

# DNS Configuration

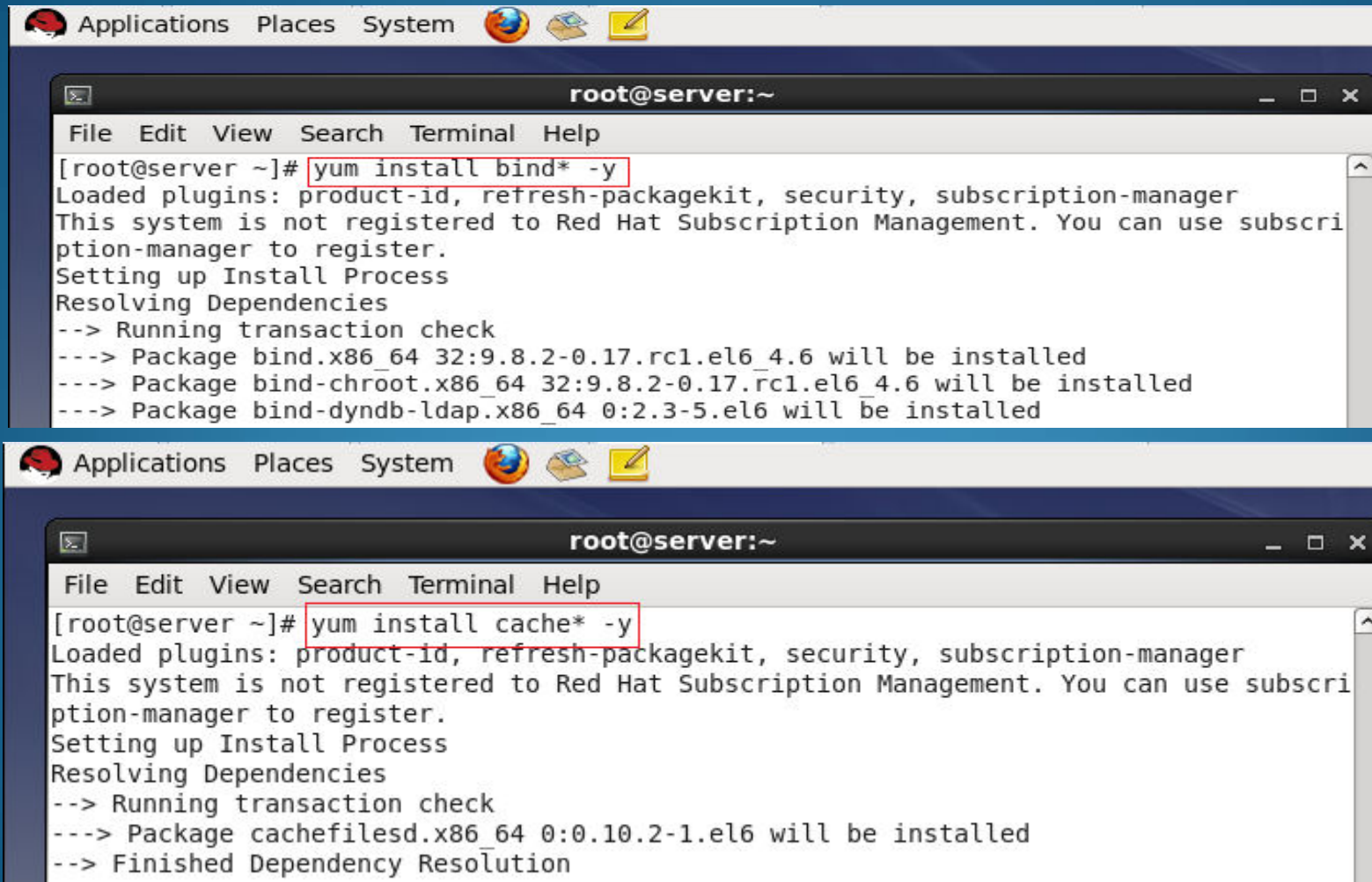
- Domain Name Service (DNS) is an internet service that maps IP addresses to fully qualified domain names (FQDN) and vice versa.
- A DNS server, or name server, is used to resolve an IP address to a hostname or vice versa.
- The entire hostname with its domain such as *server.training.com* is called a fully qualified domain name (FQDN). The right-most part of the FQDN such as .com or .net is called the *top level domain*, with the remaining parts of the FQDN, which are separated by periods, being sub-domains

# Profile for DNS Server

- Usage : To resolve IP into hostname and vice-versa
- Package : bind, caching-name
- Script : /etc/init.d/named
- Port : 53
- Configuration file : /etc/named.conf
- Document root : /var/named
- Daemon : named

