Configure Domain Name Server (DNS) in RHEL | Name Server Configuration in Linux |

DNS is a service that helps to resolve a fully qualified domain name (FQDN) into an IP address and additionally, perform a reverse translation- translation of an IP address to a user-friendly domain name.

Step 1: Install bind DNS packages.

```
dnf install bind bind-utils
```

Start the DNS server using the command below:

```
systemctl start named
```

Next, enable it so that it can kick in even after a reboot

```
systemctl enable named
```

Just to be sure that the service is running as expected, check its status

```
systemctl status named
```

Step 2: Configure bind DNS server
Let's take a backup of the config file /etc/named.conf

```
cp /etc/named.conf  /etc/named.bak
```

Now go ahead and open the file using your preferred text editor.

```
vim /etc/named.conf
```

Under the 'Options' section, ensure you comment out the lines indicated below to enable the Bind DNS server to listen to all IPs.

```
// listen-on port 53 { 127.0.0.1; };
// listen-on-v6 port 53 { ::1; };
```

Additionally, locate the allow-query parameter and adjust it according to your network subnet.

```
allow-query { localhost; 192.168.1.0/24; };
```

This setting allows only the hosts in the defined network to access the DNS server and not just any other host.

To define the reverse and forward lookup zones, copy and paste the following configuration at the end of /etc/named.conf

```
//forward zone
zone "nehraclasses.local" IN {
    type master;
    file "nehraclasses.local.db";
    allow-update { none; };
    allow-query { any; };
};
```

```
//backward zone
zone "1.168.192.in-addr.arpa" IN {
    type master;
    file "nehraclasses.local.rev";
    allow-update { none; };
    allow-query { any; };
};
```

Step 3: Create a forward DNS zone file for the domain

vim /var/named/nehraclasses.local.db
```
$TTL 86400
@ IN SOA primary-dns.nehraclasses.local. admin.nehraclasses.local. (
                    2020011800 ;Serial
                    3600 ;Refresh
                    1800 ;Retry
                    604800 ;Expire
                    86400 ;Minimum TTL
)

;Name Server Information
@ IN NS primary-dns.nehraclasses.local.
```

```
;IP Address for Name Server
primary-dns IN A 192.168.1.115

;Mail Server MX (Mail exchanger) Record
nehraclasses.local. IN MX 10 mail.nehraclasses.local.

;A Record for the following Host name
www  IN   A   192.168.1.50
mail IN   A   192.168.1.60

;CNAME Record
ftp  IN   CNAME www.nehraclasses.local.
```

Step 4: Create a reverse DNS zone file for the domain

vim /var/named/nehraclasses.local.rev

```
$TTL 86400
@ IN SOA primary-dns.nehraclasses.local. admin.nehraclasses.local. (
                    2020011800 ;Serial
                    3600 ;Refresh
                    1800 ;Retry
                    604800 ;Expire
                    86400 ;Minimum TTL
)
;Name Server Information
@ IN NS primary-dns.nehraclasses.local.
primary-dns    IN    A     192.168.1.115

;Reverse lookup for Name Server
35 IN PTR primary-dns.nehraclasses.local.

;PTR Record IP address to Hostname
50     IN    PTR    www.nehraclasses.local
60     IN    PTR    mail.nehraclasses.local
```

Next, assign the necessary file permissions to the two configuration files.

chown named:named /var/named/nehraclasses.local.db
chown named:named /var/named/nehraclasses.local.rev

To confirm that the DNS zone lookup files are free from any syntactical errors, run the commands shown:

named-checkconf
named-checkzone nehraclasses.local /var/named/nehraclasses.local.db
named-checkzone 192.168.1.115 /var/named/nehraclasses.local.rev

For the changes to be reflected in the system, restart the Bind DNS server

systemctl restart named

Add Firewall Rule.

firewall-cmd --add-service=dns --zone=public --permanent
firewall-cmd --reload

Step 5: Test the Bind DNS server from a client system

vim /etc/resolv.conf
nameserver 192.168.1.115

vim /etc/sysconfig/networkk-scripts/ifcfg-ens033
DNS=192.168.1.115

systemctl restart NetworkManager

Using the nslookup command test the Bind DNS server as shown:

nslookup primary-dns.nehraclasses.local
nslookup mail.nehraclasses.local
nslookup www.nehraclasses.local
nslookup ftp.nehraclasses.local
nslookup 192.168.1.115

The output from the nslookup command confirms that the forward DNS lookup is working as expected.

