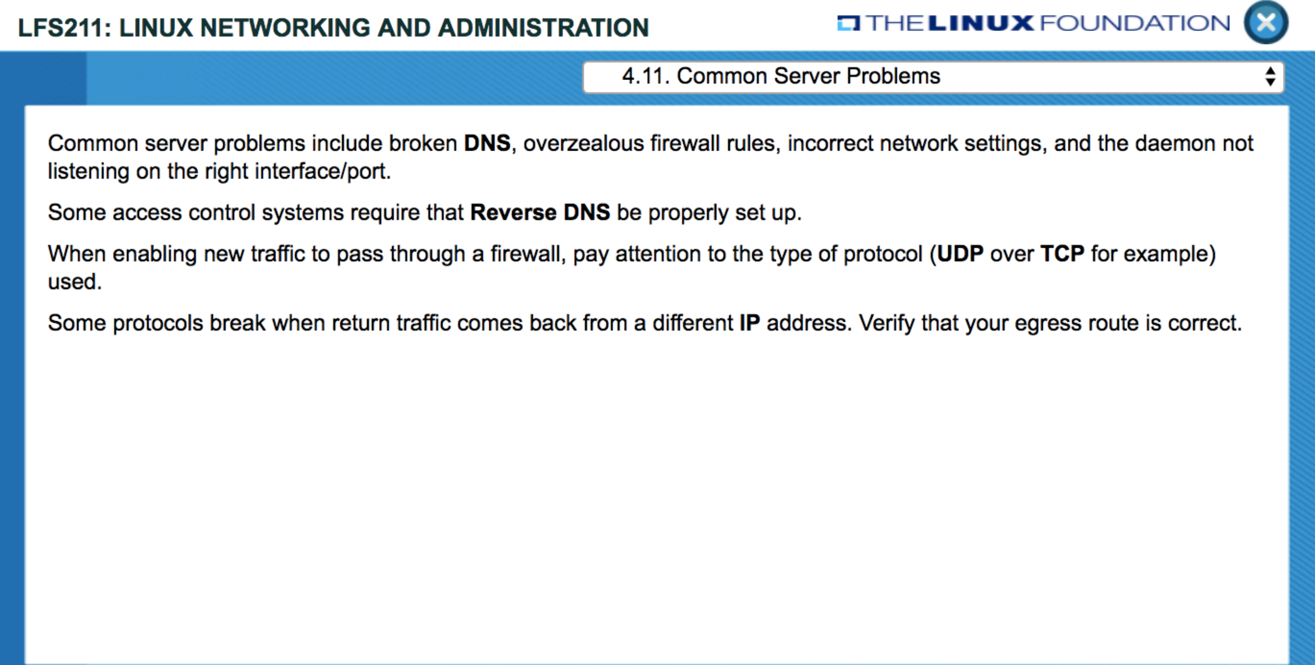


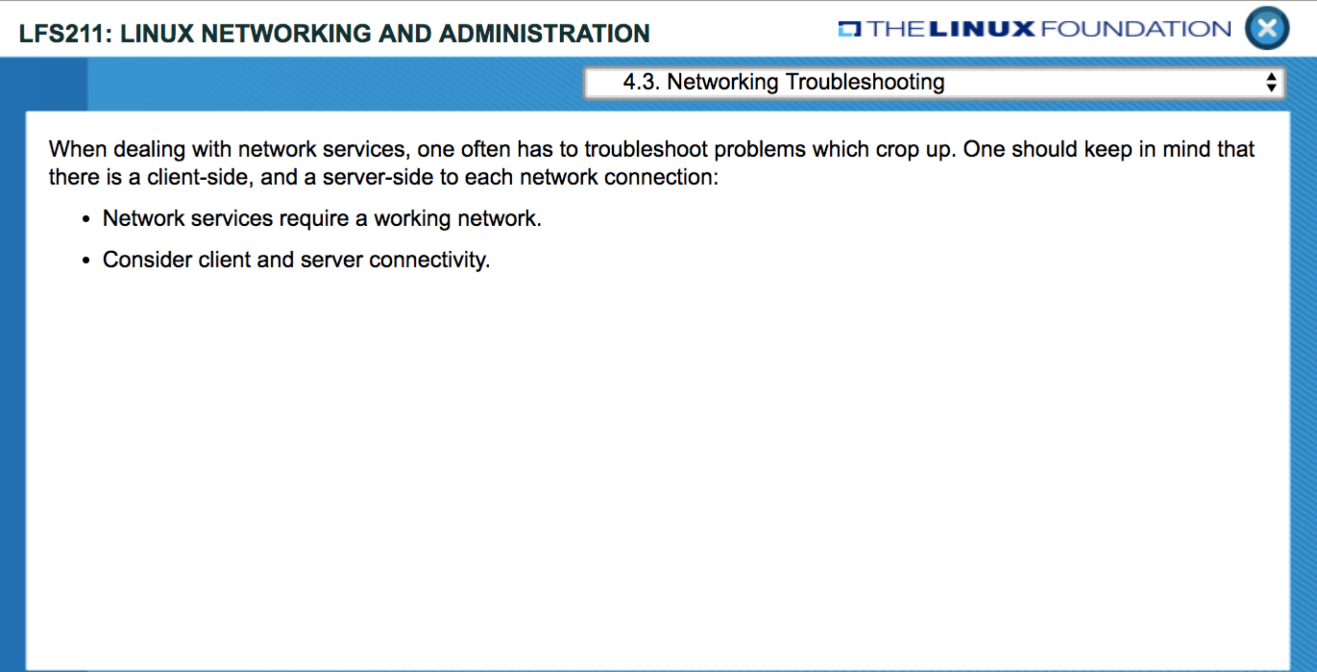
## 4.11. Common Server Problems

Common server problems include broken **DNS**, overzealous firewall rules, incorrect network settings, and the daemon not listening on the right interface/port.

Some access control systems require that **Reverse DNS** be properly set up.

