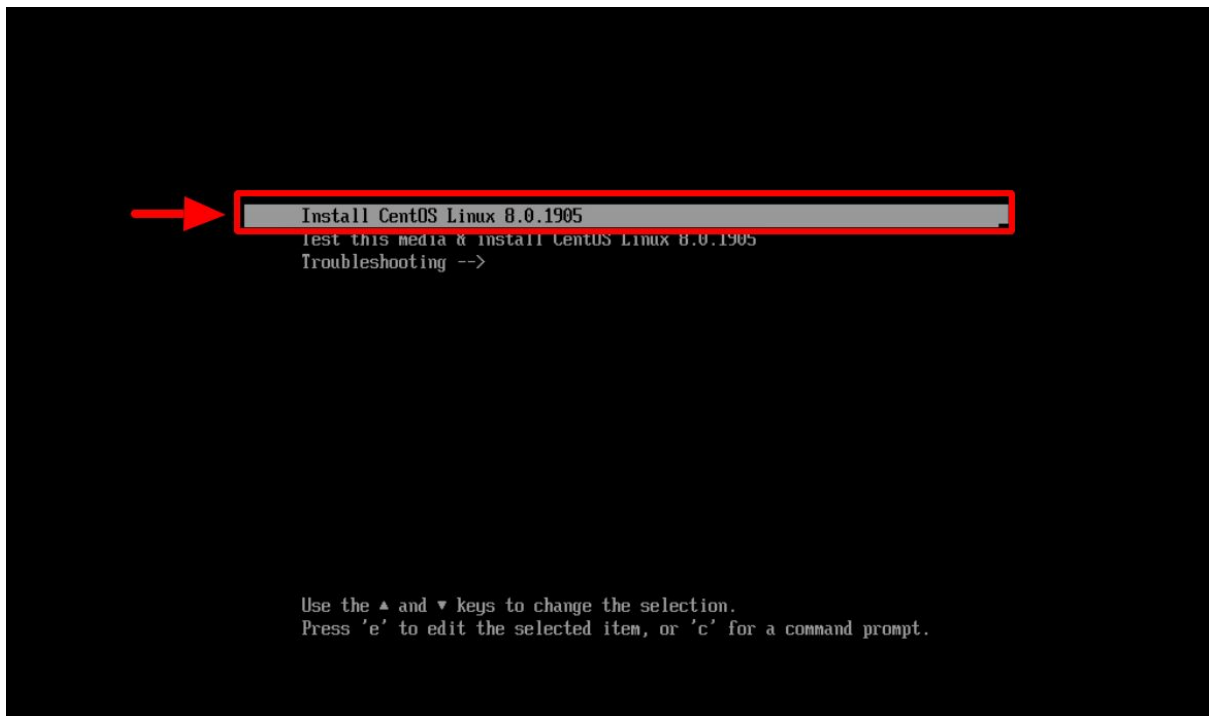
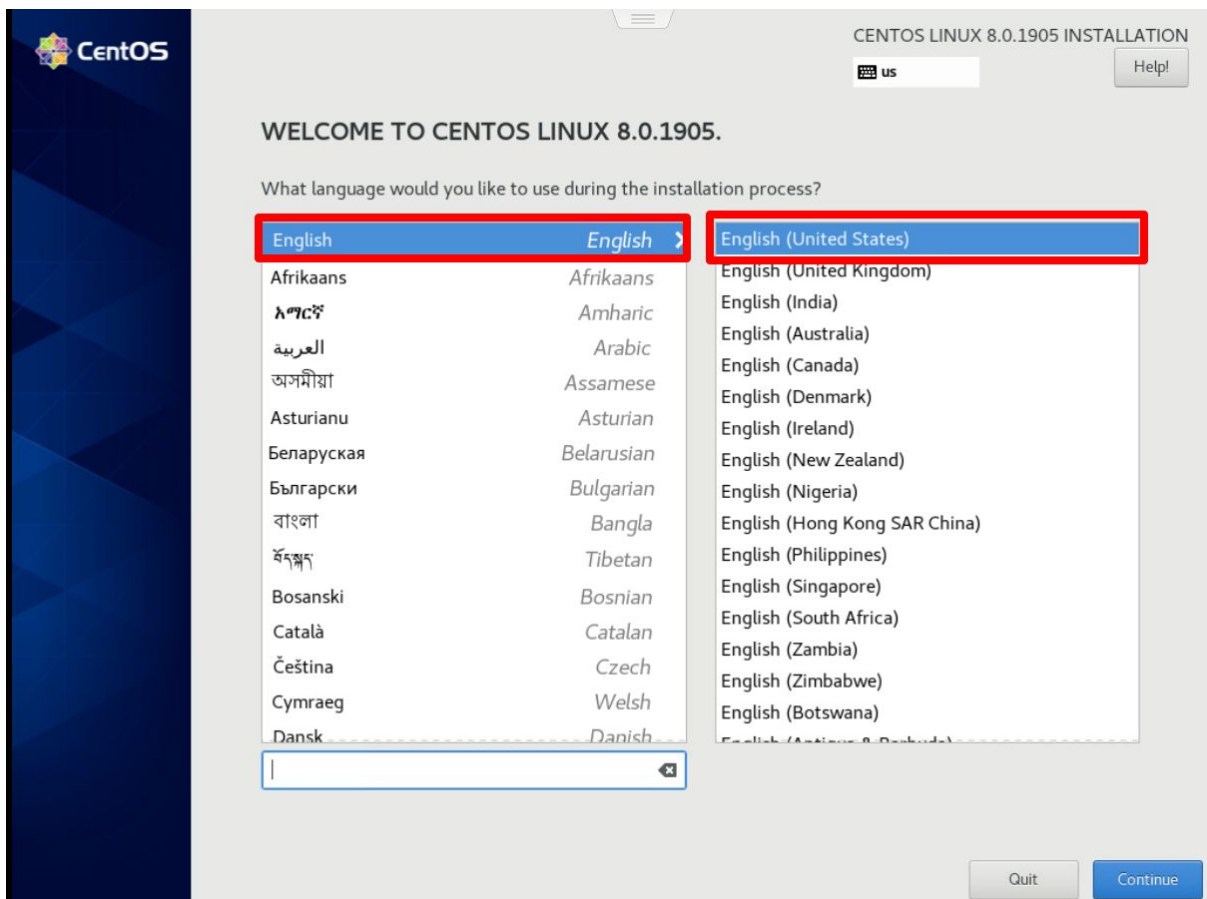


