

2. Network connectivity

Create the custom VPC first because it is utilized in the deployment of the instances.

Section 2.a is straightforward; follow the instructions and set everything up on AWS Educate according to the instructions.

a. All the AWS instances need to be connected to each other using an IP address from the 192.168.100.32/27 range (TIP: create a custom VPC). 2

i. VPC name: vpc-sysadmin, IPv4 CIDR block: 192.168.100.0/24

Create VPC

A VPC is an isolated portion of the AWS cloud populated by AWS objects, such as Amazon EC2 instances. You must specify an IPv4 address range for your VPC. Specify the IPv4 address range as a Classless Inter-Domain Routing (CIDR) block; for example, 10.0.0.0/16. You cannot specify an IPv4 CIDR block larger than /16. You can optionally associate an Amazon-provided IPv6 CIDR block with the VPC.

Name tag ⓘ

IPv4 CIDR block* ⓘ

IPv6 CIDR block ☒ No IPv6 CIDR Block ⓘ
☐ Amazon provided IPv6 CIDR block

Tenancy ⓘ

ii. Subnet: Subnet name: subnet-sysadmin, IPv4 CIDR block: 192.168.100.32/27

Create subnet

Specify your subnet's IP address block in CIDR format; for example, 10.0.0.0/24. IPv4 block sizes must be between a /16 netmask and /28 netmask, and can be the same size as your VPC. An IPv6 CIDR block must be a /64 CIDR block.

Name tag ⓘ

VPC* ⓘ

VPC CIDRs

| VPC ID | Name | Status | Status Reason |
|-----------------------|--------------|------------|---------------|
| vpc-0bda88bdf6918bcd9 | vpc-sysadmin | Associated | |
| vpc-ddb231a7 | | | |

Availability Zone ⓘ

IPv4 CIDR block* ⓘ

iii. Gateway: Gateway name: gateway-sysadmin, attached to vpc-sysadmin

Create internet gateway

An internet gateway is a virtual router that connects a VPC to the internet. To create a new internet gateway specify the name for the gateway below.

Name tag ⓘ

Attach to VPC

Attach an internet gateway to a VPC to enable communication with the internet. Specify the VPC you would like to attach below.

VPC* ⓘ

▶ AWS Command Line

| VPC ID | Name |
|-----------------------|--------------|
| vpc-0bda88bdf6918bcd9 | vpc-sysadmin |

* Required Cancel Attach

iv. Routes: Destination 0.0.0.0/0, target: gateway-sysadmin

Edit routes

| Destination | Target | Status | Propagated |
|------------------|-----------------------|--------|------------|
| 192.168.100.0/24 | local | active | No |
| 0.0.0.0/0 | igw-0a9c2f556b884e0c4 | | No |

Add route

igw-0a9c2f556b884e0c4 gateway-sysadmin

* Required Cancel Save routes

b. Make sure the IP address assigned to the instances are in the range of 192.168.100.32/27 and that the instances can reach to each other by using the ping command.

For section 2.b edit the security group attached to the instances to allow ICMP to ping to each other.

All ICMP - IPv4 ICMP 0 - 65535 Anywhere 0.0.0.0/0, ::/0 e.g. SSH for Admin Desktop

c. All instances must be publicly accessible by using a public IP, not DNS (TIP: Select 'Auto-assign Public IP=Enabled' at the time of deploying the instances).

This is a demonstration of selecting 'Auto-assign Public IP=Enabled' at the time of setting up the instances. Here is the connection to the Red Hat instance through its IP, and pinging the FTP instance's IP.

```
3.88.67.112 (ec2-user)
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings X server Exit
Quick connect... 15. 3.88.67.112 (ec2-u... 17. 54.91.239.92 (ec2-u...
[ec2-user@ip-192-168-100-48 ~]$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 9001
    inet 192.168.100.48 netmask 255.255.255.224 broadcast 192.168.100.63
    inet6 fe80::cde:85ff:febf:fe36 prefixlen 64 scopeid 0x20<link>
    ether 0e:de:85:bf:fe:36 txqueuelen 1000 (Ethernet)
    RX packets 7377 bytes 657147 (641.7 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 6045 bytes 745922 (728.4 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0


[ec2-user@ip-192-168-100-48 ~]$ ping -c 4 192.168.100.58
PING 192.168.100.58 (192.168.100.58) 56(84) bytes of data:
64 bytes from 192.168.100.58: icmp_seq=1 ttl=64 time=0.537 ms
64 bytes from 192.168.100.58: icmp_seq=2 ttl=64 time=0.585 ms
64 bytes from 192.168.100.58: icmp_seq=3 ttl=64 time=0.589 ms
64 bytes from 192.168.100.58: icmp_seq=4 ttl=64 time=0.545 ms

--- 192.168.100.58 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 2999ms
rtt min/avg/max/mdev = 0.537/0.564/0.589/0.023 ms
[ec2-user@ip-192-168-100-48 ~]$
```

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1. Instances to be deployed.

All four instances are set up in the same manner, so only the Red Hat instance will be included. First, select the instance.

**Red Hat Enterprise Linux 7.6 (HVM), SSD Volume Type** - ami-011b3ccf1bd6db744 (64-bit x86) / ami-0e3688b4a755ad736 (64-bit Arm)
Free tier eligible Red Hat Enterprise Linux version 7.6 (HVM), EBS General Purpose (SSD) Volume Type
Root device type: ebs Virtualization type: hvm ENA Enabled: Yes

Select
☒ 64-bit (x86)
☐ 64-bit (Arm)

Next, select the initial requirements according to the instructions. Also, create separate security groups for each instance as each one has individual security requirements.

| | | | | | | | | |
|-------------------------------------|-----------------|---------------------------------------|---|---|----------|---|-----------------|-----|
| <input checked="" type="checkbox"/> | General purpose | t2.micro Free tier eligible | 1 | 1 | EBS only | - | Low to Moderate | Yes |
|-------------------------------------|-----------------|---------------------------------------|---|---|----------|---|-----------------|-----|

Network vpc-0bda88bdf6918bcd9 | vpc-sysadmin [Create new VPC](#)
Subnet subnet-0f4b8774dbdff73c0 | subnet-sysadmin | us-e-v [Create new subnet](#)
27 IP Addresses available
Auto-assign Public IP Enable

| Volume Type | Device | Snapshot | Size (GiB) | Volume Type | IOPS | Throughput (MB/s) | Delete on Termination | Encrypted |
|-------------|-----------|------------------------|------------|---------------------------|------------|-------------------|-------------------------------------|---------------|
| Root | /dev/sda1 | snap-014177ea88aa8dca0 | 10 | General Purpose SSD (gp2) | 100 / 3000 | N/A | <input checked="" type="checkbox"/> | Not Encrypted |

Assign a security group: ☒ Create a new security group
☐ Select an existing security group
Security group name: RedHat
Description: 3850FinalProject

| Type | Protocol | Port Range | Source | Description |
|------|----------|------------|--------------------------|----------------------------|
| SSH | TCP | 22 | Anywhere 0.0.0.0/0, ::/0 | e.g. SSH for Admin Desktop |
| HTTP | TCP | 80 | Anywhere 0.0.0.0/0, ::/0 | e.g. SSH for Admin Desktop |

Create separate key pairs for each instance as well because if one key is compromised then other instances will not be at risk because the key is not shared.

Select an existing key pair or create a new key pair

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about [removing existing key pairs from a public AMI](#).

Key pair name

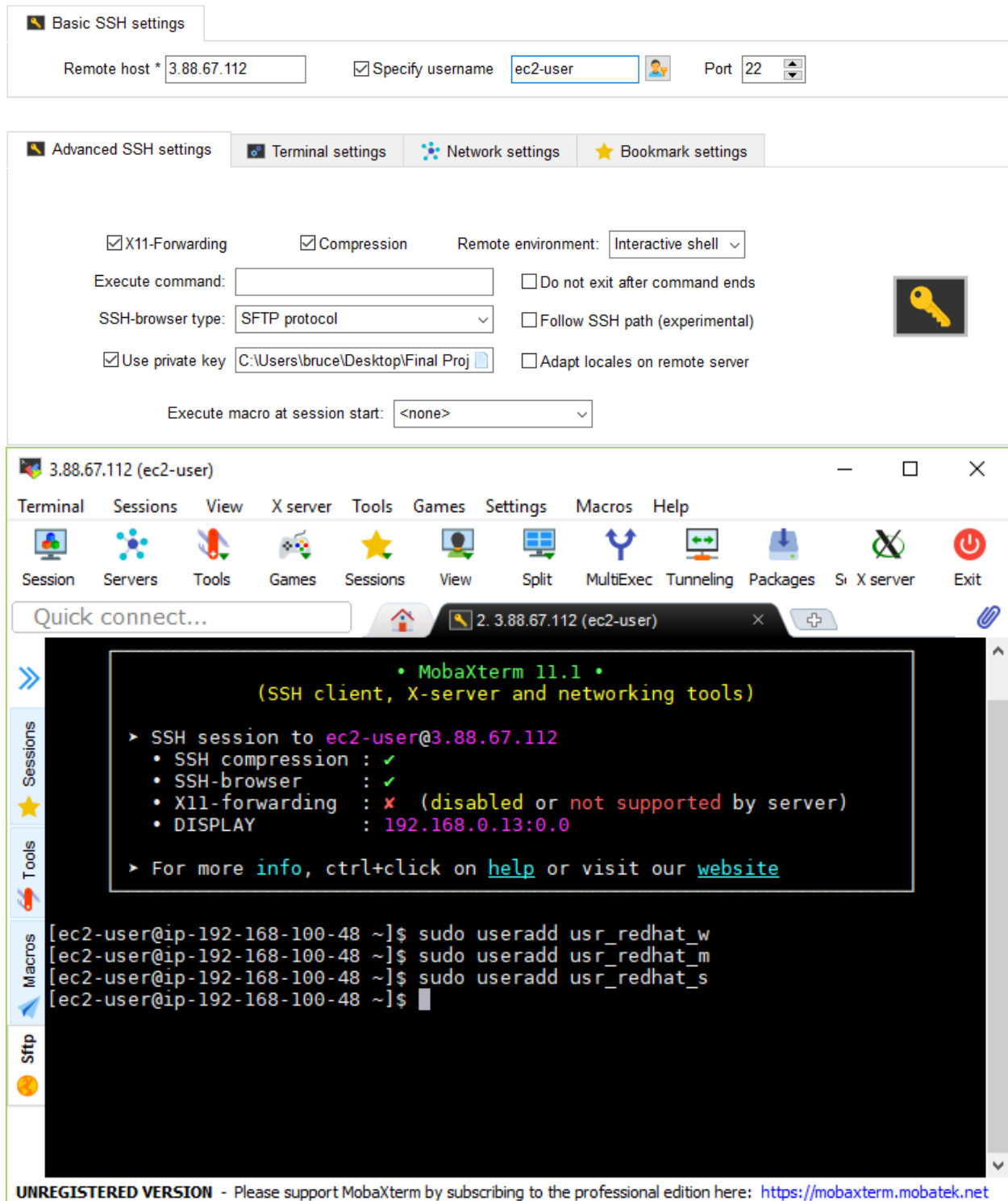
Download Key Pair

You have to download the **private key file** (*.pem file) before you can continue. **Store it in a secure and accessible location.** You will not be able to download the file again after it's created.

Cancel **Launch Instances**

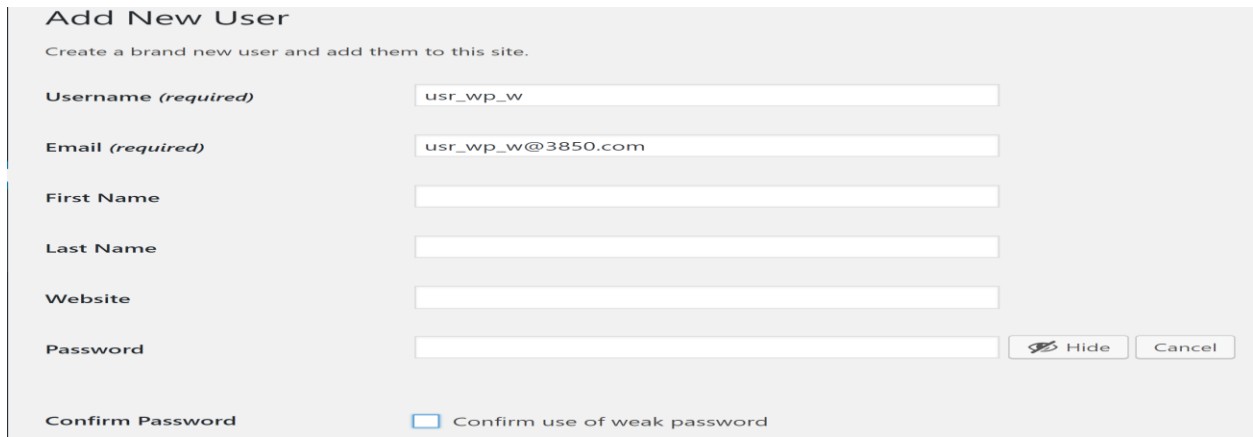
The following is User account creation:

The Red Hat and FTP are similar. In the 'Remote host' field you would enter the IPv4 Public IP of each instance and in the 'Use private key' field the respective private key.