When enabling new traffic to pass through a firewall, pay attention to the type of protocol (**UDP** over **TCP** for example) used.

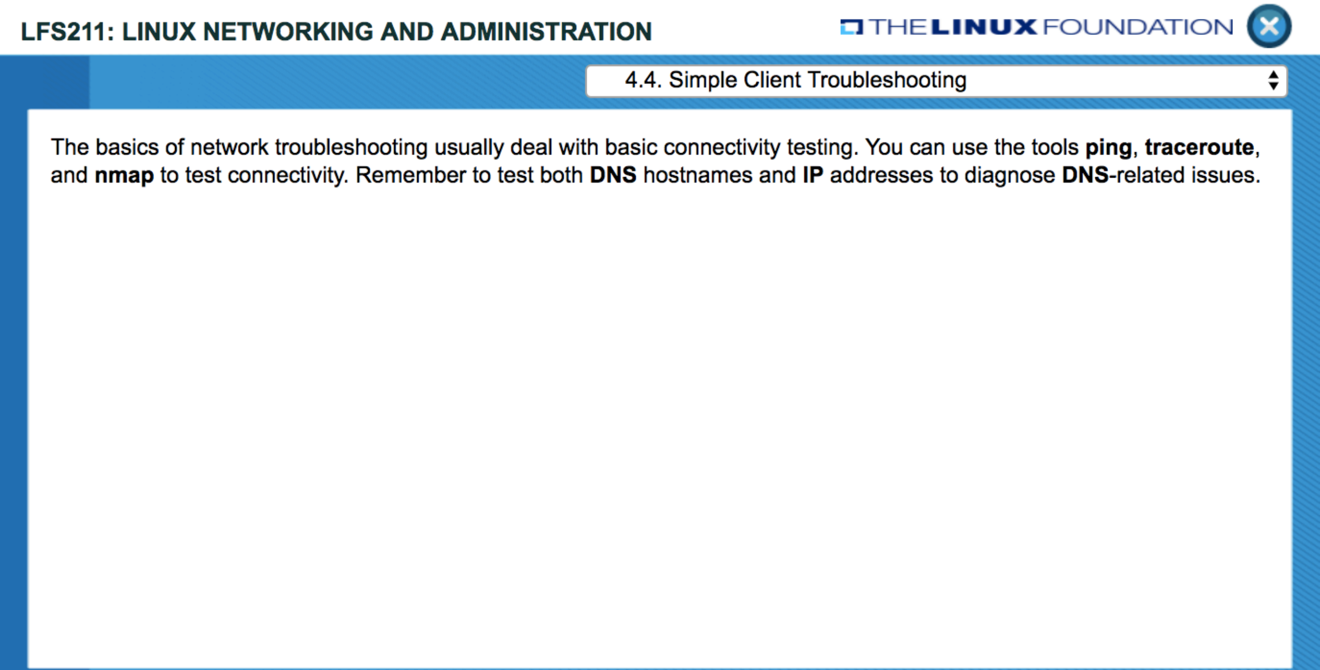
Some protocols break when return traffic comes back from a different **IP** address. Verify that your egress route is correct.



