CloudFleet Documentation

Release 0.1

The CloudFleet Team

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Contents

Welcome to the CloudFleet Documentation! Let's try to help you get started as soon as possible. Do you have your CloudFleet Blimp? If not, then you can order it now. You can also use your existing device, such as a Raspberry Pi.

If you're new here, we recommend that you start by reading the Getting Started guide.

CHAPTER 1

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Quick Start:

Getting Started

This document describes how to set up your new CloudFleet Blimp. If you feel more adventurous and would like to use your own device, like a Raspberry Pi, jump right here.

TODO: quickest possible way to get started for new customers, with any potential side-stories being linked to elsewhere in the docs.

Getting Started for Hackers

You want to use your own hardware or a virtual machine? You're at the right place! If you just want to use the CloudFleet Blimp, better go here instead.

TODO: quickest possible way to get started for hackers, with any potential side-stories being linked to elsewhere in the docs.

Assuming Raspberry Pi 2 (dm-crypt modules for the Cubox not set up automatically)

Order a CloudFleet service subscription

Go to https://cloudfleet.io/, fill out your domain info.

TODO: allow the upload of a OTP (or allow downloading of a random OTP and allow for e.g. a device labeled cf-otp to be plugged into the blimp on the first boot and use that instead of the mac address)

Set up your domain's DNS

TODO: make option to "use your own existing domain"

Maybe also move this to another page as an optional route "CloudFleet with your own domain"

Steps to set up a custom domain with a new Cubox:

- register a domain (e.g. Namecheap)
- point your blimp. DNS to CloudFleet's Pagekite frontend (the . in the end may or may not be necessary depending on your registrar)

```
<type>  <host>  <value>
CNAME   blimp   myblimp.net.
```

- point your domain's MX record to cloudfleet.cloudfleet.io

```
<type>  <host>  <value>                    <priority>
MX      @       cloudfleet.cloudfleet.io.   1
```

Prepare the Blimp's SD card

TODO: Explain how to burn the "golden image".

If you want to setup everything on a Debian Linux from scratch (for transparency or you maybe want to use an existing server), follow the detailed explanation of how to run Ansible playbooks to install everything.

TODO: add the OTP somehow

Prepare the key and storage USB devices

In the blimp repository, in the *scripts* folder is a script to format two USB devices with correct labels. It expects a key device path (e.g. /dev/sda) and a storage device path (e.g. /dev/sdb) **Warning: running this script on the provided devices will erase all data on them. Be sure to back up everything important!**

In Linux, run:

```
./scripts/format_usbs.sh <key device> <storage device>
```

`<key device>` and `<storage device>` refer to the block level storage devices (e.g. `/dev/sda/`) not partitions (e.g. `/dev/sda1`). If one has mounted filesystems from these devices at the runtime of the `format_usbs.sh` script it will fail. For example, the following script umount all filesystems from the `/dev/sda` device:

```
for fs in $(mount -l | grep /dev/sda | awk -e '{print $1}'); do umount $fs; done
```

Plug the USB devices into the device.

(on the next reboot the devices will be set up for our LUKS encrypted partition scheme)

This script is also available on the Blimp itself (if you ssh into it) and can be run as:

```
/opt/cloudfleet/engineroom/bin/cryptpart/wipe_disks.sh <key device> <storage device>
```

(typically, on the blimp, the 1st USB you plug in will be /dev/sda and the 2nd /dev/sdb, to help you visually distinguish them)

Documentation:

Technology

In this document we give a high level technical overview of CloudFleet. If you have any additional questions about how any part of CloudFleet works, feel free to drop us an email, open an issue or tell us about it on our forum. We'd love to get feedback from you!

Also, we're currently running a crowdfunding campaign to support the development of this software and offere pre-orders of packaged devices, so be sure to check it out on IndieGoGo!

