# FreeBSD Security Culture

How security audits are improving FreeBSD

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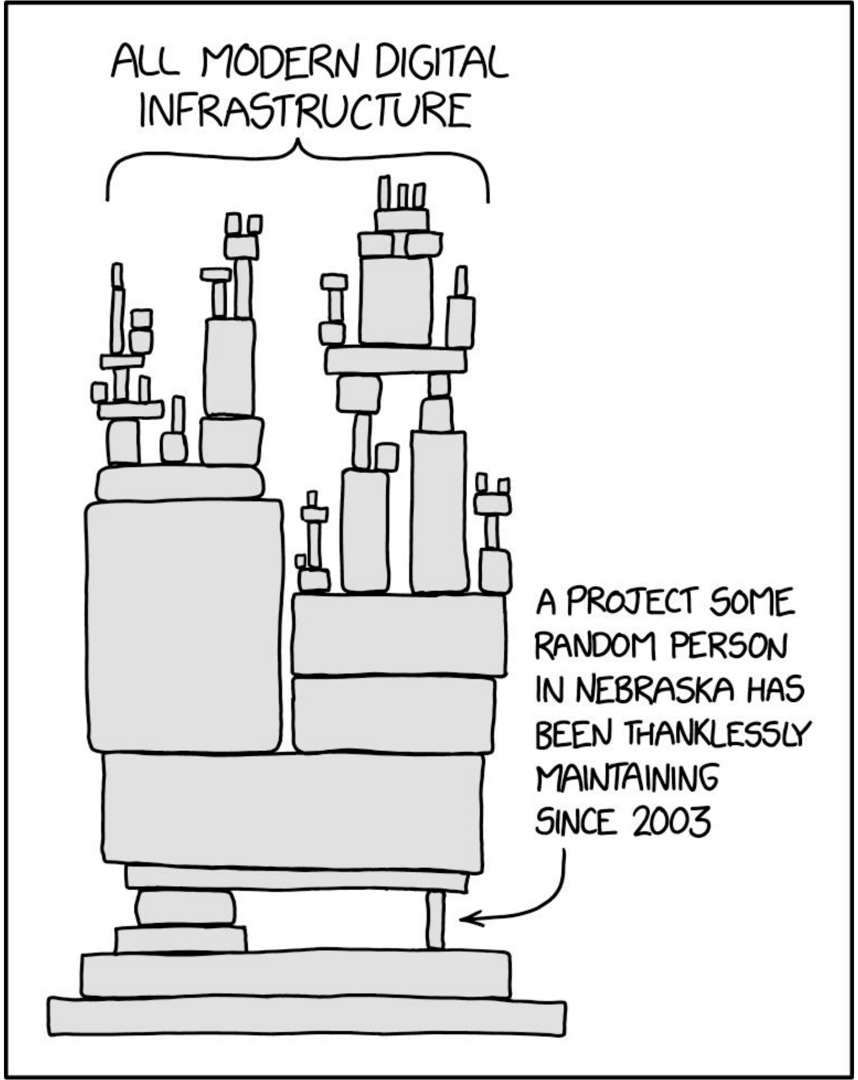
# Obligatory XKCD Reference



ALL MODERN DIGITAL INFRASTRUCTURE
A PROJECT SOME RANDOM PERSON IN NEBRASKA HAS BEEN THANKLESSLY MAINTAINING SINCE 2003

# ~~Open Source Supply Chain~~ Security Is Hard

Decades of tech debt

Sophisticated Attacks

Immature tools

Dependency webs

Lots of humans

# Alpha-Omega Mission

Catalyze sustainable security improvements within the most critical open source projects and ecosystems.