## 4.3. Networking Troubleshooting

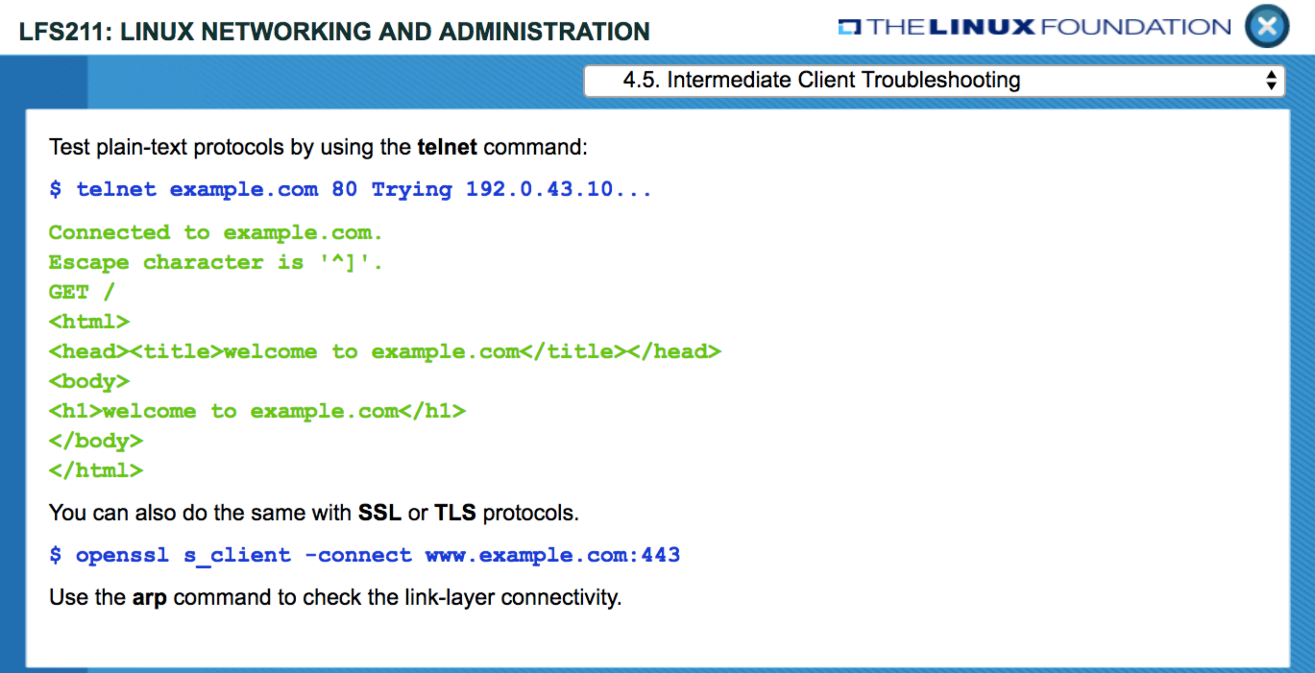
When dealing with network services, one often has to troubleshoot problems which crop up. One should keep in mind that there is a client-side, and a server-side to each network connection:

- Network services require a working network.
- Consider client and server connectivity.



