



Customize FreeRadius Module

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Setup a FreeRadius (FR) development environment

Create a virtual development environment if necessary

1. Create a VM from williamyeh/centos7-docker, if you don't want to touch your local computer environment.

Vagrant

```
Vagrant.configure(2) do |config|
  config.vm.box = "williamyeh/centos7-docker"
  config.hostmanager.enabled = true
  config.hostmanager.manage_host = true
  config.hostmanager.manage_guest = true

  config.vm.define :FRDev do |server|
    server.vm.hostname = 'FRDev'
    server.vm.network :private_network, :ip => '192.168.11.100'
    server.vm.provision :hostmanager
    server.vm.provider "virtualbox" do |v|
      v.memory = 1024
      v.cpus = 1
    end
  end
end
```

2. ssh to the VM, vagrant ssh FRDev

Setup the dependencies and compilation



If not customize modules

If you do not plan to customize FreeRadius, you might install FreeRadius by package.

1. Install git, gcc, gcc-c++ git

Vagrant

```
yum install gcc gcc-c++ git -y
```

2. Clone the librdkafka source code

Vagrant

```
cd YOURWORKDIR
git clone https://github.com/edenhill/librdkafka.git
# change the git branch if necessary, git checkout XXX
```

3. Configure, make

Vagrant

```
cd librdkafka
./configure
## Make sure no error message in the configure procedure
make
## Make sure no error message
make install
```

4. Install libtalloc, libtalloc-devel, openssl-devel, or other FreeRadius dependencies. You will know the missing dependencies on your box when run configure

Vagrant

```
yum install -y libtalloc libtalloc-devel openssl-devel
```

5. Clone the FreeRadius source code and switch to v3.0.x (stable version by 08/16)

Vagrant

```
cd YOURWORKDIR
git clone https://github.com/FreeRADIUS/freeradius-server.git
# change the git branch if necessary, git checkout XXX
git checkout v3.0.x
```

6. Run configure, make.

Vagrant

```
cd freeradius-server
./configure
## Make sure no error message in the configure procedure
make
## Make sure no error message
make install
```

7. Now, you are ready to customize FreeRadius modules.

8. After customization, you can run FreeRadius server, by radiusd -X, which print the log to STDOUT, or radiusd -x, which print the log to the log file.

Configure FreeRadius

File	Role
radiusd.conf	Defines the configuration parameters for the RADIUS server. It includes references to all of the other configuration files
clients.conf	Defines information necessary to configure the RADIUS client, including IP addresses and shared secrets. This file is referred from the radiusd.conf file.
sites-enabled/ sites-enabled/default	This is the default virtual server. This file handles authentication and accounting requests. It contains a configuration designed to work with the largest number of authentication protocols. The radiusd.conf file references the sites-enabled/default file.
dictionary	Defines local attributes for the RADIUS server. This file references the default dictionary files. The default dictionary files include thousands of attribute definitions for over one hundred vendors.

Radius sever configuration

- File location: /usr/local/etc/raddb/radiusd.conf if you compile FR from source code and set it up by make install. If install FR from package, refer the development doc for the configuration file location.

Important Field	Description
log	4.1.2 in FreeRadius Technical Guild
module	4.1.5 in FreeRadius Technical Guild
\$INCLUDE sites-enabled	A configuration file can be split into multiple pieces and then be re-assembled at load time by using an \$INCLUDE directive

Radius client configuration

Radius client is a system sending requests and receiving replies from Radius sever, such as Network Access Sever (NAS). Refer the Chapter 3 in FreeRADIUS Beginner's Guide

- File location: /usr/local/etc/raddb/client.conf if you compile FR from source code and set it up by make install. If install FR from package, refer the development doc for the configuration file location.

Important Field	Description
ipaddr	IP of the authorized client, such as the IP of NAS. Request will be silently ignored, if IP not in the clients.
secret	A login token
shortname	To distinguish other clients

Users file

It defines the users are allowed to access the network resources.

File location: /usr/local/etc/raddb/users

FreeRadius sever log

File location: /var/log/radius/radius.log

Customize a FreeRadius module

A simple example of customized Kafka module code

Customize the Kafka producer for FR module

Add the Kafka module to the FreeRadius

1. Creating configuration files /usr/local/etc/raddb/mods-available/kafka

Kafka

```
kafka {  
  topic = my_c_topic  
  ipaddr = 10.13.182.218:9092  
}
```

2. Create the following symbolic link under /usr/local/etc/raddb/mods-enabled

symbolic link

```
ln -s ../mods-available/kafka
```

3. Change default under /usr/local/etc/raddb/sites-enabled/default. The Kafka module is enabled and will be called to process AAA requests.

site configuration

```
# sql_log  
kafka  
# Cisco VoIP specific bulk accounting  
# pgsq1-voip
```

Test a customized FreeRadius module

Build Docker image and push the image to Tampa Docker registry

Build FreeRadius Docker image

Build Docker image

```
docker build -t tampalab2-laniakea.vici.verizon.com:9000/montana/m2mmc_freeradius:1.0 .
```

i Tag Numbers

Change the image tag numbers

Push FreeRadius Image to Tampa Docker registry

Push image to Tempa

```
docker login -u montana tampalab2-laniakea.vici.verizon.com:9000
docker push tampalab2-laniakea.vici.verizon.com:9000/montana/m2mmc_freeradius:1.0
```

i Registry certificate issue

If see registry certificate issue when login Tempa registry, add

```
ExecStart=/usr/bin/dockerd --insecure-registry tampalab2-laniakea.vici.verizon.com:9000 to
/usr/lib/systemd/system/docker.service
```

Restart docker service


```
sudo systemctl daemon-reload
```

```
sudo service docker restart
```

Build and push MySQL for FreeRadius (optional)

Build Docker image

```
docker build -t tampalab2-laniakea.vici.verizon.com:9000/montana/m2mmc_freeradius_mysql:1.0 .docker lc
```

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