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DNS 7

Setup Caching-Only DNS Server Using "Bind" in CentOS 6.5

by Babin Lonston | Published: September 20, 2014 | Last Updated: January 12, 2016

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There are several type of DNS servers such as master, slave, forwarding and cache, among them **Caching-Only DNS** is the one, which is easier to setup. DNS use UDP protocol so it will reduce the query time because UDP protocol does not have an acknowledgement.

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Setup Caching-Only DNS in CentOS

Read Also: Setup Master-Slave DNS Server in CentOS 6.5

The caching-only DNS server is also known as a resolver. It will query DNS records and get all DNS information from other servers and stores the each query request in its cache for later use. While we are querying same request for the second time, it will serve from its cache, this way it reduces query time.

If you're looking to setup DNS Caching-Only Server in CentOS/RHEL 7, follow this guide here:

> Setting Up Caching-Only DNS Name Server in CentOS/RHEL 7

```
IP Address      :       192.168.0.200
Host-name       :       dns.tecmintlocal.com
OS              :       Centos 6.5 Final
Ports Used      :       53
Config File     :       /etc/named.conf
script file     :       /etc/init.d/named
```

Step 1: Installing Caching-Only DNS

1. The Caching-Only DNS, can be installed by using package '**bind**'. Let's do a small search for the package name if we don't remember the fill package name using below command.

```
# yum search bind
```

```
Loaded plugins: fastestmirror, security
Loading mirror speeds from cached hostfile
================================ N/S Matched: bind ================================
PackageKit-device-rebind.x86_64 : Device rebind functionality for PackageKit
bind.x86_64 : The Berkeley Internet Name Domain (BIND) DNS (Domain Name System)
            : server
bind-chroot.x86_64 : A chroot runtime environment for the ISC BIND DNS server,
                   : named(8)
bind-devel.i686 : Header files and libraries needed for BIND DNS development
bind-devel.x86_64 : Header files and libraries needed for BIND DNS development
bind-dyndb-ldap.x86_64 : LDAP back-end plug-in for BIND
bind-libs.i686 : Libraries used by the BIND DNS packages
bind-libs.x86_64 : Libraries used by the BIND DNS packages
bind-sdb.x86_64 : BIND server with database backends and DLZ support
```

Search Bind Package

2. In the above result, you see the packages that displayed. From that we need to choose the '**bind**' and '**bind-utils**' packages, let's install them using following '**yum**' command.

```
# yum install bind bind-utils -y
```

```
tecmint@dns:~
[tecmint@dns ~]$
[tecmint@dns ~]$ sudo yum install bind bind-utils -y
Loaded plugins: fastestmirror, security
Loading mirror speeds from cached hostfile
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-utils.x86_64 32:9.8.2-0.17.rc1.el6_4.6 will be installed
--> Finished Dependency Resolution
```

Install DNS Utils

Step 2: Configure Caching-Only DNS

Nagios 4.2.0 Released – Install on RHEL/CentOS 7.x/6.x/5.x and Fedora 24-19

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configure DNS. Open and edit **named.conf** file using vim editor.

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

4. Next, make changes as suggested below or you can use your settings as per your requirements. Following are the changes, that we need to do for a caching-only DNS server. Here, by default the **localhost** will be there, we need to add the '**any**' to accept query from any range of network.

```
listen-on port 53 { 127.0.0.1; any; };
allow-query     { localhost; any; };
allow-query-cache       { localhost; any; };
```


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```
//
// 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; any; };
        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; any; };
        allow-query-cache       { localhost; any; };
        recursion yes;

        dnssec-enable yes;
        dnssec-validation yes;
        dnssec-lookaside auto;

        /* Path to ISC DLV key */
        bindkeys-file "/etc/named.iscdlv.key";

        managed-keys-directory "/var/named/dynamic";
};

logging {
        channel default_debug {
                file "data/named.run";
                severity dynamic;
        };
};

#zone "." IN {
#       type hint;
#       file "named.ca";
#};

include "/etc/named.rfc1912.zones";
include "/etc/named.root.key";
-- INSERT --                                    45,1          All
```

Configure Caching Only DNS

- **listen-on port 53** – This say that Cache server want to use the port 53 for query.
- **allow-query** – This Specifies which ip address may query the server, here I have defined for localhost, from anywhere anyone can send query.
- **allow-query-cache** – This will add the query request to the bind.

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during query it may send query to other DNS server over the internet and pull back the query.

5. After editing the file, we have to confirm whether the '**named.conf**' files ownership was not changed from **root:named**, because the DNS runs under a system user **named**.