Word Press:

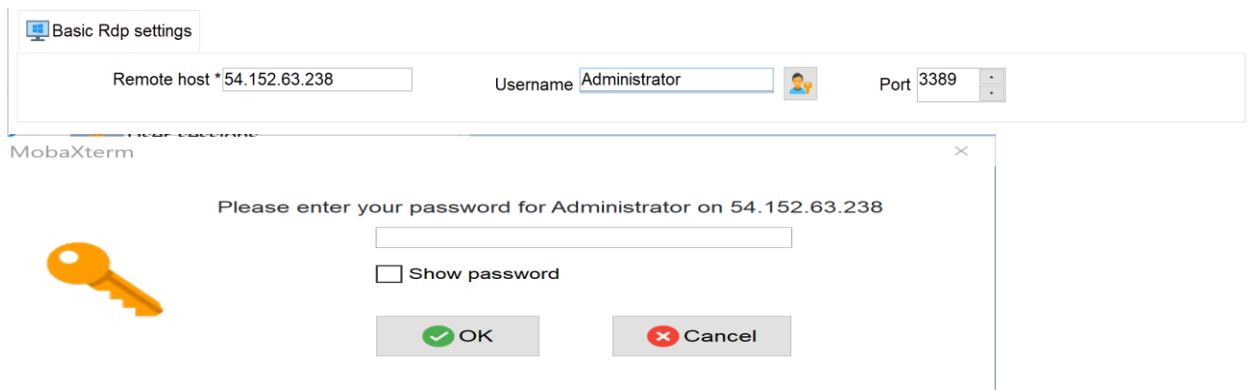
Login to the admin account for Word Press and create the users



The image shows the 'Add New User' form in WordPress. It has a title 'Add New User' and a subtitle 'Create a brand new user and add them to this site.' Below this are several input fields: 'Username (required)' with the value 'usr_wp_w', 'Email (required)' with the value 'usr_wp_w@3850.com', 'First Name', 'Last Name', 'Website', and 'Password'. There are 'Hide' and 'Cancel' buttons next to the password field. At the bottom, there is a 'Confirm Password' field and a checkbox labeled 'Confirm use of weak password'.

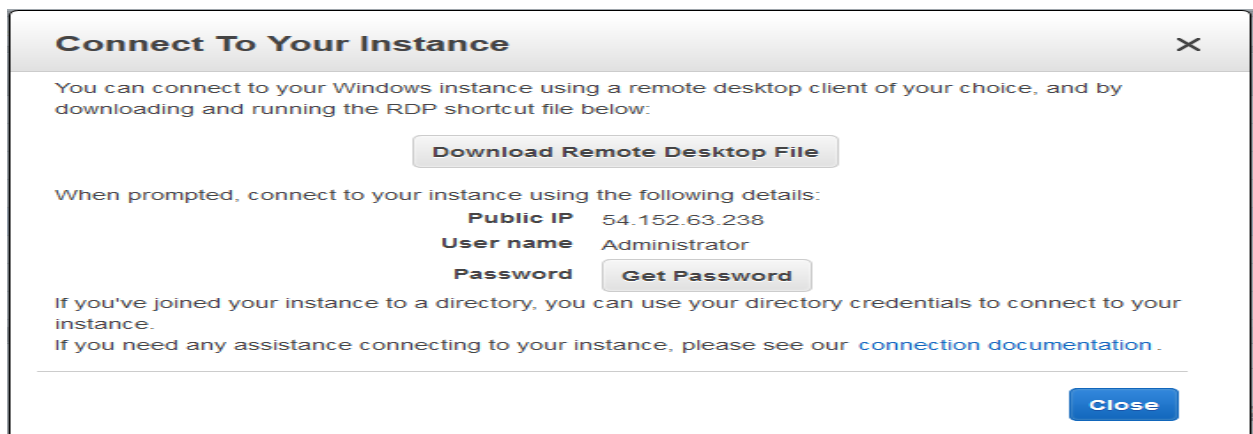
The Windows 2016:

Enter the credentials accordingly.



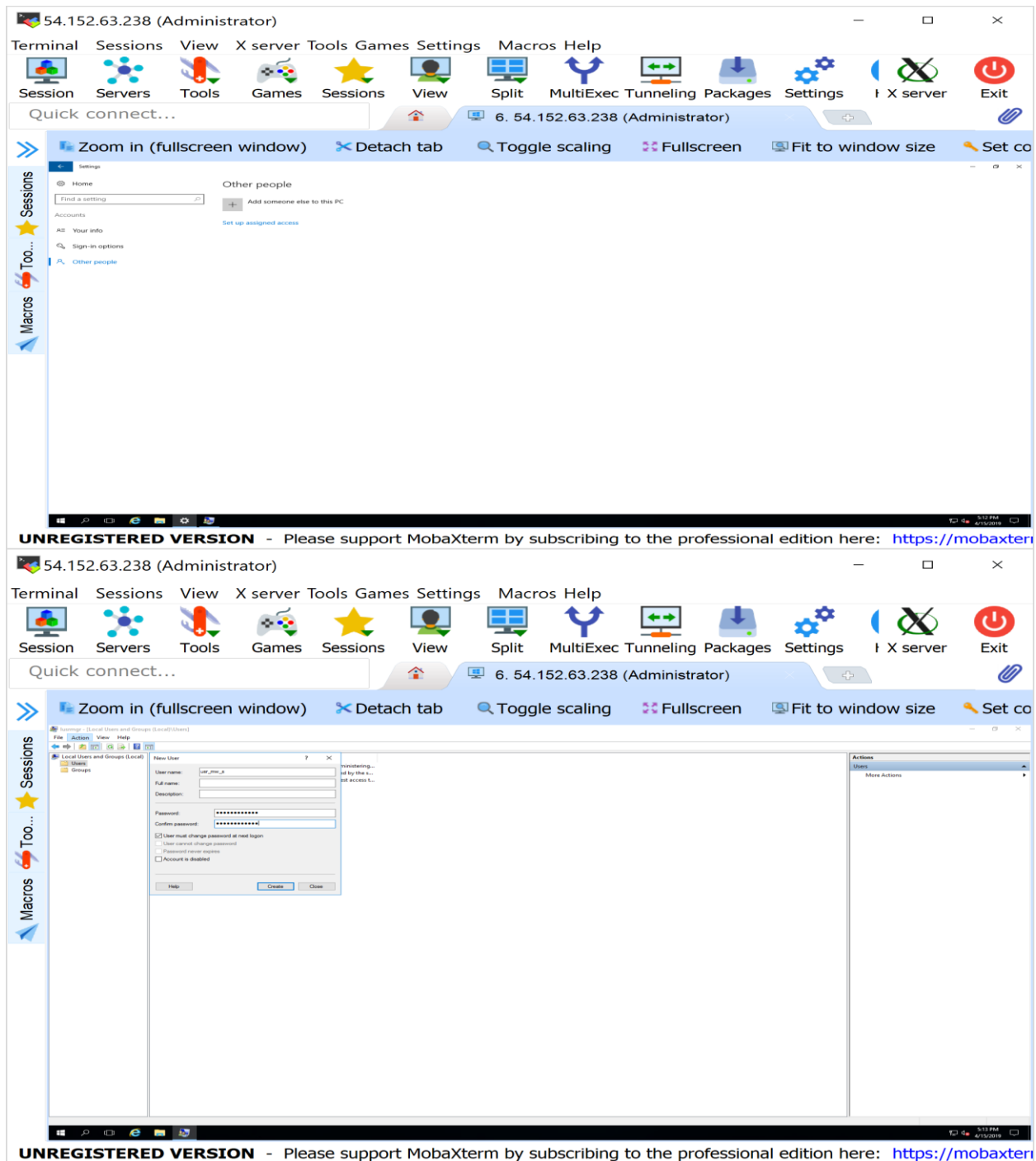
The image shows two overlapping windows. The top window is 'Basic Rdp settings' with fields for 'Remote host *' (54.152.63.238), 'Username' (Administrator), and 'Port' (3389). The bottom window is a 'MobaXterm' password prompt that says 'Please enter your password for Administrator on 54.152.63.238'. It has a password input field, a 'Show password' checkbox, and 'OK' and 'Cancel' buttons.

The username and password can be found in the aws console. To obtain the password I simply clicked 'Get Password' and entered the private key I downloaded when creating the instance to decrypt it.



The image shows the 'Connect To Your Instance' dialog box from the AWS Management Console. It has a title bar with a close button. The main text says: 'You can connect to your Windows instance using a remote desktop client of your choice, and by downloading and running the RDP shortcut file below:'. Below this is a 'Download Remote Desktop File' button. The next section says: 'When prompted, connect to your instance using the following details:'. It lists 'Public IP' as 54.152.63.238, 'User name' as Administrator, and 'Password' with a 'Get Password' button. At the bottom, there is a 'Close' button.

Once connected to the Windows 2016 instance, navigate to the settings and user accounts. Then, click 'Action' in order to add a new user

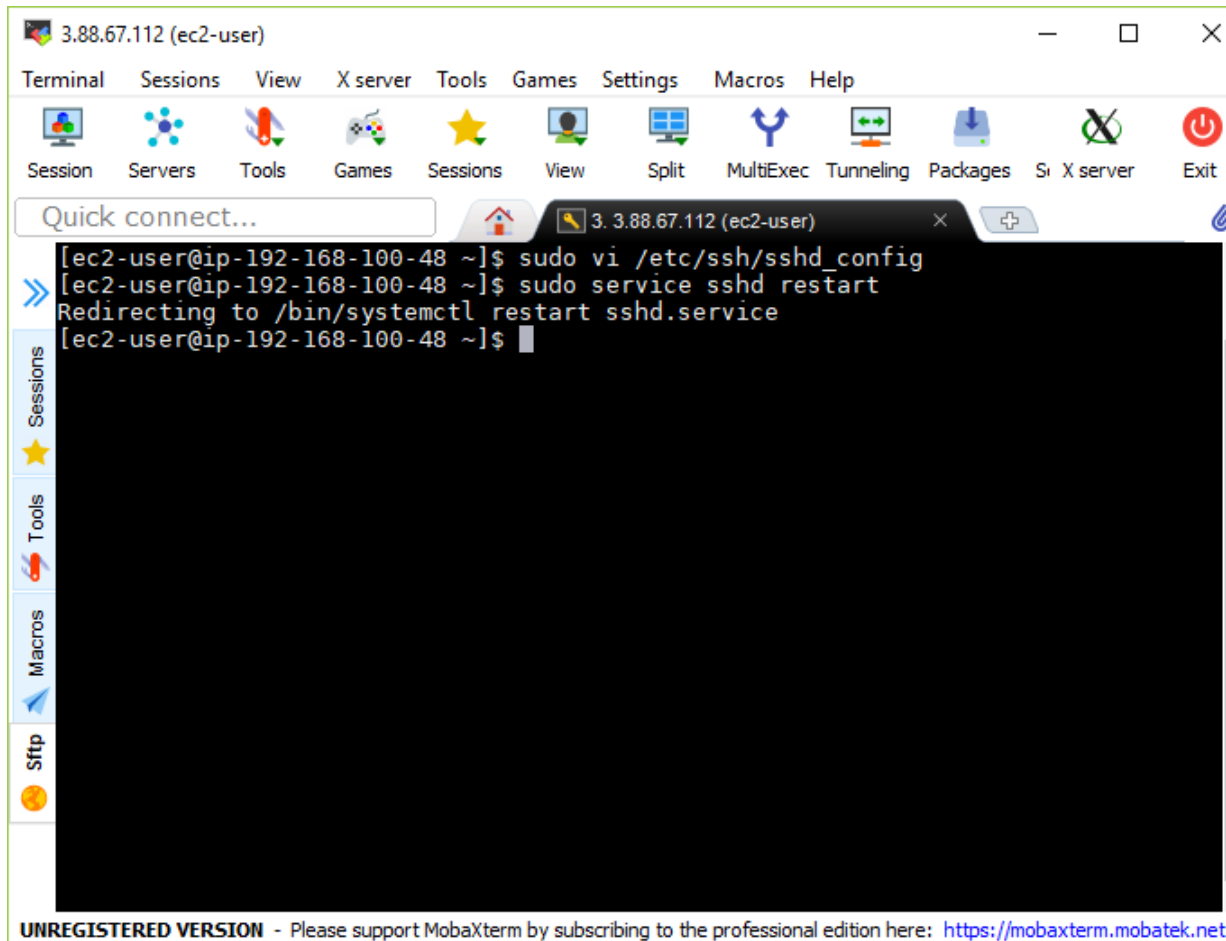


3. Users accounts.

Again, Red Hat and FTP will be similar, and Word Press and Windows 2016 are different.

a. User accounts `usr_redhat_w` and `usr_redhat_m` don't use a private/public key to ssh to the instance, they use only username and password.

