



HOME

AMIS VISION

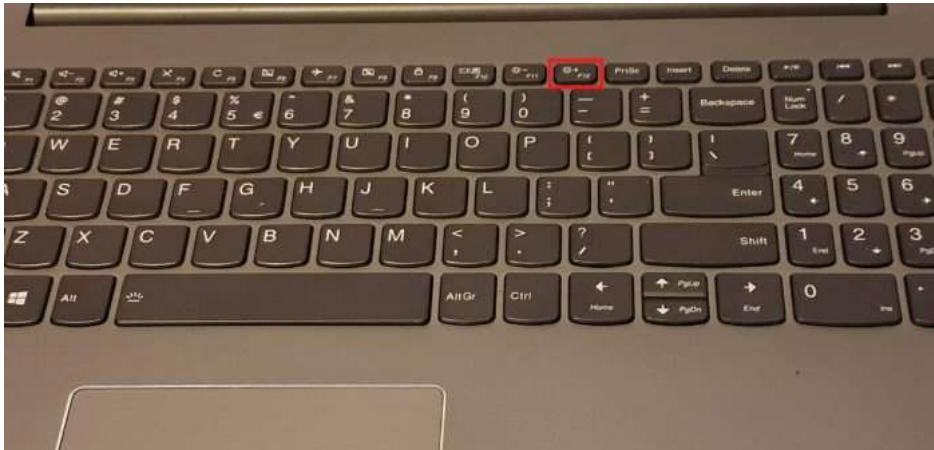
CAREERS @ AMIS

EVENTS

ABOUT

CONTACT

YOU ARE AT: Home » DevOps » Using PXE to deploy a DNS server



Using PXE to deploy a DNS server

0

BY FREDERIQUE.RETSEMA@AMIS.NL ON FEBRUARY 15, 2020

DEVOPS, PLATFORM TECHNOLOGY

Last week, I published a blog about implementing a PXE server [1]. Today I'll show how kickstart/anaconda files can be used to deploy a server. I will use the example of a DNS-server to explain what can be changed where in kickstart files and what you can do when the kickstart file isn't enough for your purposes. The full kickstart file and an example menu for the deployment can be found both at the end of this blog and on my github repository [2].

1. Kickstart files

The best place to change settings is in the kickstart file itself: many checks will be done before the installation starts. The VM that we deployed in the previous blog was configured based on DHCP, it had the following line in it:

```
network --bootproto=dhcp --device=eth0 --ipv6=auto --activate
```

For a DNS, we should use a static DNS address, so we will change this into:

```
network --bootproto=static --ip=192.168.2.3 --gateway=192.168.2.254 --nameserver=192.168.2.254 --
netmask=255.255.255.0 --ipv6=auto --device=eth0 --activate
```

The network directive is also the place to configure the name of the server:

```
network --hostname=dns
```

There is also room for specifying additional packages to the (in this case: minimal) base install. kexec-tools was already in the kickstart file, it is needed for the install itself. I added bind (for the DNS-server) and bind-utils (for utilities like dig, nslookup etc) myself:

```
%packages
@^minimal-environment
bind
```

ABOUT AUTHOR



frederique.retsema@amis.

Frederique Retsema is active in IT since 1993. Senior Consultant and developer on diverse areas including SQL and Java. She likes work with automation tools like Bamboo, Jenkins, Ansible, Terraform and CloudFormation.

View all posts

FOLLOW US ON LINKEDIN

Follow 2,857

POPULAR TAGS

Agile analytical function apex api application container cloud
service Architecture Azure BPEL bpm cloud
container Database docker DVT h
integration iot **Java** javascript jms
json kafka kubernetes linux maven monitoring
node oci oracle cloud oracle cloud infrastructure c
database oracle xml db OSB paas performance tuning
postgresql provisioning puppet push python REST saas
Scrum **soa sql** vagrant virtual box
visualization vm XML

FOLLOW US ON TWITTER

Tweets by @AMISnl

AMIS Conclusion
@AMISnl

New Article : Oracle Database – more value for money and more value for free ift.tt/32148pe by Lucas Jellem:

```
bind-utils
kexec-tools
%end
```

2. The post-install part of kickstart

There is a part in the kickstart file that by default isn't there. I'm talking about the post install part, you can use this part to add or change files after the installation, but before the reboot. This part starts with %post and ends with %end.