Moreover, you can also use the dig command as shown

dig primary-dns.nehraclasses.local

To perform a reverse DNS lookup, use the dig command as shown:

dig -x 192.168.1.115

Perfect! The reverse DNS lookup is also working as we would expect.

 # .. make primary + secondary server ..

```
[root@primary-dns ~]# yum repolist
Updating Subscription Management repositories.
Unable to read consumer identity
This system is not registered to Red Hat Subscription Management. You can use subscription-manage
r to register.
repo id                            repo name            I
InstallMedia-AppStream             Red Hat Enterprise Linux 8 - AppStream
InstallMedia-BaseOS                Red Hat Enterprise Linux 8 - BaseOS
[root@primary-dns ~]#
```

```
[root@primary-dns ~]# dnf install bind bind-utils
Updating Subscription Management repositories.
Unable to read consumer identity
This system is not registered to Red Hat Subscription M                    ion-mana
r to register.
Last metadata expiration check: 0:10:19 ago on Wednesday 16 September 2020 05:35:34 PM IST.
Package bind-utils-32:9.11.13-3.el8.x86_64 is already installed.
Dependencies resolved.
================================================================================
 Package        Architecture    Version              Repository              Siz
================================================================================
Installing:
 bind           x86_64          32:9.11.13-3.el8     InstallMedia-AppStream  2.1

Transaction Summary
================================================================================
Install  1 Package

Total size: 2.1 M
Installed size: 4.5 M
Is this ok [y/N]:
```

```
 Fingerprint: 6A6A A7C9 7C88 90AE C6AE BFE2 F76F 66C3 D408 2792
 From        : /etc/pki/rpm-gpg/RPM-GPG-KEY-redhat-release
Is this ok [y/N]: y
Key imported successfully
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing        :
  Running scriptlet: bind-32:9.11.13-3.el8.x86_64
  Installing       : bind-32:9.11.13-3.el8.x86_64
  Running scriptlet: bind-32:9.11.13-3.el8.x86_64
  Verifying        : bind-32:9.11.13-3.el8.x86_64
Installed products updated.

Installed:
  bind-32:9.11.13-3.el8.x86_64

Complete!
[root@primary-dns ~]# c
```

```
[root@primary-dns ~]# hostnamectl
    Static hostname: primary-dns.nehraclasses.local
          Icon name: computer-vm
            Chassis: vm
         Machine ID: 6b92fae73d464a90bfe74bc72ab58ba6
            Boot ID: 99ae8318296f4d3295b0ff86fd8507d5
     Virtualization: vmware
   Operating System: Red Hat Enterprise Linux 8.2 (Ootpa)
        CPE OS Name: cpe:/o:redhat:enterprise_linux:8.2:GA
             Kernel: Linux 4.18.0-193.el8.x86_64
       Architecture: x86-64
[root@primary-dns ~]#
```

 # service - start

```
[root@primary-dns ~]# systemctl start named
[root@primary-dns ~]# systemctl enable named
Created symlink /etc/systemd/system/multi-user.target.wants/named.service → /usr/lib/systemd/syst
em/named.service.
[root@primary-dns ~]# systemctl status named
● named.service - Berkeley Internet Name Domain (DNS)
   Loaded: loaded (/usr/lib/systemd/system/named.service; enabled; vendor preset: disabled)
   Active: active (running) since Wed 2020-09-16 17:46:38 IST; 11s ago
 Main PID: 34639 (named)
    Tasks: 4 (limit: 11159)
   Memory: 58.6M
   CGroup: /system.slice/named.service
           └─34639 /usr/sbin/named -u named -c /etc/named.conf

Sep 16 17:46:38 primary-dns.nehraclasses.local named[34639]: network unreachable resolving './NS>
Sep 16 17:46:38 primary-dns.nehraclasses.local named[34639]: network unreachable resolving './DN>
Sep 16 17:46:38 primary-dns.nehraclasses.local named[34639]: network unreachable resolving './NS>
Sep 16 17:46:38 primary-dns.nehraclasses.local named[34639]: network unreachable resolving './DN>
Sep 16 17:46:38 primary-dns.nehraclasses.local named[34639]: network unreachable resolving './NS>
Sep 16 17:46:39 primary-dns.nehraclasses.local named[34639]: network unreachable resolving './DN>
Sep 16 17:46:39 primary-dns.nehraclasses.local named[34639]: network unreachable resolving './DN>
Sep 16 17:46:39 primary-dns.nehraclasses.local named[34639]: network unreachable resolving './DN>
Sep 16 17:46:40 primary-dns.nehraclasses.local named[34639]: managed-keys-zone: Key 20326 for zo>
Sep 16 17:46:41 primary-dns.nehraclasses.local named[34639]: resolver priming query complete
[root@primary-dns ~]# cle
```

