Improving the FreeBSD security advisory process

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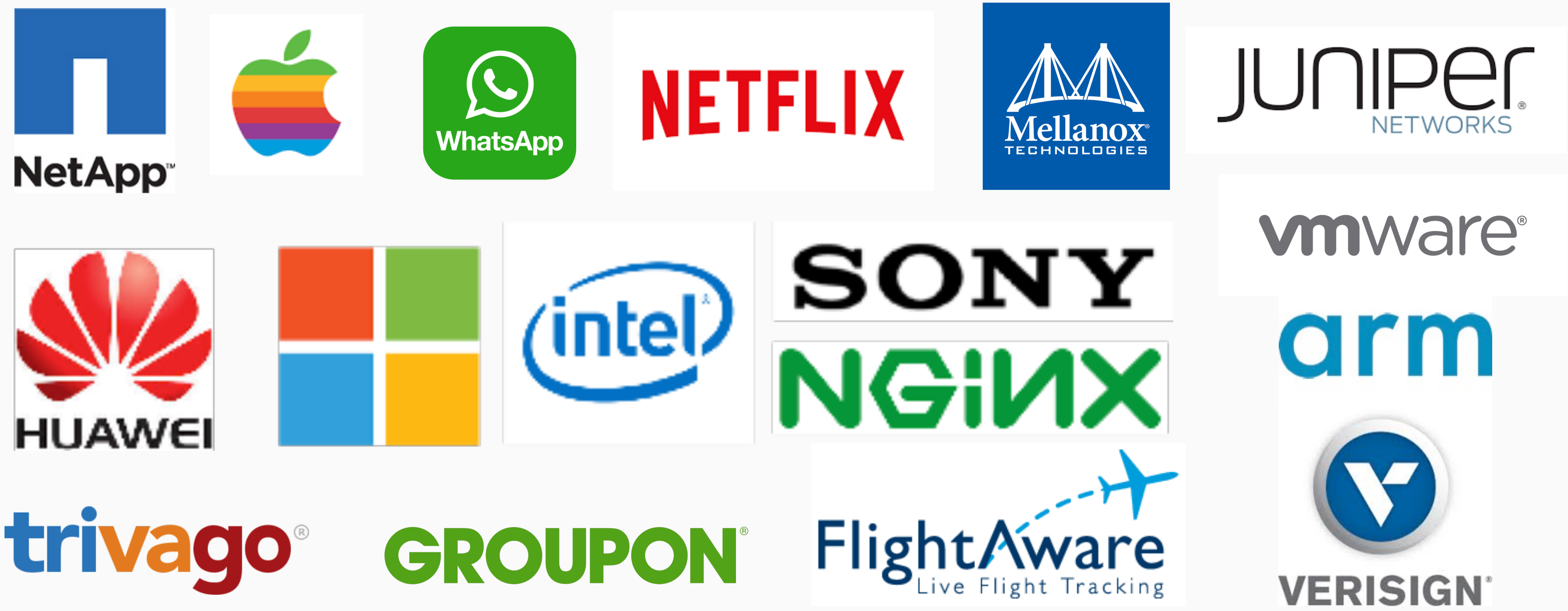
What is FreeBSD?

FreeBSD is an open source Unix-like **operating system** descended from patches developed at the University of California, Berkeley in the 1970s.

The FreeBSD Project is an active **open source community** since 1993 with hundreds of committers and thousands of contributors around the world.

The FreeBSD Foundation is a **non-profit organisation** registered in Colorado, USA in 2001 dedicated to supporting the FreeBSD Project, its development and its community.

Who uses FreeBSD?



Where FreeBSD excels

Community

- Friendly and professional
- Many active contributors and committers for 10+ and even 20+ years (and longer)

Mentoring

- Built into the Project’s culture and processes

Documentation

- FreeBSD Handbook, FAQ, Developers’ Handbook, Porters’ Handbook, Unix manual pages

Licence

- 2-clause BSD licence
- Does not restrict what you can do with your own code!

Where FreeBSD (historically) doesn't excel

Security

- Timely handling of security vulnerabilities

Large and diverse code base

Kernel

- Networking
- Storage
- Device drivers
- Virtual memory

Userland

- Libraries
- Applications

Third-party base components

- OpenSSL
- OpenSSH
- Sendmail
- Unbound
- ntpd

Ports / packages

- 35,000+ third-party applications

Vulnerability response

FreeBSD only response

- No NDA or explicit embargo
- Only applies to FreeBSD (and maybe to NetBSD and/or to OpenBSD)
- No major risk of exposure
- Examples
  - SA-18:04.vt
  - SA-17:10.kldstat

Multi-vendor coordinated response

- NDA and/or explicit embargo
- Coordinated response via private party or CERT/CC
- Requires limited disclosure to contain risk of exposure
- Examples
  - SA-18:03.speculative_execution
  - SA-18:06.debugreg

Security officer charter

- Resolving disputes involving security
- Resolving software bugs that affect the security of FreeBSD in a timely fashion
- Issuing security advisories for FreeBSD
- Responding to vendor inquiries regarding security issues
- Auditing as much code as possible
- Monitoring the appropriate channels for reports of bugs, exploits, and other circumstances that may affect the security of a FreeBSD system
- Participating in the architecture of FreeBSD in order to influence a positive impact on system security
- Maintains the FreeBSD Security Officer PGP key

Challenges facing the security team

- Extremely broad mandate
- A lot of hurry up and wait activities not conducive to a friendly employment environment
- Very high level of very technical knowledge required to respond to the large variety of issues

FreeBSD

Results of challenges

- Burn out
- Few qualified candidates have level of knowledge required to do the job

How we are fixing it

- New blood
- Splitting the technical resource requirement from the vulnerability response requirement
- Allows us to use non-technical resources for the vulnerability response while technical resources only need to focus on the technical response

FreeBSD Foundation involvement

- Holder of NDA and vendor relationships
  - Survivability of changeover of security officer
  - Vendor relationships
- Funds resources
  - Pays for the deputy security officer’s time
  - Pays for the security officer’s travel
  - Pays for development resources to enable response (one full time employee)

Case study: CVE-2018-8897 / SA-18:06.debugreg

- CVE-2018-8897 was a multi-vendor response which FreeBSD was pulled into early in the coordinated response process by Microsoft
- Included representations from the BSDs, Microsoft, Apple, Citrix, VMWare, Linux distros, Google, and Intel
- Lots of collaboration on PoCs and fixes with other BSD variants
- Once CERT/CC was involved, we were able to give pre-embargo patches to pfSense
- Published SA within one hour of drop of embargo
- We beat RedHat ☺