```
# ls -l /etc/named.conf
# ls -l /etc/named.rfc1912.zones
```

6. If the server enabled with selinux, after editing '**named.conf**' file, we need to check for the selinux context, every named config files need to be in "**system_u:object_r:named_conf_t:s0**" context as shown in the image below.

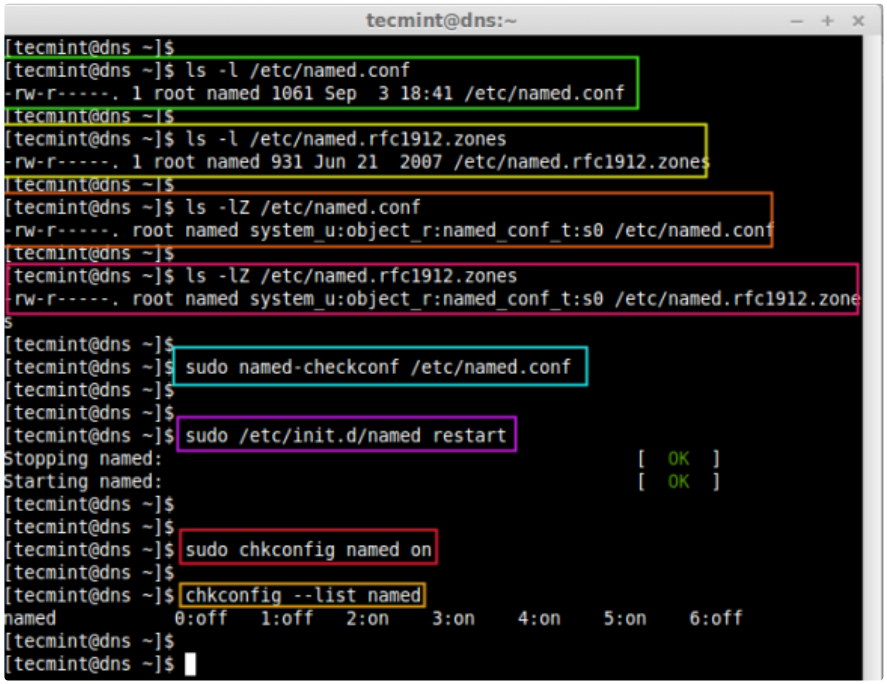
```
# ls -lZ /etc/named.conf
# ls -lZ /etc/named.rfc1912.zones
```

Okay, here we need to test DNS configuration now for some syntax error, before starting the bind service, if any error found some can be traced from **/var/messages** too.

```
# named-checkconf /etc/named.conf
```

service to take effect for above changes and make the service to run persistent while reboot the server and confirm the same.

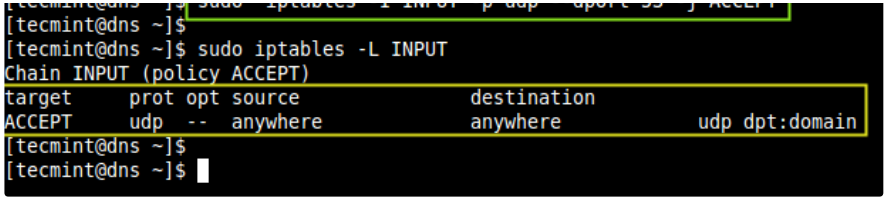
```
# /etc/init.d/named restart
# chkconfig named on
# chkconfig --list named
```



Configure and Start DNS

7. Next, open the port **53** on the firewall to allow the access.