## 4.4. Simple Client Troubleshooting

The basics of network troubleshooting usually deal with basic connectivity testing. You can use the tools **ping**, **traceroute**, and **nmap** to test connectivity. Remember to test both **DNS** hostnames and **IP** addresses to diagnose **DNS**-related issues.



## 4.5. Intermediate Client Troubleshooting

Test plain-text protocols by using the **telnet** command:

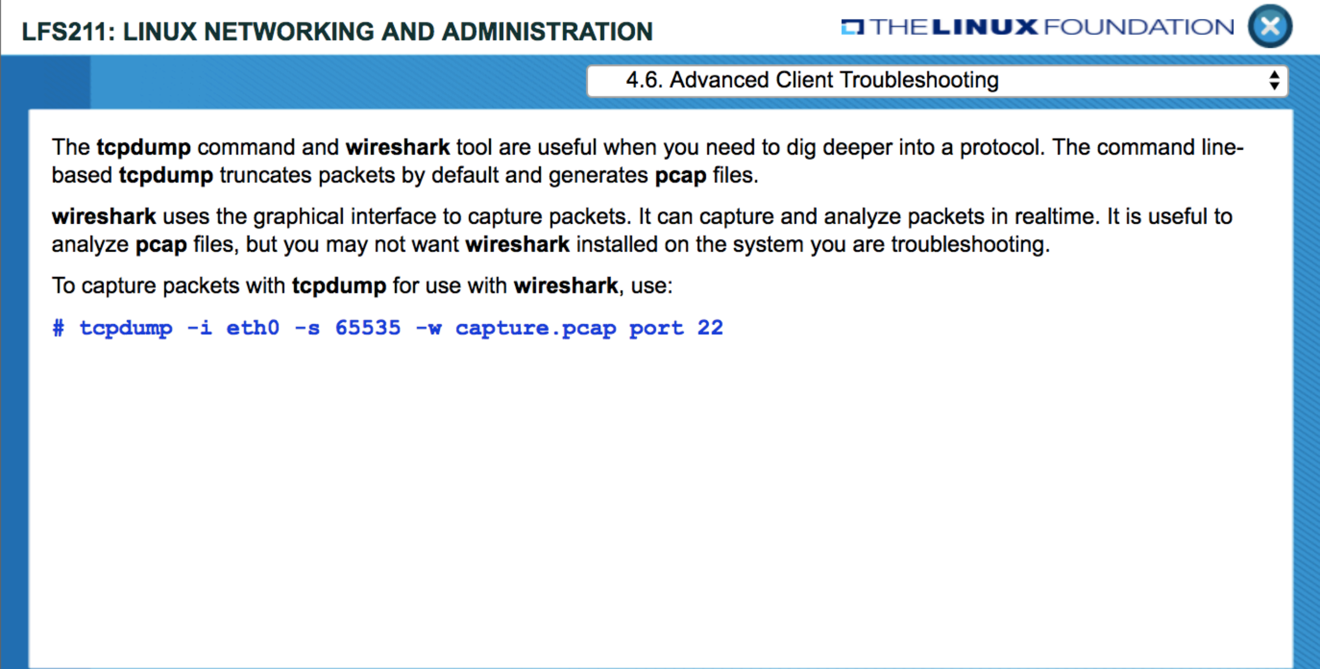
```
$ telnet example.com 80 Trying 192.0.43.10...

Connected to example.com.
Escape character is '^]'.
GET /
<html>
<head><title>welcome to example.com</title></head>
<body>
<h1>welcome to example.com</h1>
</body>
</html>
```

You can also do the same with **SSL** or **TLS** protocols.

```
$ openssl s_client -connect www.example.com:443
```

Use the **arp** command to check the link-layer connectivity.