บทที่ 1 ติดตั้ง Radius Server กับ CentOS8

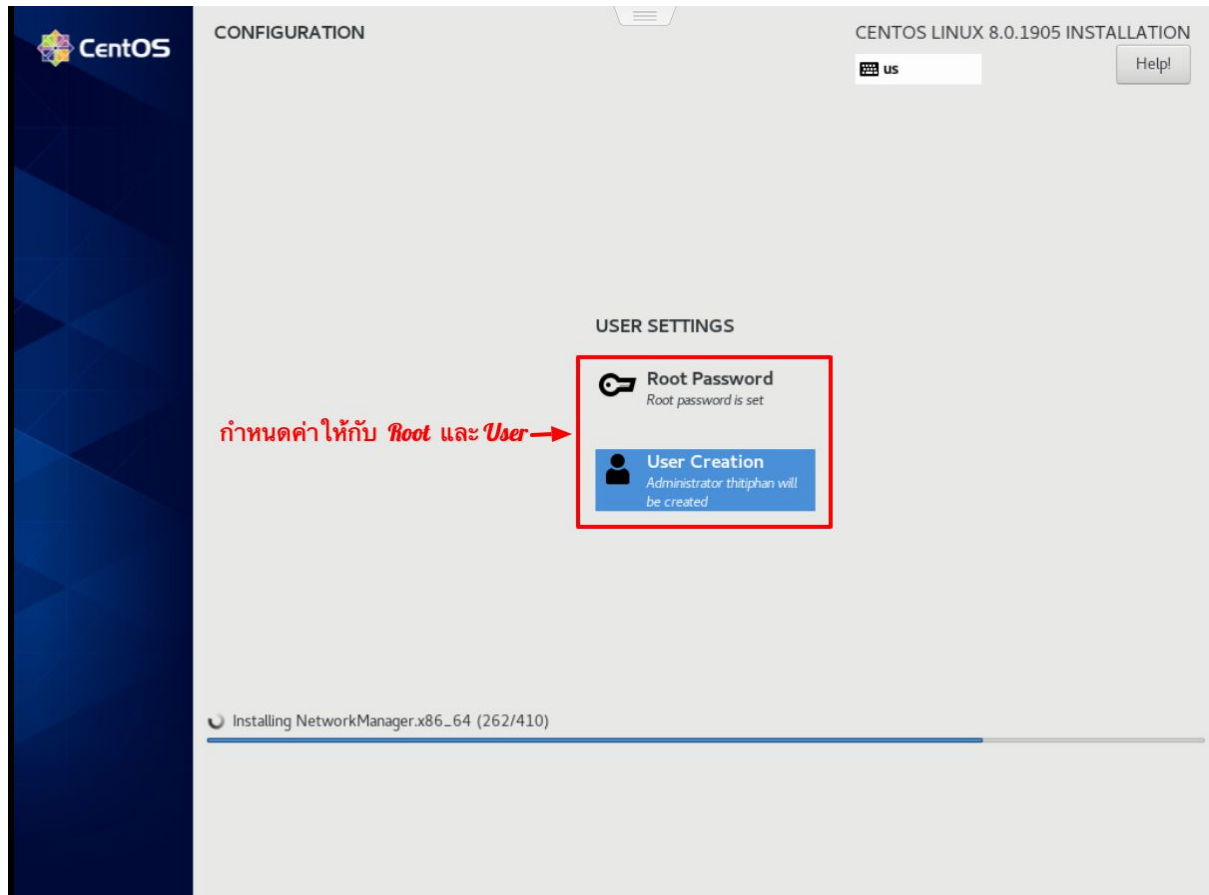
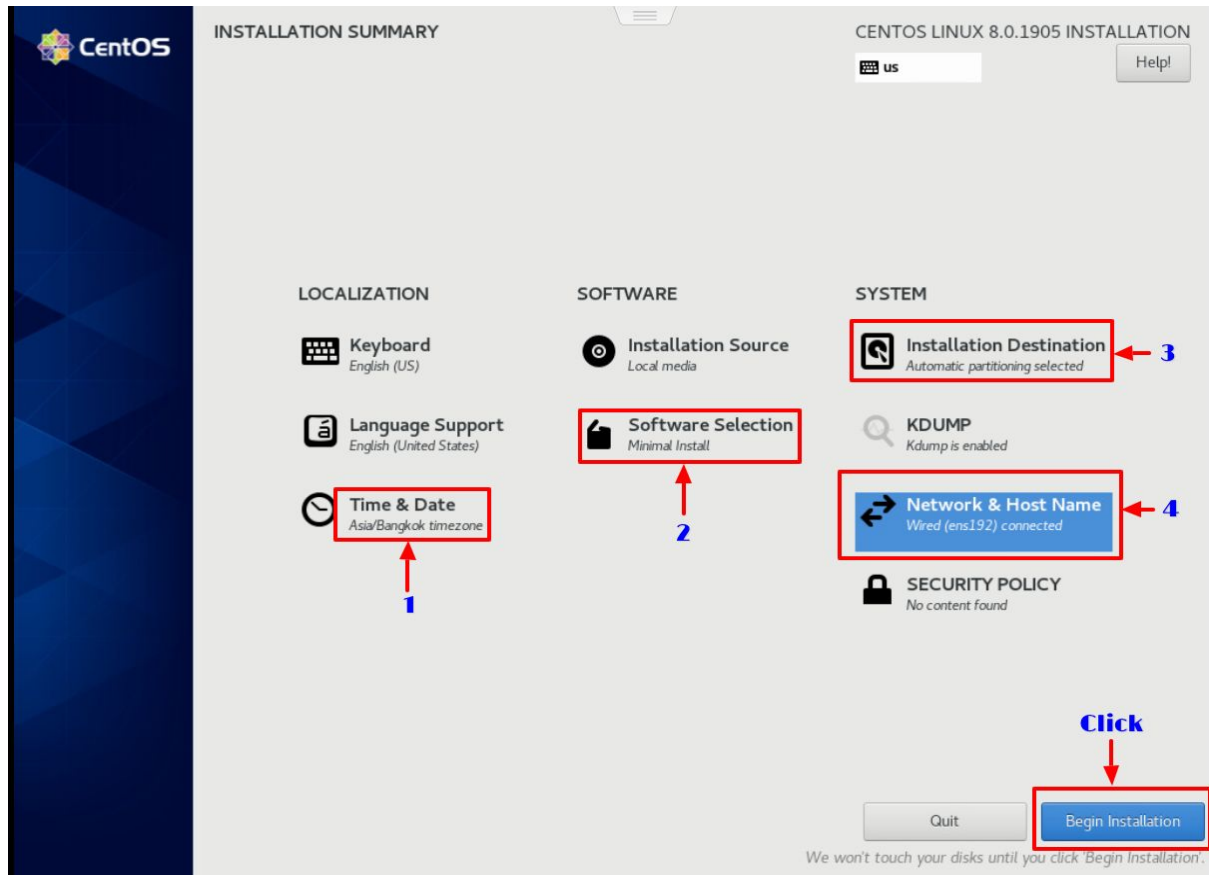
1. ติดตั้ง Linux ในที่นี้จะใช้ CentOS8



