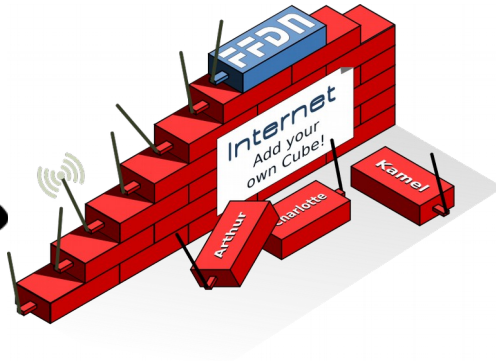# YunoHost and the Internet Cube
NGI Pointer Project

Putting users back in control of their digital life through
decentralized, user-friendly,
community-operated libre platforms.

June 1$^{\text{st}}$, 2020

Introduction

YunoHost is a free and open-source server distribution aiming at simplifying and democratizing server administration. It promotes Internet decentralization and user control. We consider that the ability to self-host one's data and services a corner stone of a more private and user-centric Internet. We believe that successfully building the decentralized Internet implies to reduce the technical and human costs involved. It must be accessible and done by the general public, and not just a tech elite.

The goal of the project is that managing a server should be as accessible and simple as having a desktop computer. Our current community is composed of various user profiles: non-technical users, amateur sysadmins, small communities, IT professionals… Most of them are driven by the current state of privacy online and are involved in various projects advocating Internet decentralization and user autonomy. YunoHost tries to satisfy the needs of those different groups, but before all values simple and clean user experience, and a reliable default configuration over customization.

The project is also tightly related to **the Internet Cube project**: a plug-and-play ARM-based computer which is preconfigured with YunoHost, a VPN client and WiFi broadcasting—allowing people to **easily start self-hosting and setup a privacy-enhanced internet access** that bypasses commercial ISP's non-neutral connections and surveillance. The Internet Cube is distributed by some non-profit alternative, associative, members-driven ISPs from the FDN federation to provide neutral VPN connections to its members.

Spirit of the YunoHost and Internet Cube projects

Context

The Internet has been the cornerstone of many technological and societal developments in the past decades. Its openness and its versatility allowed many people to create, build and develop new ways to communicate, create, work and live together. It also allowed the emergence of giants such as Google, Amazon, Facebook, Apple, Microsoft (hereafter GAFAM) and their business model built on the harvesting of user personal data to fund their centralized services, nowadays called "surveillance capitalism". Moreover, a few years ago, the Snowden Revelations showed how the global mass surveillance has gone well-beyond the simple purpose of fighting terrorism, and how it is partially enabled by the mainstream use of GAFAM's centralized services.

The result of both these elements is that nowadays, it is practically impossible to use online services without every steps being tracked, surveilled and probed. The core nature of this status-quo undermines our privacy, our rights and freedom, and more generally the balance of power in our society.

Privacy through independence

Self-hosting and YunoHost are a direct answer to the GAFAM hegemony, as it allows the general public to take back control of the services they use. People should not have to be forced to rely and trust commercial third-parties with handling their personal email, documents, images, music and social networking. Instead, by being able to have and manage their own server, people effectively emancipate themselves from those centralized services, and regain control over their personal data and metadata.

Freedom through interoperability

Centralization also means that a handful of large tech companies can dictate the rules, effectively creating walled garden in which people slowly become captive. In contrast, a more decentralized internet, built upon Free, Libre and Open-Source software (hereafter FLOSS), also encourages diversity and interoperability. This is a necessary condition for people to effectively have the freedom to choose what services to use. This is among the reason why applications installable through YunoHost are FLOSS.

Catalysing the building of the decentralized internet

But decentralization, and the interoperability and freedom that comes with it, can only become effective if its adoption goes beyond a critical mass. As long as it remains marginal, centralized and proprietary services can still impose their terms and refuse interoperability. We must therefore facilitate its construction by reducing the technical and human cost involved. This is yet another motive for the core goal of YunoHost to reduce the complexity of server administration: beyond personal servers, it should also allow the creation of a large number of small-scale organization (c.f. the CHATONS and Libre Hosters projects) that provide online services to people who do not practice self-hosting. This is also relevant considering the emergence of federated social networks which, for it to be meaningful, requires to have instances easily to deploy and maintain on the long-term.

