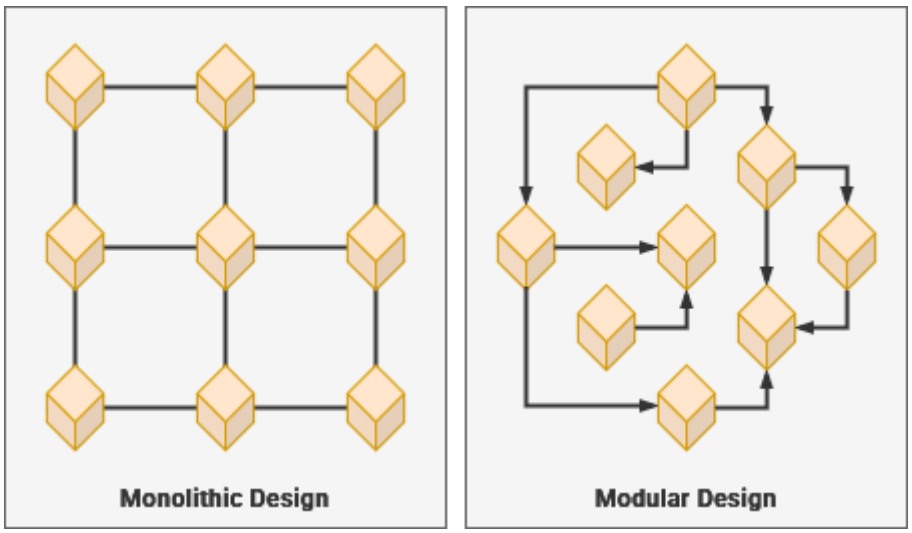
Background

Many people know how to install a computer program, but wouldn't even know where to begin if asked how the cloud works. Computers and their networks have been intentionally designed to be abstract – masking inner depths though a shared common language. These systems are a collective of parts working towards a shared desired outcome.



We leave a mark on the spaces left in our care and our personal decisions have reverberating effects that can be felt by others. When we create digital spaces, we must not forget the effect we have on our physical world – from the server in our garage to the data center down the street.

As we increasingly rely on the Cloud (or digital services hosted on someone else's computer), we must consider how this affects our personal privacy and security. The "Cloud" has taken control over the way corporations handle digital infrastructure. We have the right to control our digital ecosystem.

cloud

What is the Cloud?

By 2025, an estimated 96% of corporations will rely on it – with a majority of data stored outside their business. Everyday consumers have been forced into the "Cloud" alongside them. But, what does this mean and how does it work?

Open-source software solutions can put us back in control of our digital experiences. By joining these open collaborative communities, we can add diverse voices throughout their growth process.

Learning Objectives

Anyone can learn to host their own server, but there are questions we need to ask ourselves before we do. How does power translate into responsibility?

Hardware	**Practical** Be able to assess computer hardware components, install a working operating system and host a simple web server using open-source cloud computing technologies.
Engineering	**Technical** Understand the historical context, significance, and potential applications for cloud computing.
Diversity_1	**Social** Explore the role that cloud computing has on mediating the relationships between people, places, communities, and “Technology”.
Psychology	**Personal** Critically analyze and assess your relationship with "Technology" and the vulnerabilities that can arise through reliance on them.

Before you make the decision to build a server, it may be helpful to learn more about me – the author.

About the Author keyboard_arrow_right

What You'll Need

Aside from curiosity and hardware, you will need to create the space for reflection – about yourself and your relation to others. While you don't need to know how to write code, you must be comfortable thinking critically and logically. Confidently communicating roadblocks will be a strength and help you succeed.

As for hardware requirements, you can fulfill each at various price points, including free and low-cost options where available.

Desktop_windows

Computer

$50 – $1500

You will need computer hardware to host your server. This can be anything from a Raspberry Pi to a dedicated tower server, new or refurbished. Create a budget server and upgrade it as the need arises.

cable

Accessories

$0 – $300

You will need a display, mouse and keyboard to interact with your computer, as well as cables and a USB flash drive.

language

Internet Service

$30+/month

You will need internet access for your home server. Preferably, it is a hardwired internet connection – such as cable or fiber – as opposed to wireless – like satellite.

Router

Router

$50 – $150

You will need a router that has Port Forwarding so it can forward traffic from the router to your home server. While not required, Dynamic DNS allows you to connect to your server without purchasing a domain name.

Vpn_lock

VPN Provider

Free to $9+/month

A Virtual Private Network provider is an excellent way to maintain privacy and anonymity on the internet. While self-hosting services, they can hide personal information like what you're downloading or what websites you're accessing.

Domain_verification

Domain Name

Free – $20,000

Accessing our server over the internet will generally require a domain name – such as example.com – and there is a wide price variability.

Before you commit yourself to this project, take this opportunity to explore everything you'll need to follow along. It's also important to reflect on how you will approach this learning experience.

Requirements **keyboard_arrow_right**

Format

"Your Personal Cloud" will be a five-part series, divided into five books through this digital repository. These will follow a book metaphor with chapters and pages, progressively leading the way through making your own server.

1. Hardware
2. Software
3. Services
4. Monitoring & Maintenance
5. World Wide Web

This will not be just about *how* to do it, but also a reflection of *how and why* we arrived where we are. When we take back responsibility for our digital selves, we also gain the power and community to shape the digital world. Your perspective is vital for creating equitable technologies. Together, we can learn how to talk back and forge a new relationship with technology.

This is a self-led learning experience geared towards personal reflection on your own time and in your own space. Each book will contain do-it-yourself guides that progressively build on the last, standing as tangible milestones for your progress. We will explore why computers came to be, how we first connected them and what that means for global communities as we continue forward together.