# Configuration of DNS server

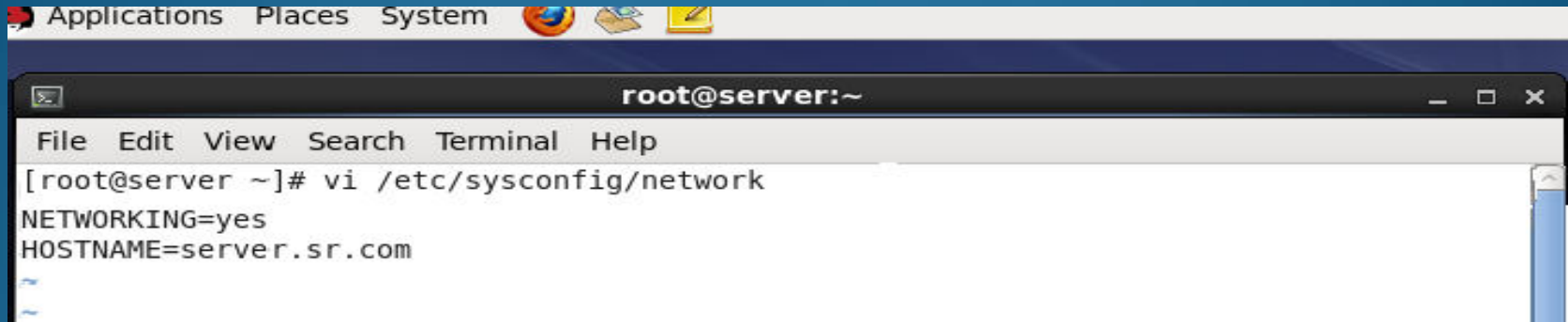
- Install the required package for DNS



The image displays two screenshots of a terminal window on a Linux system, showing the installation of DNS-related packages. The terminal window has a title bar with 'root@server:~' and standard window controls. The menu bar includes 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. The first screenshot shows the command 'yum install bind\* -y' being executed. The output indicates that the system is not registered to Red Hat Subscription Management and lists the packages to be installed: bind.x86\_64 32:9.8.2-0.17.rc1.el6\_4.6, bind-chroot.x86\_64 32:9.8.2-0.17.rc1.el6\_4.6, and bind-dyndb-ldap.x86\_64 0:2.3-5.el6. The second screenshot shows the command 'yum install cache\* -y' being executed. The output indicates that the system is not registered to Red Hat Subscription Management and lists the package to be installed: cachefilesd.x86\_64 0:0.10.2-1.el6. Both screenshots show the progress of the installation process, including resolving dependencies and running transaction checks.

```
root@server:~  
File Edit View Search Terminal Help  
[root@server ~]# yum install bind* -y  
Loaded plugins: product-id, refresh-packagekit, security, subscription-manager  
This system is not registered to Red Hat Subscription Management. You can use subscri  
ption-manager to register.  
Setting up Install Process  
Resolving Dependencies  
--> Running transaction check  
---> Package bind.x86_64 32:9.8.2-0.17.rc1.el6_4.6 will be installed  
---> Package bind-chroot.x86_64 32:9.8.2-0.17.rc1.el6_4.6 will be installed  
---> Package bind-dyndb-ldap.x86_64 0:2.3-5.el6 will be installed  
  
root@server:~  
File Edit View Search Terminal Help  
[root@server ~]# yum install cache* -y  
Loaded plugins: product-id, refresh-packagekit, security, subscription-manager  
This system is not registered to Red Hat Subscription Management. You can use subscri  
ption-manager to register.  
Setting up Install Process  
Resolving Dependencies  
--> Running transaction check  
---> Package cachefilesd.x86_64 0:0.10.2-1.el6 will be installed  
--> Finished Dependency Resolution
```

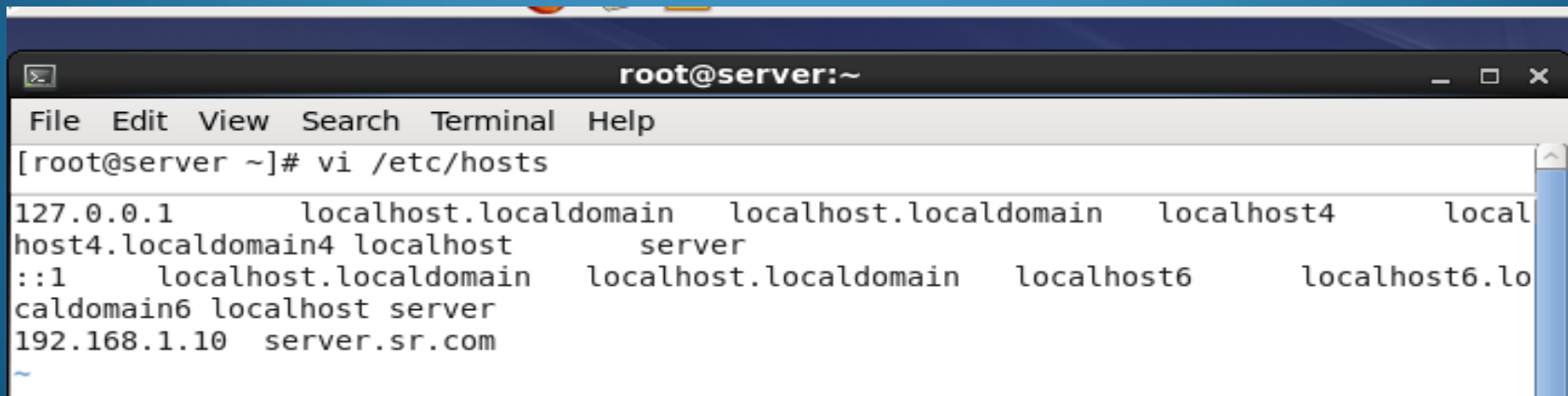
- Change the hostname by adding fully qualified domain name  
#hostname server.sr.com(where sr.com is the FQDN) and make it permanent in  
/etc/sysconfig/network file.



A terminal window titled 'root@server:~' with a menu bar (File, Edit, View, Search, Terminal, Help). The command '[root@server ~]# vi /etc/sysconfig/network' has been executed. The terminal shows the contents of the file: NETWORKING=yes and HOSTNAME=server.sr.com.

```
root@server:~  
File Edit View Search Terminal Help  
[root@server ~]# vi /etc/sysconfig/network  
NETWORKING=yes  
HOSTNAME=server.sr.com
```

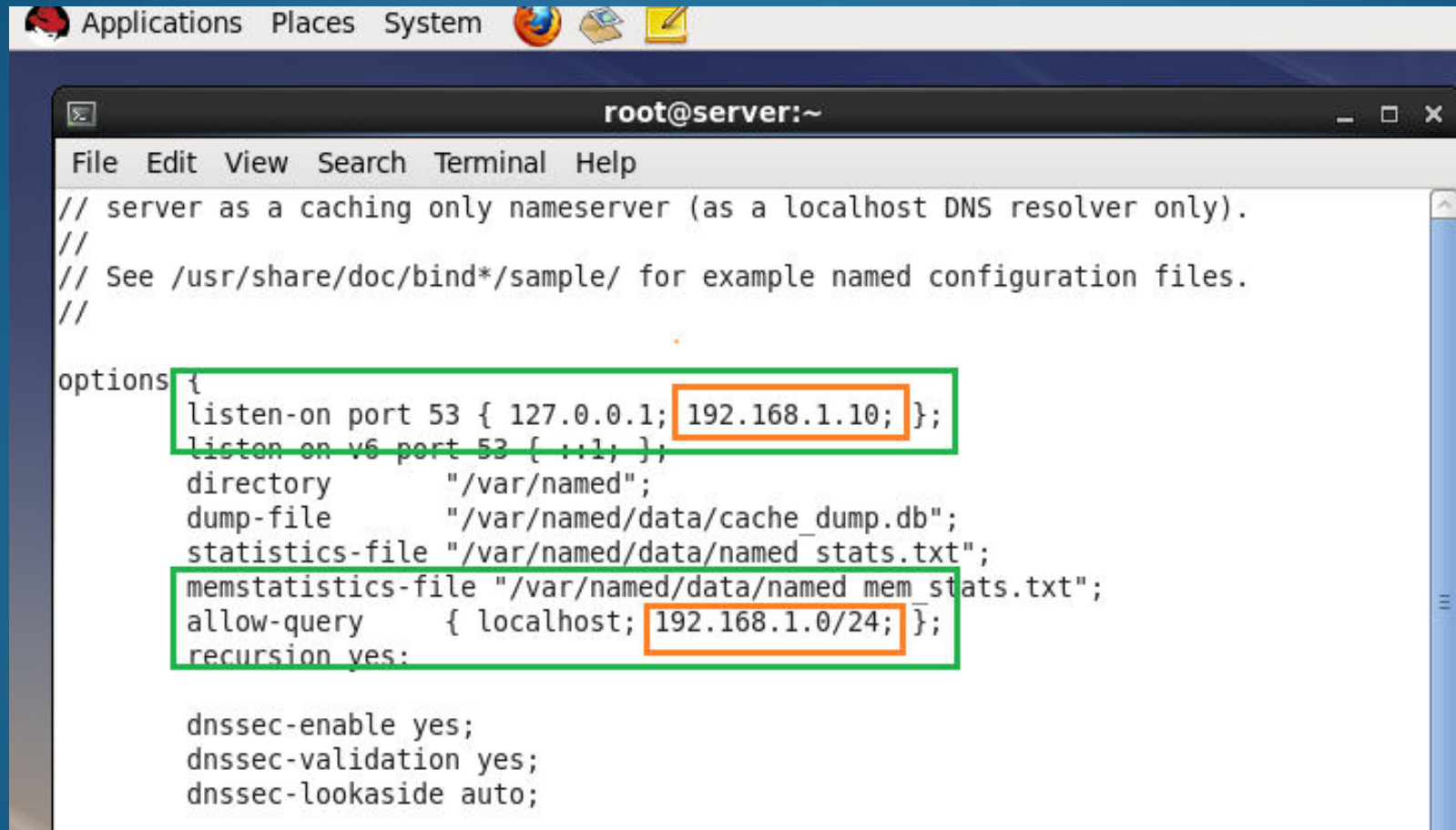
Update the /etc/hosts file with the server's ip address, and change the hostname with fully qualified domain name.



