Cloud Server Project – YOURLS URL Shortener

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ICT171: Introduction to Server Environments and Architectures

June 9th 2025

Site available at https://ict171.com

GitHub Repository available at https://github.com/aeonr6/ict171-assignment-2

IP: 3.27.183.110

Domain: https://ict171.com

Setup Guide

This project was setup using Amazon AWS on a Linux Machine, and will assume you are doing the same. The steps can also be repeated in a Virtual Machine.

This project will assume you have created a Ubuntu EC2 instance that allows SSH, HTTP, and HTTPS traffic.

Passwords for the service have been provided in the .pdf in submitted to LMS

Linking IP and DNS:

For this project, I purchased an IP directly from Amazon AWS Route 53. When done this way, AWS automatically creates a hosted zone. This document will assume you do not have a hosted zone already created.

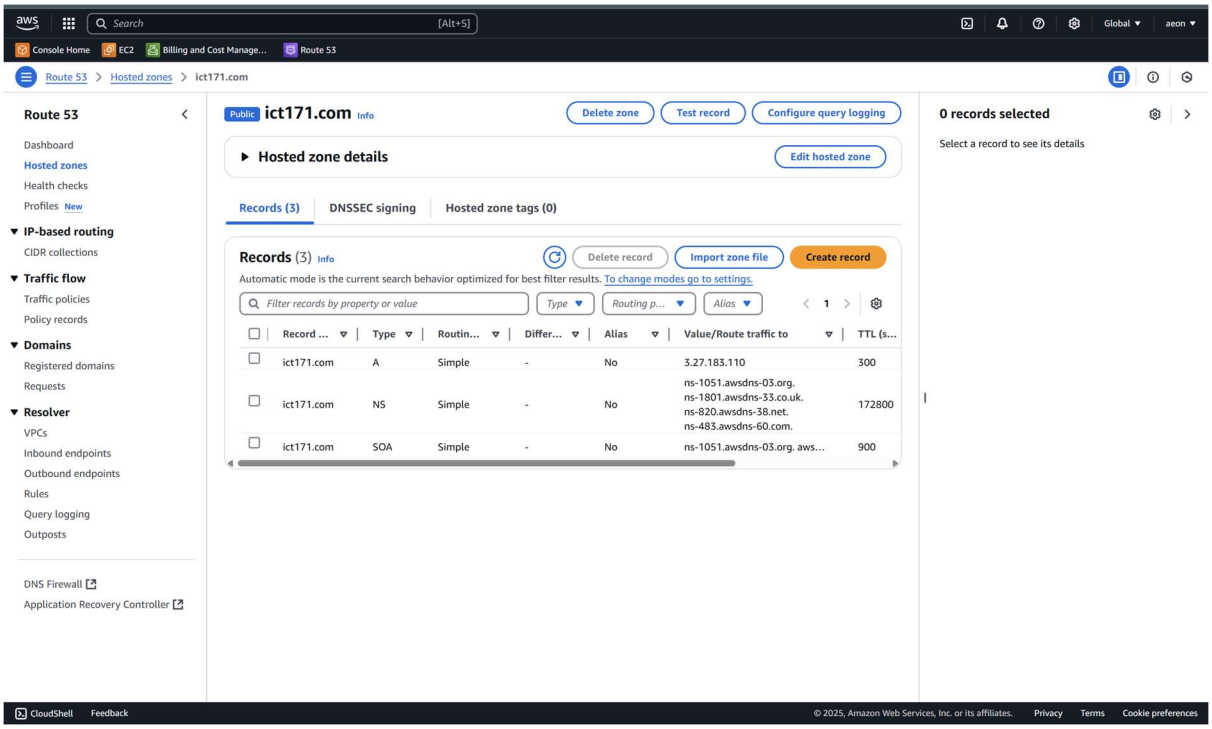
Start by navigating to Route 53 on the AWS website. Then, on the left hand side of the screen click “Hosted Zones”

In the Hosted Zones section, click “Create Hosted Zone” and enter your Domain Name into the box provided. Ensure it is set to public and click “Create Hosted Zone”

Then, click create record. This will likely create 2 records: one labelled NS and one labelled SOA. If you did not buy your Domain from AWS Route 53, edit the NS record so that it contains the name servers provided to you. You do not have to do this is you purchased a record from AWS

Click “Create Record” and select “A – IPV4”. Then, in the Value section, enter your EC2 instances public facing IP Address. Click “Create Record”.

