Iptables with shorewall!

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1. Install swarmlab-sec (Home PC)

HowTo: See http://docs.swarmlab.io/lab/sec/sec.adoc.html

NOTE

Assuming you're already logged in

2. shorewall

Shorewall is an open source firewall tool for Linux that builds upon the Netfilter (iptables/ipchains) system built into the Linux kernel, making it easier to manage more complex configuration schemes by providing a higher level of abstraction for describing rules using text files.

More: wikipedia

NOTE

Our docker instances have only one nic

to add more nic's:

create netowrk frist

```
docker network create --driver=bridge --subnet=192.168.0.0/16 net1
docker network create --driver=bridge --subnet=192.168.0.0/16 net2
docker network create --driver=bridge --subnet=192.168.0.0/16 net3
```

then connect network to container

connect network created to container

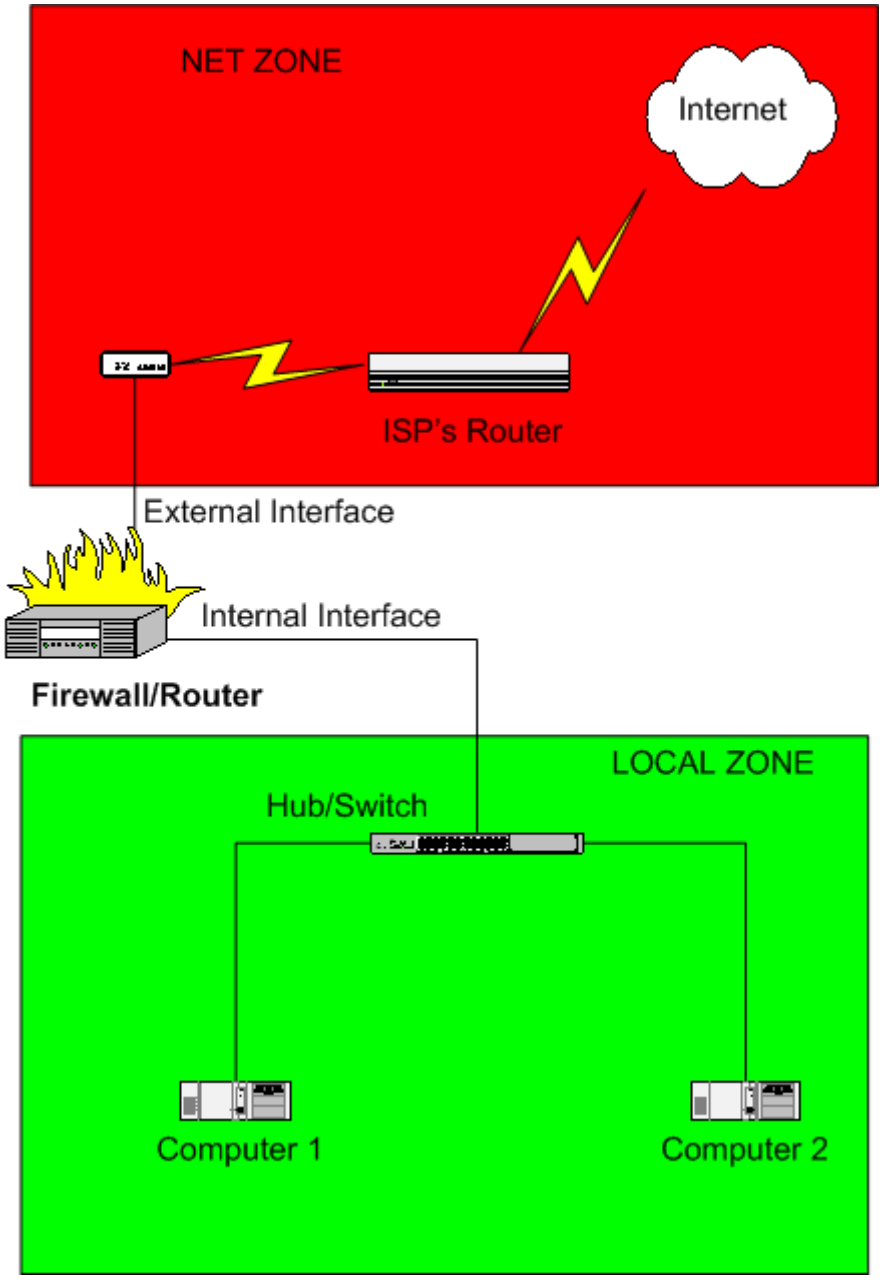
```
docker network connect net1 master
docker network connect net1 worker1
docker network connect net2 master
docker network connect net2 worker2
```

now let's look at the following image

2.1. Installation

Shorewall is already installed on swarmlab-sec.

