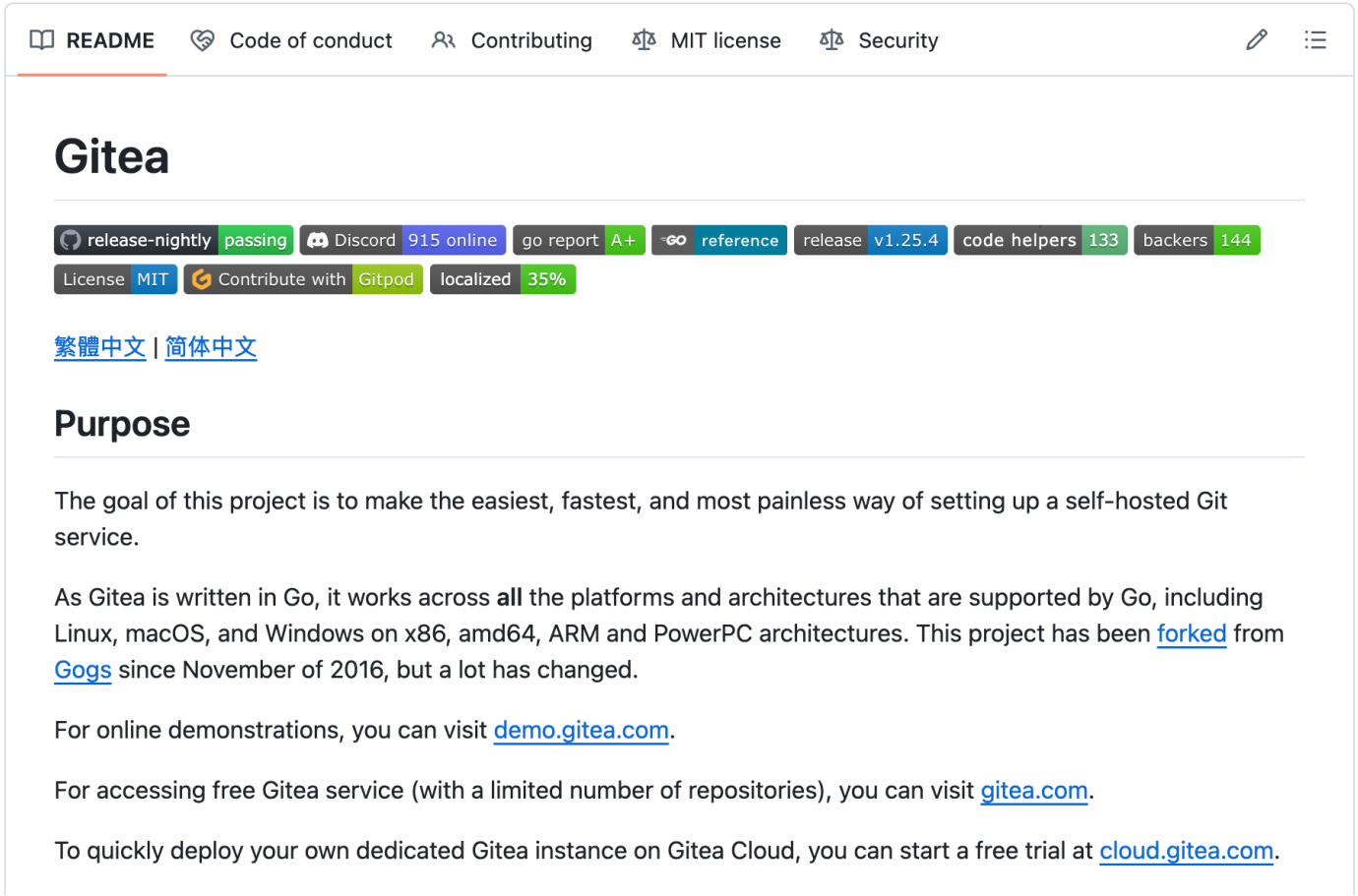
Demo: Creating a GitHub Alternative on EC2