A terminal window titled 'root@server:~' with a menu bar (File, Edit, View, Search, Terminal, Help). The command '[root@server ~]# vi /etc/hosts' has been executed. The terminal shows the contents of the file with the server's IP address and fully qualified domain name added.

```
root@server:~  
File Edit View Search Terminal Help  
[root@server ~]# vi /etc/hosts  
127.0.0.1      localhost.localdomain  localhost.localdomain  localhost4      local  
host4.localdomain4 localhost          server  
::1      localhost.localdomain  localhost.localdomain  localhost6      localhost6.lo  
caldomain6 localhost server  
192.168.1.10  server.sr.com
```

- Edit the configuration file /etc/named.conf file with server's IP address and network range for clients.
- #vi /etc/named.conf



```
root@server:~  
File Edit View Search Terminal Help  
// server as a caching only nameserver (as a localhost DNS resolver only).  
//  
// See /usr/share/doc/bind*/sample/ for example named configuration files.  
//  
options {  
    listen-on port 53 { 127.0.0.1; 192.168.1.10; };  
    listen-on v6 port 53 { ::1; };  
    directory "/var/named";  
    dump-file "/var/named/data/cache_dump.db";  
    statistics-file "/var/named/data/named_stats.txt";  
    memstatistics-file "/var/named/data/named_mem_stats.txt";  
    allow-query { localhost; 192.168.1.0/24; };  
    recursion yes;  
  
    dnssec-enable yes;  
    dnssec-validation yes;  
    dnssec-lookaside auto;
```

- Edit the zone configuration file i.e. /etc/named.rfc1912.zones and the details of the zones i.e. forward lookup zone and reverse lookup zones  
Copy the following 11 lines and paste it at the end of the line and edit them.



```
File Edit View Search Terminal Help
[root@server ~]# vi /etc/named.rfc1912.zones

zone "sr.com" IN {
    type master;
    file "sr.flz";
    allow-update { none; };
};

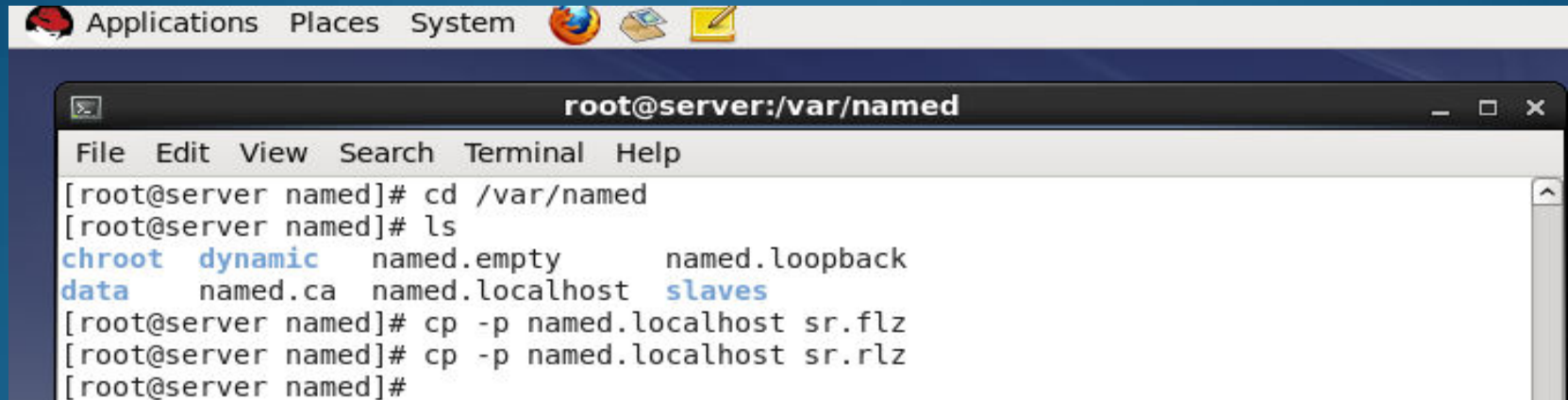
zone "1.168.192.in-addr.arpa" IN {
    type master;
    file "sr.rlz";
    allow-update { none; };
};
```

Where “sr.com” is the name of our domain

And “1.168.192.in-addr.arpa” is the reverse order of our domain network.