 # before configure DNS , take backup of below file

```
[root@primary-dns ~]# cp /etc/named.conf  /etc/named.bak
[root@primary-dns ~]#
```

```
[root@primary-dns ~]# vim /etc/named.conf
```

#B4

```
//
// named.conf
//
// Provided by Red Hat bind package to configure the ISC BIND named(8) DNS
// 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; };
        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";
        secroots-file   "/var/named/data/named.secroots";
        recursing-file  "/var/named/data/named.recursing";
        allow-query     { localhost; };

"/etc/named.conf" 59L, 1705C                                        2,1
```

 # after

```
// See /usr/share/doc/bind*/sample/ for example named configuration files.
//

options {
//      listen-on port 53 { 127.0.0.1; };
//      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";
        secroots-file   "/var/named/data/named.secroots";
        recursing-file  "/var/named/data/named.recursing";
        allow-query     { localhost; 192.168.1.0/24; };

        /*
         - If you are building an AUTHORITATIVE DNS server, do NOT enable recursion.
         - If you are building a RECURSIVE (caching) DNS server, you need to enable
           recursion.
         - If your recursive DNS server has a public IP address, you MUST enable access
-- INSERT --                                                  19,46-53         12%
```

 # add this .. forwarding Lookup zone + reverse lookup zone

```
        file "named.ca";
};

include "/etc/named.rfc1912.zones";
include "/etc/named.root.key";
//forward zone
zone "nehraclasses.local" IN {
    type master;
    file "nehraclasses.local.db";
    allow-update { none; };
    allow-query { any; };
};

//backward zone
zone "1.168.192.in-addr.arpa" IN {
    type master;
    file "nehraclasses.local.rev";
    allow-update { none; };
    allow-query { any; };
};
-- INSERT --
```

 # Save + exit

```
[root@primary-dns ~]# vim /var/named/nehraclasses.local.db
```

```
$TTL 86400
@ IN SOA primary-dns.nehraclasses.local. admin.nehraclasses.local. (
                                        2020011800 ;Serial
                                        3600 ;Refresh
                                        1800 ;Retry
                                        604800 ;Expire
                                        86400 ;Minimum TTL
)

;Name Server Information
@ IN NS primary-dns.nehraclasses.local.        I

;IP Address for Name Server
primary-dns IN A 192.168.1.115

;Mail Server MX (Mail exchanger) Record
nehraclasses.local. IN MX 10 mail.nehraclasses.local.

;A Record for the following Host name
www   IN   A    192.168.1.50
    INSERT
```

Create Reverse Zone file

```
root@primary-dns ~]# vim /var/named/nehraclasses.local.rev

                                        I
$TTL 86400
@ IN SOA primary-dns.nehraclasses.local. admin.nehraclasses.local. (
                                        2020011800 ;Serial
                                        3600 ;Refresh
                                        1800 ;Retry
                                        604800 ;Expire
                                        86400 ;Minimum TTL
)
;Name Server Information
@ IN NS primary-dns.nehraclasses.local.
primary-dns       IN        A         192.168.1.115
                                                       I
;Reverse lookup for Name Server
35 IN PTR primary-dns.nehraclasses.local.

;PTR Record IP address to Hostname
50      IN      PTR     www.nehraclasses.local
60      IN      PTR     mail.nehraclasses.local
```