To enable password login, edit the `sshd_config` file by changing 'PasswordAuthentication no' to 'PasswordAuthentication yes'. Then, at the bottom add 'Match User `usr_redhat_w`, User `usr_redhat_m` PasswordAuthentication yes'. Finally, save the changes then restart the `sshd` service



The screenshot shows a MobaXterm terminal window titled '3.88.67.112 (ec2-user)'. The terminal displays the following commands and output:

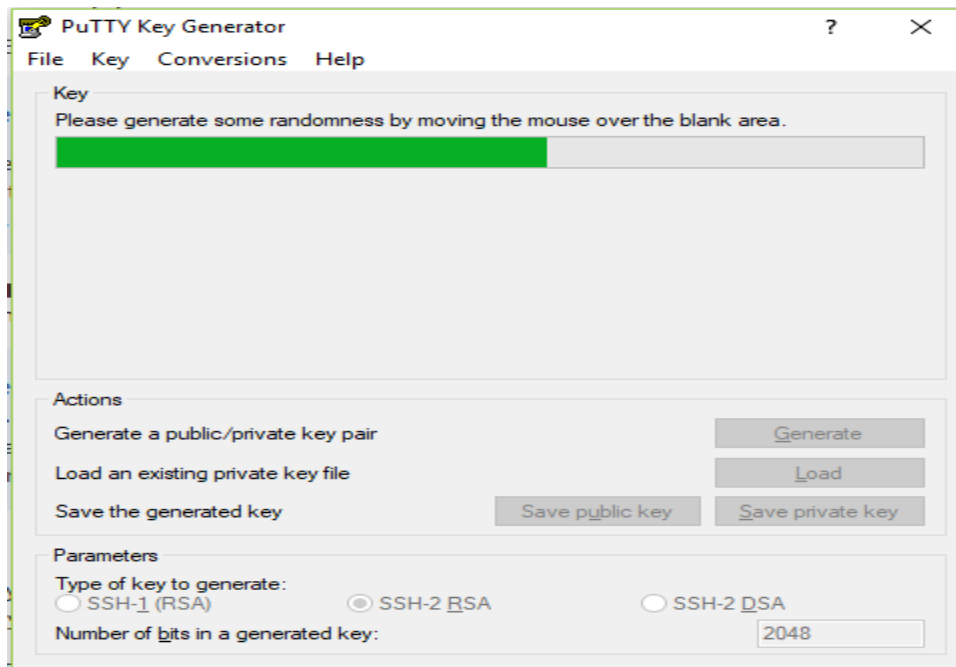
```
[ec2-user@ip-192-168-100-48 ~]$ sudo vi /etc/ssh/sshd_config
[ec2-user@ip-192-168-100-48 ~]$ sudo service sshd restart
Redirecting to /bin/systemctl restart sshd.service
[ec2-user@ip-192-168-100-48 ~]$
```

The terminal window includes a menu bar with options: Terminal, Sessions, View, X server, Tools, Games, Settings, Macros, Help. Below the menu is a toolbar with icons for Session, Servers, Tools, Games, Sessions, View, Split, MultiExec, Tunneling, Packages, X server, and Exit. A sidebar on the left contains icons for Sessions, Tools, Macros, and Sftp. At the bottom, a message reads: 'UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: <https://mobaxterm.mobatek.net>'.

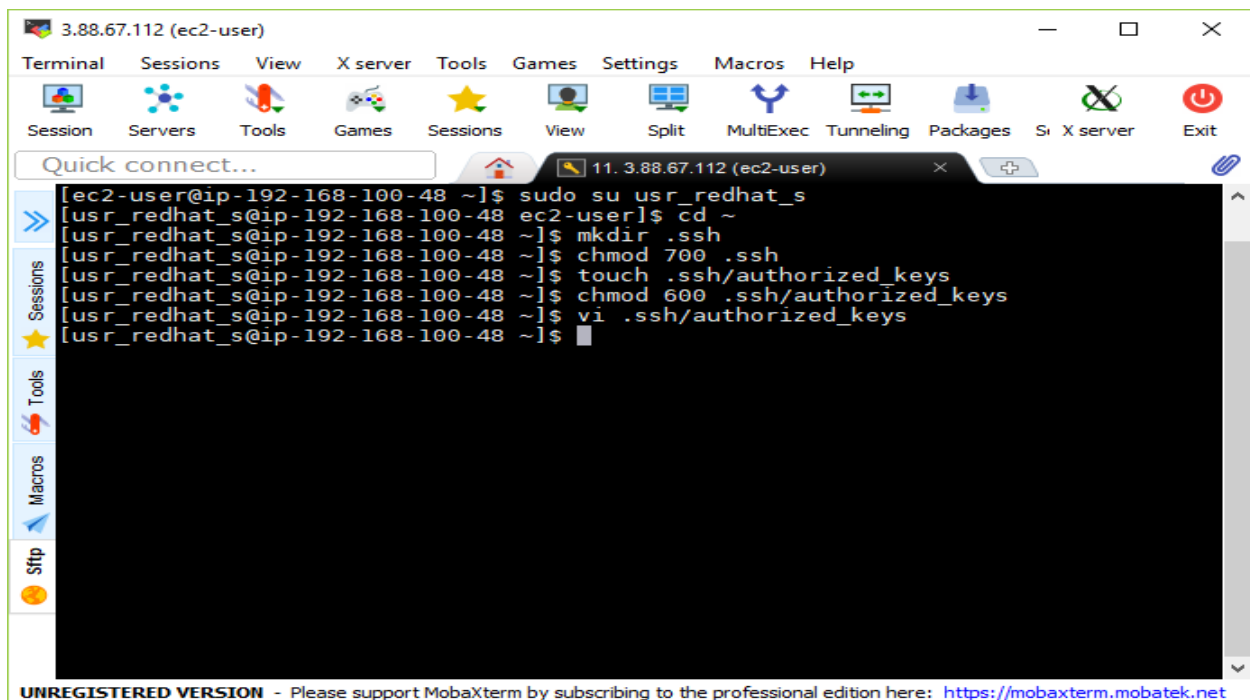
b. The user account `usr_redhat_s` uses a private and public key to ssh to the instance.

Similarly, edit the `sshd_config` file by adding 'Match User `usr_redhat_s` PasswordAuthentication no' to the bottom of the file. Save the changes, and restart the `sshd` service.

To create the key, I utilized PuttyGen. Simply click 'Generate', follow the instructions, and save the private key'

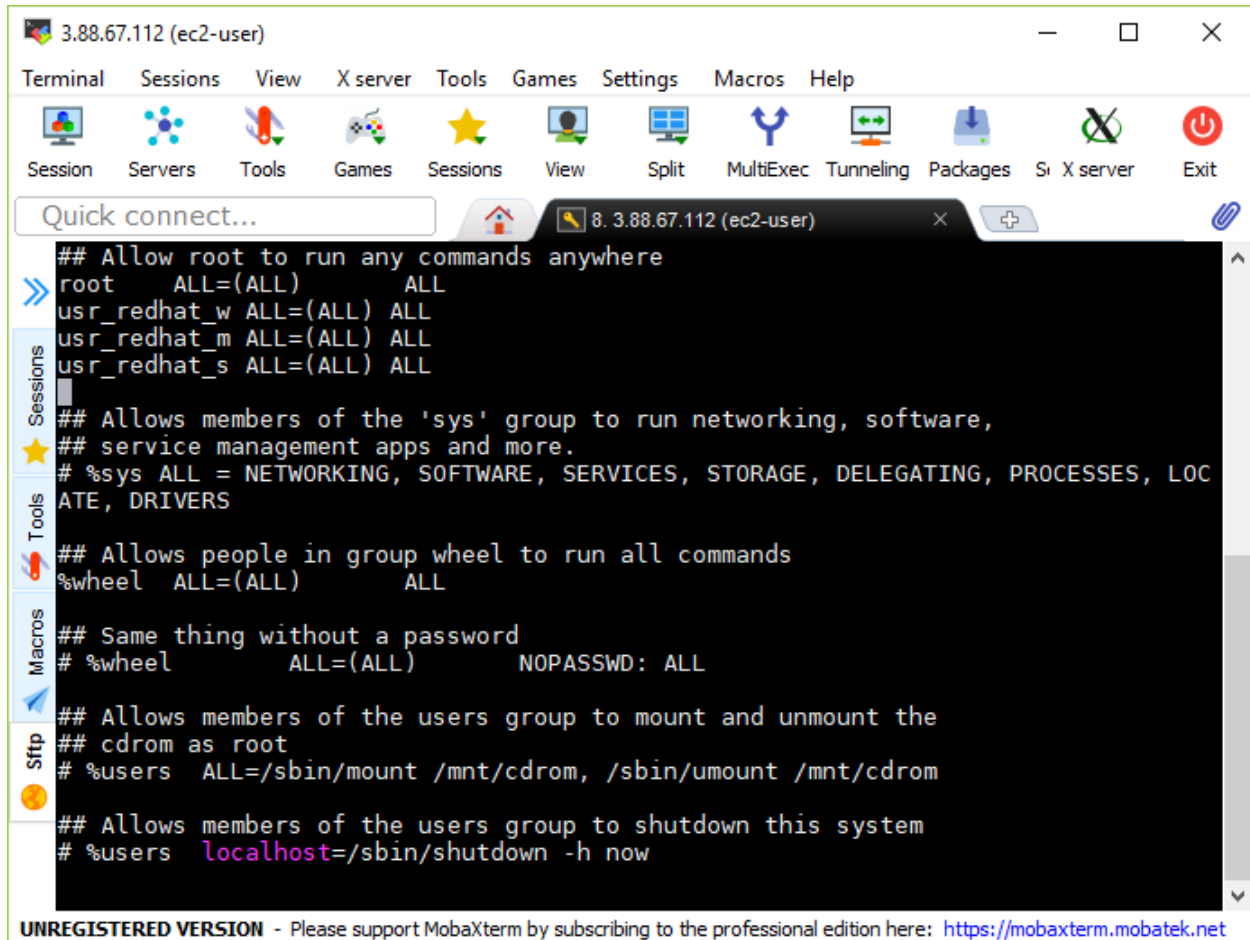


In the instance, create a file for the public key with the correct permissions to be used in coordination with the private key. (The authorized_keys file will contain the public key which is created by PuttyGen)



c. User accounts `usr_redhat_w`, `usr_redhat_m` and `usr_redhat_s` have root privileges.

To allow root privileges, edit the sudoers file (in this case I executed 'sudo vi /etc/sudoers'). Then, add the users similar to root 'usr_redhat_w ALL=(ALL) ALL, etc.'



The screenshot shows a MobaXterm terminal window titled '3.88.67.112 (ec2-user)'. The window has a menu bar (Terminal, Sessions, View, X server, Tools, Games, Settings, Macros, Help) and a toolbar with icons for Session, Servers, Tools, Games, Sessions, View, Split, MultiExec, Tunneling, Packages, X server, and Exit. A 'Quick connect...' search bar is visible. The terminal displays the content of the /etc/sudoers file, which includes permissions for root, several users (usr_redhat_w, usr_redhat_m, usr_redhat_s), the sys group, the wheel group, and the users group. At the bottom, a message states: 'UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: <https://mobaxterm.mobatek.net>'.

```
## Allow root to run any commands anywhere
root    ALL=(ALL)    ALL
usr_redhat_w ALL=(ALL) ALL
usr_redhat_m ALL=(ALL) ALL
usr_redhat_s ALL=(ALL) ALL

## Allows members of the 'sys' group to run networking, software,
## service management apps and more.
# %sys ALL = NETWORKING, SOFTWARE, SERVICES, STORAGE, DELEGATING, PROCESSES, LOC
ATE, DRIVERS

## Allows people in group wheel to run all commands
%wheel  ALL=(ALL)    ALL

## Same thing without a password
# %wheel    ALL=(ALL)    NOPASSWD: ALL

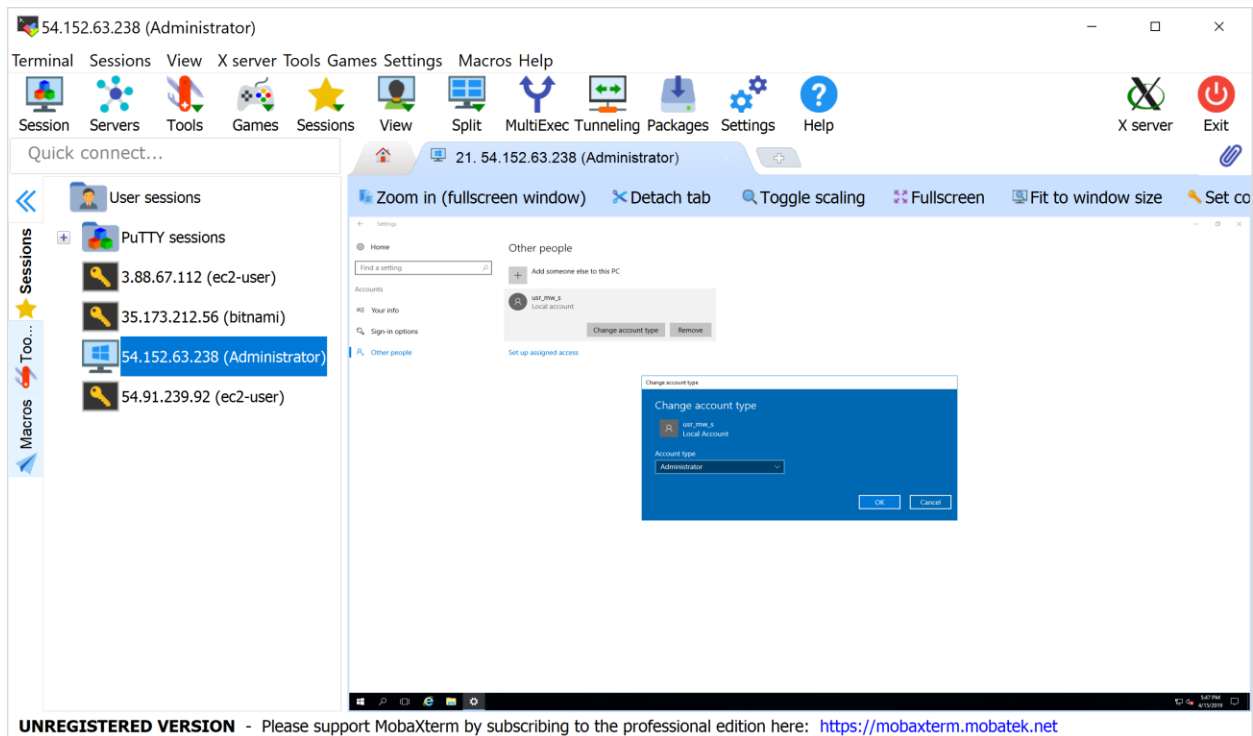
## Allows members of the users group to mount and unmount the
## cdrom as root
# %users  ALL=/sbin/mount /mnt/cdrom, /sbin/umount /mnt/cdrom

## Allows members of the users group to shutdown this system
# %users  localhost=/sbin/shutdown -h now
```

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d. User account `usr_mw_s` has Administrator privileges.