Overview and ambition with this NGI pointer project

YunoHost and the Internet Cube successfully developed tools that drastically reduce the cost of setting up and maintaining one own's server. So far, the solution has been mostly used by early adopters who are not afraid to tinker. We believe that the project can go one step further to be able to reach a larger audience through two complementary approaches.

1. Creating a digital home for everybody with Yunohost

The current communication, documentation and general aesthetic of both projects is mostly designed for tinkerers. Similarly, the initial setup remains complex to some extend and lack a proper UX analysis. We believe that the projects can go one step further and reach a larger and even less technical audience by iterating on the tone and narrative. Here, we are thinking about individuals who are not familiar with Internet architecture concepts (such as servers) and could be interested in setting up a micro-platform to host services for themselves, their friends/family circle, small association, classroom, etc. They should find in YunoHost and Internet Cube a spot-on solution for their use case, that make them feel confident and capable, and they should be able to set-it up in just a couple of hours.

Milestones

1.1 Rework projects homepage, narratives and general communication
1.2 Simplify the installation procedure for Yunohost
1.3 Integrate UX studies and build a more powerful administration interface
1.4 Research innovative solutions for user support

2. YunoHost for small-scale community-operated libre platforms

While self-hosting is one strategy in the big picture of internet decentralization, YunoHost can also be (and is already) used as a basis to build small-scale community-operated libre platforms in the veins of the CHATONS and Libre-Hosters projects, or in schools or other contexts with around 500 users. In order to generalize this concept, these platforms must be able to provide competitive alternatives to GAFAM in terms of cost, features, reliability and user experience. Here, we therefore want to focus on integrating several features to help the management of such platforms, and to reinforce YunoHost's application catalog around high-profile solutions that address key user needs. Overall, YunoHost should become a well-known stack to create and maintain such a platform, and a team should be able to bootstrap it in just a couple of days.

Milestones

2.1 Extend user management capabilities (autonomy, scale)
2.2 Build an app catalog with competitive alternatives to GAFAMs services
2.3 Design an adequate front-end and user portal for small-scale platforms

Detailed Milestones

1. Creating a digital home for everybody with Yunohost

Milestone 1.1 Rework projects homepage, narratives and general communication

- Conduct UX studies of projects homepage, target audience and general communication
- Build a communication plan
- Draft a new narrative to present the projects that is understandable and appealing to non-tech users
- Produce new graphic elements (logos, illustrations, sketches)
- Produce new homepages for yunohost.org and internetcu.be
- Create two presentations videos for yunohost.org and internetcu.be