```
# iptables -I INPUT -p udp --dport 53 -j ACCEPT
```



Iptables Open DNS Port

Step 4: Chroot Caching-Only DNS

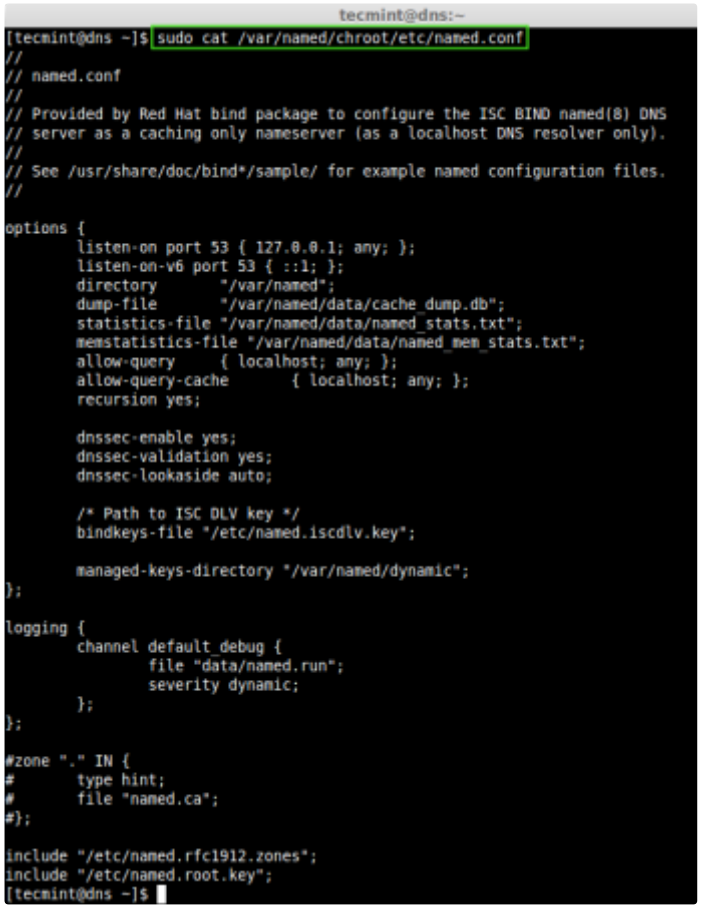
8. If you want to run the DNS caching-server under **chroot** environment, you need to install the **chroot** package only, no need of further configuration, as it by default hard-link to chroot.

```
# yum install bind-chroot -y
```

Once **chroot** package has been installed, you can restart the named service to take new changes.

```
# /etc/init.d/named restart
```

9. Once you restart named service, it automatically create a hard-link from the **/etc/named** config files to **/var/named/chroot/etc/** directory. To confirm, just use the **cat** command under /var/named/chroot.



Chroot Caching Only DNS

In the above configuration, you will see the same **/etc/named.conf** configuration, as it will be replaced while installing **bind-chroot** package.

Step 5: Client Side DNS Setup

to the client machines.

In **Debian** based machines it will be under **/etc/resolv.conf** and in RPM based machines it will be under **setup** command or we can edit manually under **/etc/sysconfig/network-scripts/ifcfg-eth0** file.

11. Finally it's time to check our cache server using some tools. We can test using **dig** & **nslookup** commands in Linux systems, and in windows you can use the **nslookup** command.

Let's query '**facebook.com**' for first time, so that it will cache its query.

```
# dig facebook.com
```

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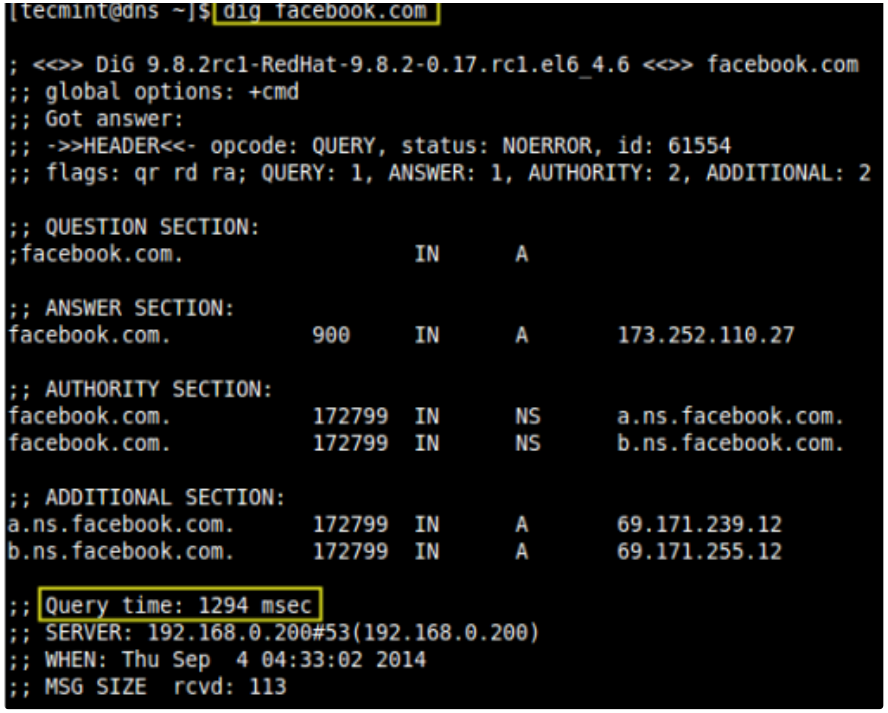

Check DNS using Dig

Now, issue again same query, you will get replied from our cache server till it expires.