> These resources can be exported for your own personal archive.

These books will provide quick links to community-crafted resources – like Wikipedia – to help place ideas within larger concepts. Links within the text to academic, corporate and community resources will attempt to lend weight to the claims. Illustrations, digrams and visual resources are heavily leveraged to express and communicate abstract concepts.

A Project Notebook is offered alongside these lessons to keep track of technical notes, as well as to provide a central space for reflection and brainstorming. This can be printed – or downloaded as a form-fillable PDF – to act as a reference throughout all five books.

Process

We will be the same techniques and technologies used by many companies to host their own websites and cloud services. Created through community-powered projects, these technologies are robust enough for corporations while still accessible to someone looking to host a small home server.

> All of the software you will need is offered free-of-charge by the original developers and can be downloaded from their servers.

Group_work	**Debian** This community-maintained Linux operating system is used to power many corporate machines.
Group_work	**Docker** This open-source software can quickly setup secure "containers" – or applications running within their own isolated "virtual operating system".

Group_work

Portainer

This community-supported application makes it easy to create and destroy Docker containers from your web browser through an intuitive graphical interface.

Group_work

nginx

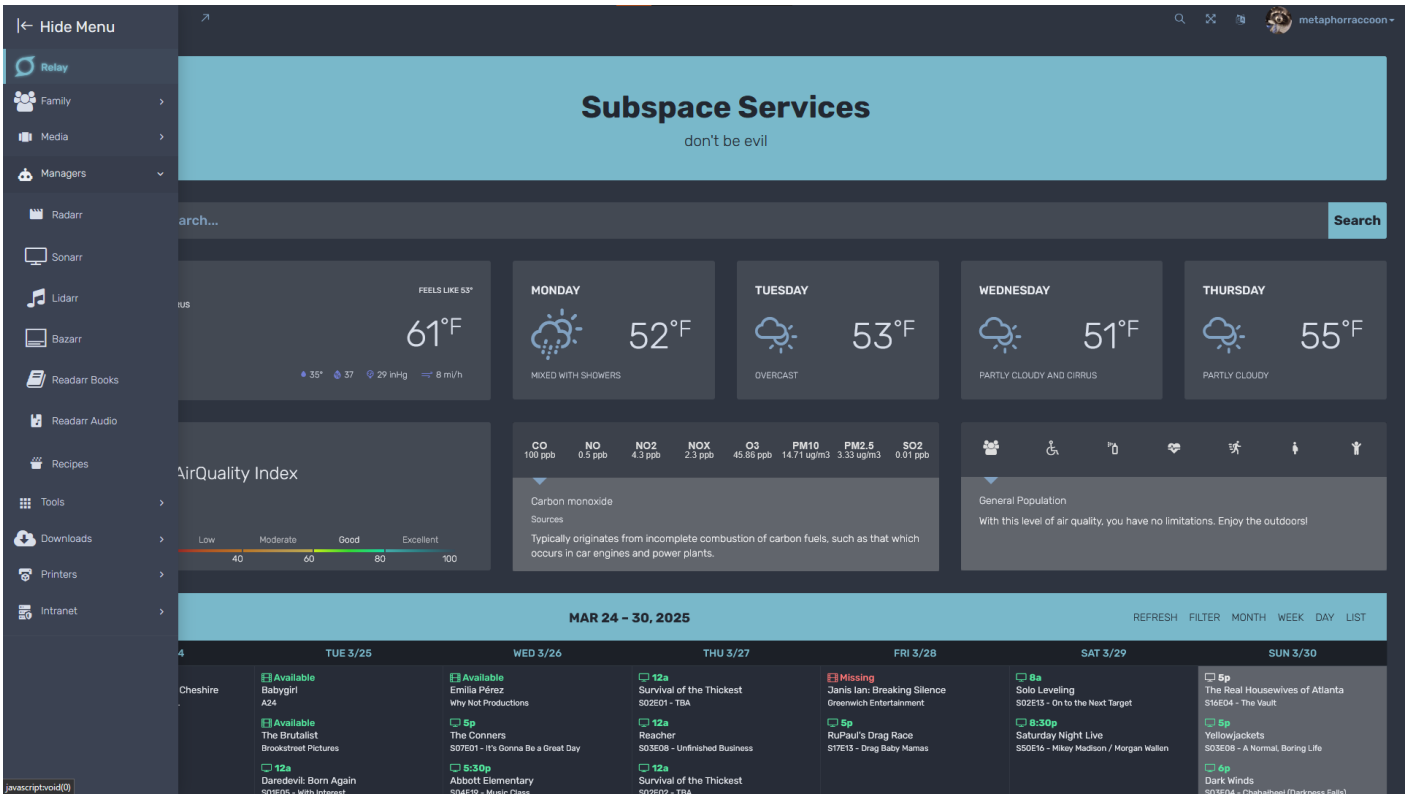
This open-source software is a web server that powers a large portion of the modern Internet and offers tools for securely connecting self-hosted applications to the World Wide Web for access remotely.

Once the foundation has been laid, there are a wide gamut of open-source applications that can be self-hosted on your server. These provide services ranging from cloud office suites to personal media management. We dedicate a book to each unique service, providing a more in-depth examination of the project, it's purpose and how to install it.

Outcome

You will be create a personal home server using available hardware – such as a Raspberry Pi single-board computer or a refurbished desktop computer. This will host a basic website that is available at a domain name that you own.

Installation will require physical access to a monitor and keyboard, but the server will be setup for remote desktop and command line access. This can be available only through your home network or using a browser-based web application to access them while away from home.



Many self-hosted services offer modern, responsive applications that you control through your browser or platform-specific software. Organizr enables you to create a personalized homepage to keeps your services in one place – on desktop and mobile.

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