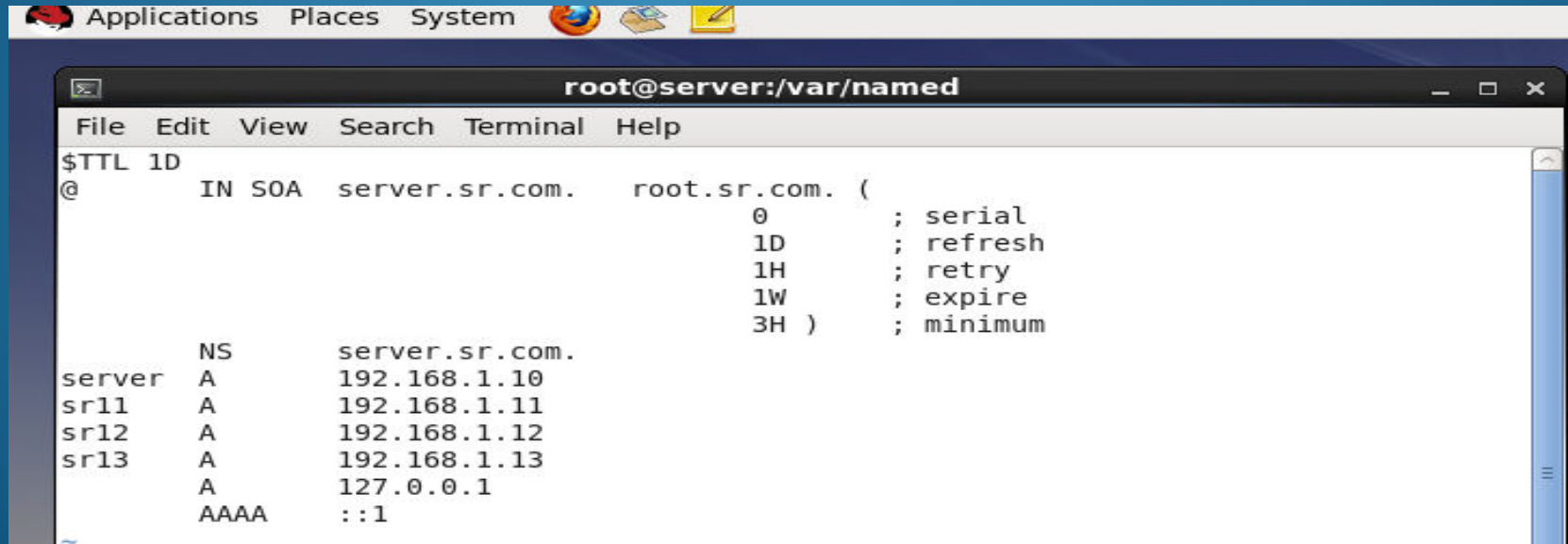
- Navigate to /var/named directory and create a forward and reverse zone files.
- Now copy the named.localhost file with its permissions as sr.flz and sr.rlz and edit it.



A terminal window titled 'root@server:/var/named' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the following commands and output:

```
[root@server named]# cd /var/named
[root@server named]# ls
chroot  dynamic  named.empty  named.loopback
data    named.ca  named.localhost  slaves
[root@server named]# cp -p named.localhost sr.flz
[root@server named]# cp -p named.localhost sr.rlz
[root@server named]#
```

Edit sr.flz file as follows



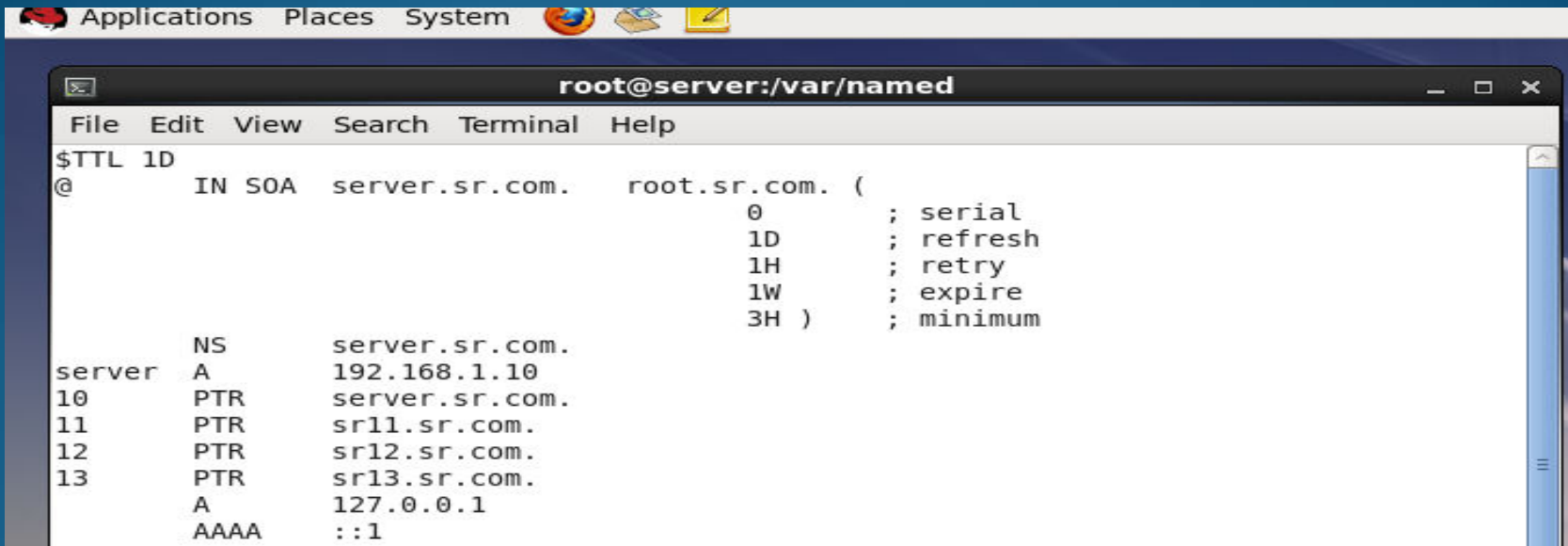
A terminal window titled 'root@server:/var/named' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the contents of the sr.flz file:

```
$TTL 1D
@      IN SOA  server.sr.com.  root.sr.com. (
                                   0      ; serial
                                   1D      ; refresh
                                   1H      ; retry
                                   1W      ; expire
                                   3H )    ; minimum

server NS      server.sr.com.
server A      192.168.1.10
sr11  A      192.168.1.11
sr12  A      192.168.1.12
sr13  A      192.168.1.13
      A      127.0.0.1
      AAAA   ::1
```



- Edit sr.rlz file as follows



A screenshot of a terminal window titled "root@server:/var/named". The window displays the contents of a zone file. The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The text in the terminal is as follows:

```
$TTL 1D
@      IN SOA  server.sr.com.  root.sr.com. (
                        0      ; serial
                        1D     ; refresh
                        1H     ; retry
                        1W     ; expire
                        3H )   ; minimum

server NS      server.sr.com.
server A      192.168.1.10
10 PTR       server.sr.com.
11 PTR       sr11.sr.com.
12 PTR       sr12.sr.com.
13 PTR       sr13.sr.com.
A           127.0.0.1
AAAA        ::1
```