Using CloudFleet consists of three main components:

- the Blimp hardware - a physical machine used as your Blimp
- the Blimp software - the open source software running on your Blimp
- CloudFleet services - a set of online services we provide to make the setup and usage of your Blimp easy and safe

Hardware

You can get a pre-packaged CloudFleet Blimp from us or you can setup *your own hardware or VM* as a Blimp. When you purchase your Blimp from us you get this device that you just plug into your router and power and it is ready for use:

Hardware changes fast, so it's possible that these specs might change soon, but this is the current hardware overview. The main hardware platform offered as the CloudFleet Blimp (and supported for those who want to "build their own lightsaber") is a Raspberry Pi 2 Model B. The machine's specification is:

- 900MHz quad-core ARM Cortex-A7 CPU

- 1GB RAM

Additional components that we package with the Blimp are:

- Custom case with CloudFleet branding
- 8 GB boot Micro SD card
- 32 GB storage USB
- Encryption USB key
- Ethernet & power cables

We also test our software on Debian amd64 VMs, we have some Solidrun Cuboxes that mostly work and we are open to patches if you would like to add support for some other hardware platforms.

Software

In a way, the CloudFleet Blimp is your personal data center and the Blimp software includes all the web applications being served from this data center to you.

Openness

All of the CloudFleet Blimp software is open source. This is a precondition for security – if you cannot inspect the code that is manipulating your data, how can you be sure what is it doing with it? It is of course not necessary for every person to inspect the source code, but the possibility of willing people being able to do so is a huge step forward in ensuring transparency and openness of CloudFleet as a privacy-protecting cloud platform.

All of the software that we develop that is running on the Blimp is open source and licensed under the GNU AGPLv3 license.

CloudFleet is all about bringing you the best of the open source world in an easy-to-use device. Our first approach is to always use existing solutions if they fit our requirements. Naturally, your Blimp includes existing open source code such as:

- Debian GNU/Linux OS
- Mailpile
- Pagekite
- cryptsetup
- Docker
- AngularJS

- ...

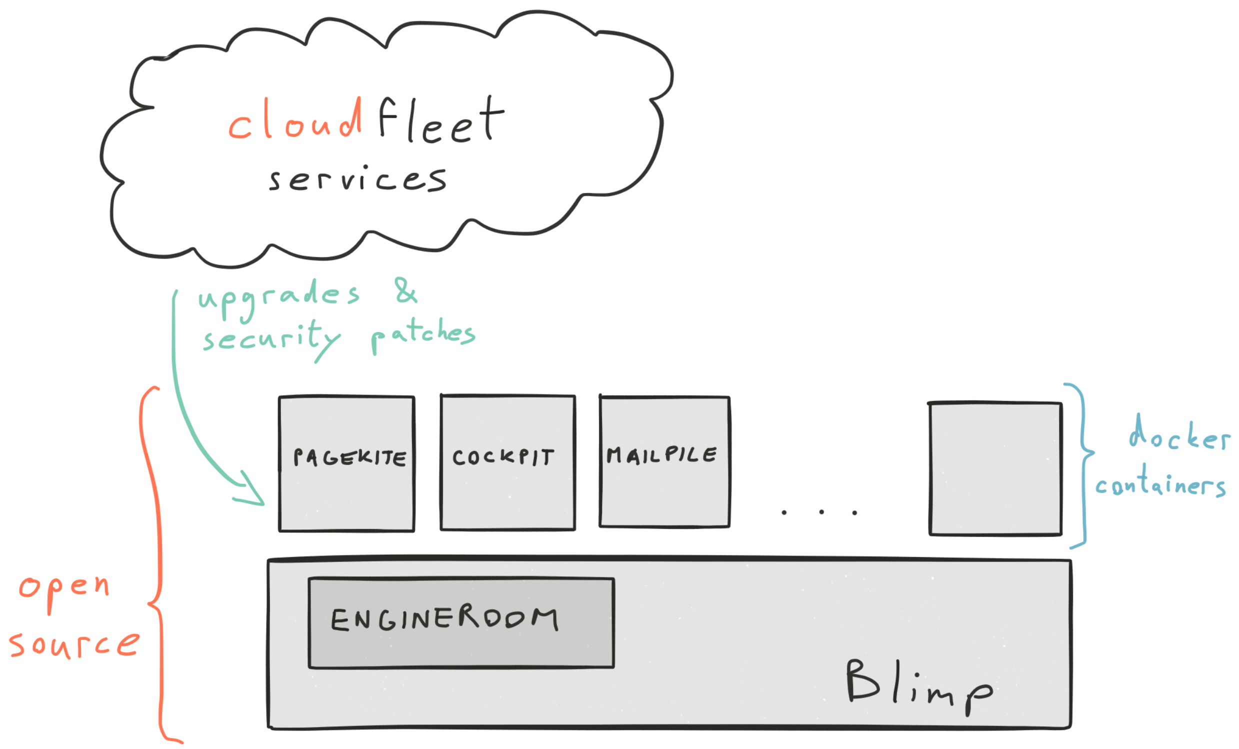
We strive to participate in the open source community and collaborate with other project developers, submit issues, discuss solutions and contribute patches as much as we can.