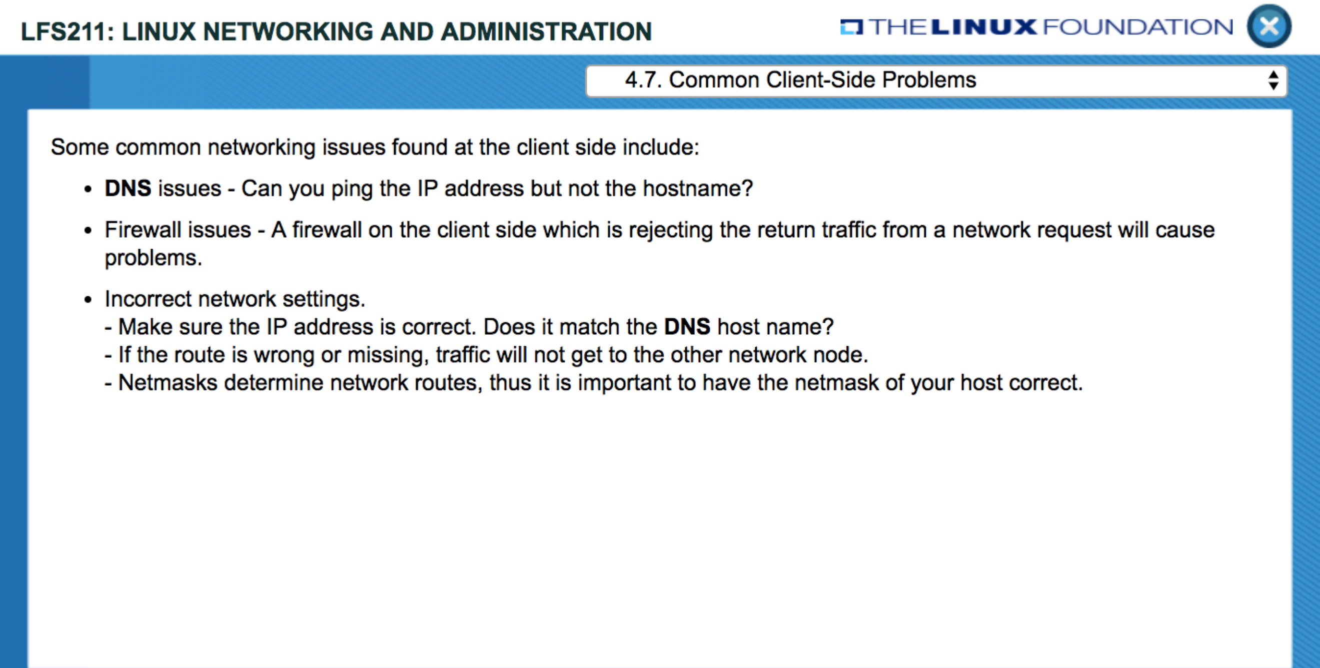
## 4.6. Advanced Client Troubleshooting

The **tcpdump** command and **wireshark** tool are useful when you need to dig deeper into a protocol. The command line-based **tcpdump** truncates packets by default and generates **pcap** files.

**wireshark** uses the graphical interface to capture packets. It can capture and analyze packets in realtime. It is useful to analyze **pcap** files, but you may not want **wireshark** installed on the system you are troubleshooting.