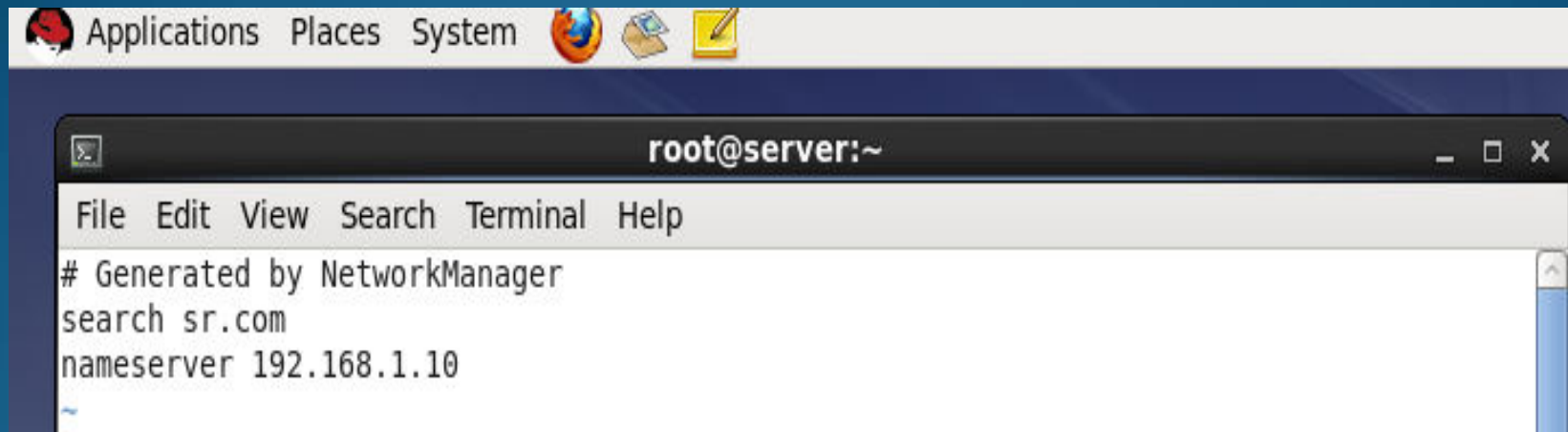
Check zone files are consistent or not by using the command  
#named-checkzone <domainname> zone file



A screenshot of a terminal window titled "root@server:/var/named". The window shows the execution of the "named-checkzone" command. The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The text in the terminal is as follows:

```
[root@server named]# named-checkzone sr.com sr.flz
zone sr.com/IN: loaded serial 0
OK
[root@server named]# named-checkzone sr.com sr.rlz
zone sr.com/IN: loaded serial 0
OK
[root@server named]#
```

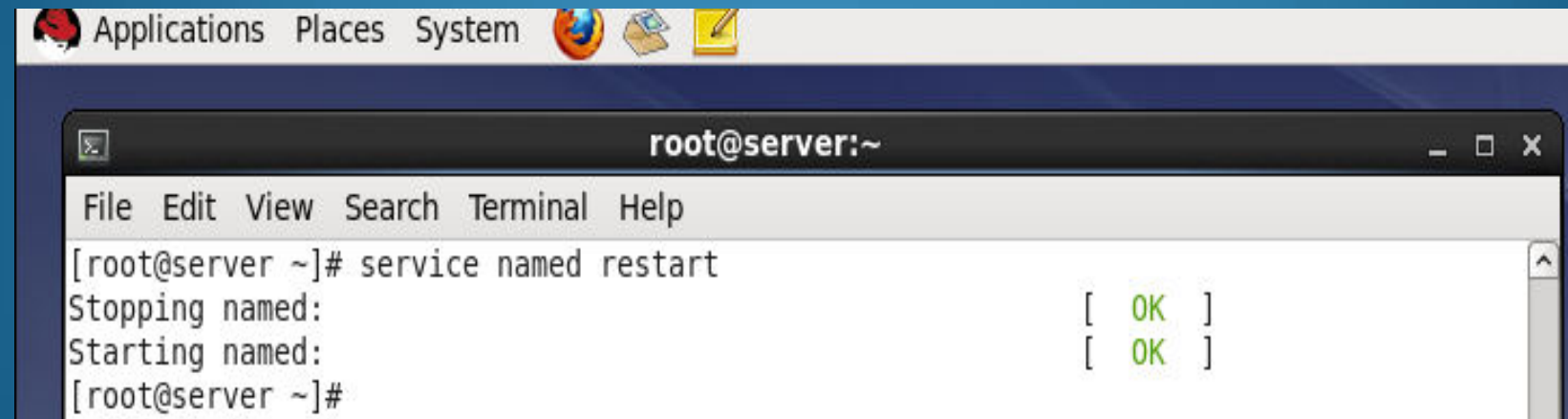
- Add the address of DNS server in /etc/resolv.conf



A screenshot of a terminal window titled "root@server:~". The window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal output shows the contents of the /etc/resolv.conf file, which was generated by NetworkManager. It contains the search domain "sr.com" and the nameserver address "192.168.1.10".

```
root@server:~  
File Edit View Search Terminal Help  
# Generated by NetworkManager  
search sr.com  
nameserver 192.168.1.10
```