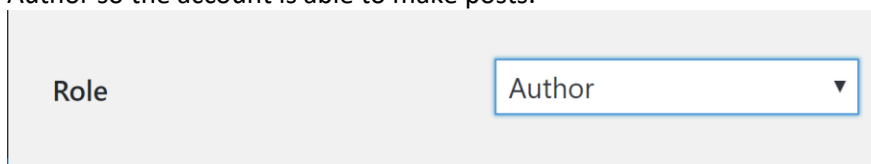
In Accounts change account type of `usr_mw_s` to 'Administrator'.



Word Press privileges:

I will also change the word press account privileges so they are able to make posts as well.

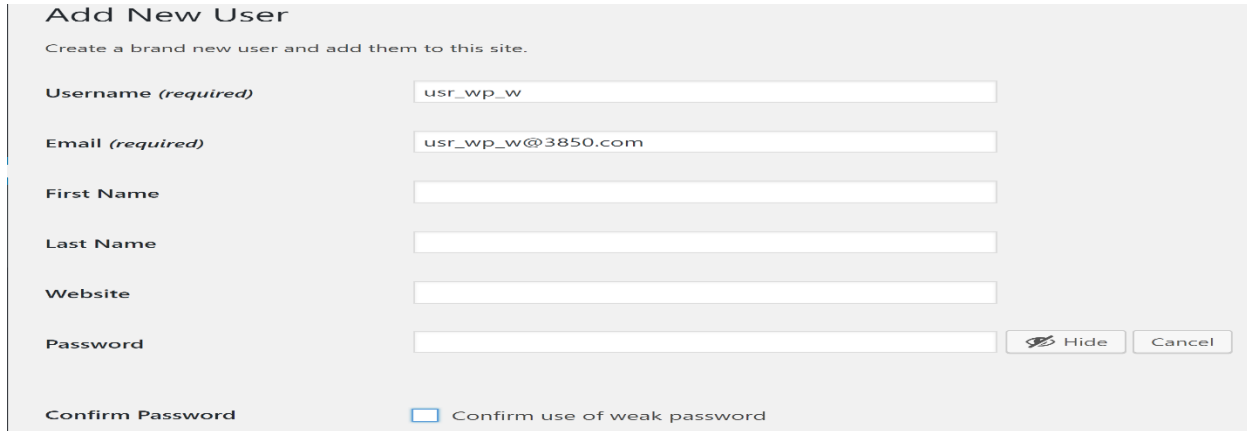
Navigate to the user you wish to update (in this case `usr_wp_w` and `usr_wp_m`) and update the role to Author so the account is able to make posts.



4. Users passwords.

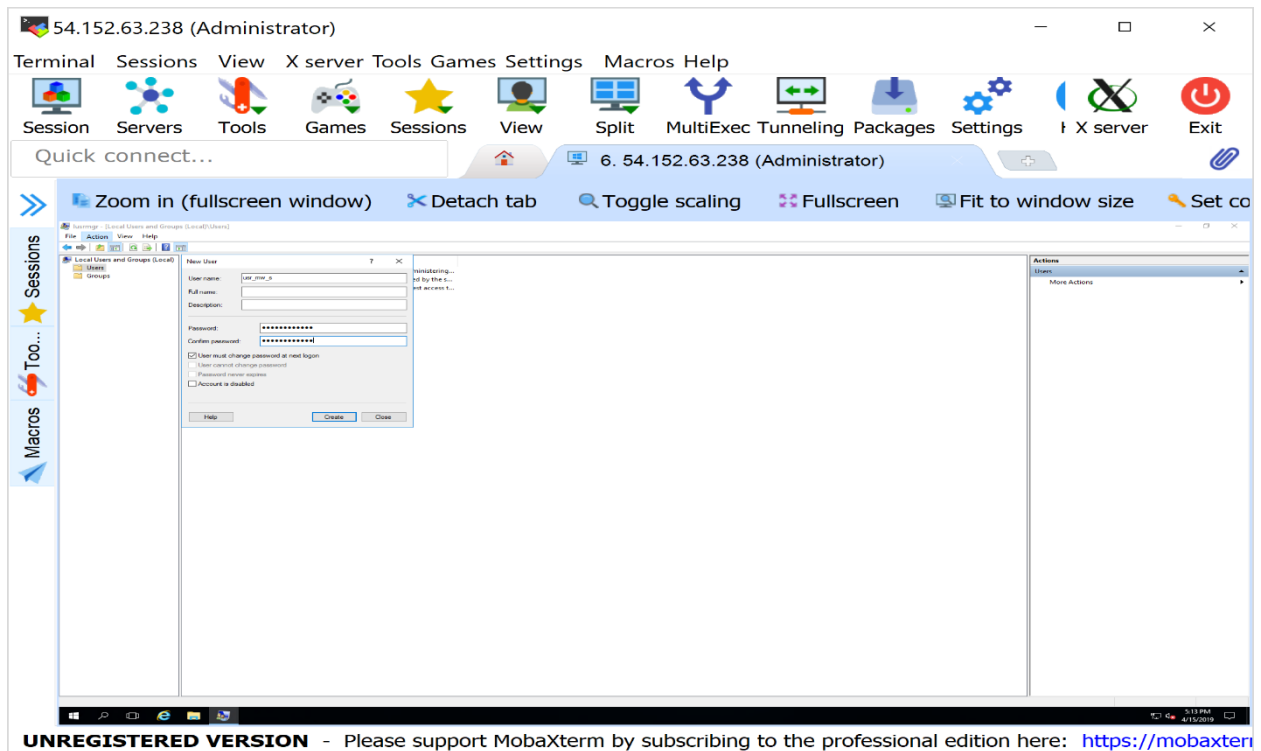
Again, Red Hat and FTP are similar, and Word Press and Windows 2016 is different. Just follow the instructions accordingly.

For Word Press the password can be created upon account creation.



The screenshot shows a web form titled "Add New User" with the instruction "Create a brand new user and add them to this site." The form contains several input fields: "Username (required)" with the value "usr_wp_w", "Email (required)" with the value "usr_wp_w@3850.com", "First Name", "Last Name", "Website", and "Password". There are "Hide" and "Cancel" buttons next to the password field. At the bottom, there is a "Confirm Password" label and a checkbox labeled "Confirm use of weak password".

For Windows 2016 the password can be created upon account creation.



- Passwords for user accounts that end in “w” (i.e. `usr_redhat_w`, `usr_ftp_w` and `usr_wp_w`) must have exactly 8 random characters (use only lower and upper case letters from the English alphabet).
- Passwords for user accounts that end in “m” must have exactly 10 random characters (combine lower and upper case letters from the English alphabet and numbers).
- Passwords for user accounts that end in “s” must have exactly 12 random characters (combine lower and upper case letters from the English alphabet and numbers and special characters).

```

3.88.67.112 (ec2-user)
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages S X server Exit
Quick connect... 8. 3.88.67.112 (ec2-user)
[ec2-user@ip-192-168-100-48 ~]$ sudo passwd usr_redhat_w
Changing password for user usr_redhat_w.
New password:
Retype new password:
passwd: all authentication tokens updated successfully.
[ec2-user@ip-192-168-100-48 ~]$ sudo passwd usr_redhat_m
Changing password for user usr_redhat_m.
New password:
Retype new password:
passwd: all authentication tokens updated successfully.
[ec2-user@ip-192-168-100-48 ~]$ sudo passwd usr_redhat_s
Changing password for user usr_redhat_s.
New password:
Retype new password:
Sorry, passwords do not match.
New password:
Retype new password:
passwd: all authentication tokens updated successfully.
[ec2-user@ip-192-168-100-48 ~]$

```

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5. [Bonus points 10%] In the Red Hat instance create a MySQL database with the following fields: `id`, `email`, `monthly_salary`, `phone_number`, assign a 10-character password for the root MySQL account using a combination of letters and numbers only. Fill out the database with 3 registers with fake information. Use the `usr_redhat_m` user account to complete this task.

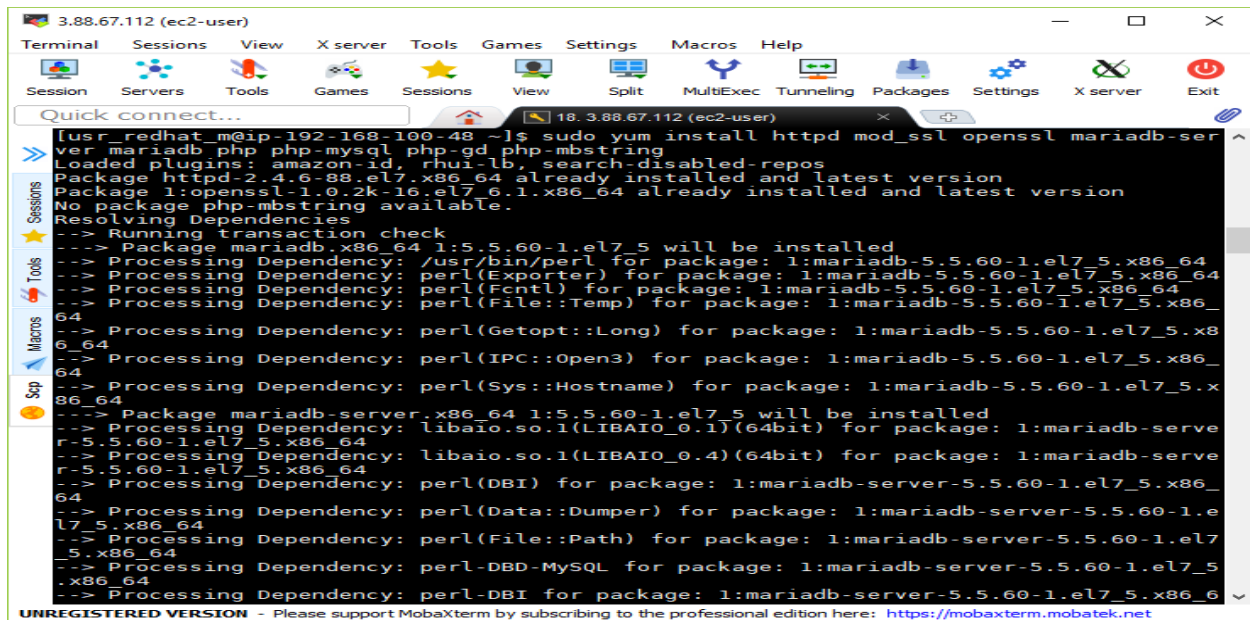
Install a LAMP server using the commnds: ‘`sudo yum update -y`’ and ‘`sudo yum install httpd mod_ssl openssl mariadb-server mariadb php php-mysql php-gd php-mbstring`’.

```

3.88.67.112 (ec2-user)
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings X server Exit
Quick connect... 18. 3.88.67.112 (ec2-user)
[usr_redhat_m@ip-192-168-100-48 ~]$ sudo yum update -y
Loaded plugins: amazon-id, rhui-lb, search-disabled-repos
Resolving Dependencies
--> Running transaction check
--> Package NetworkManager.x86_64 1:1.12.0-6.el7 will be updated
--> Package NetworkManager-config-server.noarch 1:1.12.0-6.el7 will be updated
--> Package NetworkManager-libnm.x86_64 1:1.12.0-6.el7 will be updated
--> Package NetworkManager-libnm.x86_64 1:1.12.0-10.el7_6 will be an update
--> Package NetworkManager-team.x86_64 1:1.12.0-6.el7 will be updated
--> Package NetworkManager-tui.x86_64 1:1.12.0-6.el7 will be updated
--> Package NetworkManager-tui.x86_64 1:1.12.0-10.el7_6 will be an update
--> Package bind-libs-lite.x86_64 32:9.9.4-72.el7 will be updated
--> Package bind-libs-lite.x86_64 32:9.9.4-73.el7_6 will be an update
--> Package bind-license.noarch 32:9.9.4-72.el7 will be updated
--> Package bind-license.noarch 32:9.9.4-73.el7_6 will be an update
--> Package cloud-init.x86_64 0:18.2-1.el7 will be updated
--> Package cloud-init.x86_64 0:18.2-1.el7_6.2 will be an update
--> Package cronie.x86_64 0:1.4.11-19.el7 will be updated
--> Package cronie.x86_64 0:1.4.11-20.el7_6 will be an update
--> Package cronie-anacron.x86_64 0:1.4.11-19.el7 will be updated
--> Package cronie-anacron.x86_64 0:1.4.11-20.el7_6 will be an update
--> Package dbus.x86_64 1:1.10.24-12.el7 will be updated
--> Package dbus.x86_64 1:1.10.24-13.el7_6 will be an update
--> Package dbus-libs.x86_64 1:1.10.24-12.el7 will be updated
--> Package dbus-libs.x86_64 1:1.10.24-13.el7_6 will be an update
--> Package device-mapper.x86_64 7:1.02.149-8.el7 will be updated
--> Package device-mapper.x86_64 7:1.02.149-10.el7_6.3 will be an update
--> Package device-mapper-libs.x86_64 7:1.02.149-8.el7 will be updated
--> Package device-mapper-libs.x86_64 7:1.02.149-10.el7_6.3 will be an update
--> Package freetype.x86_64 0:2.8.12.el7 will be updated
--> Package freetype.x86_64 0:2.8.12.el7_6.1 will be an update

