What does it take to run a Linux distribution?

An overview of the infrastructure behind Arch Linux

Christian Heusel — christian@heusel.eu

Meta

- **Description**: https://cfp.tuebix.org/tuebix-2026/talk/YG8988/
- **Slides**: https://md.archlinux.org/p/2026-tuebix-presentation#/
  (interactive presentation)

What? — Scope

- Around 50 Servers and various services all around the 🌍
  - Root servers / Cloud servers
  - Paid servers / sponsored servers
- Infrastructure as code repository 🍱
  gitlab.archlinux.org/archlinux/infrastructure
  - Terraform (2.6k LoC HCL)
    (`tf-stage1` / `tf-stage2`)
  - Ansible (15k LoC Jinja / 11k YAML)

Ansible

```
- name: Setup bugbuddy.archlinux.org
  hosts: bugbuddy.archlinux.org
  remote_user: root
  roles:
    - { role: common }
    - { role: firewalld }
    - { role: wireguard }
    - { role: sshd }
    - { role: root_ssh }
    - { role: prometheus_exporters }
    - { role: promtail }
    - { role: fail2ban }
    - { role: bugbuddy }
```

```
- name: Install anubis bot policy dropins
  copy: src={{ item }}.yaml dest=/etc/anubis/{{ item }}.yaml
  notify: Restart anubis
  when: anubis_extra_rules is defined
  loop: "{{ anubis_extra_rules }}"
```

tf-stage1

```
machines = {
    "accounts.archlinux.org" = {
      server_type = "cx23"
      domain      = "accounts"
      location    = "hel1"
    }
    # ...
}
```

```
archlinux_org_a_aaaa = {
    "@" = {
      ipv4_address = "209.126.35.79"
      ipv6_address = "2604:cac0:a104:d::3"
      ttl          = 60
    }
    archive = {
      ipv4_address = "49.12.124.107"
      ipv6_address = "2a01:4f8:242:5614::2"
    }
}
```

tf-stage2

```
resource "fastly_service_vcl" "fastly_mirror_pkgbuild_com" {
  name = "Arch Linux Fastly Mirror"

  domain {
    name    = "fastly.mirror.pkgbuild.com"
    comment = "Arch Linux Fastly Mirror"
  }

  backend {
    address           = "mirror.pkgbuild.com"
    name              = "MIRRORPKGBUILD"
    port              = 443
    override_host     = "mirror.pkgbuild.com"
    use_ssl           = true
```

Arch Linux Principles

1. **Simplicity**
2. **Modernity**
3. **Pragmatism**
4. **User centrality**
5. **Versatility**

➡ ***K****eep* ***I****t* ***S****imple* ***S****tupid (****KISS****)*

Additional Goals 🥅

- As much independence as possible 🗽
- Ensure easy Maintainablility 🚧
- Maximize uptime 💯
- Enable the other contributors in the project 🥲
- Contributing should be fun 😙
- Security & privacy-preserving measures 🔐

How? — Tech Stack

“Professional homelabbing”

- Servers with Arch Linux (btw!) 😜
- Monitoring via Grafana / Prometheus / Loki / Tempo 🔎
- 1 Service ➡ 1 VServer (mostly)
- NGinX as reverse proxy / TLS termination 🔄
- Borg for backup 💾
- BTRFS as filesystem 📁

Social challenges 💭

- **Getting started:** New people and 🐔 & 🐣
- **Culture:** money & companies 💰
- **Availability:** Timezones, no “shifts”, no fixed commitment 🕐
- **Opinions:** Resistance to change & finding consensus 😫
- **Motivation:** Maintenance (“boring”) 🥱 vs. feature work 🚀
- **Recognition:** infra admin is a thankless job 😒

Costs — What do we pay? 

- **Cheap**: ~1k per Month for the overall infra (hosting at Hetzner) 😇
- ~~**Cheap**~~: Money is not the only resource that we have 🫣
- **Free**: GeoMirrors, Fastly CDN, HAProxy ADN, Gitlab, Hetzner Discount, Statuspage 🤑
- **Donations**: Although money is coming in, more ➡️ better 📈