3. Basic Two-Interface Firewall



connect to master first

Assuming you're already logged in master!

master is now our Firewall/Router

swarmlab-sec login

4. Shorewall Concepts

The configuration files for Shorewall are contained in the directory /etc/shorewall

4.1. zones — Shorewall zone declaration file

The /etc/shorewall/zones file declares your network zones. You specify the hosts in each zone through entries in /etc/shorewall/interfaces

/etc/shorewall/zones

```
#ZONE   TYPE     OPTIONS                IN_OPTIONS             OUT_OPTIONS
fw      firewall
net     ipv4
loc     ipv4
```

4.2. interfaces — Shorewall interfaces file

The interfaces file serves to define the firewall's network interfaces to Shorewall.

/etc/shorewall/interfaces

```
#ZONE       INTERFACE       BROADCAST      OPTIONS
net         eth0                           dhcp,routefilter
loc         eth1            detect
```

4.3. policy — Shorewall policy file

This file defines the high-level policy for connections between zone

/etc/shorewall/policy

```
#SOURCE    DEST        POLICY      LOGLEVEL    LIMIT
loc        net         ACCEPT
net        all         DROP        info
all        all         REJECT      info
```

4.4. rules — Shorewall rules file

Entries in this file govern connection establishment by defining exceptions to the policies

/etc/shorewall/rules

```
#ACTION    SOURCE    DEST              PROTO     DPORT
ACCEPT     $FW       net               udp       53
ACCEPT     net       $FW           udp       53
ACCEPT     $FW       net               tcp       80
ACCEPT     net       $FW           tcp       80
```

4.5. Compile then Execute

Shorewall uses a "compile" then "execute" approach. The Shorewall configuration compiler reads the configuration files and generates a shell script. Errors in the compilation step cause the script to be discarded and the command to be aborted. If the compilation step doesn't find any errors then the shell script is executed.

/sbin/shorewall

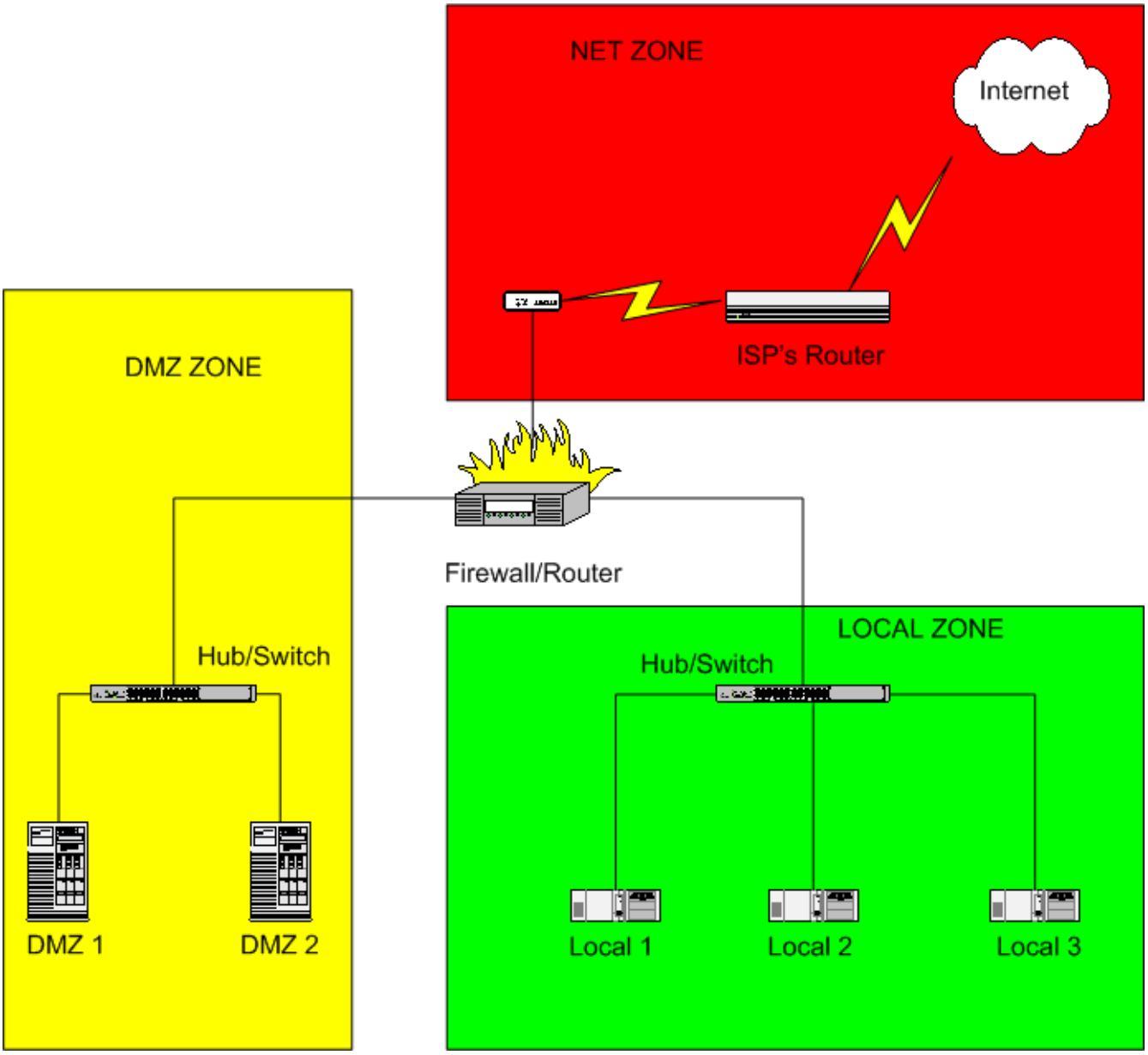
```
/sbin/shorewall start
/sbin/shorewall stop
/sbin/shorewall clear
```