# Alpha-Omega Explained

α → Leverage

Ω → Scale

# Alpha-Omega By the Numbers

**$8.5M**

Granted since 2022

**30**

Full Time Engineers Funded

**9160**

Repositories Secured

**24**

Security Audits

**$4.5M**

In Grants in 2024

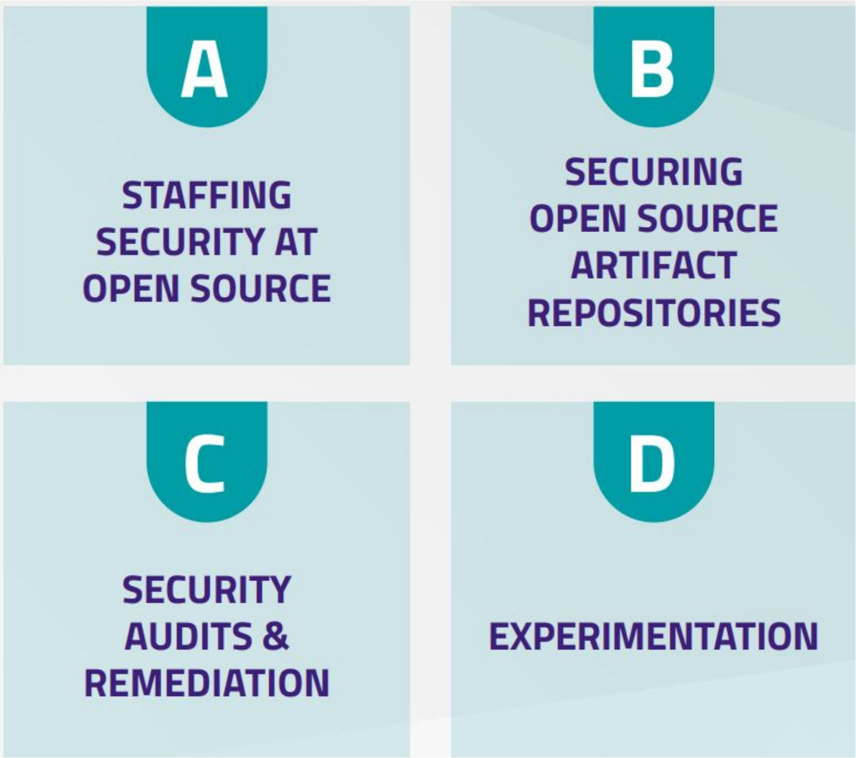
**11**

Security Projects Completed

Orgs Funded

**21**

# Alpha-Omega: Our Approach



A

STAFFING SECURITY AT OPEN SOURCE

B

SECURING OPEN SOURCE ARTIFACT REPOSITORIES

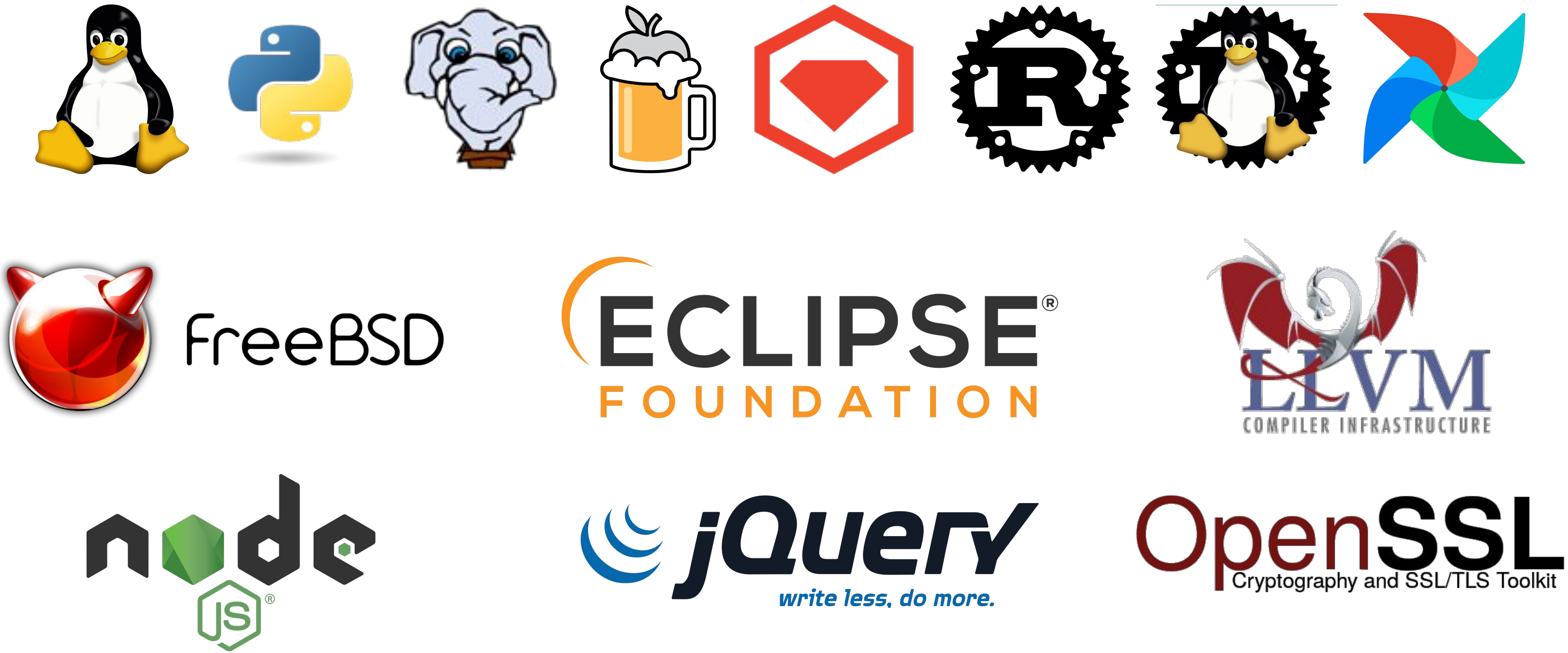
C

SECURITY AUDITS & REMEDIATION

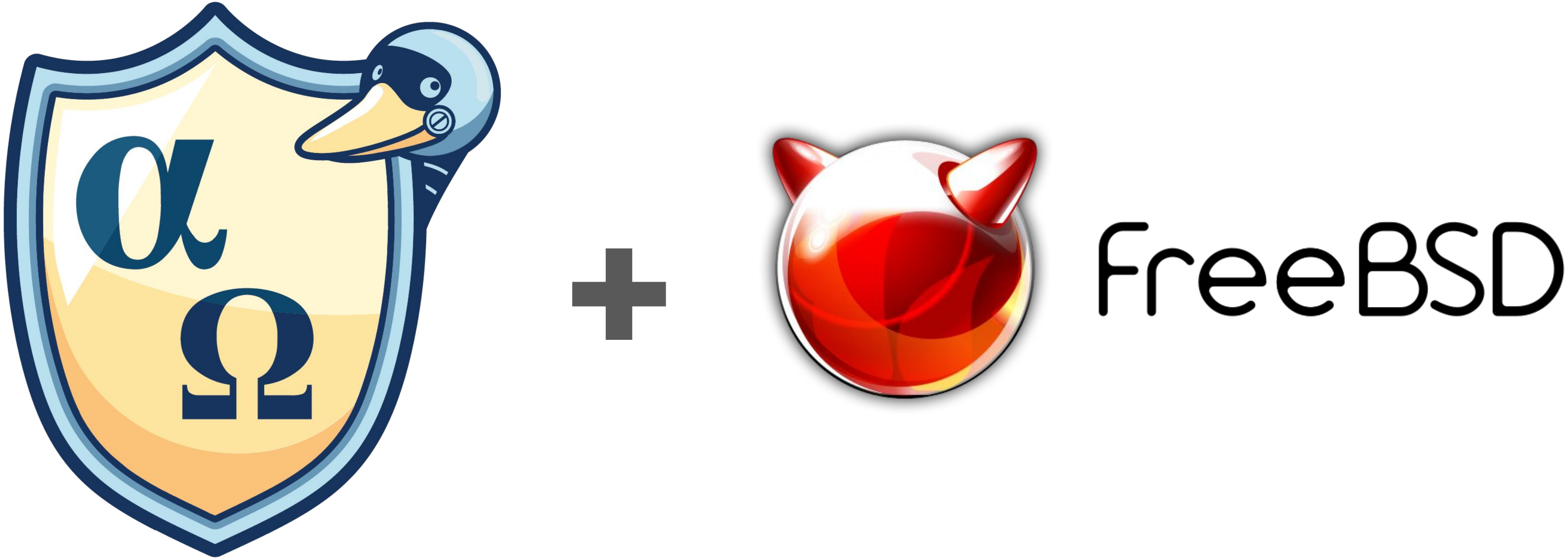
