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How to Configure, Install and Use libnetfilter_queue on Linux

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According to libnetfilter_queue home page, libnetfilter_queue is a userspace library that allows one to retrieve and manipulate the packets that have been queued by kernel packet filter. It is supposed to replace the old ip_queue/libipq mechanism.

0. Dependencies

libnetfilter_queue requires a kernel that includes nfnetlink_queue subsystem. If your Linux kernel is 2.6.14 or later, the subsystem is normally enabled.

You can confirm this by looking into your kernel configuration file. The configuration file is normally located at your system /boot/ directory, with the name like config-<your kernel version>. Open the file, and look for CONFIG_NETFILTER_NETLINK_QUEUE and

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CONFIG_NETFILTER_ADVANCED. Make sure the two lines are not commented out.



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In addition, libnetfilter_queue library depends on libnfnetlink. A lower-level library for netfilter related kernel/userspace communication. And since this library depends on nfnetlink kernel subsystem, you'll need to ensure CONFIG_NETFILTER_NETLINK is not commented out in your kernel configuration file.

In summary, you'll need to check CONFIG_NETFILTER_ADVANCED, CONFIG_NETFILTER_NETLINK and CONFIG_NETFILTER_NETLINK_QUEUE in you kernel configuration file, and install libnfnetlink and libnetfilter_queue user space libraries.

2. Installation

This is simple. First, you need to install libnfnetlink library. Download the tar file [here](#).

Then go the directory where the file is downloaded, follow the commands below,

```
tar -xvf libnfnetlink-1.0.0.tar.bz2
```

```
cd libnfnetlink-1.0.0/
```

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```
./configure
```

```
make
```

```
sudo make install
```

Next, you need to install libnetfilter_queue library.

Download the tar file [here](#). Then follow the same procedure above. Build and install the library.

After installation, issue `sudo ldconfig` command to create necessary links and cache to the newly installed libraries.

3. Understand the Sample Code

There're not many tutorials and examples around, but libnetfilter_queue has provided a simple example and some documentation. You can find the sample code at the `utils/ nfqnl_test.c` of the libnetfilter_queue folder you downloaded.



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The basic idea of the code is to set up libnetfilter_queue library, and bind the program to a queue. You can refer to documentation [here](#) and [here](#) to help you understand the code.

To compile the sample code, use the command below,

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```
gcc -Wall -o test nfqnl_test.c  
-lnetlink -lnetfilter_queue
```

To run the code, use the command below,

```
sudo ./test
```

Note that you'll need to set up a queue in kernel packet filter table in order to see how the program working. Suppose we want to queue all TCP packets sending out from our local machine, you'll need to enter the command below,

```
sudo iptables -A OUTPUT -p tcp -j  
NFQUEUE --queue-num 0
```

Now you can see the test program is outputting some information about the packet,

```
.....  
hw_protocol=0x0000 hook=3  
id=422 outdev=2 payload_len=52  
  
entering callback  
  
pkt received
```

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```
hw_protocol=0x0000 hook=3  
id=423 outdev=2 payload_len=52
```

```
entering callback
```

To stopping running the program, kill test and then issue the command

```
iptables -flush
```

4. Additional Notes

libnetfilter_queue can be quite powerful combined with iptables rules. It doesn't only allow you to receive the packet, but also provide the ability to modify the packet and inject the modified packet back to kernel. With these APIs, you can implement user space NATing, packet sniffing/capturing programs etc.

References:

1. libnetfilter_queue home page: http://www.netfilter.org/projects/libnetfilter_queue/

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Configure, Install and Use libnetfilter_queue on Linux”

**STEVE TRAPP**

FEBRUARY 11, 2012 AT 12:07 AM

Your instructions were great!! It bridged the gap between netfilter.org’s libnetfilter_queue documentation and the 3 things I didn’t know:

1. Getting an example program so that I didn’t have to figure out how to do the initial setting up.
2. How to compile this example program.
3. The detail of “iptables –flush” I didn’t know how to get rid of all rules before.

THANK YOU! 😊

[Reply](#)**ROMAN10**

FEBRUARY 13, 2012 AT 3:45 AM

You’re welcome! Glad it helped. 😊

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**TRUONG**

AUGUST 7, 2012 AT 2:18 AM

Hi,

Thank for great tutorial.

But I see that the libnetfilter_queue library doesn't have make file. so I can't install it.

Can you show me how to install libnetfilter?

Thank,

[Reply](#)**HAYRO**

AUGUST 10, 2012 AT 12:14 AM

Here it tells: http://blog.inliniac.net/tag/libnetfilter_queue/

Download the library libnfnetlink version 0.0.25 from <http://ftp.netfilter.org/pub/libnfnetlink/>



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```
$ tar xvfj libnfnetlink-0.0.25.tar.bz2
```

```
$ cd libnfnetlink-0.0.25/
```

```
$ ./configure
```

```
$ make
```

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```
$ sudo make install
```

Next download libnetfilter_queue version 0.0.13
from http://ftp.netfilter.org/pub/libnetfilter_queue/

```
$ tar xvfj libnetfilter_queue-0.0.13.tar.bz2
$ cd libnetfilter_queue-0.0.13
$ ./configure
$ make
$ sudo make install
```

Okay, that sets up the Netfilter libraries.

[Reply](#)



HAYRO

AUGUST 10, 2012 AT 4:11 PM

Waht if I want to put a delay and collect the packets
to be sent in one time before reinjecting the
packets?

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**TANIA**

DECEMBER 20, 2012 AT 8:57 PM

when I write this
sudo iptables -A OUTPUT -p tcp -j NFQUEUE
-queue-num 0

i get
Bad argument `--queue-num'

Why?

[Reply](#)**BOB**

MAY 22, 2014 AT 3:09 AM

You can try double-dash: "--queue-num 0", or
simply remove this option because 0 is the
default value

[Reply](#)**NIR**

APRIL 3, 2013 AT 10:07 AM

Hello

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We have installed libnetfilter 1.0.0 and libnfnetlink 1.0.1 in directory /usr/local in fedora os .by simple command .configure ,make and make install.

Is it correct way of installation?Does we have to load or insert any of this module in kernal ?

[Reply](#)



SHRU

APRIL 3, 2013 AT 10:40 AM

hello

I am running the same nfq_test.c with libnfnetlink 1.0.0 and libetfilter 1.0.1 installed in /usr/local/ ..

when i try to run ./test i get nothing print after setting copy_packet mode..

inshort i unable to get same output as yours..

please help me where to install libnetlink and filter ??to make it executable??

[Reply](#)

**ANONYMOUS**

SEPTEMBER 20, 2017 AT 12:11 AM

Just to let you know, you have a typo in
CONFIG_NETFITLER_NETLINK. It should be
CONFIG_NETFILTER_NETLINK.

[Reply](#)**T**

MARCH 24, 2018 AT 10:02 PM

It's -queue-num not -queue-num (note the leading
extra '-')

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