NOTE

The 'compiled' scripts are placed by default in the directory /var/lib/shorewall and are named to correspond to the command being executed. For example, the command /sbin/shorewall start will generate a script named /var/lib/shorewall/.start and, if the compilation is error free, that script will then be executed. If the script executes successfully, it then copies itself to /var/lib/shorewall/firewall. When an /sbin/shorewall stop or /sbin/shorewall clear command is subsequently executed, /var/lib/shorewall/firewall is run to perform the requested operation.

The AUTOMAKE option in /etc/shorewall/shorewall.conf may be set to automatically generate a new script when one of the configuration files is changed. When no file has changed since the last compilation, the /sbin/shorewall start, /sbin/shorewall reload and /sbin/shorewall restart commands will simply execute the current /var/lib/shorewall/firewall script.

5. Three-Interface Firewall



5.1. zones

/etc/shorewall/zones

```
#ZONE   TYPE    OPTIONS                 IN_OPTIONS              OUT_OPTIONS
fw      firewall
net     ipv4
loc     ipv4
dmz     ipv4                #new line
```

5.2. interfaces

/etc/shorewall/interfaces

```
#ZONE       INTERFACE       BROADCAST      OPTIONS
net         eth0                           dhcp,routefilter
loc         eth1            detect
dmz         eth2            detect      #new line
```

5.3. policy

/etc/shorewall/policy

```
#SOURCE    DEST        POLICY      LOGLEVEL    LIMIT
loc        net         ACCEPT
dmz        net         DROP                    #new line
net        all         DROP        info
all        all         REJECT      info
```

5.4. rules

/etc/shorewall/rules

```
#ACTION    SOURCE    DEST              PROTO     DPORT
ACCEPT     $FW       net               udp       53
ACCEPT     net       $FW            udp       53
ACCEPT     $FW       net               tcp       80
ACCEPT     net       $FW            tcp       80
#New lines
ACCEPT     $FW       dmz               udp       53
ACCEPT     dmz       $FW            udp       53
ACCEPT     $FW       dmz               tcp       80
ACCEPT     dmz       $FW            tcp       80

ACCEPT     loc       dmz               tcp       80 # Add your rules for the zones
you have defined.
ACCEPT     dmz       loc            tcp       80 #
ACCEPT     loc       net               tcp       80 # This here is an example
ACCEPT     net       loc            tcp       80 # for communication
ACCEPT     dmz       net               tcp       80 # over port 80
ACCEPT     net       dmz            tcp       80 # aka the web
```

5.5. masq - Shorewall Masquerade/SNAT definition file

/etc/shorewall/masq - directs the firewall where to use many-to-one (dynamic) Network Address Translation (a.k.a. Masquerading) and Source Network Address Translation (SNAT).

/etc/shorewall/masq

```
#INTERFACE   SOURCE          ADDRESS         PROTO   DPORT
eth0         eth1
eth0         eth2
```

5.6. snat — Shorewall SNAT/Masquerade definition file

This file is used to define dynamic NAT (Masquerading) and to define Source NAT (SNAT). It superseded shorewall-masq(5) in Shorewall 5.0.14.

/etc/shorewall/masq

```
#ACTION    SOURCE              DEST
MASQUERADE 192.168.0.0/24      eth0
MASQUERADE 192.168.1.0/24      eth0
```

- You have a simple masquerading setup where eth0 connects to internet and eth1 connects to your local network with subnet 192.168.0.0/24.
- You add a router to your local network to connect subnet 192.168.1.0/24 which you also want to masquerade. You then add a second entry for eth0 to this file

Beginning with that release, the Shorewall compiler will automatically convert existing masq files to the equivalent snat file, and rename the masq file to masq.bak.

5.7. Compile and Execute

/sbin/shorewall

```
/sbin/shorewall start
/sbin/shorewall stop
/sbin/shorewall clear
```