To capture packets with **tcpdump** for use with **wireshark**, use:

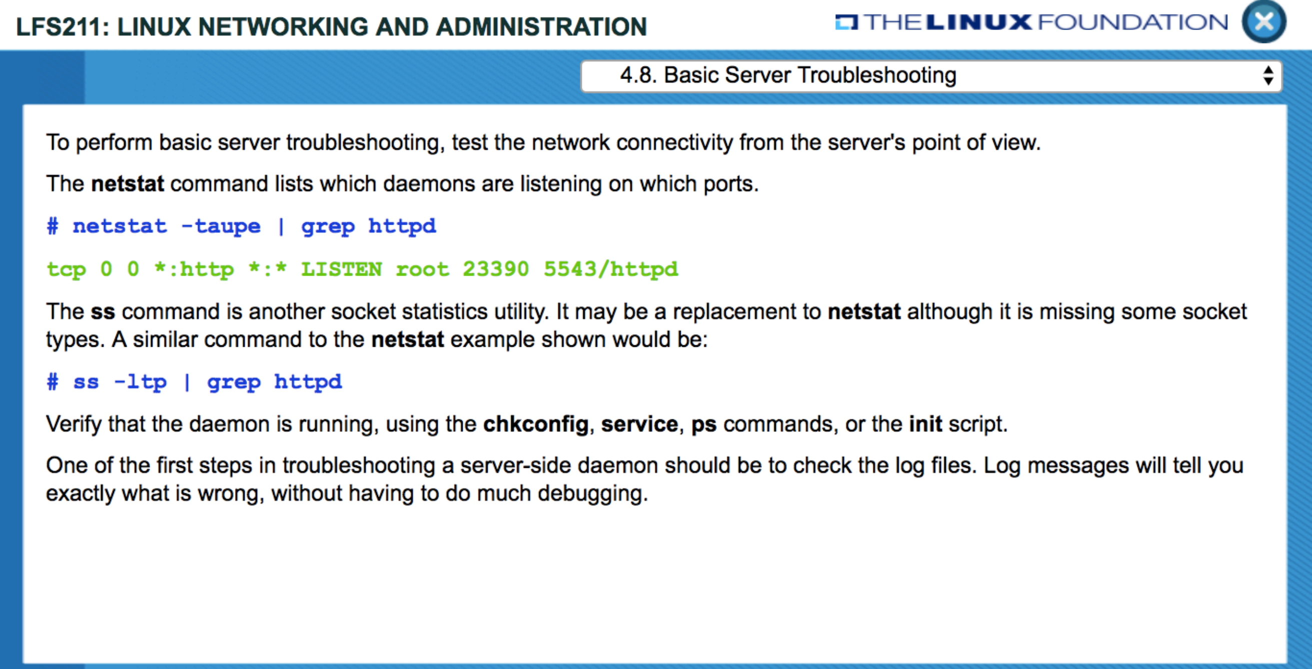
```
# tcpdump -i eth0 -s 65535 -w capture.pcap port 22
```



## 4.7. Common Client-Side Problems

Some common networking issues found at the client side include:

- **DNS** issues - Can you ping the IP address but not the hostname?
- Firewall issues - A firewall on the client side which is rejecting the return traffic from a network request will cause problems.
- Incorrect network settings.
  - Make sure the IP address is correct. Does it match the **DNS** host name?
  - If the route is wrong or missing, traffic will not get to the other network node.
  - Netmasks determine network routes, thus it is important to have the netmask of your host correct.



## 4.8. Basic Server Troubleshooting

To perform basic server troubleshooting, test the network connectivity from the server's point of view.

