Assignment 1

Due: 30 June 2021 by 23:59:59 EST

Grade: 5% of final mark

Description:

As a system administrator, a substantial portion of your time will be spent working with ticketing systems. Effective use of a ticketing system will help you prioritize work and understand how your organization functions as a whole when it comes to IT usage.

This assignment will require you to provision a virtual machine and then install the *OTRS* ticketing system on it. Evaluation is broken down into separate criteria so that you can still receive a passing grade even if you do not get the system functioning fully.

VM Setup:

To start the assignment, you will need to create a virtual machine (VM) using your DigitalOcean account. Login to the dashboard and proceed by following these instructions:

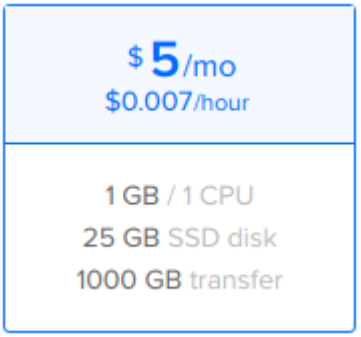
1. At the top right of the dashboard, click the 'Create' button, and then select 'Droplets'.

2. Under the 'Choose an Image' section, click 'Snapshots'.

3. Select the 'Ubuntu itec2210.ca-base-image'.

4. Under 'Choose a plan' leave 'Standard' selected.

5. Click the arrow to scroll to the left of the list of Droplet types, e.g. the default may be $40/month, scroll to the far left until you can choose $5/month.

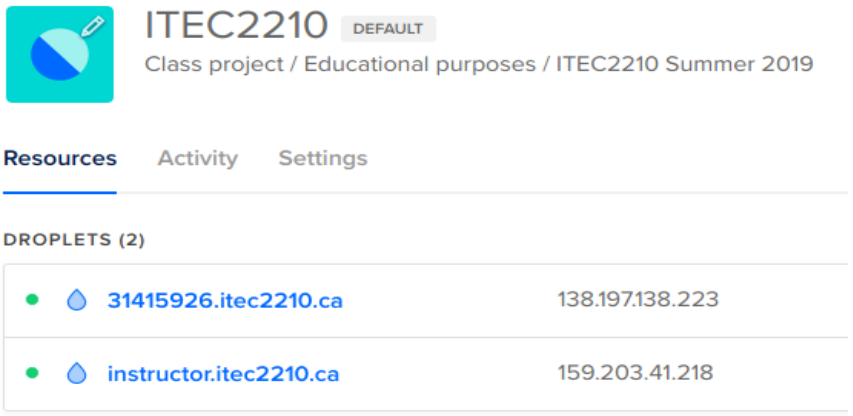


6. Switch the ‘Authentication’ button to Password. Choose a memorable one and be sure to record it somewhere safe.

7. At the very bottom under ‘Choose a hostname’, use your student number. For example, if your student number is 31415926, make the hostname ‘31415926.itec2210.ca’.

8. Click ‘Create’.

8. You will now be back at the dashboard. Once your VM is finished provisioning, look for it in the list and copy its IP address somewhere.



9. In the menu on the very left, select ‘Networking’. Click on ‘itec2210.ca’.

10. In the HOSTNAME field add your student number again. This step is crucial for grading. If you do not do this your assignment cannot be graded.

11. In the ‘WILL REDIRECT TO’ field, input the IP address you recorded, or select your VM from the list.

12. Click ‘Create Record’.

13. You may now use PuTTY or any SSH client to connect to your VM. For the hostname, use the DNS entry that you created e.g 31415926.itec2210.ca. When prompted for the username, input ‘itec2210’. The password is ‘limoncelli’.

For example, type `ssh itec2210@31415926.itec2210.ca` to connect as the `itec2210` user to the system identified by the DNS record 31415926.itec2210.ca. The `@` sign designates user@hostname, and you are connecting as the itec2210 user in this case.

OTRS Setup

The OTRS installation guide provides all the commands and information that you need to achieve 5/5 on this assignment (with some caveats, which I mention below). The installation guide is available here:

https://doc.otrs.com/doc/manual/admin/6.0/en/html/manual-installation-of-otrs.html

Errata

There are a number of caveats in the documentation that you must be aware of before starting the installation. These notes correspond to the numbered steps in the OTRS documentation.

DO NOT PROCEED until you have read through all the documentation first. If you start running commands without understanding the purpose of each, you will encounter problems and have to start again.

Any time you see a 'shell >' line, you will use the command *after* the > symbol in your terminal. For example, your PuTTY/SSH prompt will look something like this for Step 1: root@instructor: # tar xzf otrs-x.x.x.tar.gz

The documentation assumes that you are working as the 'root' user when you are typing commands in the 'shell >' prompt. Use 'sudo -i -u root' to become the root user, then proceed with the installation.

While you can use 'sudo' to run each command as your regular user, for the purposes of this assignment, it will be easier to just become root and follow the instructions. OTRS will then set appropriate permissions on files for you at the end of the install process.

You MUST remember to use the Debian/Ubuntu specific version of each command, not the RedHat or SuSE versions. If you use the latter then you will get stuck.