CSC 410/510

Richard Kelley

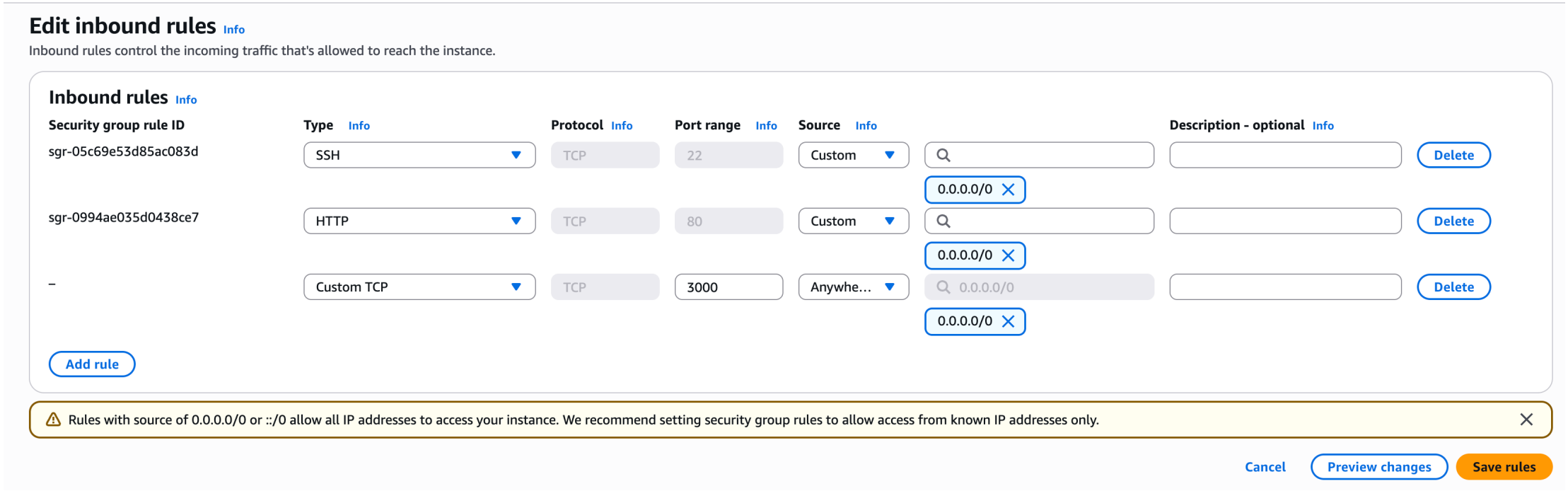
GitHub Alternatives



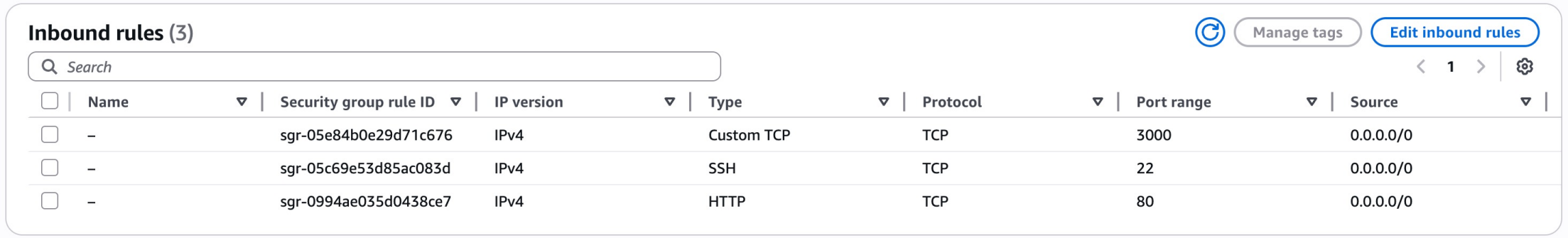
Plan For Today

- 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



Update Security Group Inbound Rules



Inbound rules (3)