For the DNS-server, there should be changes in the configuration file /etc/named.conf. After the installation of the DNS-server, the DNS-server will by default respond only to connections from its own server (localhost). To be useful for other servers in the network this should be changed to the network the DNS server is running on. Two lines must be changed: the line where we listen on port 53 must be changed from 127.0.0.1 to the network address of the DNS-server, in my case 192.168.2.3 ("listen-on port 53 { 192.168.2.3;}",) and the line where we allow queries from our network must be changed from localhost to 192.168.2.0/24 (every node in our network: "allow-query { 192.168.2.0/24;}",).

The configuration file should also contain our own (local) domain mydomain.org, where we can add some DNS-entries. After the line

```
zone "." IN {
    type "hints";
};
```

the following text should be added:

```
zone "mydomain.org" IN {
    type master;
    file "mydomain.org";
    allow-update { none; };
};
```

The "allow-update { none;}" will take care that the domain cannot be changed by other nodes, the only way to change the content of this zone is to change the configuration file mydomain.org.

After that, the file mydomain.org will be created in the /var/named directory, with the following content:

```
1 $TTL 86400
2 $ORIGIN mydomain.org.
3
4 @ IN SOA dns.mydomain.org. info.mydomain.org (
5     20200214
6     3600
7     1800
8     604800
9     86400)
10 @ IN NS dns.mydomain.org.
11 dns IN A 192.168.2.3
12 server1 IN A 192.168.2.11
13 server2 IN A 192.168.2.12
```

Now, the only thing left to do is to change the firewall. When we would configure a DNS server by hand, we would simply use the following commands on the command line:

```
firewall-cmd --add-port=53/tcp
firewall-cmd --add-port=53/tcp --permanent
firewall-cmd --add-port=53/udp
firewall-cmd --add-port=53/udp --permanent
```

The problem is, however, that when we would use this in the kickstart file, the changes would be made on the installation environment, not on the destination host. So we have to come up with a trick to do these changes directly after the reboot of the server.

3. Start up script

We can do that by creating a start up script that will only run once, after the first start of the server. The script should run after the firewall is started. We will create a "oneshot service" in systemd, which removes itself after execution. Anaconda should create a file /etc/systemd/system/dnsconf.service with the following content:

```
1 [Unit]
2 Description=Configure selinux for named
3 After=firewalld.service
4
5 [Service]
```

Oracle Database - more value for money and ...
Oracle is not known for low prices or free products. However, when it comes to the Oracle Database technology.amis.nl

AMIS Conclusion
@AMISnl

Grote databases migreren van on prem naar de cloud naar hogere versies zonder downtime? Hoe kan je razendsnel reageren als er iets mis gaat in de IT van jouw bedrijf? Lees het in de nieuwe [#knowwhyweekly](#) van Andre van Dalen [bit.ly/2HhiFDw#Cloud#Orac](#)



Feb 13, 20

AMIS Conclusion
@AMISnl

Vacature Accountmanager New Business: jij gaat net 4 wij voor succes! Werken bij een organisatie waar je ve vrijheid krijgt? Reageer snel op deze vacature [bit.ly/37n99tn](#)



Feb 11, 20

AMIS Conclusion
@AMISnl

New Article : Use OCI Monitoring, Alarms and Notifications for Your Own Custom and Functional Metrics [ift.tt/2SgdTwp](#) by Lucas Jellema

Use OCI Monitoring, Alarms and Notifications ...
In earlier articles, I have discussed features in Oracle Cloud Infrastructure for monitoring metrics technology.amis.nl

Feb 10, 20

AMIS Conclusion
@AMISnl

The latest The AMIS Oracle Technology Weekly! [paper.li/AMIS_Services/...](#) Thanks to [@avioconsulting](#) [@rubicon_red](#)

```
6 Type=oneshot
7 ExecStart=/bin/firewall-cmd --add-port=53/tcp
8 ExecStart=/bin/firewall-cmd --add-port=53/tcp --permanent
9 ExecStart=/bin/firewall-cmd --add-port=53/udp
10 ExecStart=/bin/firewall-cmd --add-port=53/udp --permanent
11 ExecStart=rm -f /etc/systemd/system/dnsconf.service
12 ExecStart=rm -f /etc/systemd/system/multi-user.target.wants/dnsconf.service
13
14 [Install]
15 WantedBy=multi-user.target
```

To let this work, there should be a softlink in /etc/systemd/system/multi-user.target.wants. Normally, you wouldn't create this softlink yourself, it is placed there by the command `systemctl enable dnsconf`. But because systemd is not running on the target system when you create these files, Anaconda will have to put the softlink there for you. The creation of the file /etc/systemd/system/dnsconf.service and the creation of the softlink is done in the %post part of the Anaconda file. The same is true for the DNS service itself:

```
In -s /etc/systemd/system/dnsconf.service /etc/systemd/system/multi-user.target.wants/dnsconf.service
In -s /etc/systemd/system/named.service /etc/systemd/system/multi-user.target.wants/named.service
```

4. Conclusion

The nice thing about this solution is that you can deploy an OS and configure it over the network. Even without logging on to the server, this solution will work as soon as you see the login prompt: you can use `dig @192.168.2.3 server1.mydomain.org` from another server and you will see the address 192.168.2.11 as a result.