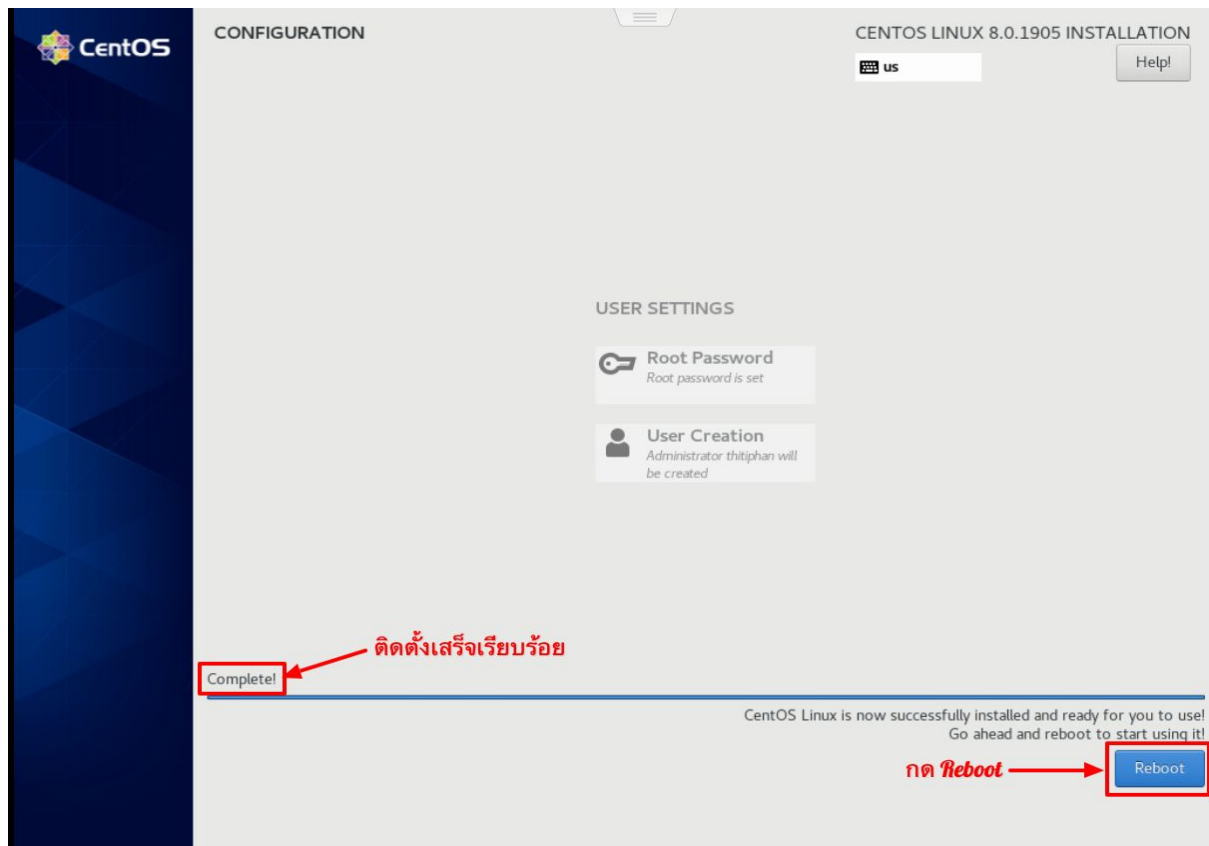
1.1 เลือกภาษาที่จะใช้ในการติดตั้ง



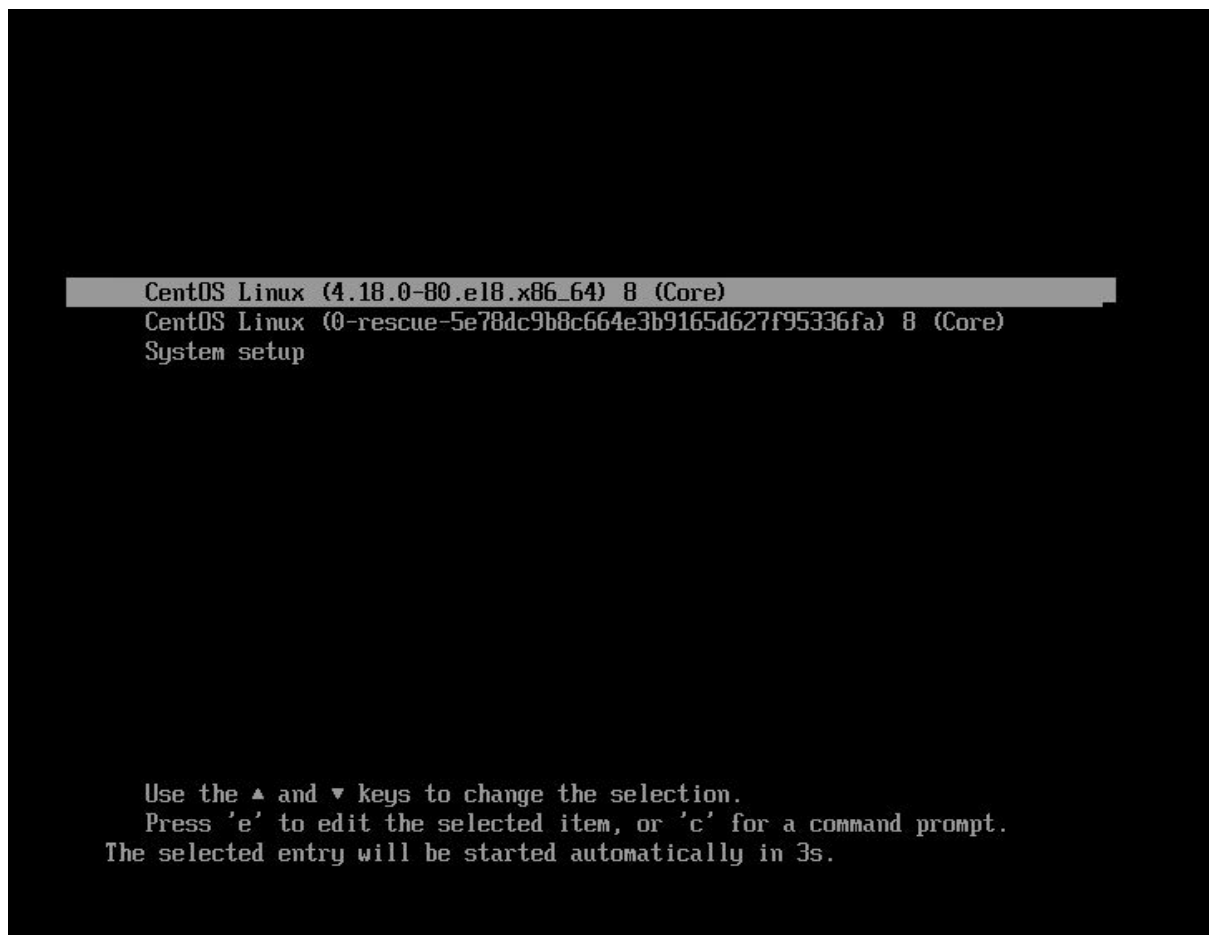
1.3 กำหนดเขตเวลา (1), เลือกแพคเกจที่จะติดตั้ง(2) , เลือกพื้นที่ในการติดตั้ง(3) , กำหนดค่า Network(4) และ เริ่มการติดตั้ง



1.4 เมื่อติดตั้ง CentOS 8 เสร็จแล้วให้ Reboot 1 รอบ



จะได้



1.5 Login ด้วย root เพื่อเข้าไป Update และติดตั้งโปรแกรมที่จำเป็นเพิ่มเติม

```
CentOS Linux 8 (Core)  
Kernel 4.18.0-80.el8.x86_64 on an x86_64
```

```
raduis2020 login: root  
Password:  
Last login: Tue May 5 12:18:43 on tty1  
[root@raduis2020 ~]#
```