Manage tags | Edit inbound rules

Search

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Name	Security group rule ID	IP version	Type	Protocol	Port range	Source
–	sgr-05e84b0e29d71c676	IPv4	Custom TCP	TCP	3000	0.0.0.0/0
–	sgr-05c69e53d85ac083d	IPv4	SSH	TCP	22	0.0.0.0/0
–	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
```

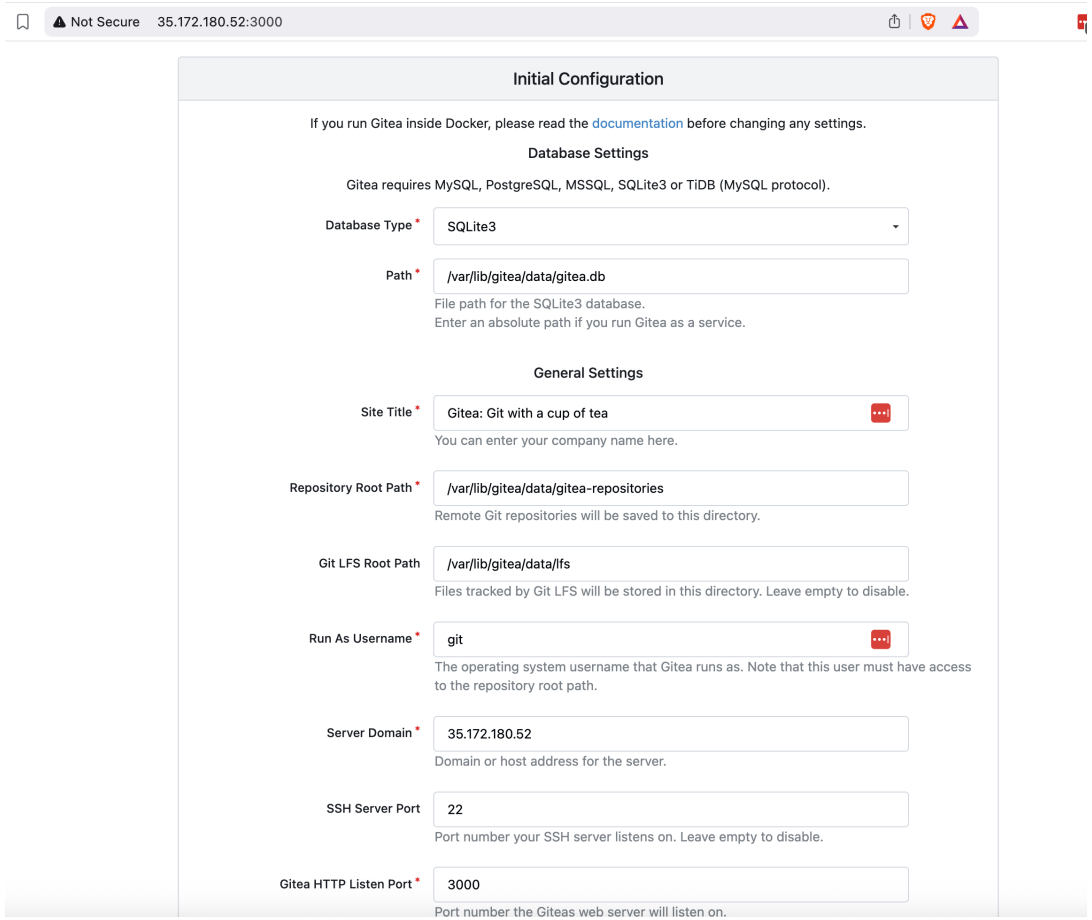
Enable and start service

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