```

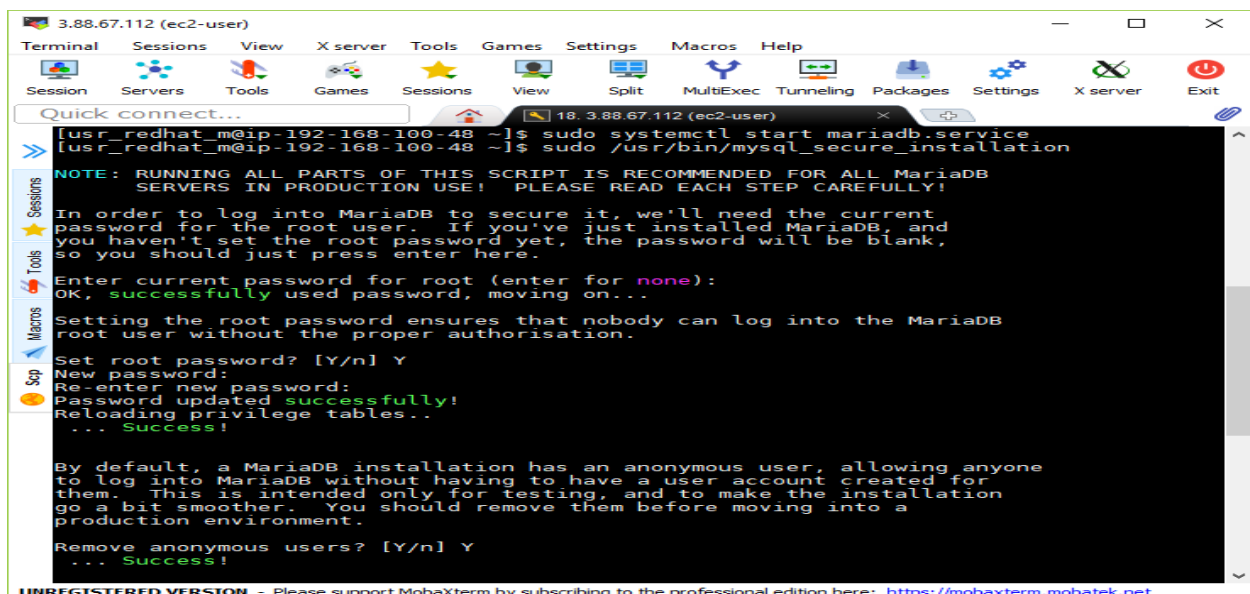
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The screenshot shows a MobaXterm terminal window with the title '3.88.67.112 (ec2-user)'. The terminal displays the command `sudo yum install httpd mod_ssl openssl mariadb-server mariadb-php php-mysql php-gd php-mbstring` and its output. The output indicates that several packages are already installed or the latest version is being installed. It then lists the dependencies for the `mariadb-server` package, including `perl(Fcntl)`, `perl(File::Temp)`, `perl(Getopt::Long)`, `perl(IPC::Open3)`, `perl(Sys::Hostname)`, `libaio.so.1(LIBAIO_0.1)`, `libaio.so.1(LIBAIO_0.4)`, `perl(DBI)`, `perl(Data::Dumper)`, `perl(File::Path)`, `perl-DBD-MySQL`, and `perl-DBI`. The terminal also shows the command `sudo systemctl start mariadb.service` and `sudo /usr/bin/mysql_secure_installation`.

```
[usr_redhat_m@ip-192-168-100-48 ~]$ sudo yum install httpd mod_ssl openssl mariadb-server mariadb-php php-mysql php-gd php-mbstring
Loaded plugins: amazon-id, rhui-lb, search-disabled-repos
Package httpd-2.4.6-88.el7.x86_64 already installed and latest version
Package 1:openssl-1.0.2k-16.el7_6.1.x86_64 already installed and latest version
No package php-mbstring available.
Resolving Dependencies
--> Running transaction check
--> Package mariadb.x86_64 1:5.5.60-1.el7_5 will be installed
--> Processing Dependency: /usr/bin/perl for package: 1:mariadb-5.5.60-1.el7_5.x86_64
--> Processing Dependency: perl(Exporter) for package: 1:mariadb-5.5.60-1.el7_5.x86_64
--> Processing Dependency: perl(Fcntl) for package: 1:mariadb-5.5.60-1.el7_5.x86_64
--> Processing Dependency: perl(File::Temp) for package: 1:mariadb-5.5.60-1.el7_5.x86_64
--> Processing Dependency: perl(Getopt::Long) for package: 1:mariadb-5.5.60-1.el7_5.x86_64
--> Processing Dependency: perl(IPC::Open3) for package: 1:mariadb-5.5.60-1.el7_5.x86_64
--> Processing Dependency: perl(Sys::Hostname) for package: 1:mariadb-5.5.60-1.el7_5.x86_64
--> Package mariadb-server.x86_64 1:5.5.60-1.el7_5 will be installed
--> Processing Dependency: libaio.so.1(LIBAIO_0.1)(64bit) for package: 1:mariadb-server-5.5.60-1.el7_5.x86_64
--> Processing Dependency: libaio.so.1(LIBAIO_0.4)(64bit) for package: 1:mariadb-server-5.5.60-1.el7_5.x86_64
--> Processing Dependency: perl(DBI) for package: 1:mariadb-server-5.5.60-1.el7_5.x86_64
--> Processing Dependency: perl(Data::Dumper) for package: 1:mariadb-server-5.5.60-1.el7_5.x86_64
--> Processing Dependency: perl(File::Path) for package: 1:mariadb-server-5.5.60-1.el7_5.x86_64
--> Processing Dependency: perl-DBD-MySQL for package: 1:mariadb-server-5.5.60-1.el7_5.x86_64
--> Processing Dependency: perl-DBI for package: 1:mariadb-server-5.5.60-1.el7_5.x86_64
UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: https://mobaxterm.mobatek.net
```

Start the database: 'sudo systemctl start_mariadb.service' and 'sudo /usr/bin/mysql_secure_installation'.



The screenshot shows a MobaXterm terminal window with the title '3.88.67.112 (ec2-user)'. The terminal displays the output of the `mysql_secure_installation` script. It starts with a note that running all parts of the script is recommended for production use. It then prompts the user to enter the current password for root, which is successfully used. Next, it prompts the user to set a new root password, which is also successfully updated. The script then reloads the privilege tables. Finally, it prompts the user to remove anonymous users, which is also successfully done. The terminal also shows the command `sudo systemctl start mariadb.service` and `sudo /usr/bin/mysql_secure_installation`.

```
[usr_redhat_m@ip-192-168-100-48 ~]$ sudo systemctl start mariadb.service
[usr_redhat_m@ip-192-168-100-48 ~]$ sudo /usr/bin/mysql_secure_installation

NOTE: RUNNING ALL PARTS OF THIS SCRIPT IS RECOMMENDED FOR ALL MariaDB
SERVERS IN PRODUCTION USE!  PLEASE READ EACH STEP CAREFULLY!

In order to log into MariaDB to secure it, we'll need the current
password for the root user.  If you've just installed MariaDB, and
you haven't set the root password yet, the password will be blank,
so you should just press enter here.

Enter current password for root (enter for none):
OK, successfully used password, moving on...

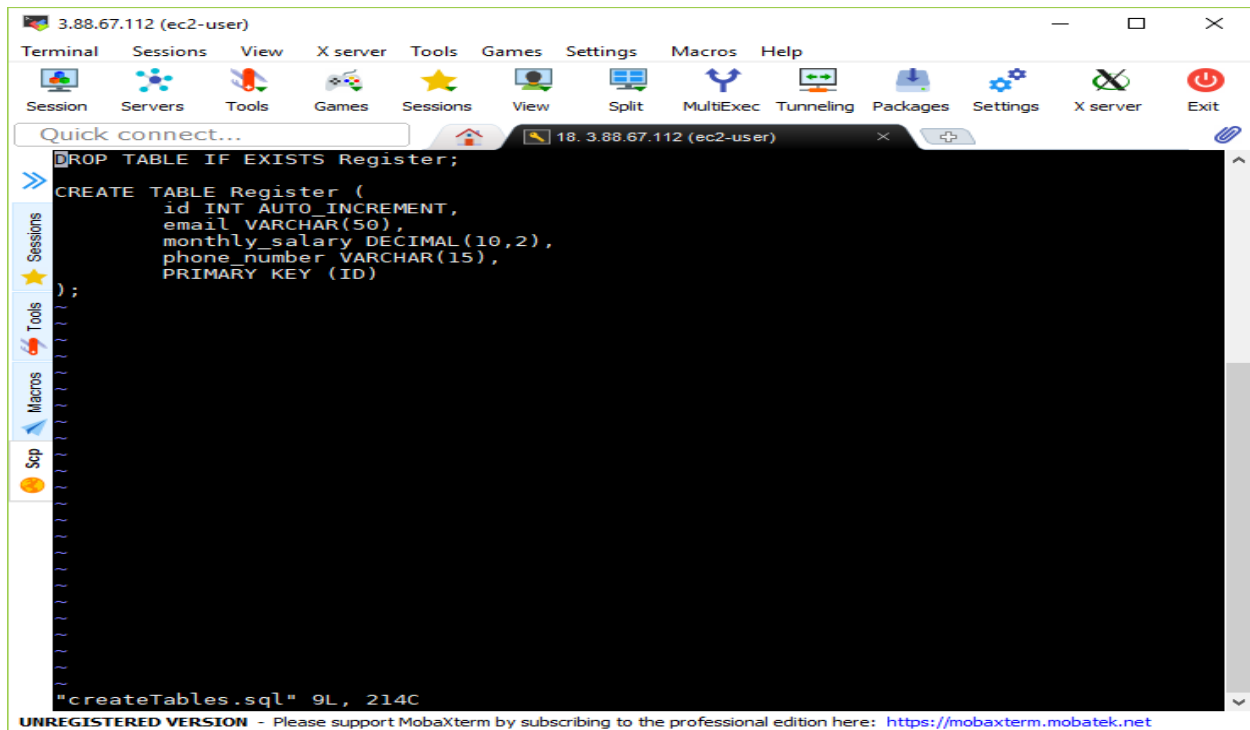
Setting the root password ensures that nobody can log into the MariaDB
root user without the proper authorisation.

Set root password? [Y/n] Y
New password:
Re-enter new password:
Password updated successfully!
Reloading privilege tables..
... Success!

By default, a MariaDB installation has an anonymous user, allowing anyone
to log into MariaDB without having to have a user account created for
them.  This is intended only for testing, and to make the installation
go a bit smoother.  You should remove them before moving into a
production environment.

Remove anonymous users? [Y/n] Y
... Success!
UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: https://mobaxterm.mobatek.net
```