1.5.1 Update ระบบ โดยใช้คำสั่ง dnf update -y

```
(43/241): dbus-common-1.12.8-9.el8.noarch.rpm          736 kB/s | 45 kB      00:00  
(44/241): dbus-daemon-1.12.8-9.el8.x86_64.rpm         2.5 MB/s | 240 kB     00:00  
(45/241): dbus-libs-1.12.8-9.el8.x86_64.rpm           1.9 MB/s | 183 kB     00:00  
(46/241): dbus-tools-1.12.8-9.el8.x86_64.rpm          1.0 MB/s | 85 kB      00:00  
(47/241): device-mapper-1.02.163-5.el8.0.1.x86_64.rpm  3.9 MB/s | 371 kB     00:00  
(48/241): device-mapper-event-1.02.163-5.el8.0.1.x86_64.rpm  2.7 MB/s | 266 kB     00:00  
(49/241): device-mapper-event-libs-1.02.163-5.el8.0.1.x86_64.rpm  2.7 MB/s | 265 kB     00:00  
(50/241): device-mapper-libs-1.02.163-5.el8.0.1.x86_64.rpm  4.1 MB/s | 483 kB     00:00  
(51/241): dhcp-client-4.3.6-34.el8.x86_64.rpm         3.3 MB/s | 318 kB     00:00  
(52/241): device-mapper-persistent-data-0.8.5-2.el8.x86_64.rpm  3.6 MB/s | 473 kB     00:00  
(53/241): dhcp-common-4.3.6-34.el8.noarch.rpm         2.5 MB/s | 286 kB     00:00  
(54/241): dhcp-libs-4.3.6-34.el8.x86_64.rpm           1.9 MB/s | 147 kB     00:00  
(55/241): dmidecode-3.2-3.el8.x86_64.rpm              1.1 MB/s | 89 kB      00:00  
(56/241): dnf-4.2.7-7.el8_1.noarch.rpm                4.3 MB/s | 490 kB     00:00  
(57/241): dnf-plugins-core-4.0.3-1.el8.noarch.rpm     941 kB/s | 62 kB      00:00  
(58/241): dnf-data-4.2.7-7.el8_1.noarch.rpm            1.6 MB/s | 139 kB     00:00  
(59/241): dracut-config-rescue-049-27.git20190906.el8_1.1.x86_64.rpm  888 kB/s | 53 kB      00:00  
(60/241): dracut-network-049-27.git20190906.el8_1.1.x86_64.rpm  1.5 MB/s | 98 kB      00:00  
(61/241): dracut-049-27.git20190906.el8_1.1.x86_64.rpm  3.4 MB/s | 364 kB     00:00  
(62/241): dracut-squash-049-27.git20190906.el8_1.1.x86_64.rpm  866 kB/s | 53 kB      00:00  
(63/241): elfutils-libs-1.44.6-3.el8.x86_64.rpm       2.7 MB/s | 288 kB     00:00  
(64/241): elfutils-default-yama-scope-0.176-5.el8.noarch.rpm  838 kB/s | 47 kB      00:00  
(65/241): elfutils-1.44.6-3.el8.x86_64.rpm            6.1 MB/s | 1.0 MB     00:00  
(66/241): elfutils-libelf-0.176-5.el8.x86_64.rpm      2.3 MB/s | 211 kB     00:00  
(67/241): elfutils-libs-0.176-5.el8.x86_64.rpm        3.4 MB/s | 321 kB     00:00  
(68/241): ethtool-5.8-2.el8.x86_64.rpm                2.8 MB/s | 151 kB     00:00  
(69/241): firewall-filesystem-0.7.0-5.el8_1.1.noarch.rpm  1.3 MB/s | 75 kB      00:00  
(70/241): firewall-0.7.0-5.el8_1.1.noarch.rpm         4.1 MB/s | 478 kB     00:00  
(71/241): gettext-libs-0.19.8.1-17.el8.x86_64.rpm    3.3 MB/s | 314 kB     00:00  
(72/241): gettext-0.19.8.1-17.el8.x86_64.rpm         6.1 MB/s | 1.1 MB     00:00  
(73/241): glibc-common-2.28-72.el8_1.1.x86_64.rpm    5.6 MB/s | 836 kB     00:00  
(74/241): glibc-2.28-72.el8_1.1.x86_64.rpm            8.3 MB/s | 2.5 MB     00:00  
(75/241): gmp-6.1.2-18.el8.x86_64.rpm                 3.4 MB/s | 322 kB     00:00  
(76/241): glibc-2.28-72.el8_1.1.x86_64.rpm            9.7 MB/s | 3.7 MB     00:00  
(77/241): glibc-langpack-en-2.28-72.el8_1.1.x86_64.rpm  4.2 MB/s | 818 kB     00:00  
(78/241): grub2-efi-x64-2.02-78.el8_1.1.x86_64.rpm   3.8 MB/s | 480 kB     00:00  
(79/241): gnutils-3.6.8-8.el8.x86_64.rpm              4.9 MB/s | 917 kB     00:00  
(80/241): grub2-pc-2.02-78.el8_1.1.x86_64.rpm        788 kB/s | 36 kB      00:00  
(81/241): grub2-common-2.02-78.el8_1.1.noarch.rpm     3.7 MB/s | 882 kB     00:00  
(82/241): grub2-pc-modules-2.02-78.el8_1.1.noarch.rpm  5.0 MB/s | 859 kB     00:00  
(83/241): grub2-tools-minimal-2.02-78.el8_1.1.x86_64.rpm  2.6 MB/s | 281 kB     00:00  
(84/241): grub2-tools-2.02-78.el8_1.1.x86_64.rpm     7.5 MB/s | 2.0 MB     00:00  
(85/241): grubby-8.40-37.el8.x86_64.rpm               618 kB/s | 50 kB      00:00  
(86/241): grub2-tools-extra-2.02-78.el8_1.1.x86_64.rpm  3.8 MB/s | 1.1 MB     00:00  
(87/241): gzip-1.9-9.el8.x86_64.rpm                  1.9 MB/s | 167 kB     00:00  
(88/241): hw-ctrl-utils-1.1-5.el8.x86_64.rpm          594 kB/s | 56 kB      00:00  
(89/241): initscripts-10.00-4-1.el8.x86_64.rpm       2.5 MB/s | 338 kB     00:00  
(90-91/241): hwdatal-0.314-8.2.el8_1.noarch.r 36% [=====] 1 12 MB/s | 96 MB 00:14 ETA
```

จากนั้น Reboot 1 รอบ โดยใช้คำสั่ง init 6

1.5.2 ติดตั้งโปรแกรมพื้นฐานที่จำเป็น เช่น wget ,net-tools , nano โดยใช้คำสั่ง dnf install

wget net-tools nano -y

```
raduis2020 login: root
Password:
Last login: Tue May  5 12:19:46 on tty1
[root@raduis2020 ~]# dnf install wget net-tools nano
Last metadata expiration check: 0:11:45 ago on Tue 05 May 2020 12:30:18 PM +07.
Dependencies resolved.
=====
Package                        Architecture      Version           Repository        Size
=====
Installing:
wget                          x86_64            1.19.5-8.el8_1.1  AppStream         735 k
nano                          x86_64            2.9.8-1.el8       BaseOS             581 k
net-tools                     x86_64            2.0-0.51.20160912git.el8.x86_64  BaseOS            323 k
=====
Transaction Summary
=====
Install 3 Packages

Total download size: 1.6 M
Installed size: 6.1 M
Is this ok [y/N]: y
Downloading Packages:
(1/3): wget-1.19.5-8.el8_1.1.x86_64.rpm                2.0 MB/s | 735 kB  00:00
(2/3): nano-2.9.8-1.el8.x86_64.rpm                     1.2 MB/s | 581 kB  00:00
(3/3): net-tools-2.0-0.51.20160912git.el8.x86_64.rpm    665 kB/s | 323 kB  00:00
-----
Total                                     881 kB/s | 1.6 MB  00:01
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing                :                               1/1
  Installing               : net-tools-2.0-0.51.20160912git.el8.x86_64 1/3
  Running scriptlet: net-tools-2.0-0.51.20160912git.el8.x86_64 1/3
  Installing              : nano-2.9.8-1.el8.x86_64 2/3
  Running scriptlet: nano-2.9.8-1.el8.x86_64 2/3
  Installing              : wget-1.19.5-8.el8_1.1.x86_64 3/3
  Running scriptlet: wget-1.19.5-8.el8_1.1.x86_64 3/3
  Verifying               : wget-1.19.5-8.el8_1.1.x86_64 1/3
  Verifying               : nano-2.9.8-1.el8.x86_64 2/3
  Verifying               : net-tools-2.0-0.51.20160912git.el8.x86_64 3/3

Installed:
wget-1.19.5-8.el8_1.1.x86_64      nano-2.9.8-1.el8.x86_64      net-tools-2.0-0.51.20160912git.el8.x86_64

Complete!
[root@raduis2020 ~]#
```