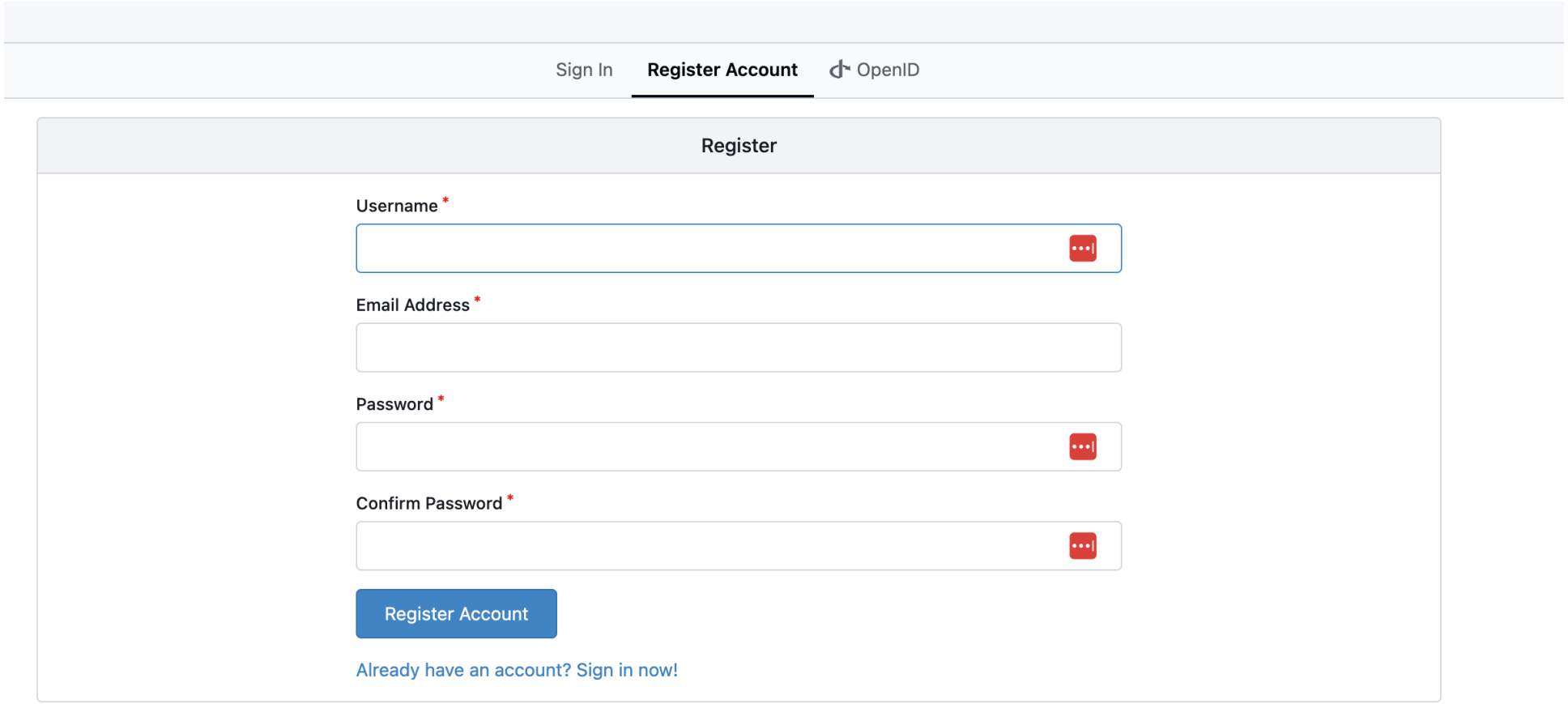
Debugging

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

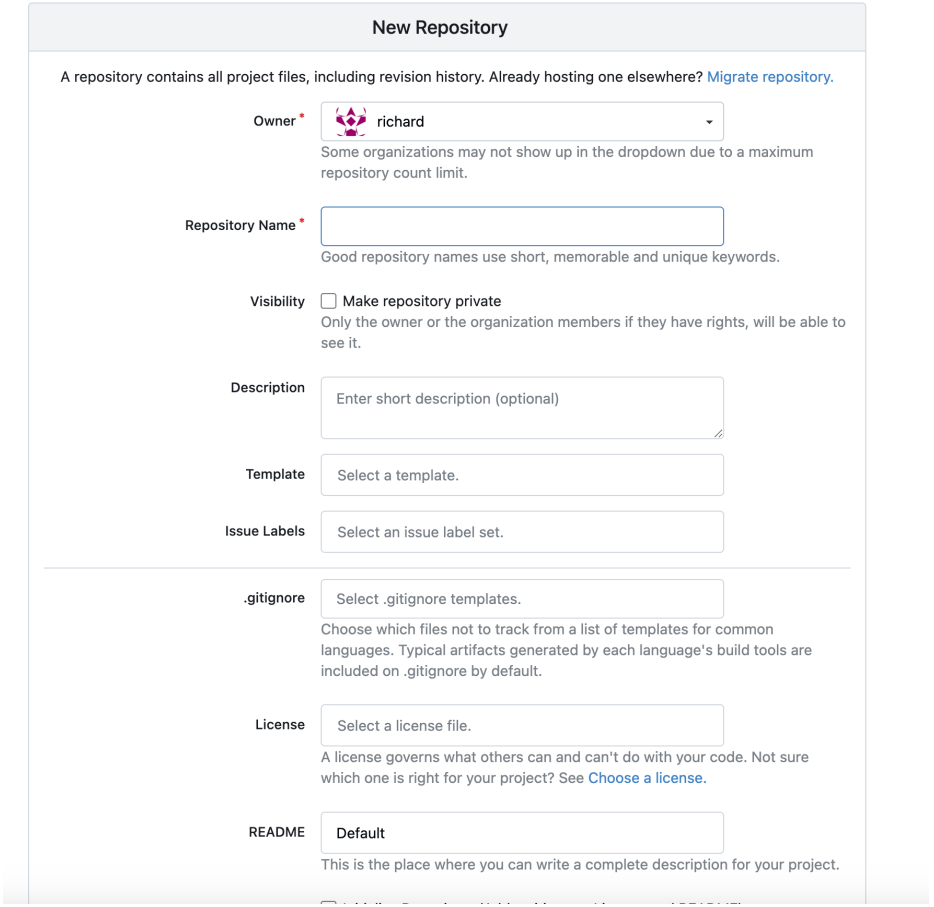
Set up Database



Register a new user



Create a repository



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