It will then look something like this:



Hosting and Server

Begin by connecting to the cloud server via SSH

```
sudo ssh yourkeypair.pem ubuntu@ec2ipaddress
```

Ensure all apps are updated and upgraded using the command

```
sudo apt update && sudo apt upgrade -y
```

The -y automatically confirms the code

Then, download apache2

```
sudo apt install apache2 -y
```

Install php and its dependencies

```
Sudo apt install php libapache2-mod-php php-mysql php-cli php-curl php-mbstring
php-xml unzip curl -y
```

This will automatically download and unzip the required dependencies for php

Then install mysql using the command

sudo apt install mysql-server -y

You will then allow mysql to install a necessary server deployment

sudo mysql_secure_installation

This will then ask you a few setup questions that allow mysql to deploy safely

You will then configure the mysql settings by logging into the mysql server and creating a database

sudo mysql -u root -p

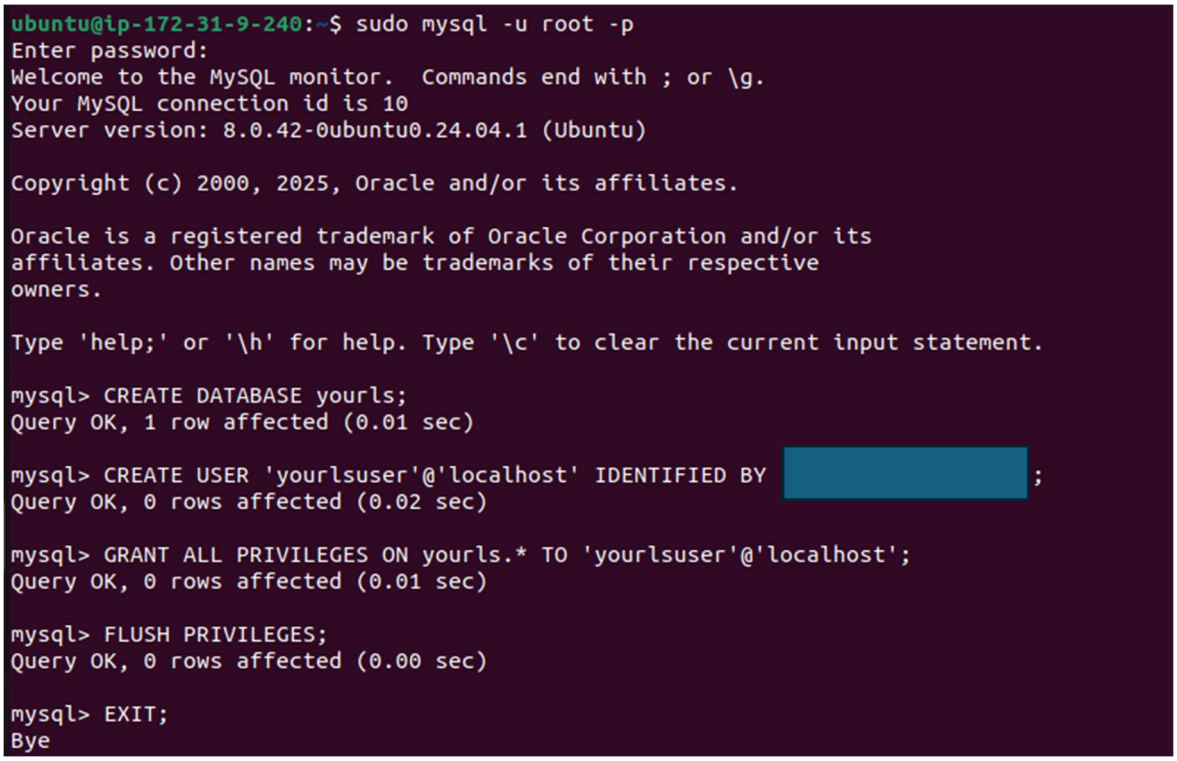
CREATE DATABASE yourls;

CREATE USER ‘yourlsuser’@’localhost’ IDENTIFIED BY ‘Password’;

GRANT ALL PRIVILEGES ON yourls.* TO ‘yourlsuser’@’localhost’;

FLUSH PRIVILEGES;

EXIT;



Then, exit the virtual machine and install yourls directly from the source to the computer you are working on. This is available at https://github.com/YOURLS/YOURLS/releases .