1.5.3 ติดตั้ง Web Server โดยใช้คำสั่ง dnf install httpd -y

```
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing                :                               1/1
  Installing               : apr-1.6.3-9.el8.x86_64 1/10
  Running scriptlet: apr-1.6.3-9.el8.x86_64 1/10
  Installing              : apr-util-bdb-1.6.1-6.el8.x86_64 2/10
  Installing              : apr-util-openssl-1.6.1-6.el8.x86_64 3/10
  Installing              : apr-util-1.6.1-6.el8.x86_64 4/10
  Running scriptlet: apr-util-1.6.1-6.el8.x86_64 4/10
  Installing              : httpd-tools-2.4.37-16.module.el8.1.0+256+ae790463.x86_64 5/10
  Installing              : mailcap-2.1.48-3.el8.noarch 6/10
  Running scriptlet: httpd-filesystem-2.4.37-16.module.el8.1.0+256+ae790463.noarch 7/10
  Installing              : httpd-filesystem-2.4.37-16.module.el8.1.0+256+ae790463.noarch 7/10
  Installing              : centos-logos-httpd-00.5-2.el8.noarch 8/10
  Installing              : mod_http2-1.11.3-3.module.el8.1.0+213+acce2796.x86_64 9/10
  Installing              : httpd-2.4.37-16.module.el8.1.0+256+ae790463.x86_64 10/10
  Running scriptlet: httpd-2.4.37-16.module.el8.1.0+256+ae790463.x86_64 10/10
  Verifying               : apr-1.6.3-9.el8.x86_64 1/10
  Verifying               : apr-util-1.6.1-6.el8.x86_64 2/10
  Verifying               : apr-util-bdb-1.6.1-6.el8.x86_64 3/10
  Verifying               : apr-util-openssl-1.6.1-6.el8.x86_64 4/10
  Verifying               : centos-logos-httpd-00.5-2.el8.noarch 5/10
  Verifying               : httpd-2.4.37-16.module.el8.1.0+256+ae790463.x86_64 6/10
  Verifying               : httpd-filesystem-2.4.37-16.module.el8.1.0+256+ae790463.noarch 7/10
  Verifying               : httpd-tools-2.4.37-16.module.el8.1.0+256+ae790463.x86_64 8/10
  Verifying               : mod_http2-1.11.3-3.module.el8.1.0+213+acce2796.x86_64 9/10
  Verifying               : mailcap-2.1.48-3.el8.noarch 10/10

Installed:
httpd-2.4.37-16.module.el8.1.0+256+ae790463.x86_64      apr-util-bdb-1.6.1-6.el8.x86_64
apr-util-openssl-1.6.1-6.el8.x86_64                    apr-1.6.3-9.el8.x86_64
apr-util-1.6.1-6.el8.x86_64                             centos-logos-httpd-00.5-2.el8.noarch
httpd-filesystem-2.4.37-16.module.el8.1.0+256+ae790463.noarch  httpd-tools-2.4.37-16.module.el8.1.0+256+ae790463.x86_64
mod_http2-1.11.3-3.module.el8.1.0+213+acce2796.x86_64    mailcap-2.1.48-3.el8.noarch

Complete!
[root@raduis2020 ~]#
```

จากนั้นสั่งให้ Web Server ทำงาน ด้วยคำสั่ง `systemctl enable httpd` และ `systemctl start httpd` กับเปิด Port 80 สำหรับ Web Server เพื่อให้สามารถเรียกเว็บจากภายนอกได้ ด้วยคำสั่ง `firewall-cmd --add-port=80/tcp --permanent` และ `firewall-cmd --reload`

```
[root@raduis2020 ~]# firewall-cmd --add-port=80/tcp --permanent
success
[root@raduis2020 ~]# firewall-cmd --reload
success
[root@raduis2020 ~]#
```

1.5.4 ติดตั้งภาษา php โดยใช้คำสั่ง `dnf install php -y`

```
Install 5 Packages

Total download size: 6.9 M
Installed size: 29 M
Downloading Packages:
(1/5): nginxfilesystem-1.14.1-9.module_e18.0.0+e34fea82.noarch.rpm      150 kB/s | 24 kB      00:00
(2/5): php-7.2.11-2.module_e18.1.0+209+03b9a8ff.x86_64.rpm           6.4 MB/s | 1.5 MB      00:00
(3/5): php-common-7.2.11-2.module_e18.1.0+209+03b9a8ff.x86_64.rpm     4.9 MB/s | 655 kB      00:00
(4/5): php-fpm-7.2.11-2.module_e18.1.0+209+03b9a8ff.x86_64.rpm        14 MB/s | 1.6 MB      00:00
(5/5): php-cli-7.2.11-2.module_e18.1.0+209+03b9a8ff.x86_64.rpm        5.9 MB/s | 3.1 MB      00:00
-----
Total                                                                    5.5 MB/s | 6.9 MB      00:01
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing :                                                                1/1
  Installing : php-common-7.2.11-2.module_e18.1.0+209+03b9a8ff.x86_64      1/5
  Installing : php-cli-7.2.11-2.module_e18.1.0+209+03b9a8ff.x86_64         2/5
  Running scriptlet: nginxfilesystem-1:1.14.1-9.module_e18.0.0+e34fea82.noarch 3/5
  Installing : nginxfilesystem-1:1.14.1-9.module_e18.0.0+e34fea82.noarch    3/5
  Installing : php-fpm-7.2.11-2.module_e18.1.0+209+03b9a8ff.x86_64         4/5
  Running scriptlet: php-fpm-7.2.11-2.module_e18.1.0+209+03b9a8ff.x86_64   4/5
  Installing : php-7.2.11-2.module_e18.1.0+209+03b9a8ff.x86_64            5/5
  Running scriptlet: php-7.2.11-2.module_e18.1.0+209+03b9a8ff.x86_64       5/5
  Running scriptlet: php-fpm-7.2.11-2.module_e18.1.0+209+03b9a8ff.x86_64   5/5
  Verifying   : nginxfilesystem-1:1.14.1-9.module_e18.0.0+e34fea82.noarch   1/5
  Verifying   : php-7.2.11-2.module_e18.1.0+209+03b9a8ff.x86_64           2/5
  Verifying   : php-cli-7.2.11-2.module_e18.1.0+209+03b9a8ff.x86_64       3/5
  Verifying   : php-common-7.2.11-2.module_e18.1.0+209+03b9a8ff.x86_64    4/5
  Verifying   : php-fpm-7.2.11-2.module_e18.1.0+209+03b9a8ff.x86_64      5/5


Installed:
  php-7.2.11-2.module_e18.1.0+209+03b9a8ff.x86_64      php-fpm-7.2.11-2.module_e18.1.0+209+03b9a8ff.x86_64
  nginxfilesystem-1:1.14.1-9.module_e18.0.0+e34fea82.noarch  php-cli-7.2.11-2.module_e18.1.0+209+03b9a8ff.x86_64
  php-common-7.2.11-2.module_e18.1.0+209+03b9a8ff.x86_64

Complete!
[root@raduis2020 ~]#
```