Create the sql files:
Initial database

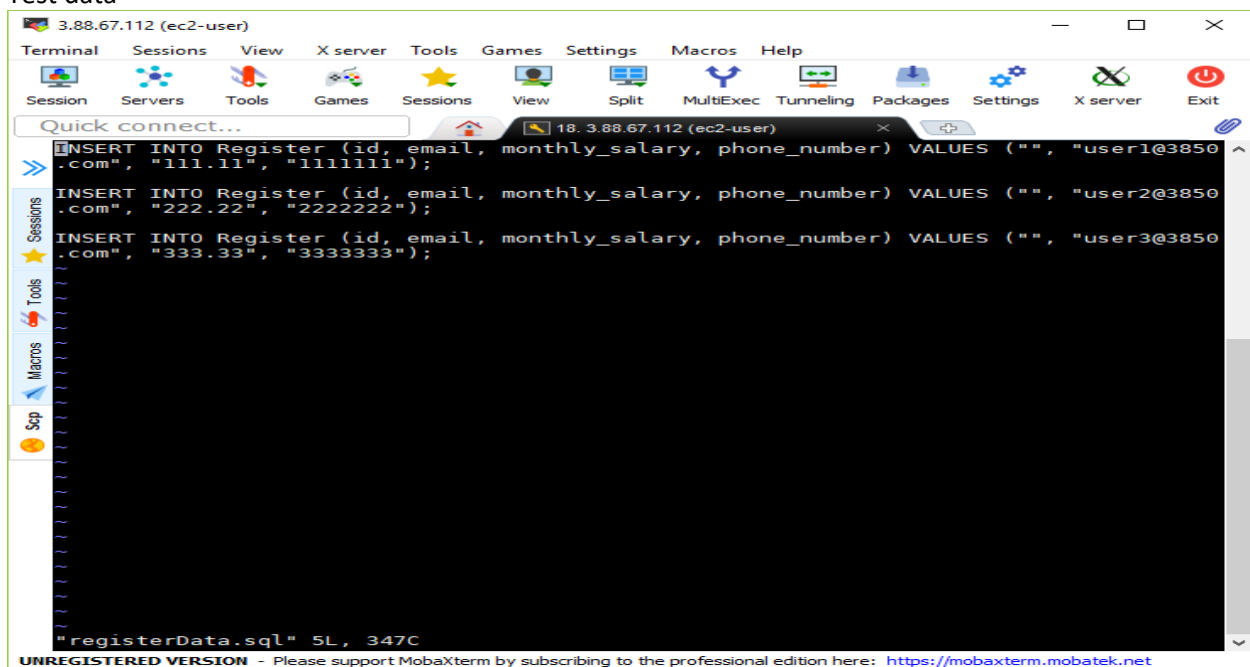


The screenshot shows the MobaXterm interface with a terminal window titled "18. 3.88.67.112 (ec2-user)". The terminal displays the following SQL commands:

```
DROP TABLE IF EXISTS Register;  
CREATE TABLE Register (  
    id INT AUTO_INCREMENT,  
    email VARCHAR(50),  
    monthly_salary DECIMAL(10,2),  
    phone_number VARCHAR(15),  
    PRIMARY KEY (ID)  
);
```

The status bar at the bottom indicates "UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: <https://mobaxterm.mobatek.net>".

Test data

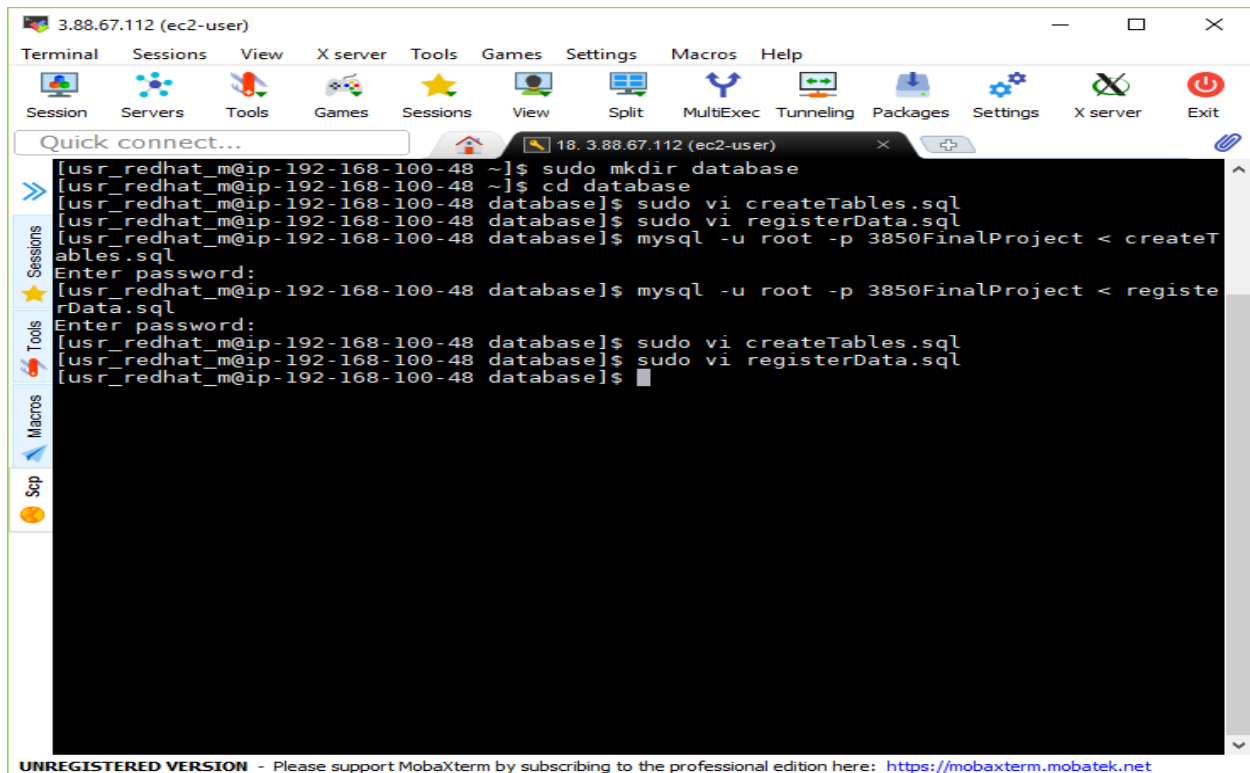


The screenshot shows the MobaXterm interface with a terminal window titled "18. 3.88.67.112 (ec2-user)". The terminal displays the following SQL commands:

```
INSERT INTO Register (id, email, monthly_salary, phone_number) VALUES ("", "user1@3850.com", "111.11", "1111111");  
INSERT INTO Register (id, email, monthly_salary, phone_number) VALUES ("", "user2@3850.com", "222.22", "2222222");  
INSERT INTO Register (id, email, monthly_salary, phone_number) VALUES ("", "user3@3850.com", "333.33", "3333333");
```

The status bar at the bottom indicates "UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: <https://mobaxterm.mobatek.net>".

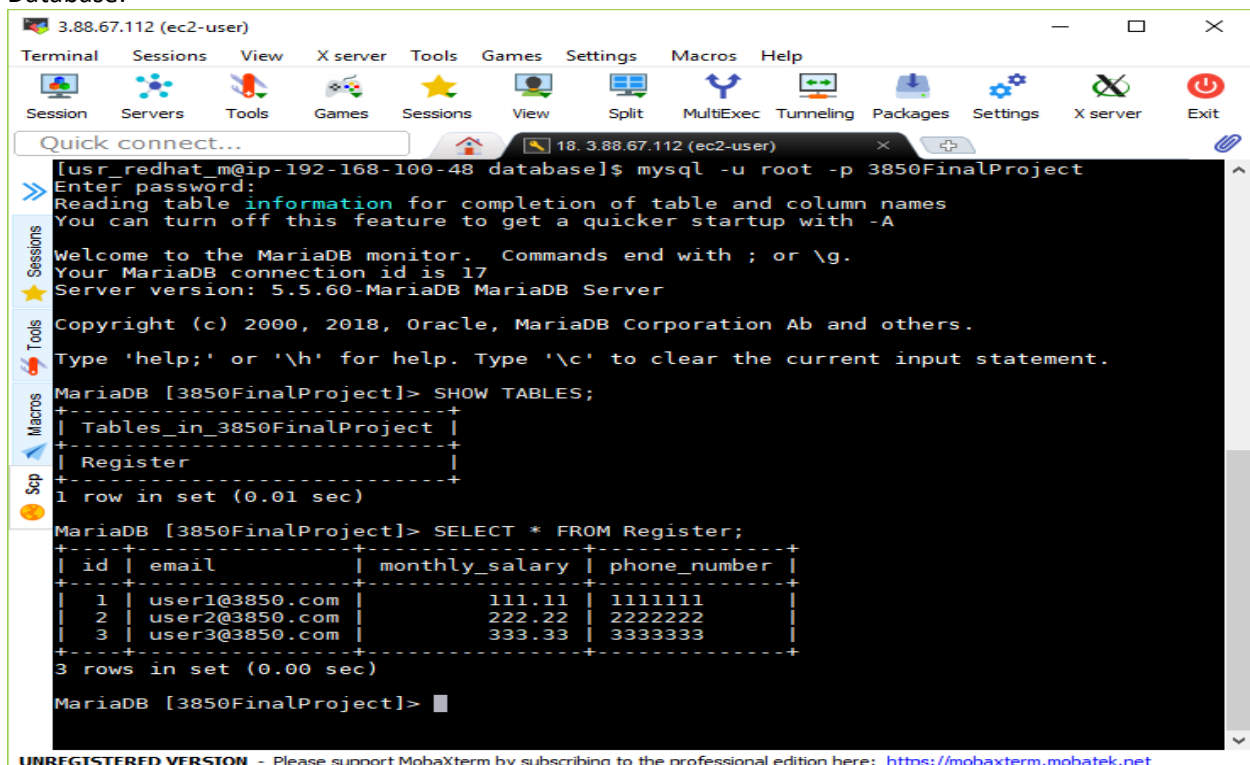
Execute the sql files so it is stored in the database: 'mysql -u root -p 3850FinalProject < createTables.sql' and 'mysql -u root -p 3850FinalProject < registerData.sql'



The screenshot shows a MobaXterm terminal window with the following commands and output:

```
[usr_redhat_m@ip-192-168-100-48 ~]$ sudo mkdir database
[usr_redhat_m@ip-192-168-100-48 ~]$ cd database
[usr_redhat_m@ip-192-168-100-48 database]$ sudo vi createTables.sql
[usr_redhat_m@ip-192-168-100-48 database]$ sudo vi registerData.sql
[usr_redhat_m@ip-192-168-100-48 database]$ mysql -u root -p 3850FinalProject < createTables.sql
Enter password:
[usr_redhat_m@ip-192-168-100-48 database]$ mysql -u root -p 3850FinalProject < registerData.sql
Enter password:
[usr_redhat_m@ip-192-168-100-48 database]$ sudo vi createTables.sql
[usr_redhat_m@ip-192-168-100-48 database]$ sudo vi registerData.sql
[usr_redhat_m@ip-192-168-100-48 database]$
```

Database:



The screenshot shows a MobaXterm terminal window with the following commands and output:

```
[usr_redhat_m@ip-192-168-100-48 database]$ mysql -u root -p 3850FinalProject
Enter password:
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 17
Server version: 5.5.60-MariaDB MariaDB Server

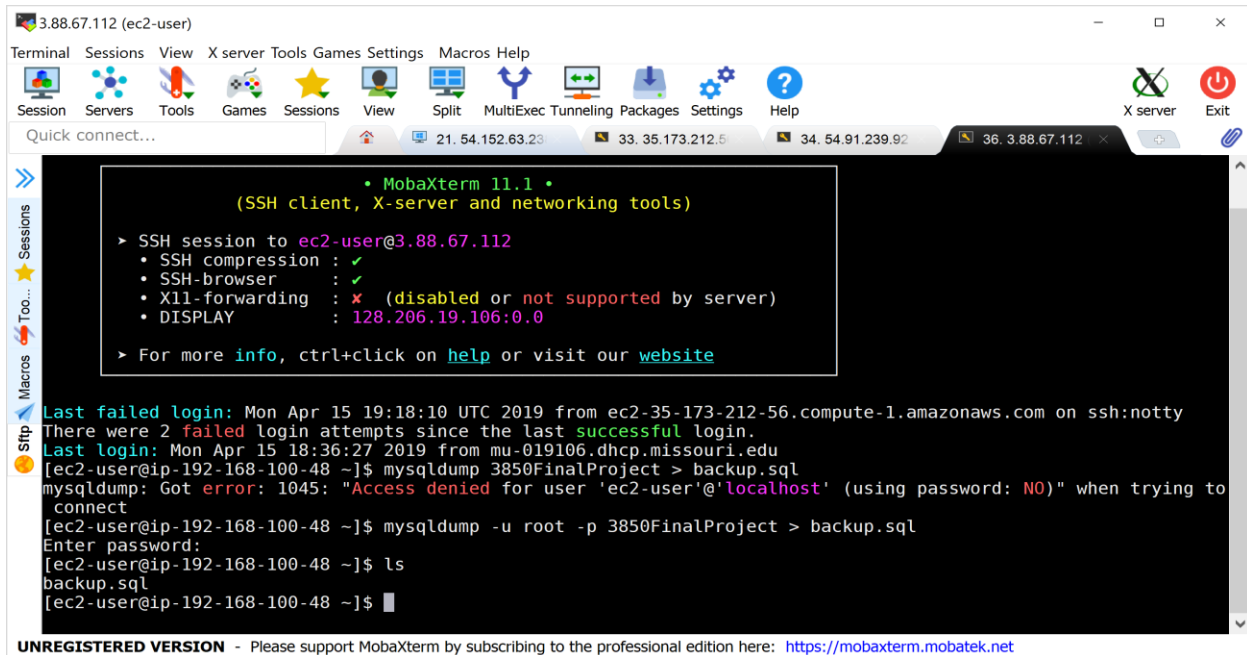
Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [3850FinalProject]> SHOW TABLES;
+-----+
| Tables_in_3850FinalProject |
+-----+
| Register                    |
+-----+
1 row in set (0.01 sec)

MariaDB [3850FinalProject]> SELECT * FROM Register;
+----+-----+-----+-----+
| id | email          | monthly_salary | phone_number |
+----+-----+-----+-----+
| 1  | user1@3850.com | 111.11         | 11111111     |
| 2  | user2@3850.com | 222.22         | 22222222     |
| 3  | user3@3850.com | 333.33         | 33333333     |
+----+-----+-----+-----+
3 rows in set (0.00 sec)

MariaDB [3850FinalProject]>
```


6. [Bonus points 10%] Make a backup of the database created in the Redhat instance (have one backup file) and publish it on the WordPress instance using the `usr_wp_w` user account. Execute `mysqldump` to copy the specified database.