Specific validation criteria

- New users without prior knowledge are able to understand the stakes of the project, that it is within their reach and are enthusiast to try it
- The new homepage and graphical elements implement common practices for accessibility
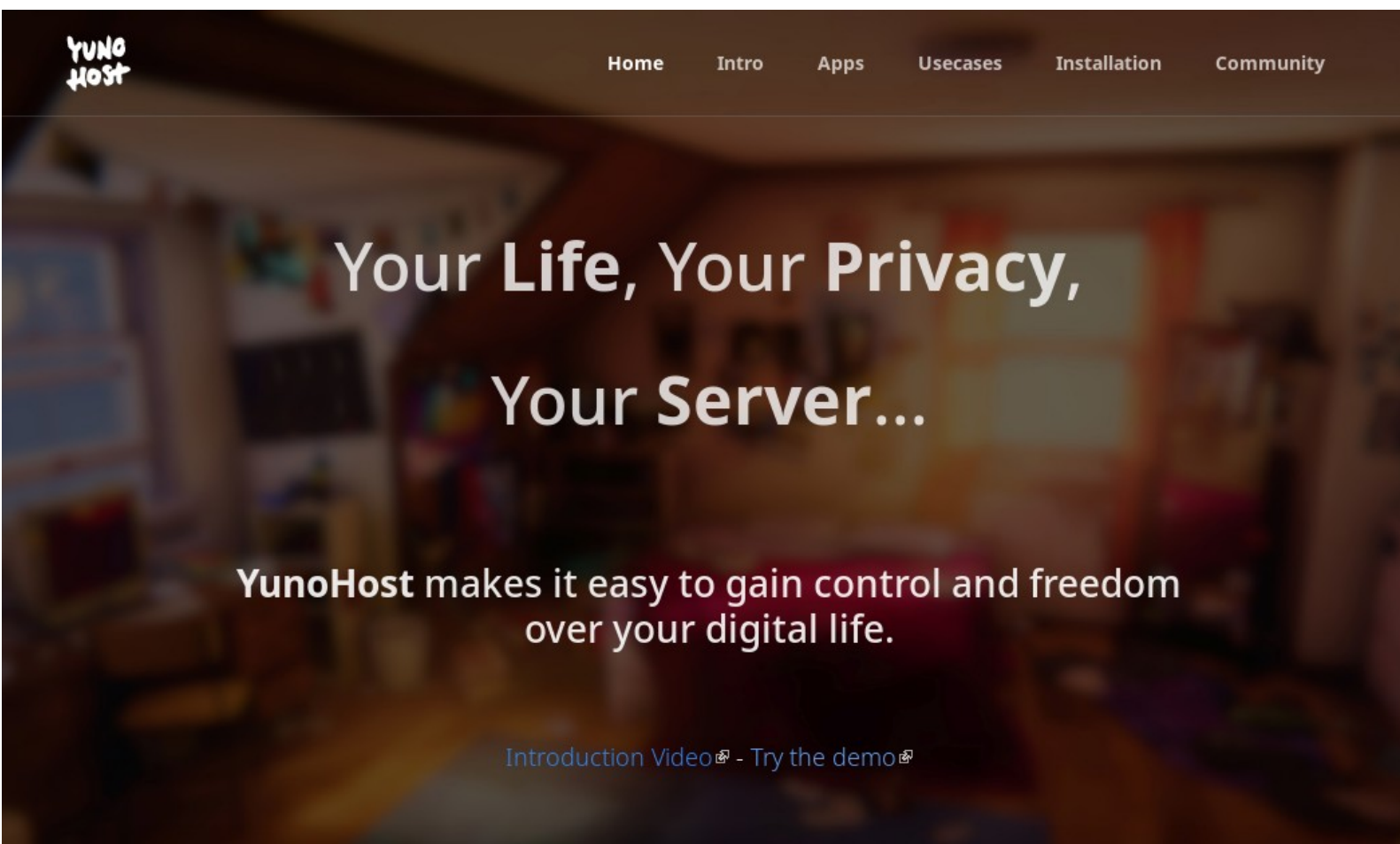
Milestone 1.2 Simplify the installation procedure for Yunohost

- UX study of installation procedure and common issues
- Simplify installation documentation and steps
- Installation videos

Specific validation Criteria

- New users without prior knowledge are able to deploy a VPS server autonomously in 1 hour
- New users without prior knowledge are able to deploy a server using an old computer in 3 hours

Milestone 1.3 Integrate UX studies and build a more powerful administration interface

- UX study of web administration panel
- Rework / fix UX issues in web administration panel
- Extend the possibilities of the webadmin by using modern frontend technologies (e.g. progressive apps using VueJS …)

Milestone 1.4 Research innovative solutions for user support

- Be able to ask for support directly from the webadmin with all information needed to get efficient support
- Suggest automatically some solutions from documentation or forum
- Integrate Debug-me to get interactive help from a friend, a professional or the YunoHost Team

2. YunoHost for small-scale community-operated libre platforms

Milestone 2.1 Extend user management capabilities (autonomy, scale)

- Add registration features (users are able to register directly or using invitation links)
- User password recovery or send a request to admin..
- Be able to scale and manage up to about 500 users (benchmark SSOwat performances, optimize SSOwat json, adapt admin interface, ..)