ทดสอบภาษา PHP โดยสร้างไฟล์ตามโค้ดต่อไปนี้

```
<?php      phpinfo();      ?>
```

10.255.1.249/info.php

PHP Version 7.2.11

System	Linux raduis2020.pwk.ac.th 4.18.0-147.8.1.el8_1.x86_64 #1 SMP Thu Apr 9 13:49:54 UTC 2020 x86_64
Build Date	Oct 9 2018 15:09:36
Server API	FPM/FastCGI
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc
Loaded Configuration File	/etc/php.ini
Scan this dir for additional .ini files	/etc/php.d
Additional .ini files parsed	/etc/php.d/20-bz2.ini, /etc/php.d/20-calendar.ini, /etc/php.d/20-ctype.ini, /etc/php.d/20-curl.ini, /etc/php.d/20-exif.ini, /etc/php.d/20-fileinfo.ini, /etc/php.d/20-ftp.ini, /etc/php.d/20-gettext.ini, /etc/php.d/20-iconv.ini, /etc/php.d/20-phar.ini, /etc/php.d/20-sockets.ini, /etc/php.d/20-tokenizer.ini
PHP API	20170718
PHP Extension	20170718
Zend Extension	320170718
Zend Extension Build	API320170718,NTS
PHP Extension Build	API20170718,NTS

1.5.5 ติดตั้งฐานข้อมูล MySQL โดยใช้คำสั่ง dnf install mariadb-server -y

- สั่งให้ Mariadb Server ทำงาน ด้วยคำสั่ง systemctl enable mariadb และ
systemctl start mariadb

```
[root@raduis2020 ~]# systemctl enable mariadb
Created symlink /etc/systemd/system/mysql.service → /usr/lib/systemd/system/mariadb.service.
Created symlink /etc/systemd/system/mysqld.service → /usr/lib/systemd/system/mariadb.service.
Created symlink /etc/systemd/system/multi-user.target.wants/mariadb.service → /usr/lib/systemd/system/mariadb.service.
[root@raduis2020 ~]# systemctl start mariadb
[root@raduis2020 ~]# _
```

- กำหนดรหัสผ่านให้กับ mariadb-server ด้วยคำสั่ง mysql_secure_installation

```
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!

Normally, root should only be allowed to connect from 'localhost'. This
ensures that someone cannot guess at the root password from the network.

Disallow root login remotely? [Y/n] y
... Success!

By default, MariaDB comes with a database named 'test' that anyone can
access. This is also intended only for testing, and should be removed
before moving into a production environment.

Remove test database and access to it? [Y/n] y
- Dropping test database...
... Success!
- Removing privileges on test database...
... Success!

Reloading the privilege tables will ensure that all changes made so far
will take effect immediately.

Reload privilege tables now? [Y/n] y
... Success!

Cleaning up...

All done! If you've completed all of the above steps, your MariaDB
installation should now be secure.

Thanks for using MariaDB!
[root@raduis2020 ~]#
```

- ทดสอบเข้า MySQL Server ด้วยคำสั่ง mysql -u root -p และสร้างฐานข้อมูลสำหรับ
ทำ Radius Server ด้วยคำสั่ง create database radius character set utf8; จะได้ตามภาพ

```
[root@raduis2020 ~]#
[root@raduis2020 ~]# mysql -u root -p
Enter password:
Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MariaDB connection id is 17
Server version: 10.3.17-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 [(none)]> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
+-----+
3 rows in set (0.001 sec)

MariaDB [(none)]>
MariaDB [(none)]> create database radius character set utf8;
Query OK, 1 row affected (0.001 sec)

MariaDB [(none)]> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| radius |
+-----+
4 rows in set (0.001 sec)

MariaDB [(none)]> _
```

2. ติดตั้ง phpMyAdmin

2.1 ติดตั้ง unzip ด้วยคำสั่ง `dnf install unzip -y`

2.2 ติดตั้ง php เพิ่มเติมด้วยคำสั่ง `dnf install php php-pdo php-pecl-zip php-json php-mbstring php-mysqlnd -y`

2.3 สั่ง restart Web Server ด้วยคำสั่ง `systemctl restart httpd`

2.4 ดาวน์โหลดและติดตั้ง phpMyAdmin

2.4.1 [root]# `wget https://...../5.0.1/phpMyAdmin-5.0.1-all-languages.zip`

2.4.2 [root]# `unzip phpMyAdmin-5.0.1-all-languages.zip`

2.4.3 [root]# `mv phpMyAdmin-5.0.1-all-languages /usr/share/phpmyadmin`

2.4.4 [root]# `mkdir /usr/share/phpmyadmin/tmp`

2.4.5 [root]# `chown -R apache:apache /usr/share/phpmyadmin`

2.4.6 [root]# `chmod 777 /usr/share/phpmyadmin/tmp`

2.5 Configure phpMyAdmin

2.5.1 [root]# `nano /etc/httpd/conf.d/phpmyadmin.conf`

2.5.2 คัดลอก Config ด้านลงในไฟล์ตามข้อ 2.5.1

Alias /phpmyadmin /usr/share/phpmyadmin

<Directory /usr/share/phpmyadmin/>

 AddDefaultCharset UTF-8

 <IfModule mod_authz_core.c>

 # Apache 2.4

 <RequireAny>

 Require all granted

 </RequireAny></IfModule></Directory>

<Directory /usr/share/phpmyadmin/setup/>

 <IfModule mod_authz_core.c>

 # Apache 2.4

 <RequireAny>

 Require all granted

 </RequireAny></IfModule>

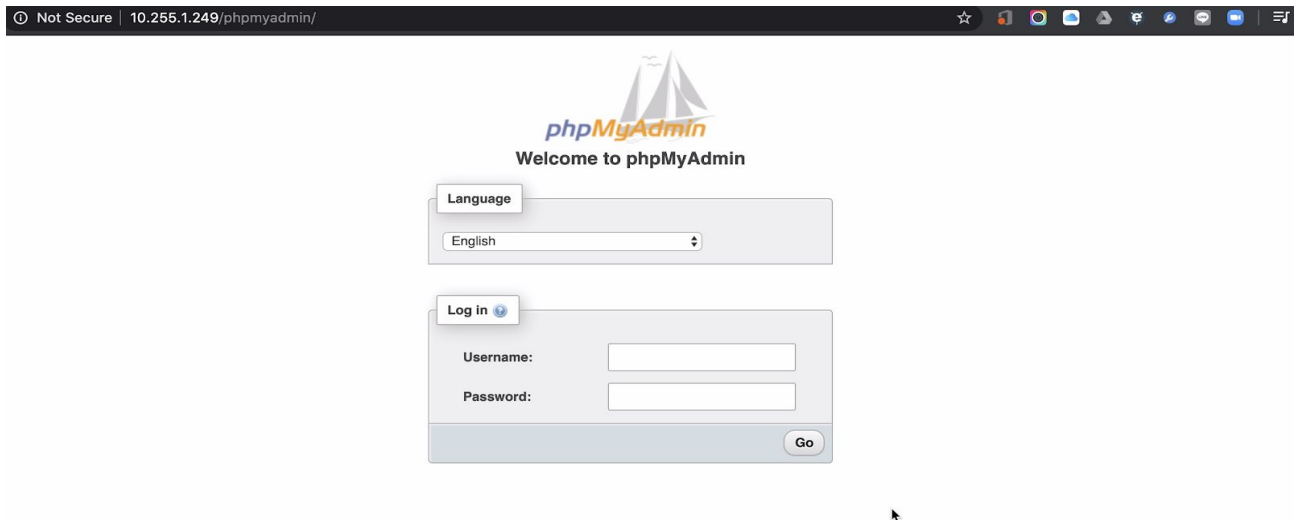
 </Directory>

2.5.3 บันทึกไฟล์ในข้อ 2.5.1 และกำหนดสิทธิ์ให้สามารถใช้งานบน SELinux ได้ ด้วยคำสั่ง