- Restart the named services

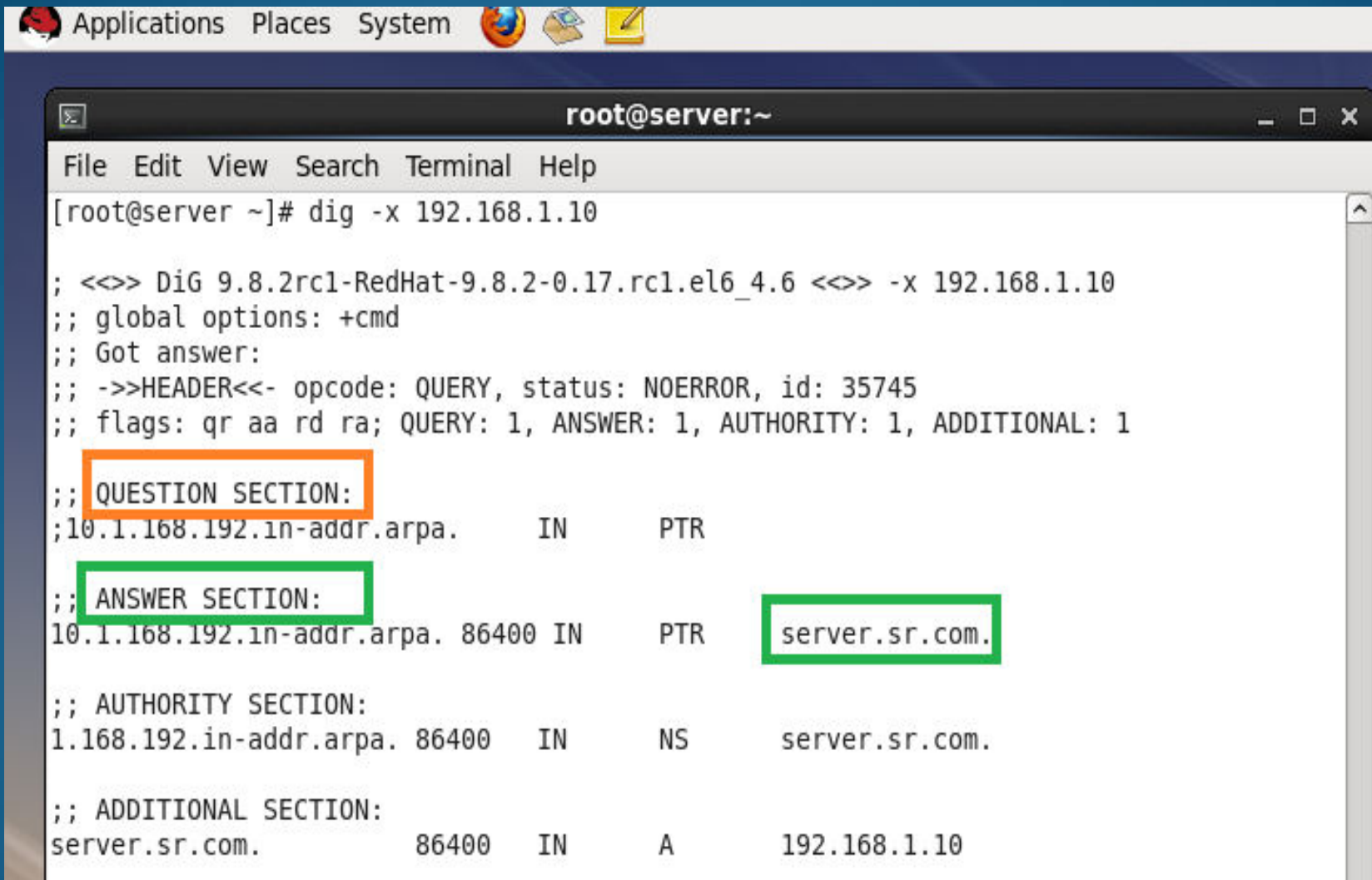


A screenshot of a terminal window titled "root@server:~". The window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal output shows the command "service named restart" being executed. The output indicates that the "named" service was successfully stopped and started, with "OK" status for both actions.

```
root@server:~  
File Edit View Search Terminal Help  
[root@server ~]# service named restart  
Stopping named: [ OK ]  
Starting named: [ OK ]  
[root@server ~]#
```



- Check with giving IP of hostname



The screenshot shows a Linux desktop environment with a terminal window titled "root@server:~". The terminal displays the output of the command "dig -x 192.168.1.10". The output includes the following sections:

```
[root@server ~]# dig -x 192.168.1.10

; <<>> DiG 9.8.2rc1-RedHat-9.8.2-0.17.rc1.el6_4.6 <<>> -x 192.168.1.10
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 35745
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 1

;; QUESTION SECTION:
;10.1.168.192.in-addr.arpa.      IN      PTR

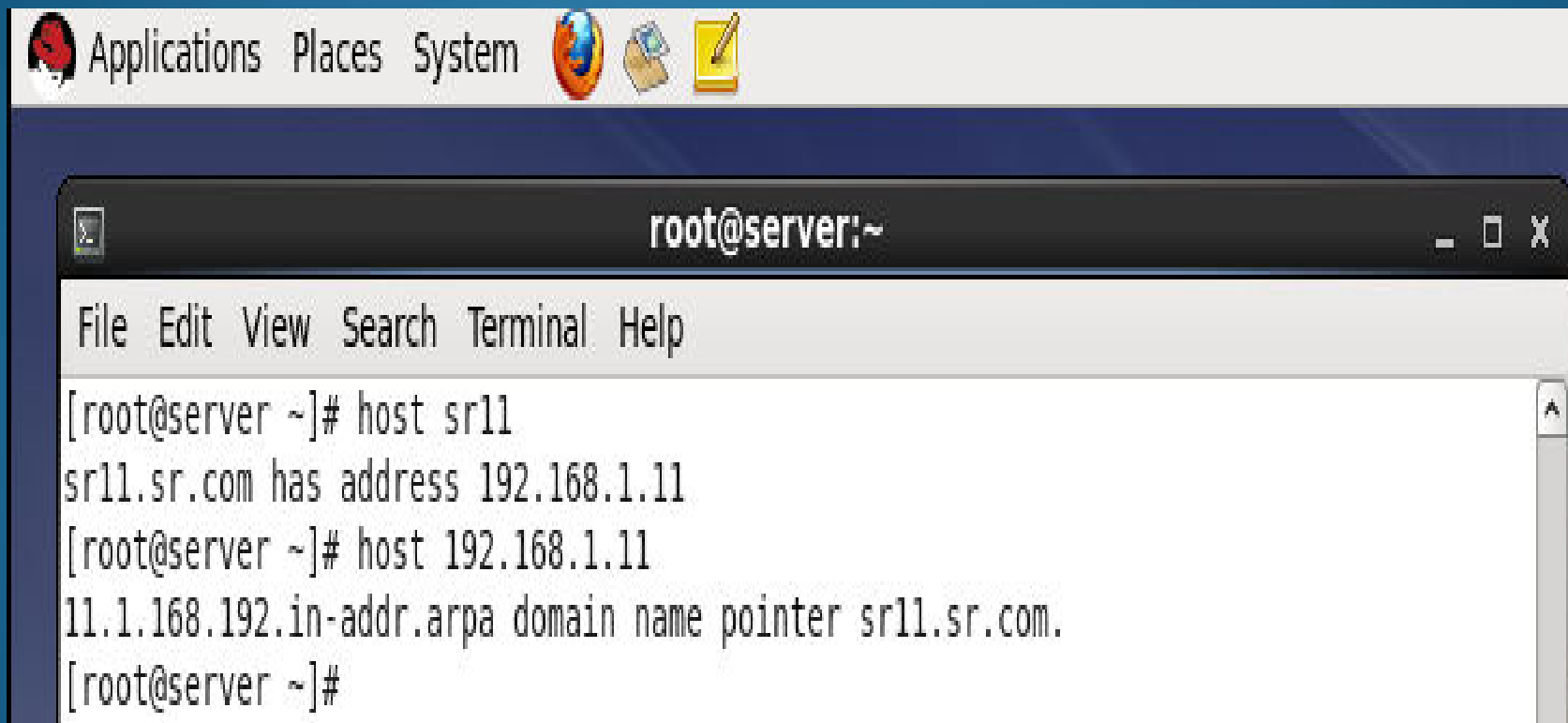
;; ANSWER SECTION:
10.1.168.192.in-addr.arpa. 86400 IN      PTR      server.sr.com.

;; AUTHORITY SECTION:
1.168.192.in-addr.arpa. 86400 IN      NS      server.sr.com.

;; ADDITIONAL SECTION:
server.sr.com.      86400 IN      A      192.168.1.10
```

In the original image, the "QUESTION SECTION:" header is highlighted with an orange box, the "ANSWER SECTION:" header is highlighted with a green box, and the value "server.sr.com." in the answer section is highlighted with a green box.