The screenshot shows a MobaXterm 11.1 terminal window. The title bar indicates the connection is to 3.88.67.112 (ec2-user). The terminal displays the following text:

```
• MobaXterm 11.1 •
(SSH client, X-server and networking tools)

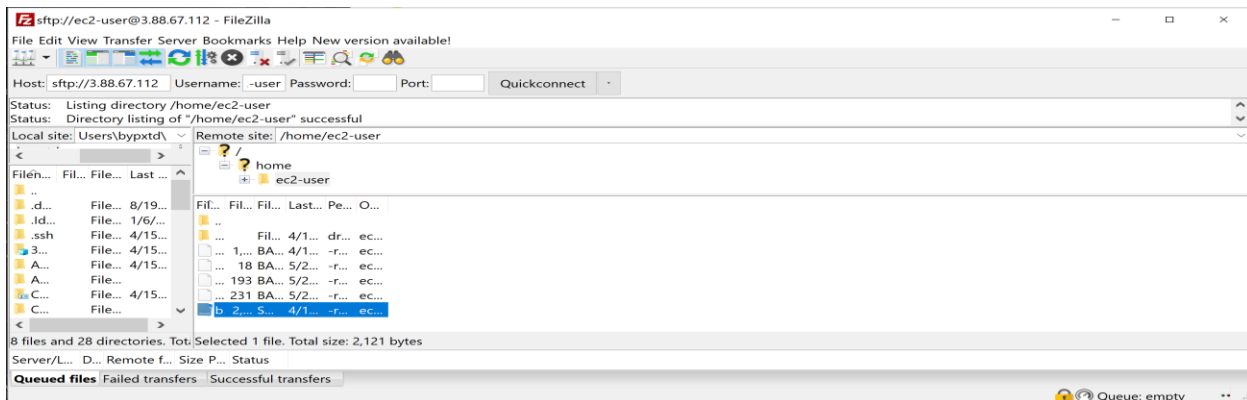
> SSH session to ec2-user@3.88.67.112
• SSH compression : ✓
• SSH-browser      : ✓
• X11-forwarding   : ✗ (disabled or not supported by server)
• DISPLAY          : 128.206.19.106:0.0

> For more info, ctrl+click on help or visit our website

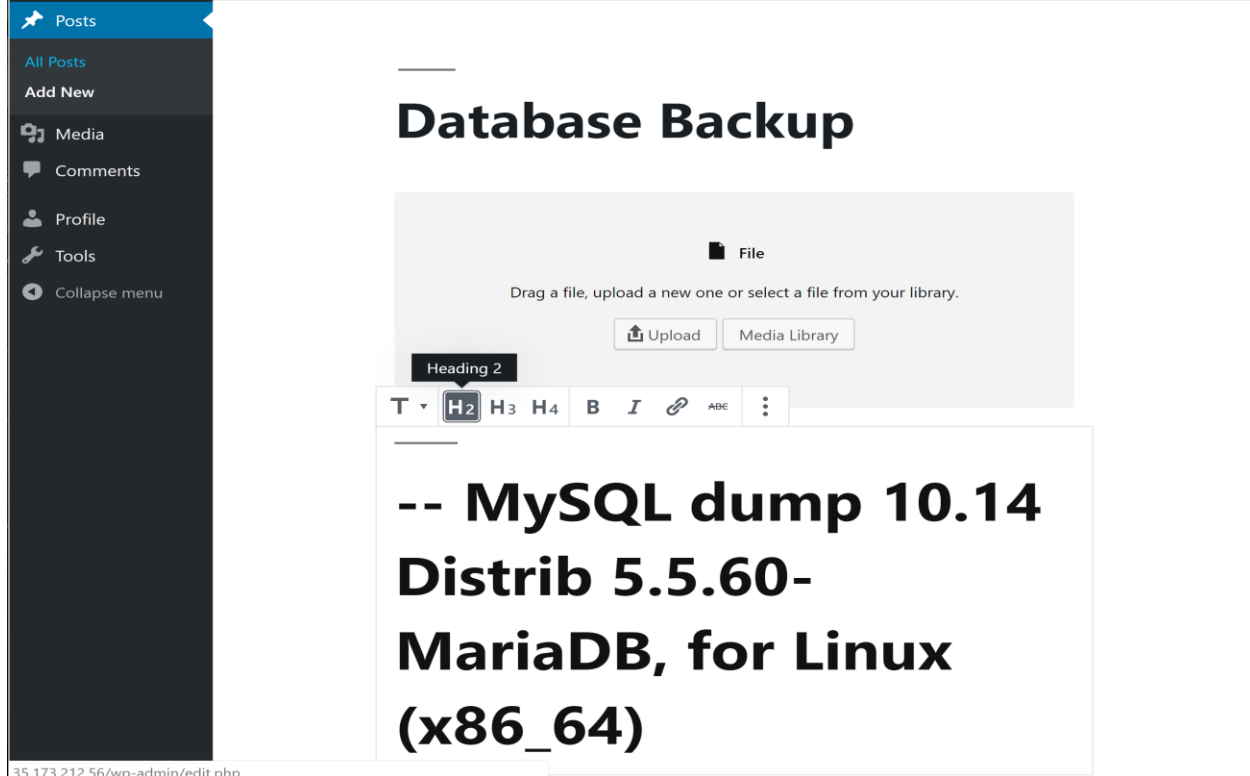
Last failed login: Mon Apr 15 19:18:10 UTC 2019 from ec2-35-173-212-56.compute-1.amazonaws.com on ssh:notty
There were 2 failed login attempts since the last successful login.
Last login: Mon Apr 15 18:36:27 2019 from mu-019106.dhcp.missouri.edu
[ec2-user@ip-192-168-100-48 ~]$ mysqldump 3850FinalProject > backup.sql
mysqldump: Got error: 1045: "Access denied for user 'ec2-user'@'localhost' (using password: NO)" when trying to
connect
[ec2-user@ip-192-168-100-48 ~]$ mysqldump -u root -p 3850FinalProject > backup.sql
Enter password:
[ec2-user@ip-192-168-100-48 ~]$ ls
backup.sql
[ec2-user@ip-192-168-100-48 ~]$
```

At the bottom of the terminal window, a message reads: "UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: <https://mobaxterm.mobatek.net>".

FileZilla to transfer the backup.sql to the local machine.

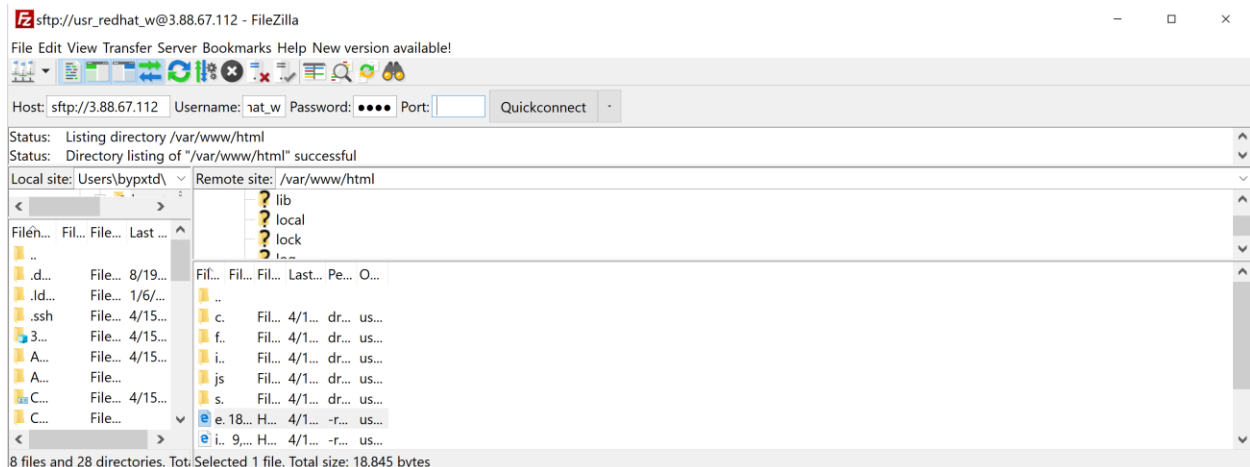


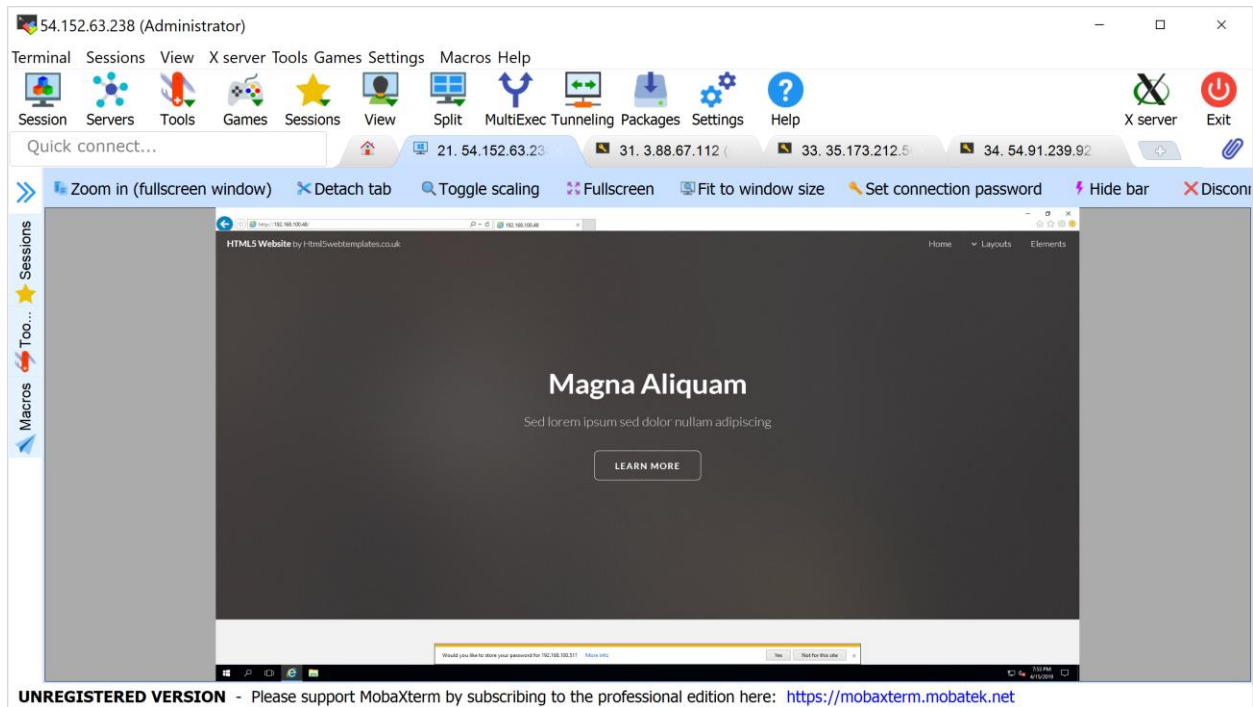
Login as `usr_wp_w` and create a new post with the contents within `backup.sql` (you can open the file in any text editor to obtain the contents).