change the ownership both the files

```
[root@primary-dns ~]# chown named:named /var/named/nehraclasses.local.db
[root@primary-dns ~]# chown named:named /var/named/nehraclasses.local.rev
[root@primary-dns ~]#
                                        I
```
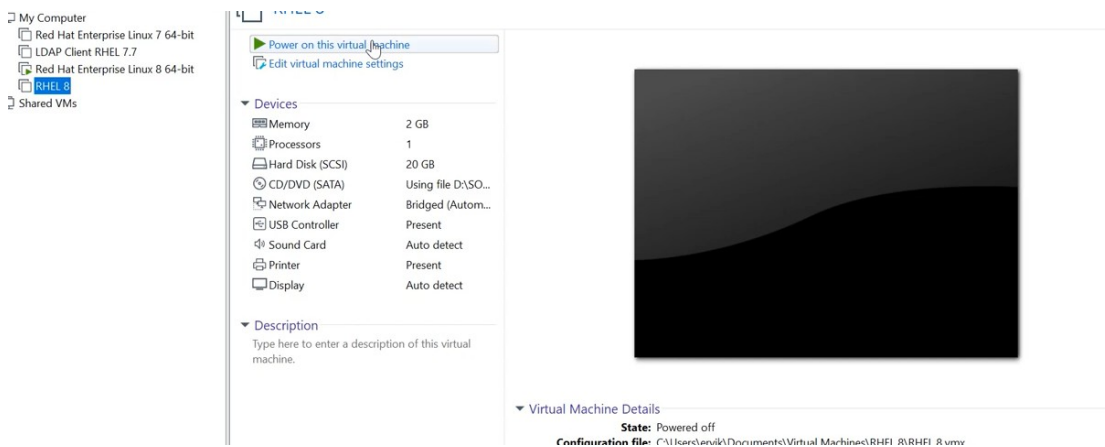
check conf setting is correct or not

```
[root@primary-dns ~]# named-checkconf
[root@primary-dns ~]# named-checkzone nehraclasses.local /var/named/nehraclasses.local.db
zone nehraclasses.local/IN: loaded serial 2020011800
OK
[root@primary-dns ~]# named-checkzone 192.168.1.115 /var/named/nehraclasses.local.rev
zone 192.168.1.115/IN: loaded serial 2020011800
OK
```

Add Services in Firewall

```
[root@primary-dns ~]# firewall-cmd  --add-service=dns --zone=public  --permanent
success
[root@primary-dns ~]# firewall-cmd  --reload
success
[root@primary-dns ~]# systemctl restart named
[root@primary-dns ~]#
```