Architecture

From a high level, the CloudFleet Blimp consists of the base Linux running certain "bare metal" programs (e.g. cryptsetup for disk encryption) and a Docker daemon that drives the majority of the software components as Docker containers.

The use of Docker containers allows for uniform and automatic upgrades of all the software components, no matter what their internal technology is. For example, some of the containers include Mailpile written in Python or the Blimp Cockpit (web dashboard) written as a JavaScript app and they are both upgraded in the same way by pulling in newer versions of the Docker images built from the open GitHub repositories and published in our private ARM Docker registry *marina.io* that we provide as part of the *CloudFleet services*.

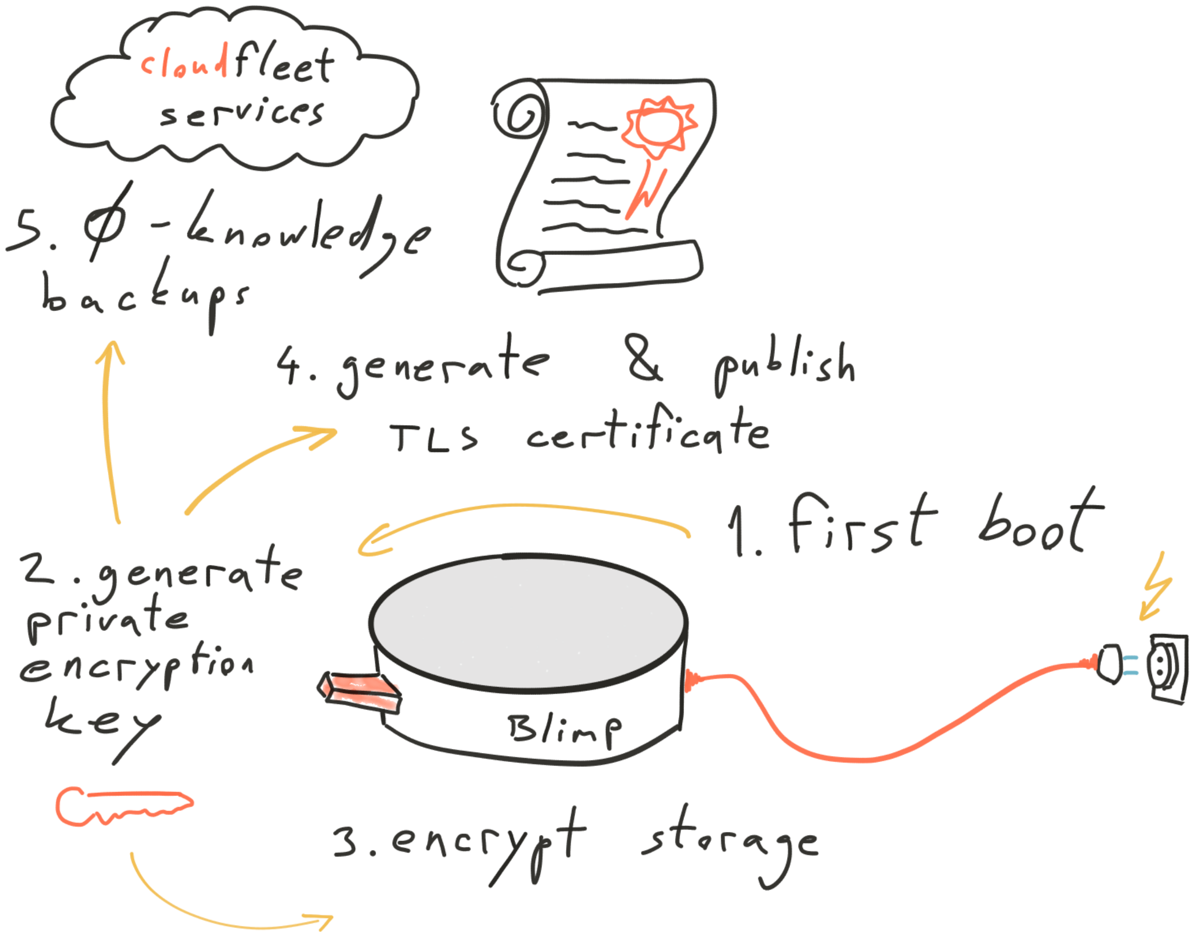
This containerized architecture is illustrated in the following diagram:



Startup Workflow

Our goal is to protect the privacy of CloudFleet users as much as possible – even we must not be able to access anyone's private data. Towards this end, we carefully crafted the startup workflow so that all of the sensitive private encryption keys are generated when the users first plug the Blimp in at their home, where it is under their control.

This startup workflow is illustrated in the following diagram:



The source code for this process lives in the Engineroom repo. During the first boot (when the device is with the user), the Blimp detects the empty storage and key USBs. It randomly generates the encryption key pair, storing the private key on the encryption key USB. This key remains accessible only to the user and should be removed from the Blimp after it fully boots and kept safe (preferrably in multiple copies).

Once the encryption key USB is prepared, the *storage USB* is encrypted for the user's data, a *TLS certificate* is generated and published for encrypted HTTPS web traffic and automatic encrypted *zero-knowledge backups* of the user's data are started.

Access

You access the CloudFleet Blimp software as a responsive web app using your browser. You can access it from anywhere.

Domain

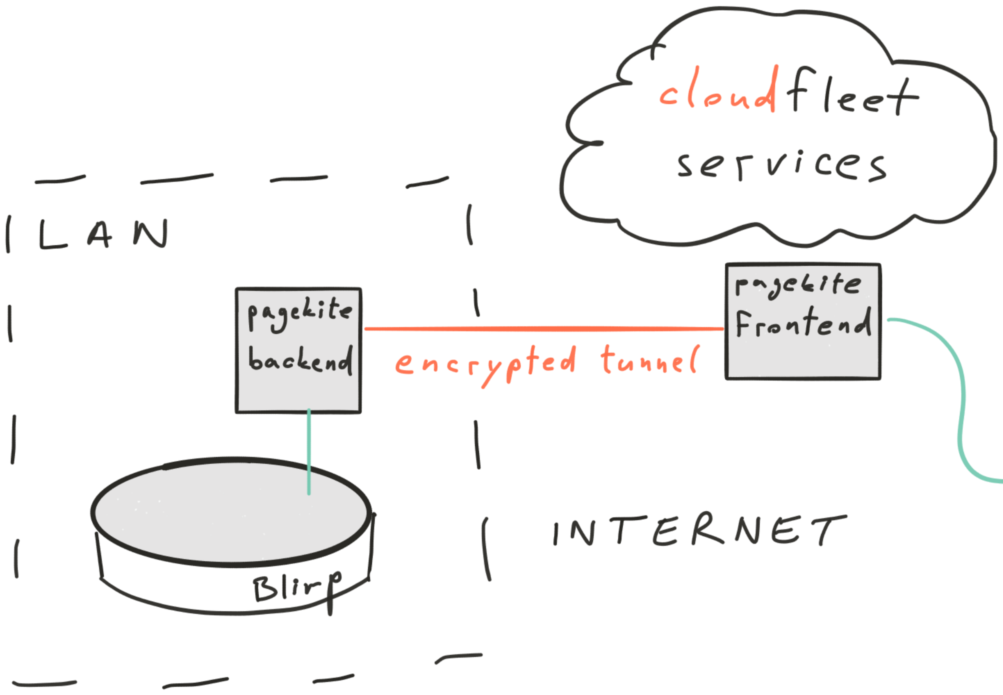
During the order process of the CloudFleet Blimp (or the CloudFleet services in case you are using your own hardware), you select a custom domain you want to use to access your Blimp. Having a private domain and not just a subdomain is important, because it allows us to publish your private TLS certificate for use with that domain (multiple subdomains share a single TLS certificate).

