

Demo: Creating a GitHub Alternative on EC2

CSC 410/510

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GitHub Alternatives

The screenshot shows the Gitea GitHub alternative interface. At the top, there is a navigation bar with links to 'README', 'Code of conduct', 'Contributing', 'MIT license', and 'Security'. To the right of the navigation bar are edit and settings icons. Below the navigation bar, the title 'Gitea' is displayed in a large, bold font. Underneath the title, there is a row of status indicators: 'release-nightly passing', 'Discord 915 online', 'go report A+', 'reference', 'release v1.25.4', 'code helpers 133', and 'backers 144'. There are also buttons for 'License MIT', 'Contribute with Gitpod', and 'localized 35%'. Below these, there are links for '繁體中文 | 简体中文'. The main content area is titled 'Purpose' and contains the following text: 'The goal of this project is to make the easiest, fastest, and most painless way of setting up a self-hosted Git service. As Gitea is written in Go, it works across all the platforms and architectures that are supported by Go, including Linux, macOS, and Windows on x86, amd64, ARM and PowerPC architectures. This project has been forked from [Gogs](#) since November of 2016, but a lot has changed.' It also provides links for 'demo.gitea.com', 'gitea.com', and 'cloud.gitea.com'.

繁體中文 | 简体中文

Purpose

The goal of this project is to make the easiest, fastest, and most painless way of setting up a self-hosted Git service. As Gitea is written in Go, it works across all the platforms and architectures that are supported by Go, including Linux, macOS, and Windows on x86, amd64, ARM and PowerPC architectures. This project has been [forked](#) from [Gogs](#) since November of 2016, but a lot has changed.

For online demonstrations, you can visit [demo.gitea.com](#).

For accessing free Gitea service (with a limited number of repositories), you can visit [gitea.com](#).

To quickly deploy your own dedicated Gitea instance on Gitea Cloud, you can start a free trial at [cloud.gitea.com](#).

Plan For Today

- Set up an EC2 Instance
 - Running Ubuntu
- Create a Gitea Service User
- Set up directories for new user
- Install Gitea
- Set up a Systemd service
- Install a database
- Create a git repo on our personal service!

Update Security Group Inbound Rules

Edit inbound rules Info

Inbound rules control the incoming traffic that's allowed to reach the instance.

Inbound rules						Description - optional
Security group rule ID	Type	Protocol	Port range	Source	Description - optional	Info
sgr-05c69e53d85ac083d	SSH	TCP	22	Custom	0.0.0.0/0	Delete
sgr-0994ae035d0438ce7	HTTP	TCP	80	Custom	0.0.0.0/0	Delete
-	Custom TCP	TCP	3000	Anywhere	0.0.0.0/0	Delete

[Add rule](#)

⚠ Rules with source of 0.0.0.0/0 or ::/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only. X

[Cancel](#) [Preview changes](#) [Save rules](#)

Update Security Group Inbound Rules

Inbound rules (3)							 Manage tags	Edit inbound rules						
<input type="checkbox"/>	Name	▼	Security group rule ID	▼	IP version	▼	Type	▼	Protocol	▼	Port range	▼	Source	▼
<input type="checkbox"/>	-		sgr-05e84b0e29d71c676		IPv4		Custom TCP		TCP		3000		0.0.0.0/0	
<input type="checkbox"/>	-		sgr-05c69e53d85ac083d		IPv4		SSH		TCP		22		0.0.0.0/0	
<input type="checkbox"/>	-		sgr-0994ae035d0438ce7		IPv4		HTTP		TCP		80		0.0.0.0/0	

Create an EC2 Instance

- Give it a name
- Choose Ubuntu 24.04 LTS (HVM), SSD Volume Type
 - Free-tier eligible!
- Choose the t3.micro instance type
- Create a new key pair (or use one if you already have one)
 - Give it a name,
 - Choose ED25519
 - Use .pem from Linux/Mac
- Set up a VPC (with defaults) if you need to.
- Set up 1 20GB gp3 Root volume.
- Click “Launch Instance”

SSH into the new instance

```
chmod 400 <pem file>
```

```
ssh -i <pem file> ubuntu@<ip address>
```

You get the public IPv4 address from the instance summary.