```
# dig facebook.com
```

```
; <<>> DiG 9.8.2rc1-RedHat-9.8.2-0.17.rc1.el6_4.6 <<>> facebook.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 15311
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 2, ADDITIONAL: 2

;; QUESTION SECTION:
;facebook.com.                  IN      A

;; ANSWER SECTION:
facebook.com.           898     IN      A       173.252.110.27

;; AUTHORITY SECTION:
facebook.com.           172797  IN      NS      a.ns.facebook.com.
facebook.com.           172797  IN      NS      b.ns.facebook.com.

;; ADDITIONAL SECTION:
a.ns.facebook.com.      172797  IN      A       69.171.239.12
b.ns.facebook.com.      172797  IN      A       69.171.255.12

;; Query time: 0 msec
;; SERVER: 192.168.0.200#53(192.168.0.200)
;; WHEN: Thu Sep  4 04:33:04 2014
;; MSG SIZE  rcvd: 113

[tecmint@dns ~]$
```

Check DNS Cache

Use '**nslookup**' command to confirm the same.

```
# nslookup facebook.com
```

Check DNS Query Cache

To read more about dig and nslookup command examples and usage, use the following links.

- 8 nslookup commands and usage
- 10 dig commands and usage

Here we have seen how successfully we have setup a DNS caching-only server using bind package and also secured it using chroot package.

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Tags: bind chroot

Babin Lonston **View all Posts**

I'm Working as a System Administrator for last 10 year's with 4 years experience with Linux Distributions.

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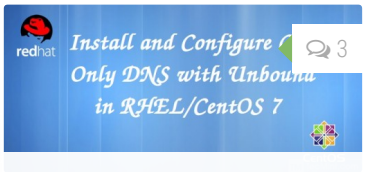

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1 MAY, 2015

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12 JAN, 2016

7 RESPONSES

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vinci December 1, 2015 at 4:04 pm

Why is the zone "." root hints and the rest of the lines commented out? Isn't the dns cache server supposed to search recursively, meaning to start with the root hints and then go downwards until it finds the domain? If you comment out the root hints zone, how is it supposed to do that? It would need a forwarders directive.

Reply

Nero December 1, 2015 at 2:36 pm

thanks for the great info on setting the caching only dns server up with bind! I was trying to set up with both unbound on one server and bind on another and this was just what I needed. Unbound seems to not be used as much yet, maybe

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https://www.rootusers.com/how-to-configure-a-caching-only-dns-name-server/

https://www.digitalocean.com/community/tutorials/how-to-set-up-the-unbound-caching-dns-resolver-on-freebsd-10-1

Good luck!

Reply

jhalbrecht June 23, 2015 at 8:56 pm

Would/should this configuration be locked down tighter perhaps with an acl that would disallow access to the nameserver from unauthorized/unwanted clients that might attempt to exploit for a DOS attack on another site?

Your config:
allow-query { localhost; any; };
allow-query-cache { localhost; any; };

Suggestion:
allow-query { friends; };

acl friends {
192.168.0/24;
localhost;
localnets;
};

Reply

Giang September 28, 2014 at 9:20 pm

how greate! Thank u so much.

Reply

Babin Lonston September 25, 2014 at 7:20 pm

You can use Webmin to manage in GUI, Using Webmin we can manage full server not only DNS.

Reply

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Nice article, thanks for sharing, is there any option to manage DNS in GUI instead of TUI… any open source tools which could be integrated with this and for the Master/Slave DNS setup??

Reply

Babin Lonston August 5, 2015 at 9:24 pm

@ Vinodh You can use Webmin..

Reply

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Comment

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