To begin, become root (per above using sudo) and install some prerequisite packages before starting at Step 1 (copy and paste the entire command starting at 'apt'):

```
root@instructor:~# apt update && apt install libapache2-mod-perl2 \
libdbd-mysql-perl libtimedate-perl libnet-dns-perl libnet-ldap-perl \
libio-socket-ssl-perl libpdf-api2-perl libdbd-mysql-perl \
libsoap-lite-perl libtext-csv-xs-perl libjson-xs-perl \
libapache-dbi-perl libxml-libxml-perl libxml-libxslt-perl \
libyaml-perl libarchive-zip-perl libcrypt-eksblowfish-perl \
libencode-hanextra-perl libmail-imapclient-perl libtemplate-perl \
libcrypt-ssleay-perl libdatetime-perl
```

Step 1: Install .tar.gz

1. To get started, you will need to use a tool like wget to download the OTRS package onto your VM. You can get the latest release directly by running this command in your terminal (copy and paste it):

   ```
   wget https://github.com/OTRS/otrs/archive/refs/tags/rel-6_0_30.tar.gz \
   -O /tmp/otrs.tar.gz
   ```

2. Next, unpack the file you just downloaded with the following command: `tar xzf /tmp/otrs.tar.gz`
3. Now run 'ls' to examine the contents of your directory. You should see the following (where otrs-6.0.29 is the unpacked source code in a directory for the OTRS application):

   ```
   root@instructor:~# ls
   otrs-rel-6_0_30
   ```

4. Now run the ‘mv’ command from the documentation:

```
mv otrs-rel-6_0_30 /opt/otrs
```

5. Confirm the directory ‘/opt/otrs’ exists using the ‘ls’ and ‘file’ commands chained together (the ‘;’ marks the end of a command, adding another command after is very common):

```
ls -Alh /opt; file /opt/otrs
```

You will receive output like the following:

```
total 4.0K
drwxrwxr-x 10 root root 4.0K Sep 28  2020 otrs
/opt/otrs: directory
```

Step 2: Install Additional Perl Modules

1. Run the perl script as shown. For any missing modules, follow the instructions from the output, ensuring you follow the Debian/Ubuntu specific commands. You should NOT have to run the CPAN shell commands because the script will find all the required dependencies.

Step 3: Create OTRS User

1. Ensure that you use the Debian/Ubuntu specific version of the commands.

Step 4: Activate Default Config File

1. Follow the given instructions.

Step 5: Check if all needed modules are installed

1. Run the scripts as indicated.

Step 6: Configuring the Apache web server

1. Step 6 is not well written and if you do not complete it correctly, nothing will work. On recent Debian and Ubuntu systems with Apache 2.4, there is no /etc/apache2/conf.d directory. Instead, do the following and then proceed with the a2enmod commands:

```
cd /etc/apache2/conf-enabled
```

```
ln -s /opt/otrs/scripts/apache2-httpd.include.conf zzz_otrs.conf
```

2. Still in Step 6, you will receive an error like the following which you can ignore: `a2enmod version`
   `ERROR: Module version does not exist!`

Step 7: File Permissions

1. In Step 7: File Permissions, you'll see the shell > prompt commands begin with 'bin'. You must ensure you are working in the /opt/otrs directory for them to work. If you aren't, type

   ```
   cd /opt/otrs
   ```

Step 8: Database Setup and Basic System

1. Be sure to replace the 'localhost' portion of the URL as specified. For example, http://localhost/otrs/installer.pl will become http://instructor.itec2210.ca/otrs/installer.pl. Use your student number in place of 'instructor'.

2. Continue with the web installer instructions:

   https://doc.otrs.com/doc/manual/admin/6.0/en/html/web-installer.html

3. When you reach the *Database Settings* step in the web installer, click Check database settings. You will receive a message like this:

   Result of database check

   ```
   Can't connect to database, read comment!
   ```

   ```
   Can't connect to MySQL server on '127.0.0.1' (111)
   ```

4. In your terminal, run `apt install mysql-server`. Next run the command `cat /etc/mysql/debian.cnf` and copy the username & password for the `debian-sys-maint` user. Add both to the web installer prompt and check database settings again.

5. Still on *Database Settings*, in your terminal do the following:

```
nano /etc/mysql/mysql.conf.d/mysqld.cnf
```

   Paste the following 5 lines at the very bottom of the file:

```
max_allowed_packet   = 64M
query_cache_size     = 32M
innodb_log_file_size = 256M
character-set-server = utf8
collation-server     = utf8_general_ci
```

   Now restart MySQL to get the new settings to take effect:

```
systemctl restart mysql.service
```

6. Continue the web installer using the MySQL debian-sys-maint password that you noted before.

7. In the web installer, under step 3/4 (Mail configuration), choose *Skip this Step* (bottom right).

8. Note the final login details, login, and proceed to creating a user (changing the URL to match your student number as appropriate): http://12345.itec2210.ca/otrs/index.pl?Action=AdminUser;Subaction=Add

   Be sure to set a password and note it down to relay to me.

9. Relay the login details for the evaluation user that you created to me on Mattermost.

Step 9: First login

1. You should already be logged in.

Step 10: The OTRS Daemon

1. Not required, you do not need to start it.

Step 11: Cron jobs for the OTRS user

1. You do not need to set up cron. Skip this step. You're done!

Step 12: You're done!

Evaluation Criteria:

Requirement	Test case	Grade
A working virtual machine	We can see your VM in the DigitalOcean control panel	1
A working webserver	http://${###}.itec2210.ca is usable with a web browser	1
A working database server	We can connect to MySQL or PostgreSQL on your VM	1
OTRS is installed on your VM	An 'otrs' user exists on your VM, and the code has been downloaded and unpacked	1
Working login to OTRS	We can login to http://${###}.itec2210.ca/otrs with a test user	1

Final notes:

You may choose to use PostgreSQL as a database instead of MySQL. If you would like some help using it I will be happy to guide you.

For anyone interested in using Docker to run MySQL and OTRS, there is an unofficial image and dockerfiles here: https://github.com/juanluisbaptiste/docker-otrs. If you would like to try it out please let me know.