After installing yourls, transfer the file over to the EC2 virtual machine and unzip it

```
scp -i yourkeypair.pem YOURLS-1.10.1.zip ubuntu@ec2ipaddress:/home/ubuntu/

ssh -i yourkeypair.pem ubuntu@ec2ipaddress

unzip YOURLS-1.10.1.zip
```

Then, move the YOURLS file to /var/www/html. You will also need to move the .htaccess file as it is a hidden file. On some distributions, the .htaccess file will not exist. The code "2>/dev/null" hides the error in this case.

```
sudo mv YOURLS-1.10.1/* /var/www/html

sudo mv YOURLS-1.10.1/.htaccess /var/www/html 2>/dev/null
```

Then, Apache must be given access to the files so that it can read and write them. Restart Apache after this to ensure settings have loaded correctly

```
sudo chown -R www-data:www-data /var/www/html

sudo systemctl restart apache2
```

You then need to allow rewrite rules for Apache and edit config settings to allow changes.

```
sudo a2enmod rewrite

sudo nano /etc/apache2/apache2.conf

        <Directory /var/www/>

                Options Indexes FollowSymLinks
```

```
        AllowOverride All

        Require all granted

    </Directory>
```

```
sudo systemctl restart apache2
```

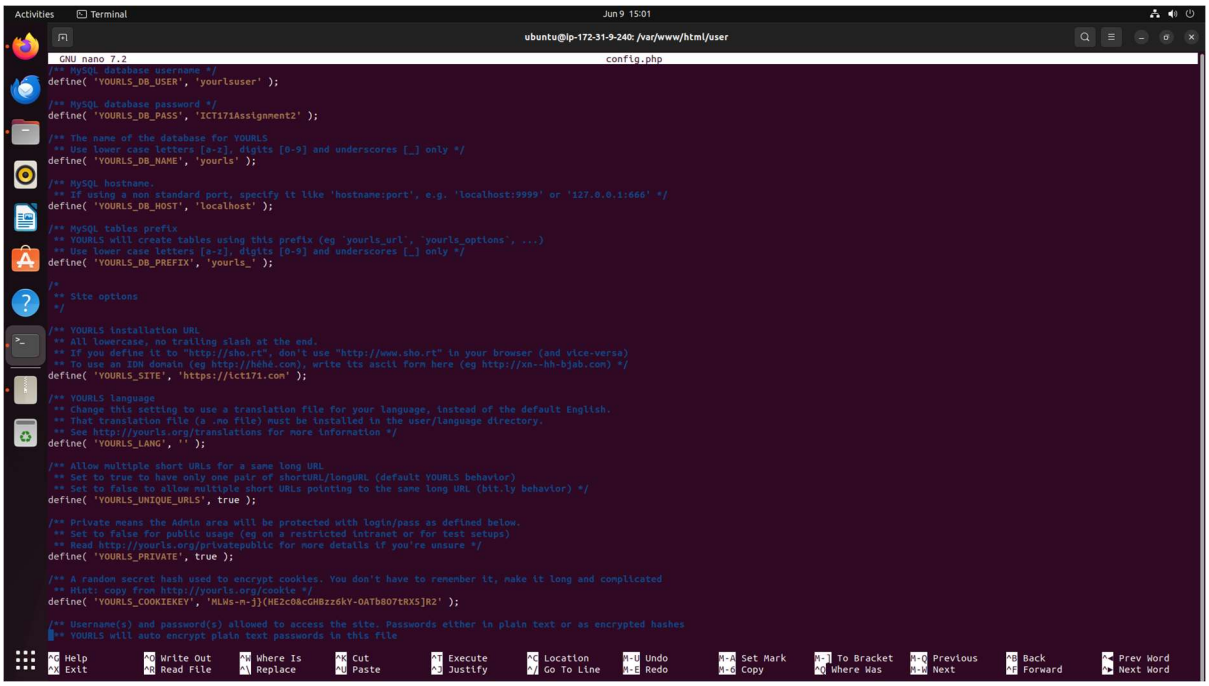
Then, you must create and edit the YOURLS config file.

```
cd /var/www/html/user

sudo cp config-sample.php config.php

sudo nano config.php
```