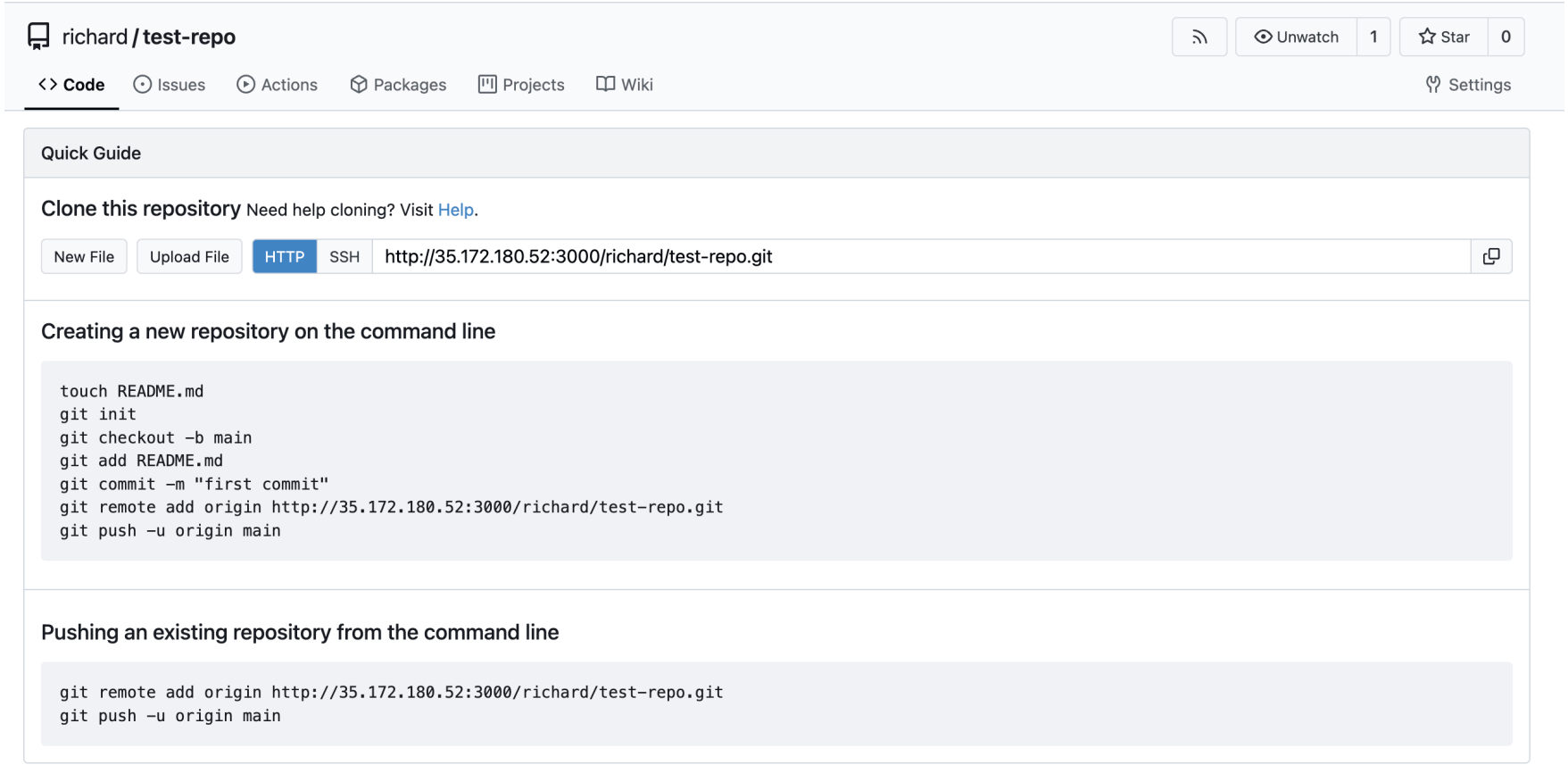
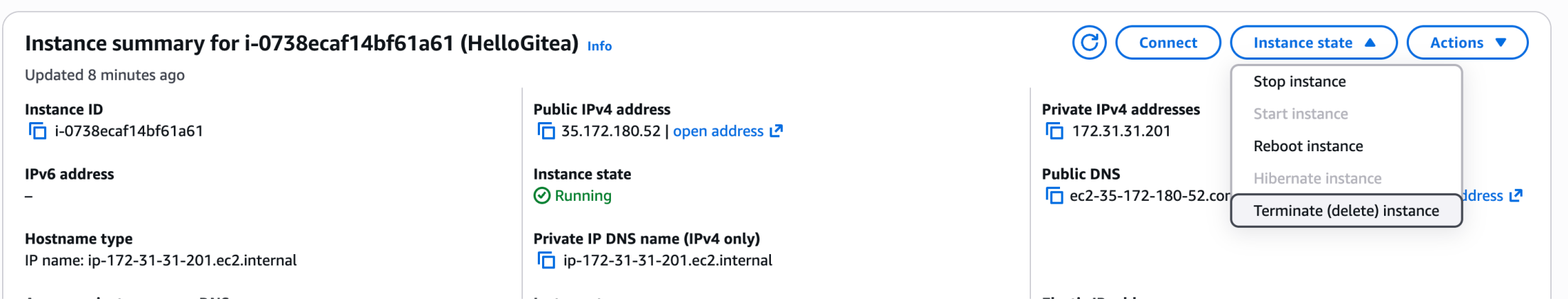


Lock down config after install

```
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)



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.