D

EXPERIMENTATION

# Alpha-Omega Engagements



# How We Came Together



FreeBSD

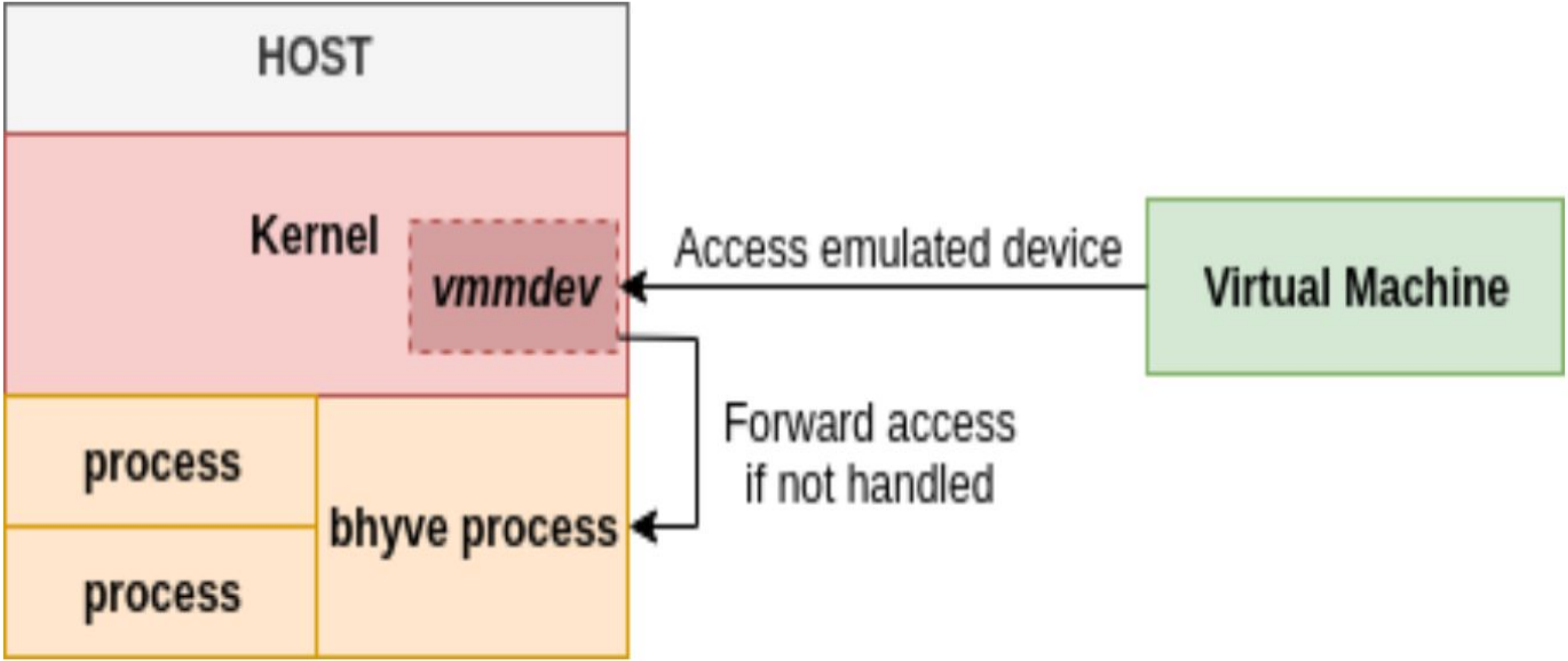
## Historical Security Culture

Robust, reliable, stable base: BSD UNIX

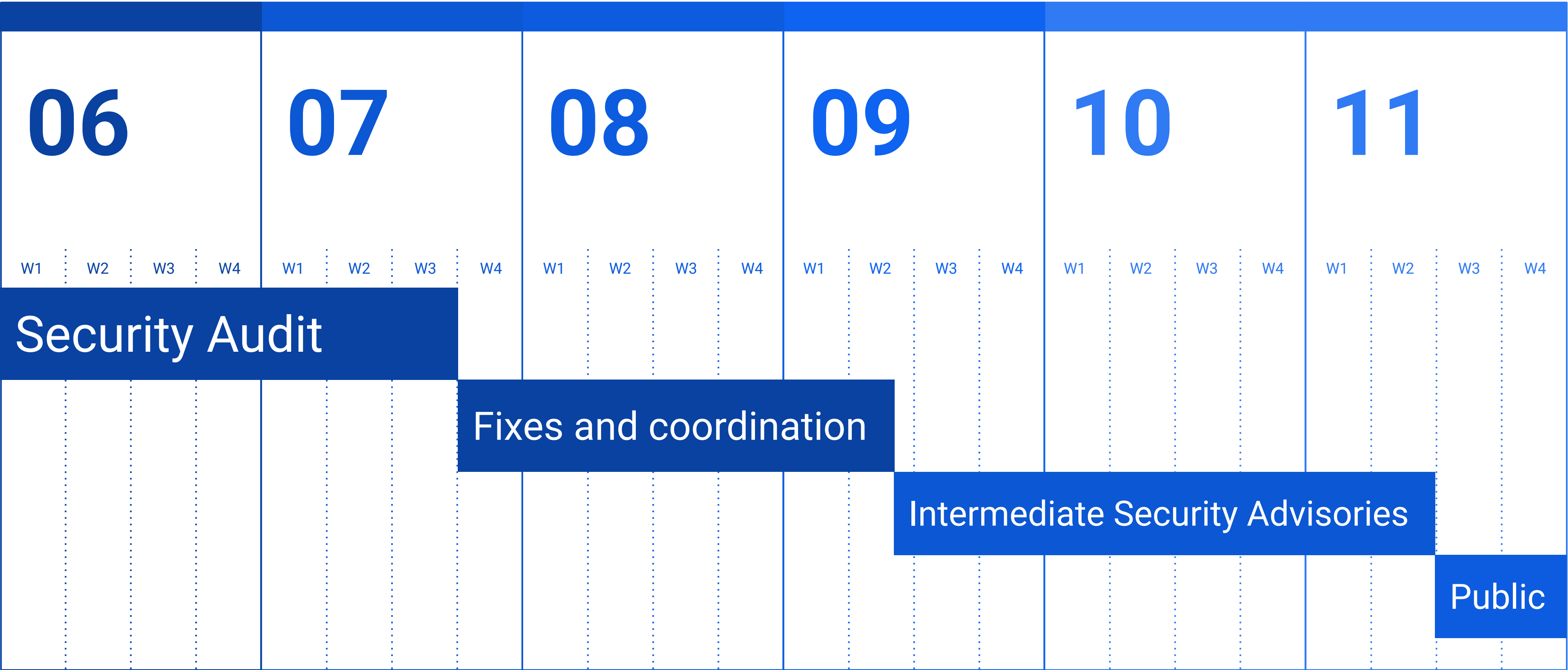
Innovative security features

Early exposure to remote attacks

# The Audit Process



# Audit, Fixes, and Disclosure Timeline



06 07 08 09 10 11

W1 W2 W3 W4 W1 W2 W3 W4 W1 W2 W3 W4 W1 W2 W3 W4 W1 W2 W3 W4 W1 W2 W3 W4

Security Audit

Fixes and coordination

Intermediate Security Advisories

Public

# Vulnerability Classes Identified

bhyve specific issues

TOCTOU

Incorrect reference counting

Missing checks for errors

Integer overflows

Uninitialized variables

# Lessons Learned

Proof of Concept **validators** are essential

**Complexity** is easily underestimated

OpSec could be improved

**Funding** fixes is just as important

# Looking Ahead: Preventative Remediations

Additional **compiler checks**

**CI/CD**

Extend and improve the **tests**

Code **ownership**

## Looking Ahead: Going Beyond

**Improve** the documentation for developers

BSD-specific security **trainings** & certification

Create an advisory **committee**?

# Security Culture Reinvigorated

Security in FreeBSD is more important than ever

There is much work to be done

We need community engagement and prioritization

**Get Involved freebsd-security@FreeBSD.org**

# Thank You

FreeBSD

FOUNDATION

α

Ω

# This Deck

go.xwind.io/FreeBSDAudit

# Resources

FreeBSD Foundation Releases Bhyve and Capsicum Security Audit Funded by Alpha-Omega Project

Alpha Omega 2024 Annual Report

freebsdfoundation.org - alpha-omega.dev - openssf.org