`chcon -Rv --type=httpd_sys_content_t /usr/share/phpmyadmin/*`

2.5.4 สั่ง restart Web Server ด้วยคำสั่ง systemctl restart httpd

2.5.5 เรียกใช้งาน phpMyAdmin ผ่าน <http://your-server-ip/phpmyadmin>



3. ติดตั้ง Install FreeRADIUS 3 และ FreeRADIUS modules

3.1 ใช้คำสั่ง `dnf install freeradius freeradius-mysql freeradius-utils -y`

```
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing      : 1/1
  Installing     : make-1:4.2.1-9.el8.x86_64 1/4
Running scriptlet: make-1:4.2.1-9.el8.x86_64 1/4
Running scriptlet: freeradius-3.0.17-6.module_el8.1.0+198+858eb655.x86_64 2/4
Installing      : freeradius-3.0.17-6.module_el8.1.0+198+858eb655.x86_64 2/4
Running scriptlet: freeradius-3.0.17-6.module_el8.1.0+198+858eb655.x86_64 2/4
Installing      : freeradius-mysql-3.0.17-6.module_el8.1.0+198+858eb655.x86_64 3/4
Installing      : freeradius-utils-3.0.17-6.module_el8.1.0+198+858eb655.x86_64 4/4
Running scriptlet: freeradius-utils-3.0.17-6.module_el8.1.0+198+858eb655.x86_64 4/4
Verifying       : freeradius-3.0.17-6.module_el8.1.0+198+858eb655.x86_64 1/4
Verifying       : freeradius-mysql-3.0.17-6.module_el8.1.0+198+858eb655.x86_64 2/4
Verifying       : freeradius-utils-3.0.17-6.module_el8.1.0+198+858eb655.x86_64 3/4
Verifying       : make-1:4.2.1-9.el8.x86_64 4/4

Installed:
  freeradius-3.0.17-6.module_el8.1.0+198+858eb655.x86_64
  freeradius-mysql-3.0.17-6.module_el8.1.0+198+858eb655.x86_64
  freeradius-utils-3.0.17-6.module_el8.1.0+198+858eb655.x86_64
  make-1:4.2.1-9.el8.x86_64

Complete!
```


3.2 ทดสอบค่า config เบื้องต้น ด้วย debug mode

3.2.1 ใช้คำสั่ง `radiusd -X` ถ้าค่าถูกต้องจะขึ้นตามภาพด้านล่าง

```
}
Listening on auth address * port 1812 bound to server default
Listening on acct address * port 1813 bound to server default
Listening on auth address :: port 1812 bound to server default
Listening on acct address :: port 1813 bound to server default
Listening on auth address 127.0.0.1 port 18120 bound to server inner-tunnel
Listening on proxy address * port 56305
Listening on proxy address :: port 57606
Ready to process requests
```

3.2.2 ใช้คำสั่ง radiusd -XC ถ้าค่าถูกต้องจะขึ้นตามภาพด้านล่าง

```
listen {
    type = "acct"
    ipv6addr = ::
    port = 0
    limit {
        max_connections = 16
        lifetime = 0
        idle_timeout = 30
    }
}
listen {
    type = "auth"
    ipaddr = 127.0.0.1
    port = 18120
}
Configuration appears to be OK
[root@raduis2020 ~]#
[root@raduis2020 ~]#
```



3.3 สั่งให้ freeradius ทำงาน

3.3.1 [root]# systemctl enable radiusd

3.3.2 [root]# systemctl start radiusd

```
[root@raduis2020 ~]#
[root@raduis2020 ~]#
[root@raduis2020 ~]# systemctl enable radiusd
Created symlink /etc/systemd/system/multi-user.target.wants/radiusd.service -> /usr/lib/systemd/system/radiusd.service.
[root@raduis2020 ~]#
[root@raduis2020 ~]# systemctl start radiusd
[root@raduis2020 ~]#
[root@raduis2020 ~]#
[root@raduis2020 ~]#
```

3.4 ติดตั้งฐานข้อมูลสำหรับ freeradius

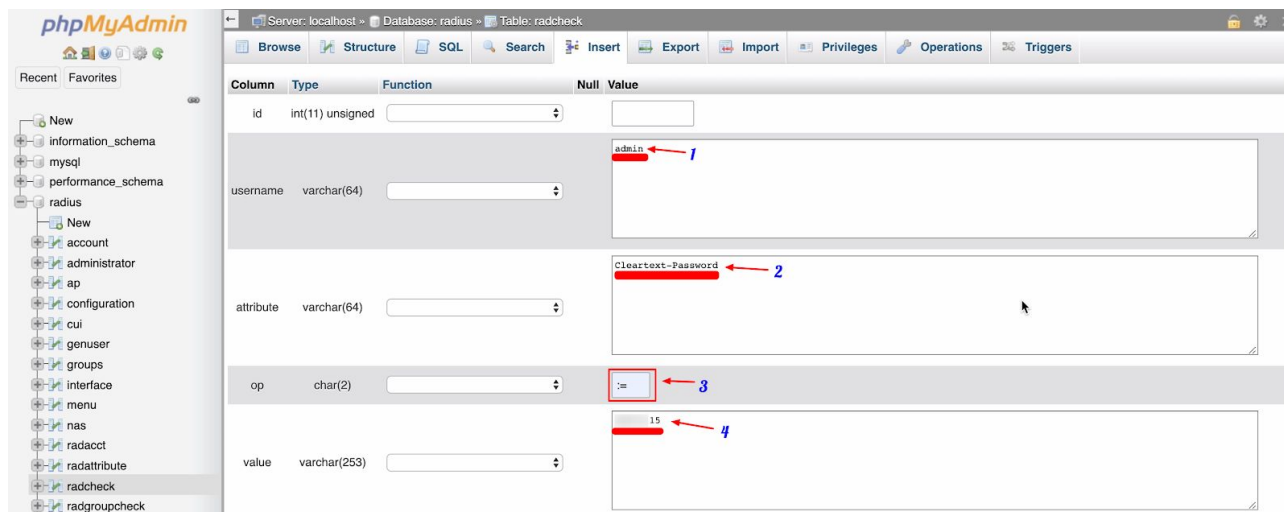
3.4.1 สั่งให้ freeradius หยุดทำงาน เพื่อกลับมาทดสอบด้วย debug mode ด้วยคำสั่ง

systemctl stop radiusd

3.4.2 [root@....]# mysql -uroot -pYourMysqlPass radius <

/etc/freeradius/3.0/mods-config/sql/main/mysql/schema.sql

3.4.3 เพิ่ม User ลงในตาราง radcheck ของ ฐานข้อมูล radius โดยใช้ phpMyAdmin ตามภาพ
แล้วกดที่ GO



3.4.4 ทดสอบผ่าน User ที่เพิ่มตามข้อ 3.4.3 ด้วยคำสั่ง radtest admin YouPassword

localhost 0 testing123

```

[root@10.255.1.249's password:
Last login: Tue May 5 21:30:34 2020 from 10.255.1.24
[root@raduis2020 ~]# radtest admin 26 localhost 0 testing123
Sent Access-Request Id 33 from 0.0.0.0:34055 to 127.0.0.1:1812 length 75
  User-Name = "admin"
  User-Password = "26"
  NAS-IP-Address = 10.255.1.249
  NAS-Port = 0
  Message-Authenticator = 0x00
  Cleartext-Password = "26"
Received Access-Reject Id 33 from 127.0.0.1:1812 to 127.0.0.1:34055 length 20
(0) -: Expected Access-Accept got Access-Reject
[root@raduis2020 ~]#
(0) attr_filter.access_reject: EXPAND %{User-Name}
(0) attr_filter.access_reject: --> admin
(0) attr_filter.access_reject: Matched entry DEFAULT at line 11
(0) [attr_filter.access_reject] = updated
(0) [eap] = noop
(0) policy remove_reply_message_if_eap {
(0)   if (&reply:EAP-Message && &reply:Reply-Message) {
(0)     if (&reply:EAP-Message && &reply:Reply-Message) -> FALSE
(0)   else {
(0)     [noop] = noop
(0)   } # else = noop
(0) } # policy remove_reply_message_if_eap = noop
(0) } # Post-Auth-Type REJECT = updated
(0) Delaying response for 1.000000 seconds
(0) Waking up in 0.3 seconds.
(0) Waking up in 0.6 seconds.
(0) Sending delayed response
(0) Sent Access-Reject Id 33 from 127.0.0.1:1812 to 127.0.0.1:34055 length 20
(0) Waking up in 3.9 seconds.
(0) Cleaning up request packet ID 33 with timestamp +166
Ready to process requests