Milestone 2.2 Build an app catalog with competitive alternatives to GAFAMs services

- Identify 10 high-profile apps that address the key user needs, actively maintain their packages and improve their integration
- Improve app catalog ergonomy and user experience
  - Integrate ~150 applications logos/icons in a 'unified' consistent way
  - Add screenshots for each apps
  - Improve presentation of apps inside the catalog (description, hardware requirements, accessibility…)
  - Be able to search an alternative to a tech giant service

Milestone 2.3 Design an adequate front-end and user portal for small-scale platforms

- Add an optional topbar to navigate between services easily (inspired by Framasoft, Sans-nuage.fr, infini.fr …)
- Improve SSOwat in multi-tenant context
- Rework user portal
  - Separated but interfaced with SSOwat
  - Add a public default homepage that list publicly available services and other info about the hoster (data location, membership conditions, terms of service …)
  - Rework the personal account management interface and application menu
  - Integrate proper introduction on the main page of each apps
- Ability to customize visual identity easily (logo, themes)

Budget

Milestones	Costs
1. Creating a digital home for everybody with Yunohost	
1.1 Rework projects homepage, narratives and general communication	9 000 €
1.2 Simplify the installation procedure for Yunohost	15 000 €
1.3 Integrate UX studies and build a more powerful administration interface	17 000 €
1.4 Research innovative solutions for user support	15 000 €
2. YunoHost for small-scale community-operated libre platforms	
2.1 Extend user management capabilities (autonomy, scale)	11 000 €
2.2 Build an app catalog with competitive alternatives to GAFAMs services	30 000 €
2.3 Design an adequate front-end and user portal for small-scale platforms	21 000 €
TOTAL	**118 000 €**

Annex. Current technical status and features

Overview

YunoHost is based on Debian GNU/Linux. Its setup includes basic services for the operation of a server, and in particular a fully functional mail stack and XMPP stack. One of the most important features of YunoHost is the ability to easily deploy FLOSS web applications in a few clicks without technical knowledge and manipulations, all those applications logins being linked together through a built-in single-sign-on (SSO). The project also include a high-level diagnosis tools that verifies common issues and provide advices to administrators on how to fix them.

To achieve its goal, YunoHost is built on a default, standardised FLOSS setup: a web server (Nginx), an SSH server (openSSH), a firewall, fail2ban, PHP, Mariadb, an XMPP server and a fully functional mail stack (including an SMTP server (postfix), an IMAP server (dovecot), a spam filter (Rspamd) and DKIM configuration) and a central authentication service using a built-in SSO relying on openLDAP.

In opposition to most other projects, YunoHost works by automating what a system administrator would have done by hand, instead of using complex and costly abstractions. This allows to keep the whole distribution lightweight and low-tech, so that it can be installed on an ARM board with as few as 8 Go of storage and 512 MB of RAM, and yet still be able to host a few apps decently. Being able to run on modest devices means for us that YunoHost is affordable and accessible to anyone - in addition to ecological concerns.

The administrator of the server can use the web administration interface (or an equivalent command line interface) to easily manage users, domains, applications, services, and backups. Each user on the server automatically gets a mailbox, an XMPP account, and access to some apps. Let's Encrypt SSL certificates can be installed in just a couple of clicks. YunoHost also provides its administrators with a high-level diagnosis tool to check for common issues (such as misconfigured DNS records, port forwarding, blacklisted email server, low system resources, …) and obtain advices on how to fix them to ensure that everything runs smoothly.

On top of this default configuration, web apps and other services can be packaged and integrated easily. The administrator can browse the app catalog and install any app conveniently. Once the installation in complete, the app can be used immediately by existing users. Thanks to SSO/LDAP integration, users may only need to log in once (in the user portal) to reach all applications. Applications may later be upgraded, backuped and restored by the administrator, just like the rest of the system.

Features summary

- Lightweight - can be installed on an ARM board, an x86 computer, or a VPS with only 256 MB of RAM and a handful of Go of storage

- Based on GNU/Linux Debian

- Fully FLOSS under aGPLv3+

- Multi-users, multi-domains

- Administration through a clean and simple web interface, or equivalent CLI

- Rich application catalog (~120 apps) which can be deployed in a handful of clicks

- Unified login to all apps through the user portal (SSO)

- Fully functional mail stack, out of the box

- An instant messaging (XMPP) server

- Let's Encrypt certificates installable in a handful of clicks

- Check for common issues using a high-level diagnosis tool

- Backup/restore system

- Decent security practices (firewall, fail2ban, Mozilla recommendations, …)

- Free and auto-configured dynDNS domain (nohost.me, noho.st, etc.)

- Hackable by technical users