Update Ubuntu

```
sudo apt update  
sudo apt upgrade -y  
sudo apt install -y git sqlite3 curl ca-certificates
```

Create Gitea service user with real home

```
sudo adduser \  
  --system \  
  --shell /bin/bash \  
  --home /home/git \  
  --gecos 'Git Version Control' \  
  --group \  
 git
```

Create directories

```
sudo mkdir -p /var/lib/gitea/{custom,data,log}  
sudo mkdir -p /etc/gitea
```

```
sudo chown -R git:git /var/lib/gitea  
sudo chown -R root:git /etc/gitea  
sudo chmod 770 /etc/gitea
```

Install Gitea binary

```
curl -L https://dl.gitea.com/gitea/1.22.3/gitea-1.22.3-linux-amd64 \  
| sudo tee /usr/local/bin/gitea > /dev/null
```

```
sudo chmod +x /usr/local/bin/gitea
```

Installing emacs

```
sudo apt install emacs
```

systemd service

```
sudo emacs /etc/systemd/system/gitea.service

[Unit]
Description=Gitea
After=network.target

[Service]
Type=simple
User=git
Group=git
WorkingDirectory=/var/lib/gitea
ExecStart=/usr/local/bin/gitea web --config /etc/gitea/app.ini
Restart=always
Environment=USER=git HOME=/home/git GITEA_WORK_DIR=/var/lib/gitea

[Install]
WantedBy=multi-user.target
```

Enable and start service

```
sudo systemctl daemon-reload  
sudo systemctl enable gitea  
sudo systemctl start gitea
```

Debugging

```
sudo journalctl -u gitea -n 200 --no-pager
```

Set up Database

Not Secure 35.172.180.52:3000

Initial Configuration

If you run Gitea inside Docker, please read the [documentation](#) before changing any settings.

Database Settings

Gitea requires MySQL, PostgreSQL, MSSQL, SQLite3 or TiDB (MySQL protocol).

Database Type * SQLite3

Path * /var/lib/gitea/data/gitea.db

File path for the SQLite3 database.
Enter an absolute path if you run Gitea as a service.

General Settings

Site Title * Gitea: Git with a cup of tea

You can enter your company name here.

Repository Root Path * /var/lib/gitea/data/gitea-repositories

Remote Git repositories will be saved to this directory.

Git LFS Root Path /var/lib/gitea/data/lfs

Files tracked by Git LFS will be stored in this directory. Leave empty to disable.

Run As Username * git

The operating system username that Gitea runs as. Note that this user must have access to the repository root path.

Server Domain * 35.172.180.52

Domain or host address for the server.

SSH Server Port 22

Port number your SSH server listens on. Leave empty to disable.

Gitea HTTP Listen Port * 3000

Port number the Giteas web server will listen on.

Register a new user

Sign In **Register Account**  OpenID

Register

Username *

Email Address *

Password *

Confirm Password *

Register Account

Already have an account? [Sign in now!](#)

Create a repository

New Repository

A repository contains all project files, including revision history. Already hosting one elsewhere? [Migrate repository](#).

Owner *  richard

Some organizations may not show up in the dropdown due to a maximum repository count limit.

Repository Name *

Good repository names use short, memorable and unique keywords.

Visibility Make repository private

Only the owner or the organization members if they have rights, will be able to see it.

Description Enter short description (optional)

Template Select a template.

Issue Labels Select an issue label set.

.gitignore Select .gitignore templates.

Choose which files not to track from a list of templates for common languages. Typical artifacts generated by each language's build tools are included on .gitignore by default.

License Select a license file.

A license governs what others can and can't do with your code. Not sure which one is right for your project? See [Choose a license](#).

README Default

This is the place where you can write a complete description for your project.

Create a repository

The screenshot shows a GitHub repository page for 'richard/test-repo'. The top navigation bar includes links for Code, Issues, Actions, Packages, Projects, and Wiki. The 'Code' tab is selected. On the right, there are icons for RSS feed, Unwatch (1), Star (0), and Settings.