The **netstat** command lists which daemons are listening on which ports.

```
# netstat -taupe | grep httpd
```

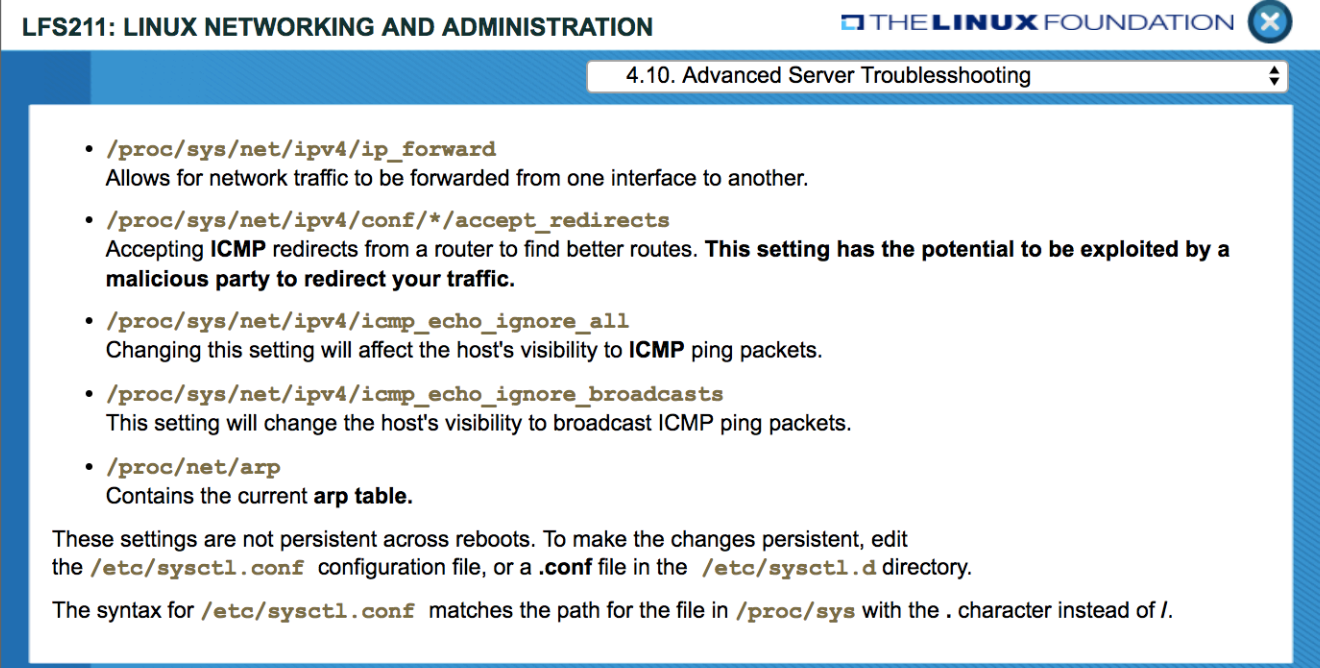
```
tcp 0 0 *:http *:* LISTEN root 23390 5543/httpd
```

The **ss** command is another socket statistics utility. It may be a replacement to **netstat** although it is missing some socket types. A similar command to the **netstat** example shown would be:

```
# ss -ltp | grep httpd
```

Verify that the daemon is running, using the **chkconfig**, **service**, **ps** commands, or the **init** script.

One of the first steps in troubleshooting a server-side daemon should be to check the log files. Log messages will tell you exactly what is wrong, without having to do much debugging.



- `/proc/sys/net/ipv4/ip_forward`
  Allows for network traffic to be forwarded from one interface to another.
- `/proc/sys/net/ipv4/conf/*/accept_redirects`
  Accepting **ICMP** redirects from a router to find better routes. **This setting has the potential to be exploited by a malicious party to redirect your traffic.**
- `/proc/sys/net/ipv4/icmp_echo_ignore_all`
  Changing this setting will affect the host's visibility to **ICMP** ping packets.
- `/proc/sys/net/ipv4/icmp_echo_ignore_broadcasts`
  This setting will change the host's visibility to broadcast ICMP ping packets.
- `/proc/net/arp`
  Contains the current **arp table.**

These settings are not persistent across reboots. To make the changes persistent, edit the `/etc/sysctl.conf` configuration file, or a **.conf** file in the `/etc/sysctl.d` directory.

The syntax for `/etc/sysctl.conf` matches the path for the file in `/proc/sys` with the **.** character instead of **/**.