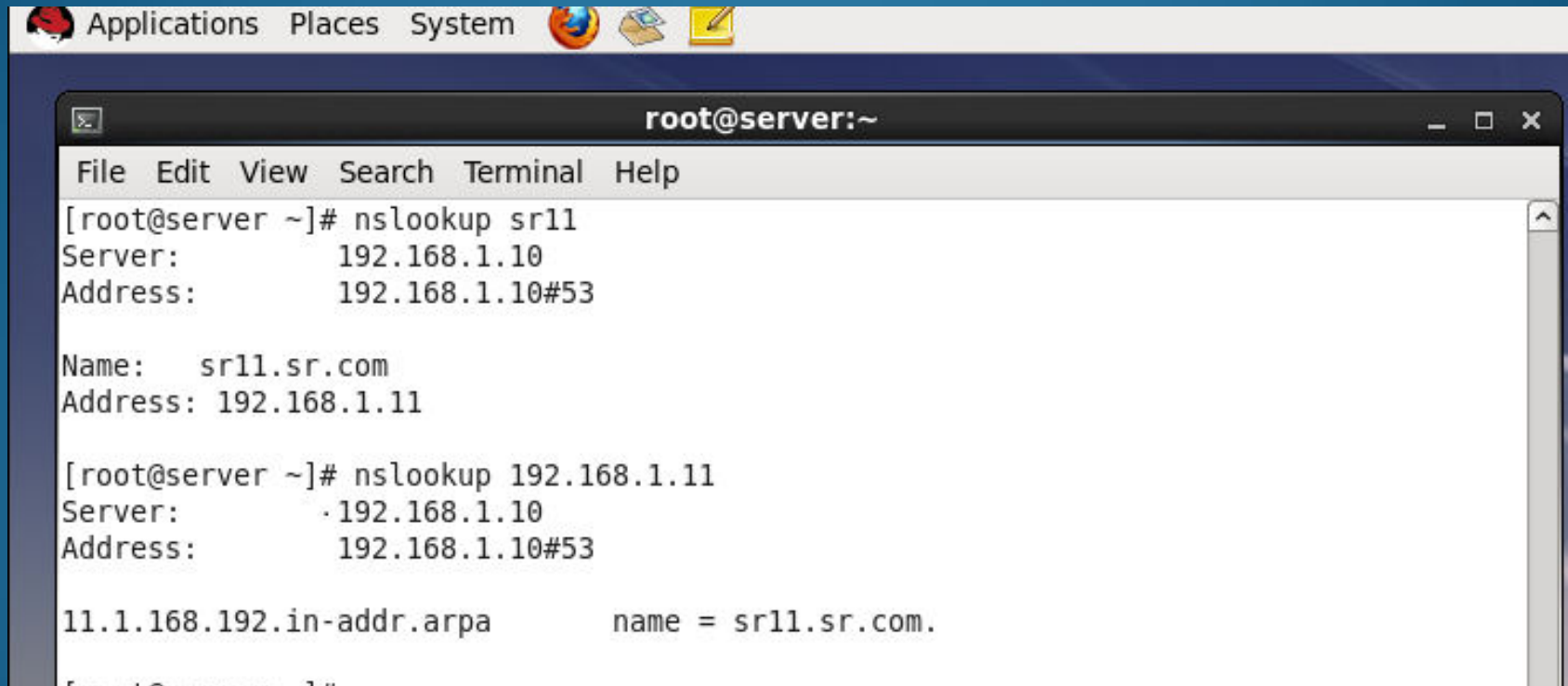
- Check the DNS resolution with host command for both server as well as clients
- #host <hostname>
- #host sr11
- Using host command with IP address of server as well as client
- #host 192.168.1.11



The screenshot shows a Linux desktop environment. At the top, there is a panel with icons for Applications, Places, and System, along with a globe icon, a folder icon, and a notepad icon. Below this, a terminal window is open. The terminal window has a title bar that reads "root@server:~". The terminal content shows the following commands and output:

```
File Edit View Search Terminal Help
[root@server ~]# host sr11
sr11.sr.com has address 192.168.1.11
[root@server ~]# host 192.168.1.11
11.1.168.192.in-addr.arpa domain name pointer sr11.sr.com.
[root@server ~]#
```

- Using nslookup command to check the DNS resolution
- #nslookup sr11
- Check with the IP addresses
- #nslookup 192.168.1.11



The screenshot shows a Linux desktop with a menu bar containing 'Applications', 'Places', and 'System'. Below the menu bar are icons for Firefox, a folder, and a document. A terminal window titled 'root@server:~' is open, displaying the following commands and output:

```
[root@server ~]# nslookup sr11
Server:          192.168.1.10
Address:         192.168.1.10#53

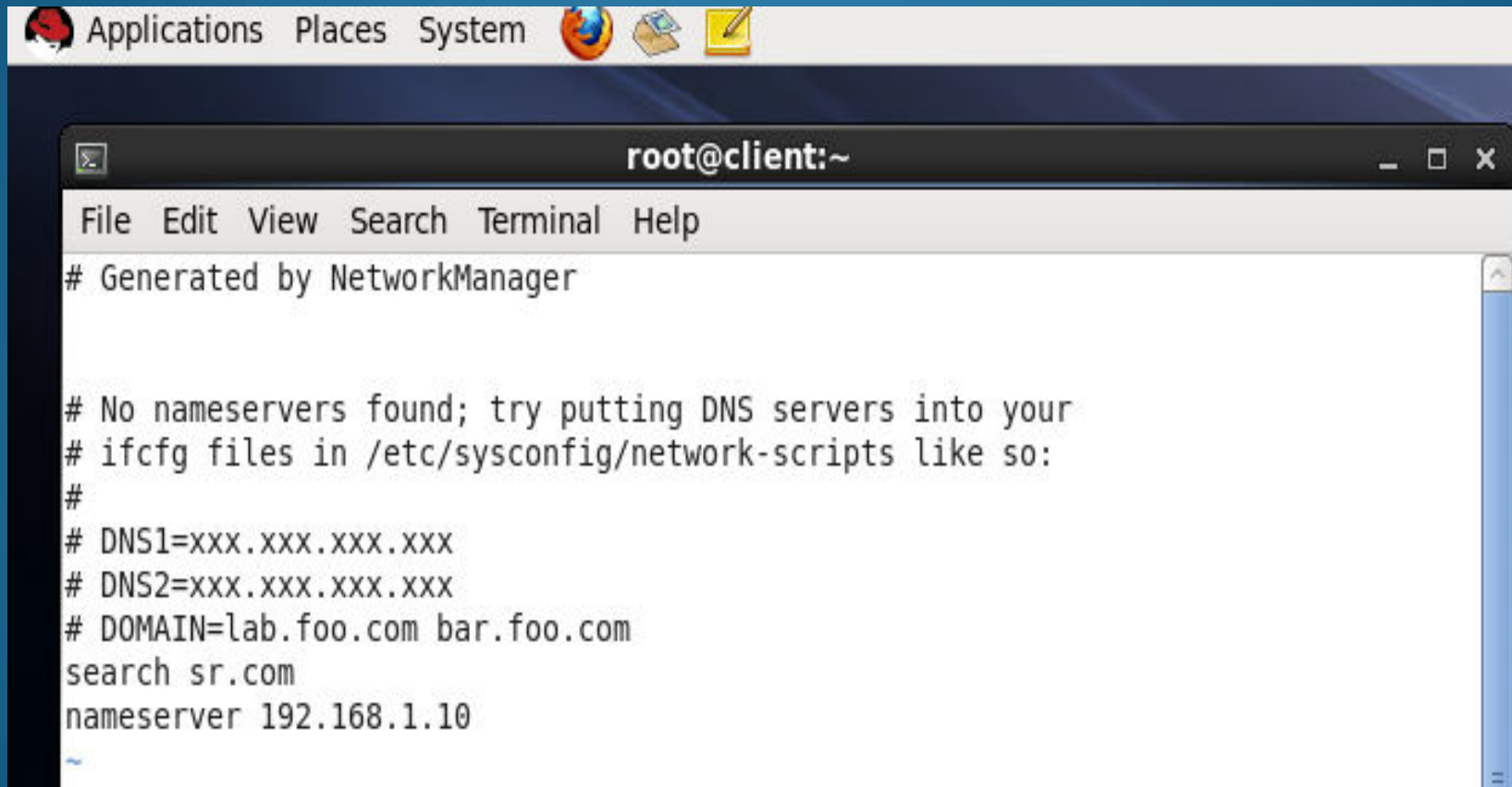
Name:   sr11.sr.com
Address: 192.168.1.11

[root@server ~]# nslookup 192.168.1.11
Server:          192.168.1.10
Address:         192.168.1.10#53

11.1.168.192.in-addr.arpa      name = sr11.sr.com.
```

