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For this assignment, I built a world time zone converter.

Users' Guide

The index page of the website is a login page, there are two users for testing, one is admin, the other is user, passwords are not needed. The default regions to convert of each user are different.

If you do not want to login as a user, you can visit the time zone page as a guest as well.

On the time zone page, if you have logged in, there is welcome information at the top.

There are two drop-down lists to select regions: the origin region and the region where you want to convert to. The real-time is set to the default time, it can be changed if you like.

When two regions and time is set, click Enter, then the origin time zone and time, converted time zone and time are shown under the Enter button. You can submit more queries if you like.

For testing, a table contains all the regions and time zones are shown at the bottom of the page.

Admin's Guide

Copy the folder to your computer, run vagrant up on your command line.

The first time you use a Vagrant box, about 270 MB of data needs to be downloaded and stored locally. After that time, it will not be downloaded again.

The build process is fully unattended. Now open in your web browser http://127.0.0.1:8080/ and you can see the login page.

For the world time zone converter, I built three virtual machines, one is the web server, the webserver is to provide a UI and allow users to do some queries. The other two are both databases, one is to store usernames and the default origin and destination regions, the other database is to store all regions available for converting, and which time zone they belong to.

When a user logged in, the web server will connect to users' information database server and get the default regions of the corresponding user.

When the user submits a query, the web server will connect to the time zone database server, and get the two time zones information to convert, then the

result is shown on the web page.

One of the main reasons to have physical insulation between the web servers is security. Also, the use of multiple servers provides a higher capability to the servers.

Future modification/extension

1.

Almost all the users' account functions such as users' password and register function are not provided (since it's complex and this is not a web development paper). A register page is needed and all the information of the new user, including the username, password and default regions need to be stored in the users' database. The users' information database is also needed to be extended since there are no attributes for password and any other users' preferences except the three attributes I mentioned in the admin's guide.

After the modification, the virtual machines need to be rebuilt.

2.

The size of the database of regions is so small compared with so many countries, regions, cities all over the world, the database needs a large extension if you want to run it on the internet.

There are two ways to add more regions or cities, the easier way is just editing the setup-city-database.sql file, then rebuild the virtual machines. The other one is using vagrant ssh to login region database and import the edited setup-city-database.sql file, then it should be ready to use, rebuild is not needed.

3.

I did not consider the daylight time, because it is so complicated, there are so many different daylight time systems, for example, the start date of daylight time in a year is different in New Zealand and Australia, and not all the states/territories in Australia are using daylight time, which is crazy. However, a robust time zone converter must consider every little issue.

4.

Of course, the UI needs to be well designed since there is almost no design of this web app.

Final Statement

All the code of this application is based on COSC349 Lab 3, and all the code beyond Lab 3 is written by me. However, some online materials gave me much

help, such as the PHP official website and W3Schools.