For a small organization with few changes in their DNS configuration, it might be considered not to allow users on this new machine at all (not even an administrator) for security reasons: in that case, a `userdel` command can be added in the %post installation part of Anaconda to delete the (in this example) `frederique` user. When there should be changes in the DNS environment, the changes are made on the kickstart file on the PXE server and the DNS server is redeployed with PXE after that.

Footnotes

- [1] <https://technology.amis.nl/2020/02/08/deploying-centos-8-using-pxe/>
- [2] <https://github.com/FrederiqueRetsema/AMIS-Blog-PXE>, in the dns directory

Content of the file /etc/lib/tftpboot/pxelinux.cfg/C0A802:

```
1 DEFAULT menu.c32
2 PROMPT 0
3 TIMEOUT 30
4 LABEL CentOS 8 dns
5 MENU centos8dns
6 KERNEL /networkboot/vmlinuz
7 APPEND initrd=/networkboot/initrd.img inst.repo=ftp://192.168.2.131/CentOS8 ks=ftp://192.168.2.131/cc
```

Content of /var/ftp/centos8dns.cfg:

```
1 #version=RHEL8
2 ignoredisk --only-use=sda
3 autopart --type=lvm
4 # Partition clearing information
5 clearpart --all
6 zerombr
7 # Use graphical install
8 graphical
9 repo --name=centos-updates --mirrorlist=http://mirrorlist.centos.org/?release=$releasever&arch=
10 repo --name=appstream-updates --mirrorlist=http://mirrorlist.centos.org/?release=$releasever&arch=
11 repo --name=extras-updates --mirrorlist=http://mirrorlist.centos.org/?release=$releasever&arch=
12 # Use FTP installation media
13 url --url=ftp://192.168.2.154/CentOS8
14 # Keyboard layouts
15 keyboard --vckeymap=us --xlayouts='us'
16 # System language
17 lang en_US.UTF-8
18
19
20 # Network information
21 network --bootproto=static --ip=192.168.2.3 --gateway=192.168.2.254 --nameserver=192.168.2.254 --r
22 network --hostname=dns.mydomain.org
23 #Root password
24 rootpw --lock
25 # Run the Setup Agent on first boot
26 firstboot --enable
27 # Do not configure the X Window System
28 skipx
29 # System services
30 services --enabled="chronyd"
31 # System timezone
32 timezone Europe/Amsterdam --isUtc
33 user --groups=wheel --name=frederique --password=$6$ISxpNV3kE7gfv1pi$RRWVusy/EiatEuCEIdYhR.R1PdTGKE
34
35
36 %packages
37 @^minimal-environment
38 bind
39 bind-utils
40 kexec-tools
41
42
43 %end
44
```

Deploying CentOS 8 using PXE - AMIS Oracle ...

technology.amis.nl PXE (Preboot eXecution Environment) is a method of deploying an operating paper.li

Feb 10, 2020

Embed

View on Twitter

META

Site Admin

Log out

Entries [RSS](#)

Comments [RSS](#)