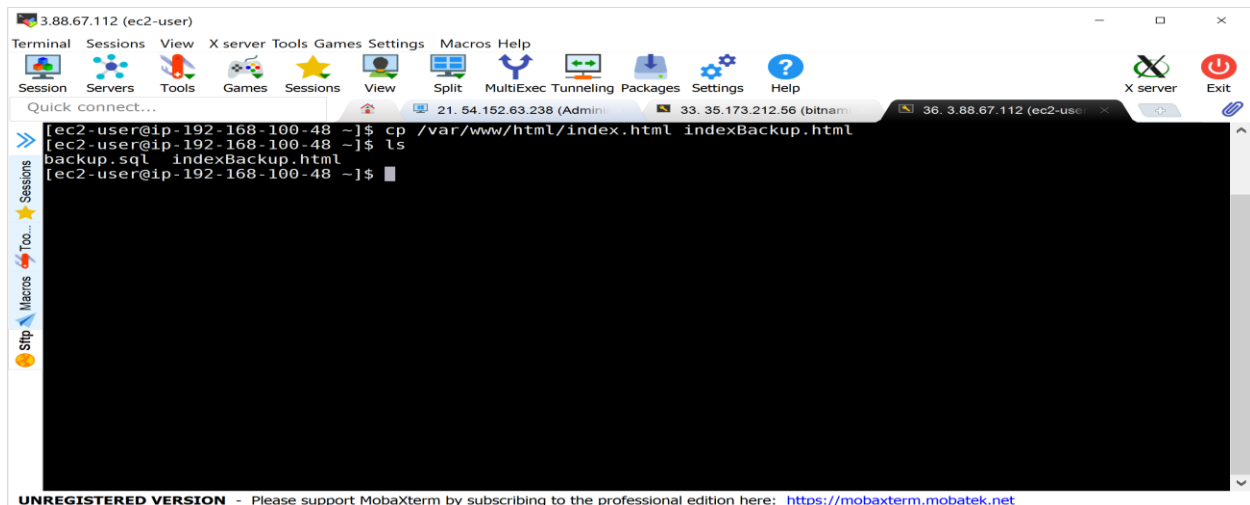
7. In the Red Hat instance enable a static website, using a template from <https://www.html5webtemplates.co.uk/templates.html>. Use the `usr_redhat_w` user account to complete this task.

I utilized FileZilla by using according credentials and then transferring the files I downloaded over to the instance.

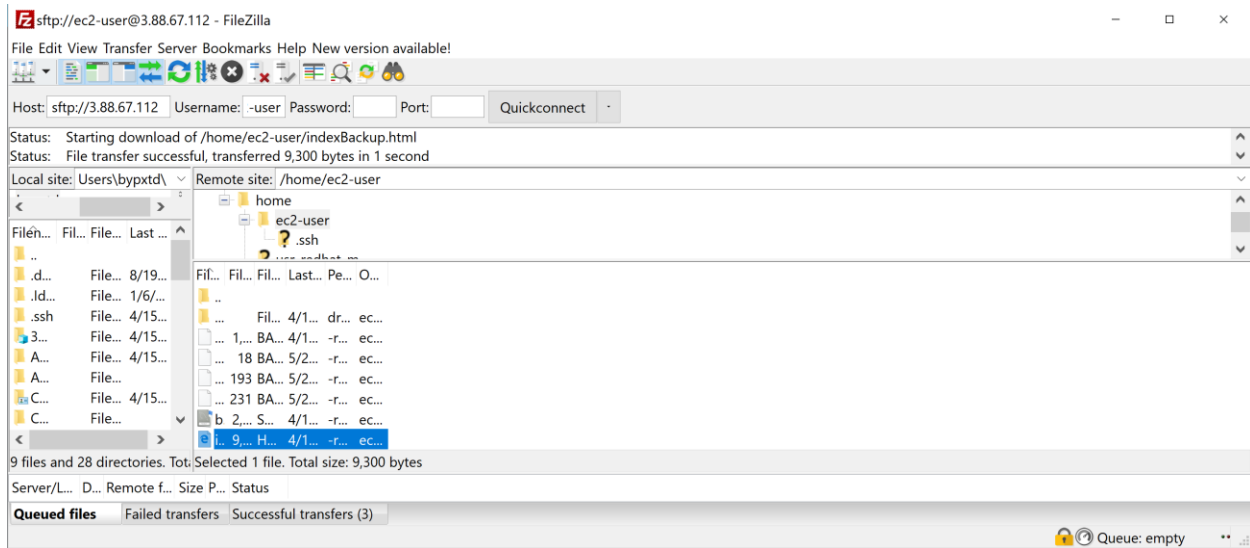




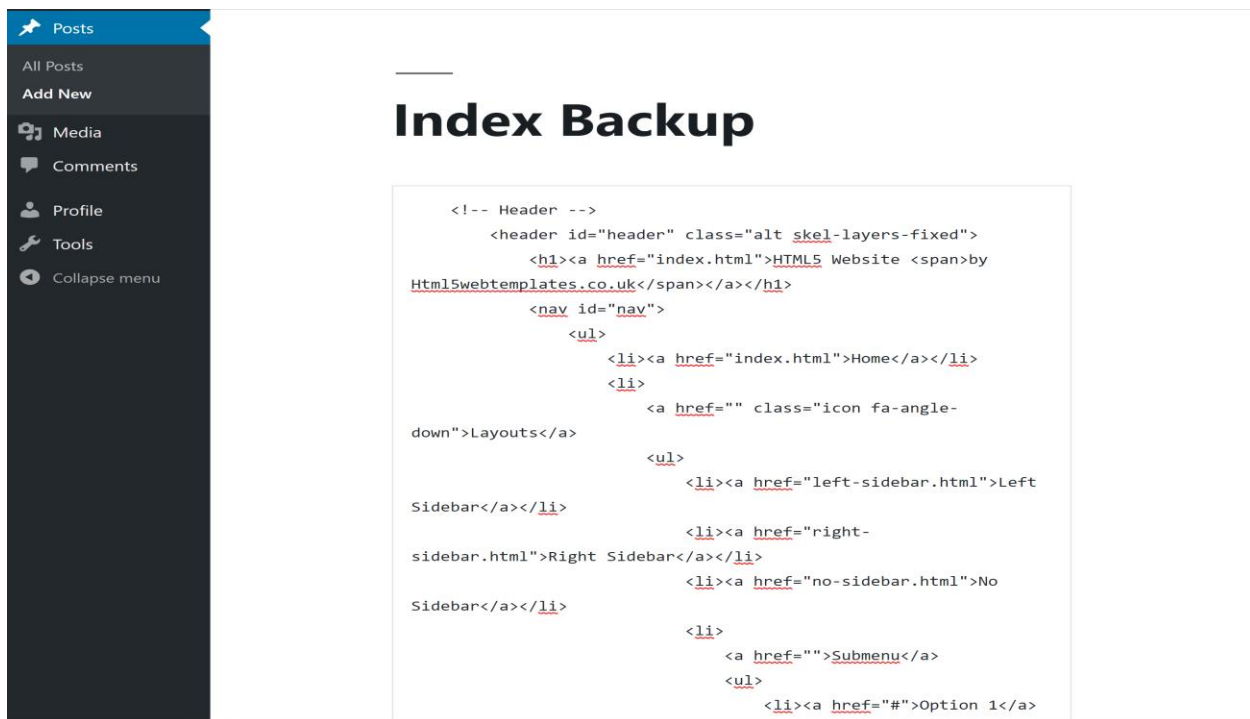
8. Make a backup of the index.html file (have one backup file) of the website created in the Red Hat instance and publish it on the WordPress instance using the usr_wp_m user account.
 Execute the cp command to copy index.html to another file



FileZilla to transfer the file to the local machine



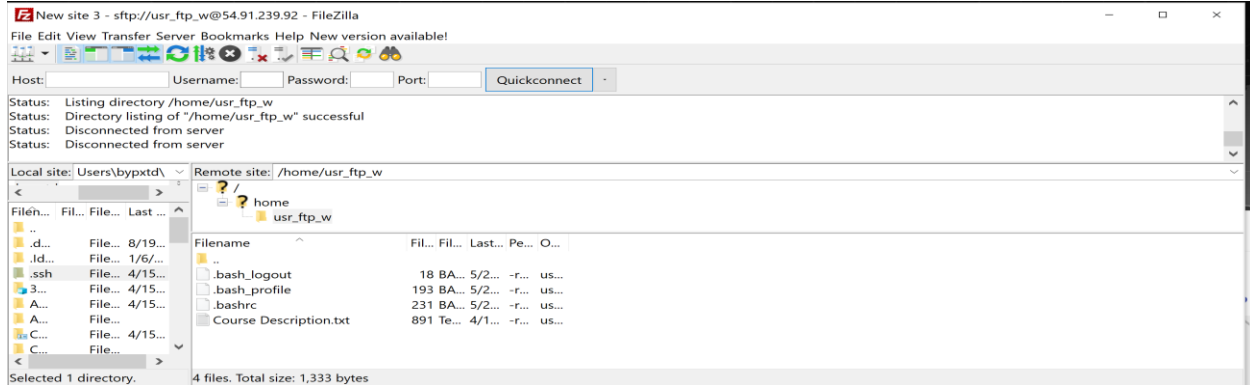
Login as `usr_wp_m` and post the contents of the `index.html` backup (Again, the contents of `index.html` can be obtained by opening it in a text editor)



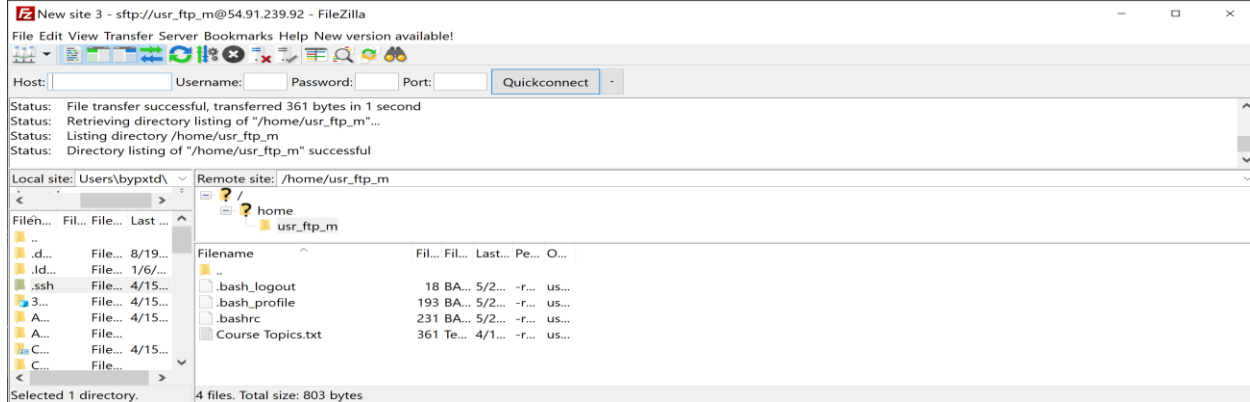
11.FTP users accounts.

Utilizing FileZilla, I logged into the user and uploaded the specified files created on the local machine.

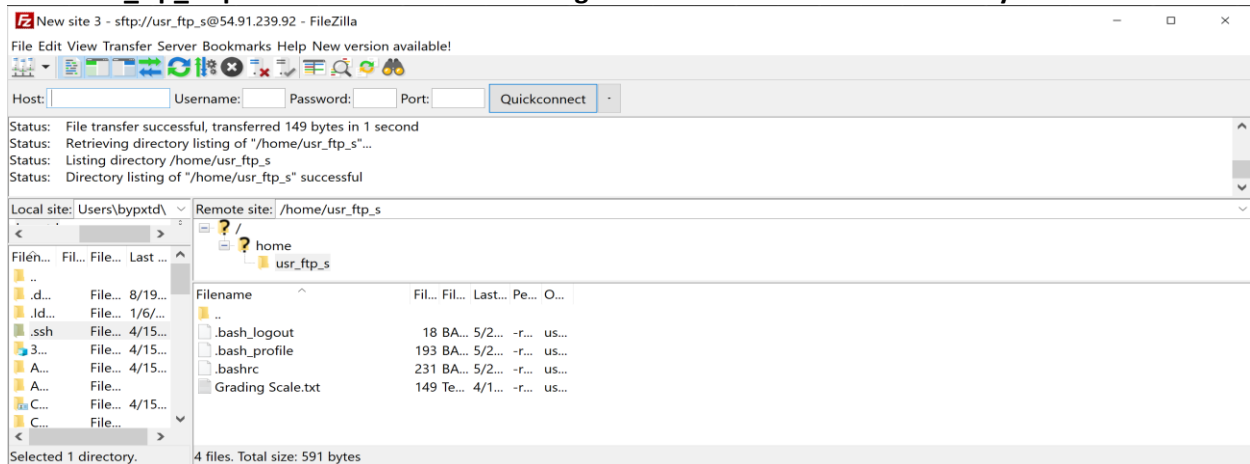
a. User `usr_ftp_w` uploads a file with the 'Course Description' section from the course's syllabus,



b. User `usr_ftp_m` uploads a file with the 'Course Topics' section from the course's syllabus,



c. Use `usr_ftp_s` uploads a file with the 'Grading Scale' section from the course's syllabus.



12.Fill out the following table

| Instance | Share the public IP | Share also... |
|--------------|---------------------|--|
| Red Hat | 3.88.67.112 | The password for the usr_redhat_s account |
| FTP | 54.91.239.92 | --- |
| Word Press | 35.173.212.56 | --- |
| Windows 2016 | 54.152.63.238 | Share the 'Remote Desktop' File and password for usr_mw_s account, that will allow us to RDP to the instance. |

usr_redhat_s = gO7!W4CnQYSP

usr_mw_s = asdFGH123!@#