- Client side configuration for DNS

- Log into client machine and add the DNS server's information in /etc/resolv.conf file



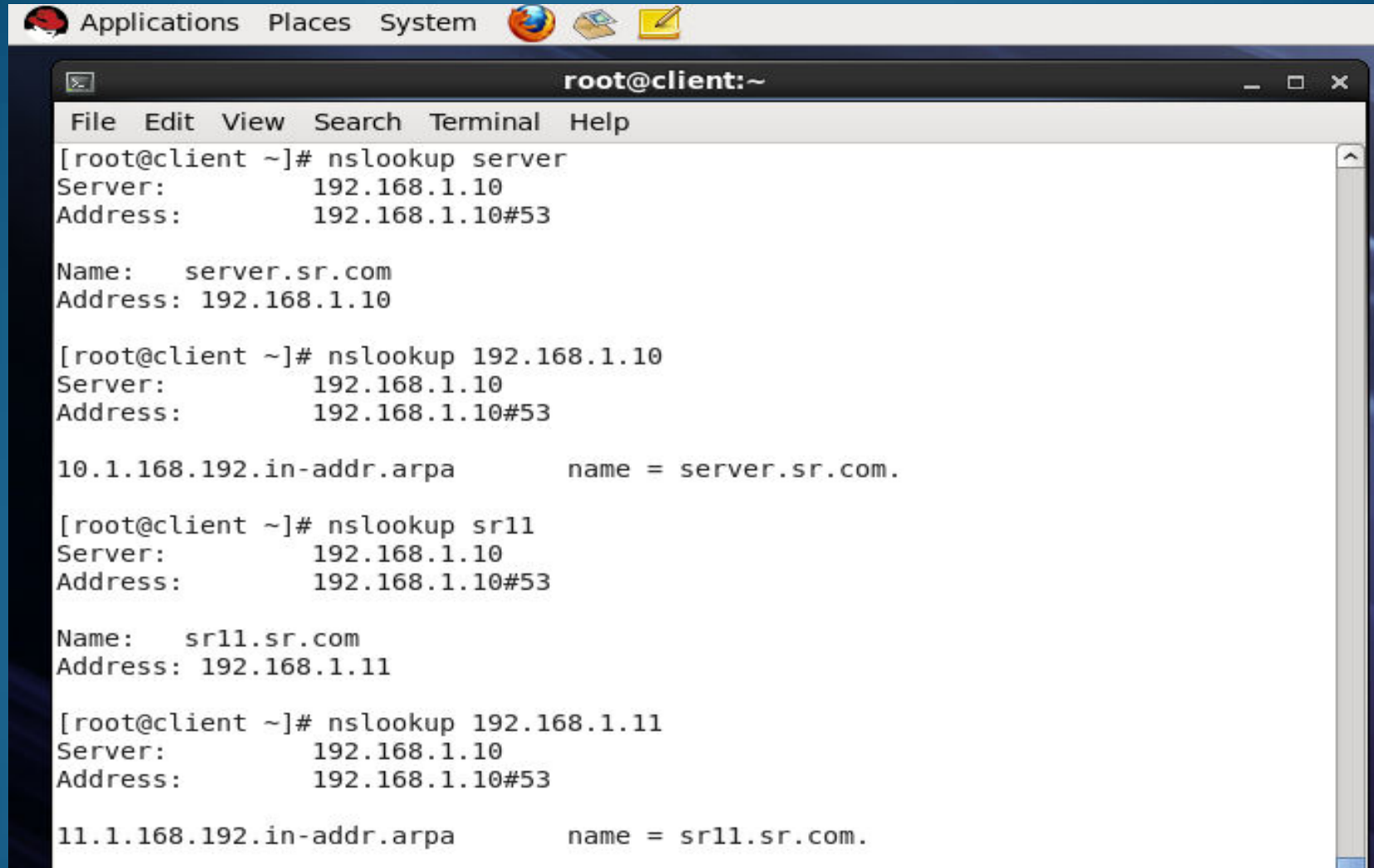
The screenshot shows a Linux desktop environment. At the top, there is a menu bar with 'Applications', 'Places', and 'System'. Below this is a panel with icons for Firefox, a folder, and a notepad. A terminal window is open, titled 'root@client:~'. The terminal has a menu bar with 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. The terminal output shows the following text:

```
# Generated by NetworkManager

# No nameservers found; try putting DNS servers into your
# ifcfg files in /etc/sysconfig/network-scripts like so:
#
# DNS1=xxx.xxx.xxx.xxx
# DNS2=xxx.xxx.xxx.xxx
# DOMAIN=lab.foo.com bar.foo.com
search sr.com
nameserver 192.168.1.10
```



- Now check with any of the options used previously like dig, host or nslookup for DNS resolution



The screenshot shows a terminal window titled "root@client:~" with a menu bar containing "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal displays the following commands and output:

```
[root@client ~]# nslookup server
Server:          192.168.1.10
Address:         192.168.1.10#53

Name:   server.sr.com
Address: 192.168.1.10

[root@client ~]# nslookup 192.168.1.10
Server:          192.168.1.10
Address:         192.168.1.10#53

10.1.168.192.in-addr.arpa      name = server.sr.com.

[root@client ~]# nslookup sr11
Server:          192.168.1.10
Address:         192.168.1.10#53

Name:   sr11.sr.com
Address: 192.168.1.11

[root@client ~]# nslookup 192.168.1.11
Server:          192.168.1.10
Address:         192.168.1.10#53

11.1.168.192.in-addr.arpa      name = sr11.sr.com.
```