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Transparently Proxy All Traffic Through TOR

Requirements:

- Linux OS (tested on alpine and ubuntu)
- iptables (Linux firewall)
- RedSocks

What is RedSocks?

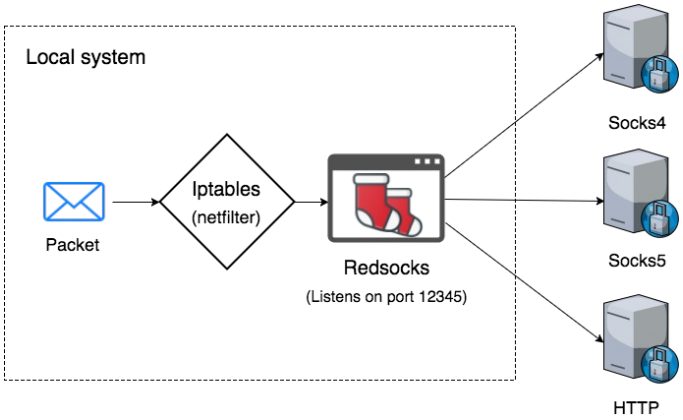
Reference: https://github.com/darkk/redsocks

Redsocks is the tool that allows you to proxify(redirect) network traffic through a **SOCKS4**, **SOCKS5** or **HTTPs** proxy server. It works on the lowest level, the kernel level (**iptables**). The other possible way is to use **application level proxy**, when **the proxy client** is implemented in the same language as an application is written in. **Redsocks** operates on the lowest system level, that's why all running application don't even have an idea that network traffic is sent through a proxy server, as a result it is called a **transparent proxy redirector**.

TCP Traffic

System's Architecture and Setup

So this is the big image, almost every tcp packet will be redirected to port 12345 which redsocks service listens for incoming packets; after that, redsocks will redirect the received traffic to another ip and port in socks protocol format.



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Walkthrough Steps

1. Configure Redsocks to listen for tcp traffic on port 12345

   For this, edit or create `/etc/redsocks.conf` file with the following configuration:

```
base {
 log_debug = on;
 log_info = on;
 log = "stderr";
 daemon = off;
 redirector = iptables;
}

redsocks {
    local_ip = 127.0.0.1;
    local_port = 12345;

    ip = DESTINATION_IP ;
    port = DESTINATION_PORT ;
    type = socks5;
      // known types: socks4, socks5, http-connect, http-relay

    // login = username;
    // password = password;
}
```

sample configuration file for my work:

```
base {
 log_debug = on;
 log_info = on;
 log = "stderr";
 daemon = off;
 redirector = iptables;
}

redsocks {
    local_ip = 127.0.0.1;
    local_port = 12345;

      ip = 192.168.0.3;  #IP OF TOR CONTAINER
      port = 9150;  #PORT OF TOR IN CONTAINER
    type = socks5;
      // known types: socks4, socks5, http-connect, http-relay
```

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```
    // login = username;
    // password = password;
}
```

the tor container I've used: https://hub.docker.com/r/peterdavehello/tor-socks-proxy/

2. After configuring redsocks service, you need to configure iptable rules:

```
iptables -t nat -N REDSOCKS

iptables -t nat -A REDSOCKS -d 0.0.0.0/8 -j RETURN
iptables -t nat -A REDSOCKS -d 10.0.0.0/8 -j RETURN
iptables -t nat -A REDSOCKS -d 127.0.0.0/8 -j RETURN
iptables -t nat -A REDSOCKS -d 169.254.0.0/16 -j RETURN
iptables -t nat -A REDSOCKS -d 172.16.0.0/12 -j RETURN
iptables -t nat -A REDSOCKS -d 192.168.0.0/16 -j RETURN
iptables -t nat -A REDSOCKS -d 224.0.0.0/4 -j RETURN
iptables -t nat -A REDSOCKS -d 240.0.0.0/4 -j RETURN

iptables -t nat -A REDSOCKS -p tcp -j REDIRECT --to-ports 12345

iptables -t nat -A OUTPUT -p tcp -j REDSOCKS

iptables -t nat -A PREROUTING -p tcp -j REDSOCKS
```

Note that this rules are temporary! For persisting rules see here:
https://askubuntu.com/questions/119393/how-to-save-rules-of-the-iptables

main reference for step one and two:
https://superuser.com/questions/1401585/how-to-force-all-linux-apps-to-use-socks-proxy

3. start redsocks service with this command:

```
sudo redsocks -c /etc/redsocks.conf
```

4. now all your TCP traffic will transparently go through tor network! Just test it

Consider defining a systemd service for redsocks.
Reference: https://medium.com/@benmorel/creating-a-linux-service-with-systemd-611b5c8b91d6

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UDP Traffic

For udp traffic, at first glance things seem to be more complicated but instead thanks to DNSPort of TOR the problem can be easily solved!

Main references:

https://en.wikibooks.org/wiki/How_to_Protect_your_Internet_Anonymity_and_Privacy/TOR_VPN

https://trac.torproject.org/projects/tor/wiki/doc/TransparentProxy

1. first edit tor's configuration file /etc/tor/torrc and add the following line at the end:

   DNSPort 53

2. start tor and add the following rules to iptables:

```
iptables -t nat -A OUTPUT -p udp --dport 53 -j DNAT --to TOR_IP:TOR_DNSPort
iptables -t nat -A OUTPUT -p tcp --dport 53 -j DNAT --to TOR_IP:TOR_DNSPort
```

   sample iptable rules for my set:

```
iptables -t nat -A OUTPUT -p udp --dport 53 -j DNAT --to 192.168.0.3:9053
iptables -t nat -A OUTPUT -p tcp --dport 53 -j DNAT --to 192.168.0.3:9053
```

3. You are all setup! Just start the redsocks and now all your traffic goes through tor transparently.

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More Technical Information

When I was looking for more information on the Internet I've come to this article which is pretty awesome and detailed from Linux's technical networking perspective.

The article: https://crosp.net/blog/administration/install-configure-redsocks-proxy-centos-linux/