For example, if you get a domain *johndoe.com*, your Blimp will be accessible at https://blimp.johndoe.com, you will be able to receive email as john@johndoe.com (aliases are also possible) and we will enable you to use the root domain *johndoe.com* for your own private website as well.

This domain is registered and automatically extended for you as part of the *CloudFleet services*. You can use *your existing domain* as well if you prefer that.

Pagekite

No port forwarding setup necessary! We want CloudFleet to be a plug-and-play experience. To make this work, we partnered with the developers of Pagekite to integrate an access proxy and encrypted tunnel to enable you to reach your Blimp from anywhere on the internet. This public frontend is offered as part of the *CloudFleet services*.



Security Overview

Security is very important to us at CloudFleet and here are some of the features we've implemented specifically to help protect your data and limit the access to it only to you.

HTTPS Connection

We've already mentioned that as part of the *startup workflow*, a TLS certificate is generated and published for you. Right now we have a semi-automatic workflow for registering certificates for all users. In the future, we plan to integrate Let's Encrypt to make this process fully automated. A private TLS certificate paired with your custom domain allows you a secure, encrypted HTTPS connection from your browser to the Cockpit, Mailpile and any other web apps hosted on your Blimp.

PGP

Mailpile supports an easy workflow for encrypting your emails using PGP (Pretty Good Privacy). This allows you to exchange encrypted emails with your contacts who also use PGP.

Full Disk Encryption

The storage USB of your Blimp where the data is stored is fully encrypted using LUKS and the cryptsetup implementation. The disk can therefore only be decrypted for data access when your own private encryption USB key is plugged into the Blimp. Once booted, you should remove the encryption USB key and store it in a safe place. In case of Blimp theft, the disk cannot be accessed without the encryption USB key.

Read more.

Zero-Knowledge Backups

Since all the data is stored on a single physical device in the user's home, it is important to have data backups in case of malfunction, damage or theft. As part of the *CloudFleet services* we provide zero-knowledge backups where the data is first encrypted with your private encryption USB key and only then sent to our backup storage servers. This allows us to safely store your data for you without being able to read it.

Independent Usage

We believe in data autonomy and because of this want to give people as much liberty as possible in their Blimp usage.

You can use CloudFleet:

- on your own hardware (e.g. your own Raspberry Pi or other server)
- with your own custom domain (that you maybe already own) and set up your own DNS rules
- without our Pagekite frontend if you would rather set up port forwarding on your router

For any other scenarios you think of, we will strive to provide as much flexibility as we can, because we want CloudFleet to be usable as open source software and not just in combination with our services. The services we provide are there just to make the setup and usage experience safe and easy for people who don't know how (or don't have time) to perform the necessary technical steps manually.

To get started using CloudFleet independently, the QuickStart for hackers is a good entry point. Also, feel free to look at the source code, open issues or talk to us otherwise.

CloudFleet Services

CloudFleet provides a set of centralised services to our subscribers to make the usage of your CloudFleet Blimp simpler and safer. The services are optional.

Providing these services takes time and money, so we provide them as a paid subscription plan. They are also our main source of income to work sustainably and further develop the open source parts of CloudFleet, so by paying for the CloudFleet services your sponsor the open source project.

Here is a list of the features you get by paying for a CloudFleet services subscription:

- custom domain registration and prolonging
- software upgrades & security patches - via the CloudFleet GitHub repositories and our private ARM Docker registry *marina.io*

- Pagekite public frontend - for global access
- zero-knowledge backups - automatic incremental encrypted backups of all your data that you can only access using your private encryption key
- public-IP mail relay - for white-listed email transport (mail servers from dynamic IP addresses are often blacklisted as spam by other mail providers)