Quick Guide

Clone this repository Need help cloning? Visit [Help](#).

New File Upload File **HTTP** SSH <http://35.172.180.52:3000/richard/test-repo.git>

Creating a new repository on the command line

```
touch README.md  
git init  
git checkout -b main  
git add README.md  
git commit -m "first commit"  
git remote add origin http://35.172.180.52:3000/richard/test-repo.git  
git push -u origin main
```

Pushing an existing repository from the command line

```
git remote add origin http://35.172.180.52:3000/richard/test-repo.git  
git push -u origin main
```

Lock down config after install

```
sudo chmod 750 /etc/gitea
sudo chmod 640 /etc/gitea/app.ini
sudo chown root:git /etc/gitea/app.ini
sudo systemctl restart gitea
```

Terminate the instance (when you're done)

Instance summary for i-0738ecaf14bf61a61 (HelloGitea) [Info](#)

Updated 8 minutes ago

Instance ID [i-0738ecaf14bf61a61](#)

IPv6 address -

Hostname type IP name: ip-172-31-31-201.ec2.internal

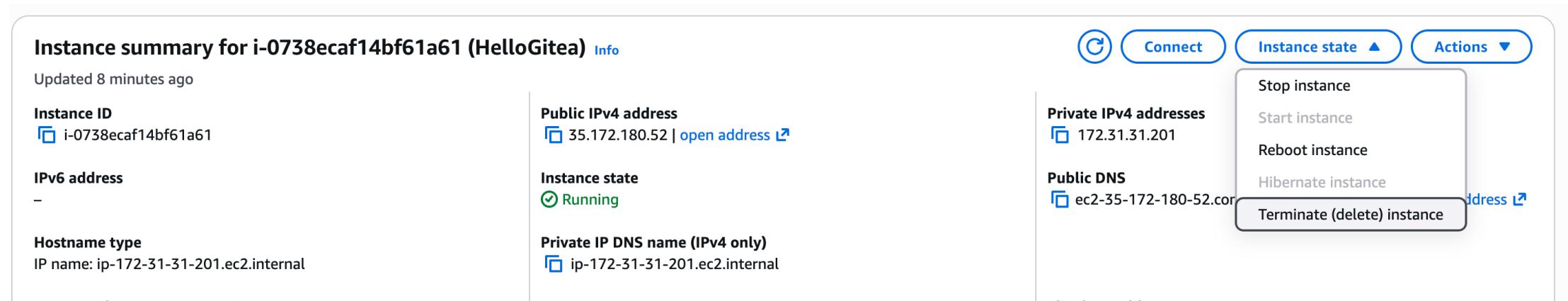
Public IPv4 address [35.172.180.52 | open address ↗](#)

Instance state [Running](#)

Private IP DNS name (IPv4 only) [ip-172-31-31-201.ec2.internal](#)

Actions ▾

- Stop instance
- Start instance
- Reboot instance
- Hibernate instance
- Terminate (delete) instance**



Going Beyond the Basics

- Next steps to get a GitHub replacement:
 - Put it behind HTTPS
 - Fix the public URL permanently
 - Enable backups
 - SQLite DB
 - Repositories
 - Config
 - Decide on Git auth method
 - Configure email
 - Lock down the instance
 - Restrict ports, force HTTPS, disable registration

Programs to know

- **chmod**
 - Change the permissions of a file or directory
- **ssh**
 - Log in to a remote machine.
- **sudo**
 - Run a command as the administrative user
- **apt**
 - Install, update, and remove software (binary packages)
- **adduser**
 - Create a new user and/or group.
- **mkdir**
 - Create a new directory
- **chown**
 - Change the owner and group of a file or directory
- **curl**
 - Download a file from a remote source.

Programs to know

- tee
 - Split
- emacs
 - Text editor. Very powerful.
- systemctl
 - Control operating system services and long-running processes.
- journalctl
 - Inspect and analyze log files collected by systemd-journald.