Ensure the above file contains the following on the required lines.

```
    define( 'YOURLS_DB_USER', 'yourlsuser' );

    define( 'YOURLS_DB_PASS', 'Password' );

    define( 'YOURLS_DB_NAME', 'yourls' );

    define( 'YOURLS_DB_HOST', 'localhost' );

    define( 'YOURLS_SITE', 'https://ict171.com' );

    define( 'YOURLS_PRIVATE', true );

    define( 'YOURLS_COOKIEKEY', 'A long random string' );

    $yourls_user_passwords = array(

        'admin' => ‘Password'

    );
```

This will look like this:



The cookie key required can be found at https://api.yourls.org/services/cookiekey/1.0/ as mentioned in the config document

The .htaccess file must then be edited and configured. In this, I have included an optional step to redirect https://ict171.com to https://ict171.com/admin

sudo nano /var/www/html/.htaccess

<IfModule mod_rewrite.c>

RewriteEngine On

#OPTIONAL STEP

RewriteBase /

RewriteCond %{REQUEST_URI} ^/$

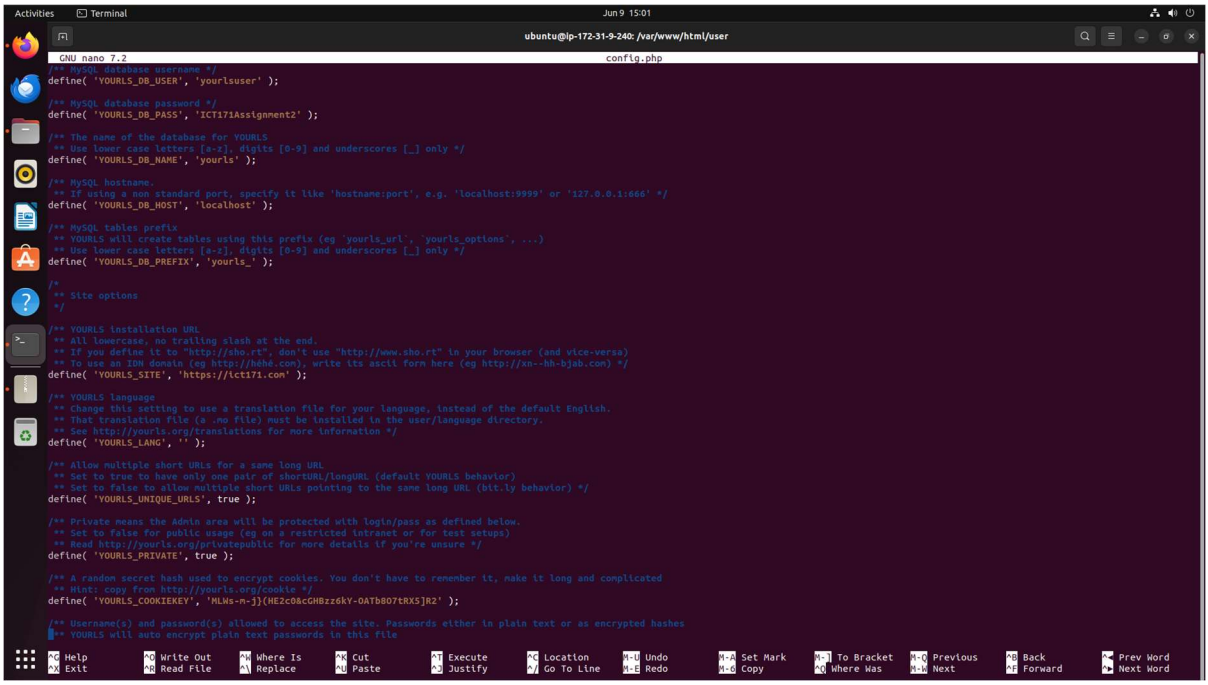
RewriteRule ^$ /admin [R=302,L]