```

จากภาพข้างต้น User ที่เพิ่มเข้าไปสามารถทำงานได้แล้ว แต่ต้องแก้ไขค่าต่อไปนี้เพิ่มเติมเพื่อให้ FreeRadius สามารถเข้าไปใช้งานฐานข้อมูล MySQL ได้

3.4.4.1 อนุญาตให้ ip ภายใน Network เข้ามาใช้งานฐานข้อมูล

#nano /etc/raddb/clients.conf จากนั้นเพิ่มกลุ่ม Network ที่จะอนุญาตเข้าไป

```

client private-pwknetwork {
    ipaddr      = 10.0.0.0/8
    secret      = testing123
}

```

3.4.4.2 Edit the radius SQL module's config

```
cd /etc/raddb/mods-available
nano sql
```

แก้ไขค่าดังต่อไปนี้

```
driver = "rlm_sql_mysql"
dialect = "mysql"
server = "localhost"
port = 3306
login = "radiuspwk"
password = "YOURMYSQLPASSWORD"
radius_db = "radius"
read_groups = yes
read_clients = yes
```

สร้าง Link ไฟล์ sql ไปยัง /etc/freeradius/3.0/mods-enabled โดยใช้คำสั่ง

```
[root... ]# ln -s /etc/raddb/mods-available/sql /etc/raddb/mods-enabled/
```

```
[root... ]# chgrp -h radiusd /etc/raddb/mods-enabled/sql
```

3.4.4.3 กำหนดสิทธิ์การเข้าถึงฐานข้อมูลตามค่าในข้อ 3.4.4.2

```
[root@raduis2020 mods-available]# mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 139
Server version: 10.3.17-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 [(none)]> GRANT ALL ON radius.* TO radiuspwk@localhost IDENTIFIED BY "bn";
Query OK, 0 rows affected (0.001 sec)

MariaDB [(none)]> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.001 sec)

MariaDB [(none)]> quit;
```

ทดสอบด้วย User ตามข้อ 3.3.4 ตอบกลับมาตามภาพล่างนี้

```
[root@raduis2020 mods-available]# radtest admin 26 localhost 0 testing123
Sent Access-Request Id 16 from 0.0.0.0:57029 to 127.0.0.1:1812 length 75
  User-Name = "admin"
  User-Password = "26"
  NAS-IP-Address = 10.255.1.249
  NAS-Port = 0
  Message-Authenticator = 0x00
  Cleartext-Password = "26"
Received Access-Accept Id 16 from 127.0.0.1:1812 to 127.0.0.1:57029 length 20
[root@raduis2020 mods-available]#
(0) sql: Executing query: INSERT INTO radpostauth (username, pass, reply, authdate) VALUES ( 'admin', '26171115',
'Access-Accept', '2020-05-05 22:35:22')
(0) sql: SQL query returned: success
(0) sql: 1 record(s) updated
rlm_sql (sql): Released connection (6)
(0) [sql] = ok
(0) [exec] = noop
(0) policy remove_reply_message_if_eap {
(0)   if (&reply:EAP-Message && &reply:Reply-Message) {
(0)     if (&reply:EAP-Message && &reply:Reply-Message) -> FALSE
(0)   } else {
(0)     [noop] = noop
(0)   } # else = noop
(0) } # policy remove_reply_message_if_eap = noop
(0) } # post-auth = ok
(0) Sent Access-Accept Id 16 from 127.0.0.1:1812 to 127.0.0.1:57029 length 0
(0) Finished request
Waking up in 4.9 seconds.
(0) Cleaning up request packet ID 16 with timestamp +62
Ready to process requests
```

3.4.5 เปิด Port Radius ให้สามารถเรียก Server จากภายนอกได้

```
[root@raduis2020 ~]# firewall-cmd --add-port=1812/udp --permanent
[root@raduis2020 ~]# firewall-cmd --add-port=1813/udp --permanent
[root@raduis2020 ~]# firewall-cmd --reload
```

3.4.5 ตั้งค่า Captive Portal ให้เรียก User จาก Radius Server

The screenshot shows the pfSense web interface for configuring an Authentication Server. The breadcrumb trail is System / User Manager / Authentication Servers / Edit. The 'Authentication Servers' tab is selected. Under 'Server Settings', the 'Descriptive name' is 'Authen For Pwk2020' and the 'Type' is 'RADIUS'. The 'RADIUS Server Settings' section includes: 'Protocol' set to 'PAP', 'Hostname or IP address' set to '10.255.1.249', 'Shared Secret' masked with dots, 'Services offered' set to 'Authentication and Accounting', 'Authentication port' set to '1812', 'Accounting port' set to '1813', and 'Authentication Timeout' set to '5'. A note explains the timeout value. The 'RADIUS NAS IP Attribute' is set to 'WAN - 10.'.

System / User Manager / Authentication Servers / Edit

Users Groups Settings **Authentication Servers**

Server Settings

Descriptive name Authen For Pwk2020

Type RADIUS

RADIUS Server Settings

Protocol PAP

Hostname or IP address 10.255.1.249

Shared Secret

Services offered Authentication and Accounting

Authentication port 1812

Accounting port 1813

Authentication Timeout 5
This value controls how long, in seconds, that the RADIUS server may take to respond to an authentication request. If left blank, the default value is 5 seconds. NOTE: If using an interactive two-factor authentication system, increase this timeout to account for how long it will take the user to receive and enter a token.

RADIUS NAS IP Attribute WAN - 10.

3.4.6 ทดสอบ Authen ผ่าน Captive Portal

The screenshot shows the pfSense web interface for testing authentication. The breadcrumb trail is Diagnostics / Authentication. A green message box states: 'User admin authenticated successfully. This user is a member of groups:'. Below this is the 'Authentication Test' section with the following fields: 'Authentication Server' set to 'Authen For Pwk2020', 'Username' set to 'admin', and 'Password' masked with dots. A 'Test' button is at the bottom.

Diagnostics / Authentication

User admin authenticated successfully. This user is a member of groups:

Authentication Test

Authentication Server Authen For Pwk2020
Select the authentication server to test against.

Username admin

Password

Test

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#หมายเหตุ

ขอขอบคุณแหล่งข้อมูลต่อไปนี้

- <https://techexpert.tips/freeradius/freeradius-installation-ubuntu-linux/>
- <https://computingforgeeks.com/how-to-install-freeradius-and-daloradius-on-ubuntu/>
- <https://computingforgeeks.com/how-to-install-mariadb-on-ubuntu-focal-fossa/>
- <https://draculaservers.com/tutorials/freeradius-ubuntu-18-04-mysql/>
- <https://www.youtube.com/watch?v=y7OavR0PZIY>
- <https://tecadmin.net/install-phpmyadmin-with-apache-on-centos-8/>
- www.google.co.th