Bugbusting

- Syzkaller

Thank you!

Mariusz Zaborski

✉ m.zaborski@fudosecurity.com

✉ oshogbo@FreeBSD.org

🌐 https://oshogbo.vexillium.org

🐦 @oshogbovx