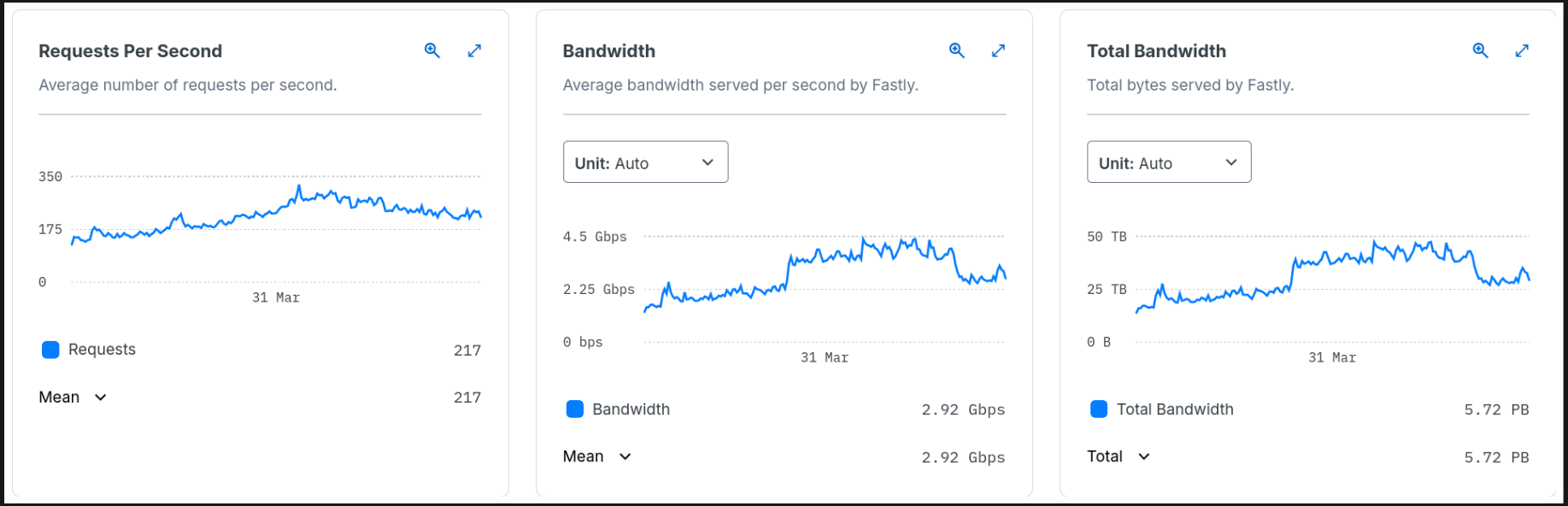
Service Catalog 📚

- **Auth** 🔐: Keycloak for Single-Sign-On
- **Knowledge resources** 📖: Wiki, manpages, static pages
- **building & running** 🏗️: gitlab runners, repro, buildservices
- **Bots** 🤖: phrik, bugbuddy, gluebuddy, bumpbuddy

Service Catalog 📚

- **Communication** 📧: mailing lists, mailserver, matrix, mumble
- **Collaboration** 👥: HedgeDoc, GitLab, security tracker, BBS, AUR
- **Package ecosystem** 📦: repo server, mirror infra, archive, archweb

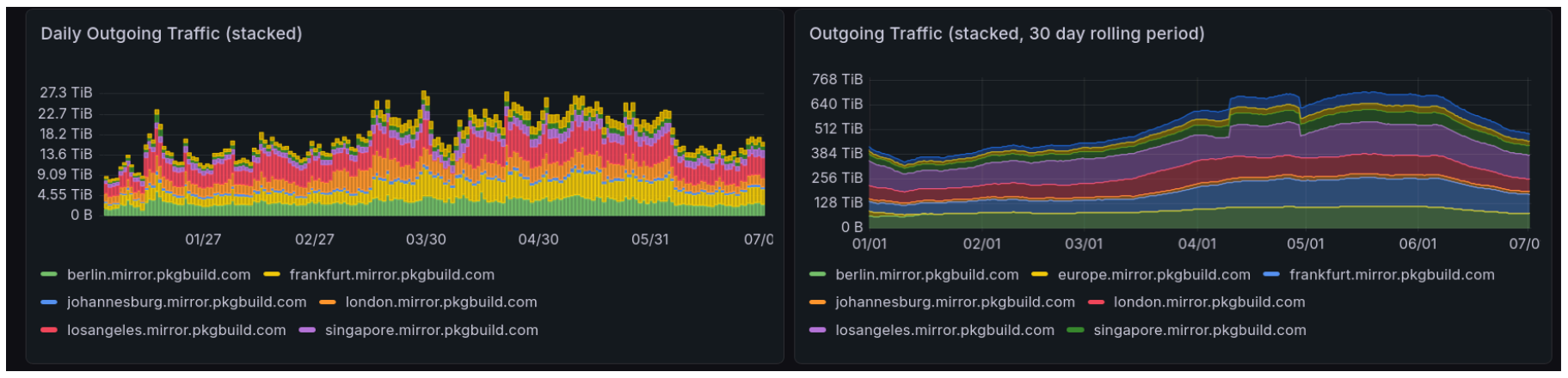
Fastly CDN 📬



(2026-01 – 2026-07)

➡️ Cache consistency excourse?

GeoMirrors



(2026-01 – 2026-07)

Arch Linux User Repository (AUR) 🤠

- Scope: 108k Packages / 141k Users / 70 Admins
- **DISCLAIMER** (…)
- AURweb
- goaurrpc

debuginfod 🐛

- binary ➡️ debug package ➡️ debuginfod
- `$DEBUGINFOD_URLS`
- `valgrind`, `gdb`, `systing` etc.

DRM Panic Screen 🐛



github.com/kdj0c/panic_report

➡️ Talk

Reproducible builds 🔁

https://reproducible-builds.org/docs/definition/

https://reproducible.archlinux.org/

💩 to deal with — 🤖

- People scripting & Downstream distributions 🙄
- `ericc-ch/copilot-api#262` 😠
- Scraping 🙄➡️😡

💩 to deal with — ⚖️

- Moderating content (CSAM etc.)
- Cease-and-desist (IDE, sdks, emulators)
- Evaluating sponsorship contracts
- Age verification laws

💩 to deal with — 🦠, 🎩 & 💣

- Malware
- DDoS
- Credential leaks & hacked accounts
- Emergency patching & security embargos

Get involved

https://wiki.archlinux.org/title/Getting_involved

https://whatcanidofor.archlinux.org/

Q&A + Discussion

About me

Christian Heusel — christian@heusel.eu

- Freelance MLOps / DevOps Consultant
- FOSS:
  - Kubeflow / Kubeflow Notebooks
  - Arch Linux
- GitHub
- LinkedIn
- Arch Linux Gitlab