#END OPTIONAL STEP

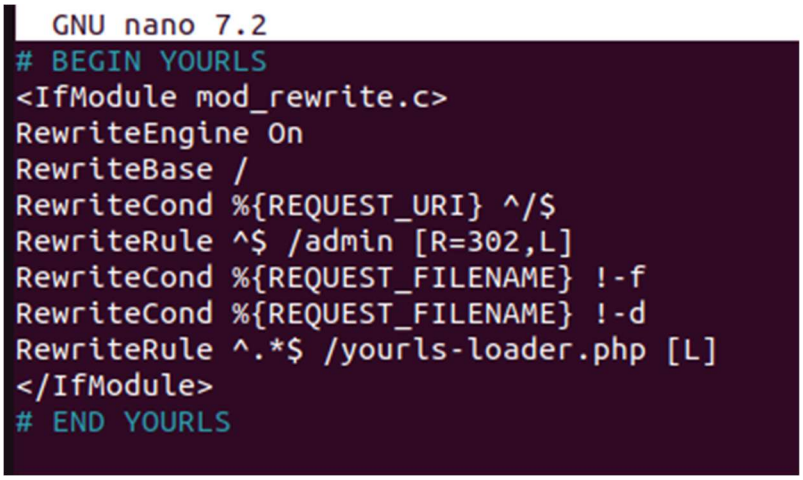
RewriteCond %{REQUEST_FILENAME} !-f

RewriteCond %{REQUEST_FILENAME} !-d

RewriteRule ^.*$ yourls-loader.php [L]



</IfModule>



Security

Now that the server has been created, a certificate must be applied to the website. This will be done using certbot, which first must be installed.

```
sudo apt install certbot python3-certbot-apache -y
```

Then, you use certbot to create and apply a certificate

```
sudo certbot - -apache2
```

It will then ask you a number of questions, including the address you would like to link the certificate to.

After this, your server will be running, and all functions of YOURLS will be available to anyone with the administrator password.

Script

This service can now be used with any web browser. However, on systems without access to a web browser, a bash script can be used to create new links. This is done using the following script:

```
#!/bin/bash


API_URL="https://ict171.com/yourls-api.php"
USERNAME="admin"
PASSWORD="Password”
LONG_URL="https://example.com"
CUSTOM_KEY="testlink"
TITLE="My Test Link"


curl
"${API_URL}?username=${USERNAME}&password=${PASSWORD}&action=shorturl
&format=simple&url=${LONG_URL}&keyword=${CUSTOM_KEY}&title=${TITLE}"
```

The above script uses the YOURLS API and its markers to shorten a URL.

The LONG_URL is the marker for the website URL you would like to redirect to

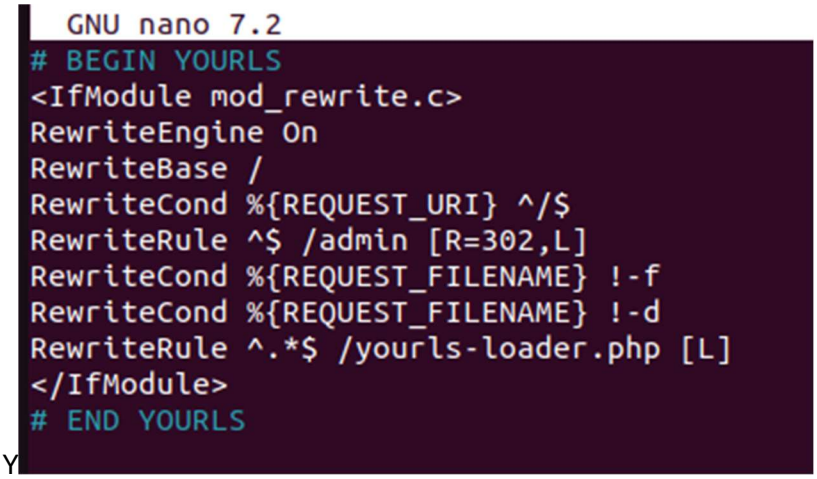
The CUSTOM_KEY is the marker for the shortened URL. For example, if you made the custom key testlink, the website would redirect to ict171.com/testlink

The TITLE is the marker for what the link is called on the admin dashboard of YOURLS.

Once this script has been edited to fit your desired link and ran, logging in to the YOURLS admin page will display this link on the table of created links.

e.g.:

Links



The original download of YOURLS is available at https://yourls.org/docs/guide/install . Some of the steps used in the creation of this project are available at this link, as it is the YOURLS installation guide.

The website is live at https://ict171.com .

This will redirect to https://ict171.com/admin .

The GitHub repository is available at https://github.com/aeonr6/ict171-assignment-2 .

An example working link is https://ict171.com/r3 which leads to the Yamaha YZF-R3 information page