conf the client + check serivce is working or not


```
[root@client-dns ~]# uname -a
Linux client-dns.nehraclasses.local 4.18.0-193.el8.x86_64 #1 SMP Fri Mar 27 14:35:58 UTC 2020 x86
_64 x86_64 x86_64 GNU/Linux
[root@client-dns ~]#
```

```
[root@client-dns ~]# vim /etc/resolv.conf
```

```
# Generated by NetworkManager
search nehraclasses.local
nameserver 192.168.1.115
~
~
~
~
~
~
```

```
[root@client-dns ~]# vim /etc/sysconfig/network-scripts/ifcfg-ens160
```

```
PROXY_METHOD=none
BROWSER_ONLY=no
BOOTPROTO=dhcp
DEFROUTE=yes
IPV4_FAILURE_FATAL=no
IPV6INIT=yes
IPV6_AUTOCONF=yes
IPV6_DEFROUTE=yes
IPV6_FAILURE_FATAL=no
IPV6_ADDR_GEN_MODE=stable-privacy
NAME=ens160
UUID=62b4bfa9-cbce-4326-91bf-3d189fe04486
DEVICE=ens160
ONBOOT=yes
DNS=192.168.1.115
~
~
~
[root@client-dns ~]# systemctl restart NetworkManager
[root@client-dns ~]#
```

```
[root@client-dns ~]# nslookup primary-dns.nehraclasses.local
Server:         192.168.1.115
Address:        192.168.1.115#53

Name:    primary-dns.nehraclasses.local
Address: 192.168.1.115

[root@client-dns ~]# nslookup mail.nehraclasses.local
Server:         192.168.1.115
Address:        192.168.1.115#53

Name:    mail.nehraclasses.local
Address: 192.168.1.60

[root@client-dns ~]#
```

```
[root@client-dns ~]# nslookup www.nehraclasses.local
Server:         192.168.1.115
Address:        192.168.1.115#53

Name:    www.nehraclasses.local
Address: 192.168.1.50

[root@client-dns ~]#
```

```
[root@client-dns ~]# nslookup ftp.nehraclasses.local
Server:         192.168.1.115
Address:        192.168.1.115#53

ftp.nehraclasses.local   canonical name = www.nehraclasses.local.
Name:    www.nehraclasses.local
Address: 192.168.1.50

[root@client-dns ~]#
```

```
[root@client-dns ~]# dig primary-dns.nehraclasses.local
```

```
                    🔍 Type here to search              O  🖽  📁  📦  📧  💻  📷  🗔  ⌨  📰

;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 60891
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
; COOKIE: 46dc382803e6cdd77cf3b2b55f620a0a6717266838fdd4b9 (good)
;; QUESTION SECTION:
;primary-dns.nehraclasses.local.            IN        A

;; ANSWER SECTION:
primary-dns.nehraclasses.local. 86400 IN A        192.168.1.115

;; AUTHORITY SECTION:
nehraclasses.local.        86400    IN      NS        primary-dns.nehraclasses.local.

;; Query time: 0 msec
;; SERVER: 192.168.1.115#53(192.168.1.115)
;; WHEN: Wed Sep 16 18:20:19 IST 2020
;; MSG SIZE  rcvd: 117
```
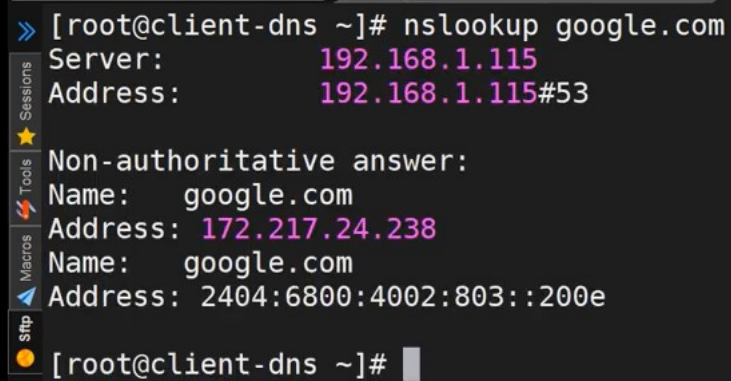
```
[root@client-dns ~]# dig -x 192.168.1.115
```

```
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NXDOMAIN, id: 49529
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 0, AUTHORITY: 1, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
; COOKIE: 134db38b074c867af065208f5f620a2803141cc2bba3a154 (good)
;; QUESTION SECTION:
;115.1.168.192.in-addr.arpa.      IN        PTR

;; AUTHORITY SECTION:
1.168.192.in-addr.arpa. 86400    IN      SOA       primary-dns.nehraclasses.local. admin.nehraclasse
s.local. 2020011800 3600 1800 604800 86400

;; Query time: 0 msec
;; SERVER: 192.168.1.115#53(192.168.1.115)
;; WHEN: Wed Sep 16 18:20:48 IST 2020
;; MSG SIZE  rcvd: 155

[root@client-dns ~]#
```
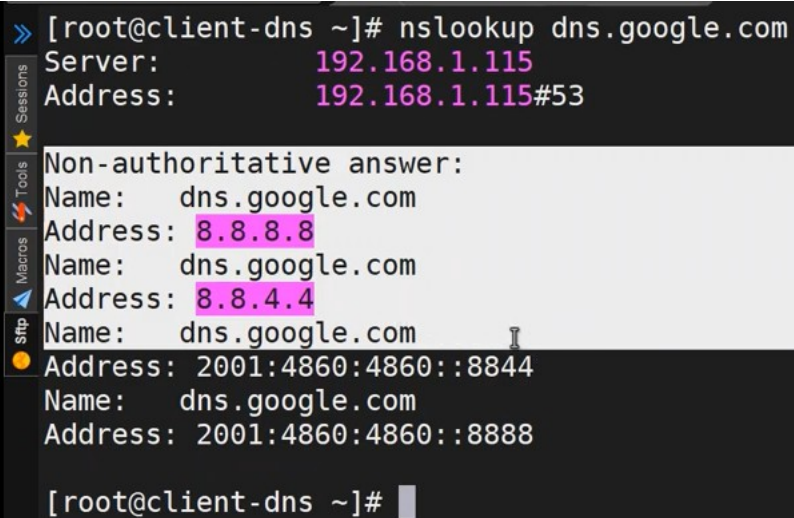
```
[root@client-dns ~]# nslookup google.com
Server:         192.168.1.115
Address:        192.168.1.115#53

Non-authoritative answer:
Name:   google.com
Address: 172.217.24.238
Name:   google.com
Address: 2404:6800:4002:803::200e

[root@client-dns ~]#
```

```
[root@client-dns ~]# nslookup dns.google.com
Server:         192.168.1.115
Address:        192.168.1.115#53

Non-authoritative answer:
Name:   dns.google.com
Address: 8.8.8.8
Name:   dns.google.com
Address: 8.8.4.4
Name:   dns.google.com
Address: 2001:4860:4860::8844
Name:   dns.google.com
Address: 2001:4860:4860::8888

[root@client-dns ~]#
```