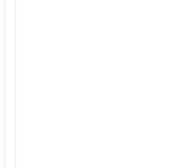

WordPress.org

```

45 %addon com_redhat_kdump --enable --reserve-mb='auto'
46
47
48
49 %end
50
51
52 %post
53 sed -i 's/127.0.0.1/192.168.2.3/g' /etc/named.conf
54 sed -i 's/allow-query/c \ \ \ \ \ \ allow-query { 192.168.2.0/24;};' /etc/named.conf
55 ZONELINENO= grep -rne "zone \"\." IN {" /etc/named.conf | awk -F":" '{print $1}'
56 let ZONELINENO=ZONELINENO+3
57
58
59 echo "" &gt; /tmp/mydomain.org
60 echo "zone \"mydomain.org\" IN {" &gt;&gt; /tmp/mydomain.org
61 echo "    type master;" &gt;&gt; /tmp/mydomain.org
62 echo "    file \"mydomain.org\";" &gt;&gt; /tmp/mydomain.org
63 echo "    allow-update{ none; };" &gt;&gt; /tmp/mydomain.org
64 echo "};" &gt;&gt; /tmp/mydomain.org
65
66
67 sed -i "${ZONELINENO} r/tmp/mydomain.org" /etc/named.conf
68
69
70 echo "\$TTL 86400" &gt; /var/named/mydomain.org
71 echo "\$ORIGIN mydomain.org." &gt;&gt; /var/named/mydomain.org
72 echo "" &gt;&gt; /var/named/mydomain.org
73 echo "@ IN SOA dns.mydomain.org. info.mydomain.org. (" &gt;&gt; /var/named/mydomain.org
74 echo "    2020021200" &gt;&gt; /var/named/mydomain.org
75 echo "    3600" &gt;&gt; /var/named/mydomain.org
76 echo "    1800" &gt;&gt; /var/named/mydomain.org
77 echo "    604800" &gt;&gt; /var/named/mydomain.org
78 echo "    86400" &gt;&gt; /var/named/mydomain.org
79 echo "@ IN NS dns.mydomain.org." &gt;&gt; /var/named/mydomain.org
80 echo "dns IN A 192.168.2.3" &gt;&gt; /var/named/mydomain.org
81 echo "server1 IN A 192.168.2.11" &gt;&gt; /var/named/mydomain.org
82 echo "server2 IN A 192.168.2.12" &gt;&gt; /var/named/mydomain.org
83
84
85 echo "[Unit]" &gt; /etc/systemd/system/dnsconf.service
86 echo "Description=Configure selinux for named" &gt;&gt; /etc/systemd/system/dnsconf.service
87 echo "After=firewalld.service" &gt;&gt; /etc/systemd/system/dnsconf.service
88 echo "" &gt;&gt; /etc/systemd/system/dnsconf.service
89 echo "[Service]" &gt;&gt; /etc/systemd/system/dnsconf.service
90 echo "Type=oneshot" &gt;&gt; /etc/systemd/system/dnsconf.service
91 echo "ExecStart=/bin/firewall-cmd --add-port=53/tcp" &gt;&gt; /etc/systemd/system/dnsconf.servi
92 echo "ExecStart=/bin/firewall-cmd --add-port=53/tcp --permanent" &gt;&gt; /etc/systemd/system/c
93 echo "ExecStart=/bin/firewall-cmd --add-port=53/udp" &gt;&gt; /etc/systemd/system/dnsconf.servi
94 echo "ExecStart=/bin/firewall-cmd --add-port=53/udp --permanent" &gt;&gt; /etc/systemd/system/c
95 echo "ExecStart=rm -f /etc/systemd/system/dnsconf.service" &gt;&gt; /etc/systemd/system/dnsconf
96 echo "ExecStart=rm -f /etc/systemd/system/multi-user.target.wants/dnsconf.service" &gt;&gt; /et
97 echo "" &gt;&gt; /etc/systemd/system/dnsconf.service
98 echo "[Install]" &gt;&gt; /etc/systemd/system/dnsconf.service
99 echo "WantedBy=multi-user.target" &gt;&gt; /etc/systemd/system/dnsconf.service
100
101
102 ln -s /etc/systemd/system/dnsconf.service /etc/systemd/system/multi-user.target.wants/dnsconf.s
103 ln -s /etc/systemd/system/named.service /etc/systemd/system/multi-user.target.wants/named.servi
104 sync
105
106 %end
107
108 %anaconda
109 pwpolicy root --minlen=6 --minquality=1 --notstrict --nochanges --notempty
110 pwpolicy user --minlen=6 --minquality=1 --notstrict --nochanges --emptyok
111 pwpolicy luks --minlen=6 --minquality=1 --notstrict --nochanges --notempty
112 %end

```

Related Posts:

				
Oracle Compute Cloud – Uploading	Getting started with git behind a company	Deploying CentOS 8 using PXE	Public Cloud consequences with	Relocating base directory Enterprise

ABOUT AUTHOR

FREDERIQUE.RETSEMA@AMIS.NL

Frederique Retsema is active in IT since 1993. Senior Consultant and developer on diverse areas including SQL and Java. She likes to work with automation tools like Bamboo, Jenkins, Ansible, Terraform and CloudFormation.

RELATED POSTS

FEBRUARY 8, 2020

1

DECEMBER 18, 2019

2

NOVEMBER 2, 2019

0

[Deploying CentOS 8 using PXE](#)

- Linux Shell Script – passing arguments to functions and returning and capturing results
- Switch off Screen Lock on Ubuntu Bionic Desktop

Leave a Reply

Enter your comment here...

This site uses Akismet to reduce spam. [Learn how your comment data is processed.](#)



⌵