Cobbler实现自动化安装操作系统

一、基本原理概述

PXE

PXE（Pre-bootExecution Environment）预启动执行环境，通过网络接口启动计算机，支持Client通过网络从Server下载映像，并由此通过网络启动操作系统；在启动过程中，Client要求Server分配IP地址，再用TFTP下载一个启动软件包到本机内存中执行，由这个启动软件包完成Client基本的软件设置并安装操作系统。要达成PXE有两个必须的条件：

(1)Client的网卡必须要支持PXE功能，并且开机时选择从网卡启动；

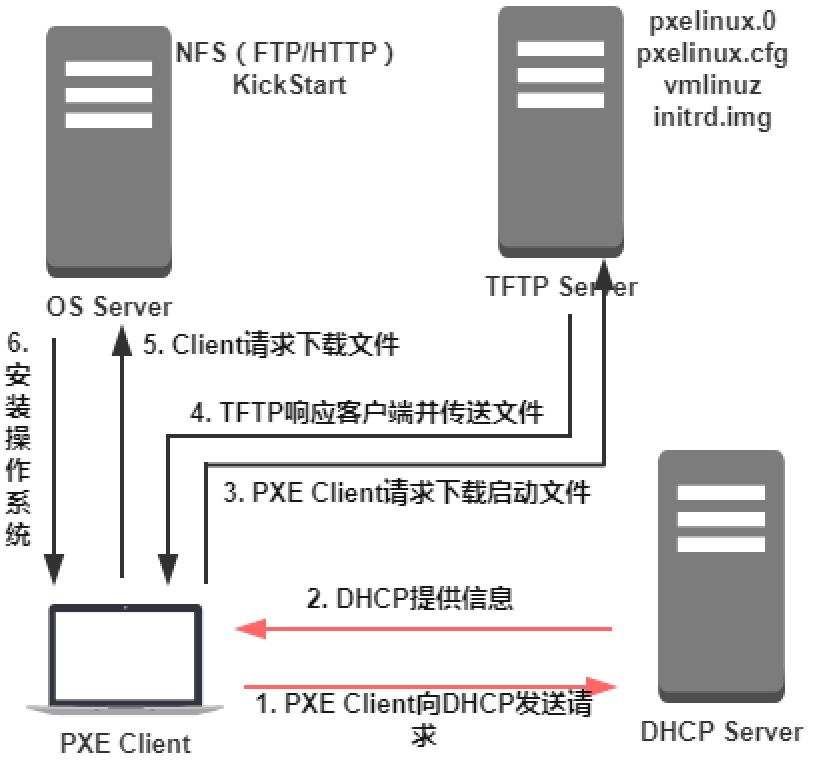
(2)完整的PXE Server必须要提供含有DHCP、TFTP服务，还要加上NFS/FTP/HTTP（选择一样即可）等提供安装文件(安装镜像的解压文件)。

KickStart

KickStart是一种无人值守的安装方式，它的工作原理是在安装过程中记录人工干预填写的各种参数，并生成一个名为ks.cfg的文件。可以简单理解为一个自动安装应答配置管理程序。通过读取这个配置文件，系统知道怎么去分区，要安装什么包，配什么IP，优化怎样的内核参数等等。其主要组成部分包括：

- KickStart安装选项，包含语言的选择，防火墙，密码，网络，分区的设置等；
- %Pre部分，安装前解析的脚本，通常用来生成特殊的ks配置，比如由一段程序决定磁盘分区等；
- %Package部分，安装包的选择，可以是@core这样的group形式，也可以是vim-*这样的包形式；
- %Post部分，安装后执行的脚本，通常用来做系统的初始化设置，比如启动的服务，相关的设定等。

PXE+KickStart的工作流程



1. PXE Client向DHCP Server发送请求：支持PXE的网络接口卡（NIC）的Client的BIOS设置成为网络启动，通过UDP（简单用户数据报协议）发送一个广播请求，向网络中的DHCP Server索取IP地址等信息。

2. DHCP Server提供信息：DHCP Server收到Client的请求，验证是否来至合法的PXE Client的请求，验证通过它将给Client返回响应，响应内容包含了为Client分配的IP Address、TFTP Server以及配置文件所在位置。

3. PXE Client请求下载启动文件：Client收到DHCP Server的响应后，会回应一个帧，以请求传送启动所需文件，这些启动文件包括：pxelinux.0（相当于boot loader）、pxelinux.cfg/default、vmlinuz、initrd.img等文件。

4. TFTP Server响应Client请求并传送文件：Client会根据该文件中定义的引导顺序，启动Linux安装程序的引导内核。

5. 请求下载自动应答文件：Client通过pxelinux.cfg/default文件成功的引导Linux安装内核后，安装程序首先必须确定你通过什么安装介质来安装linux，如果是通过网络安装（NFS, FTP, HTTP），则会在这个时候初始化网络，并定位安装源位置。（或许你会说，刚才PXE不是已经获取过IP地址了吗？为什么现在还需要一次？这是由于PXE获取的是安装用的内核以及安装程序等，而安装程序要获取的是安装系统所需的二进制包以及配置文件。由于它们需要的内容不同造成PXE模块和安装程序是相对独立的，PXE的网络配置并不能传递给安装程序。从而进行两次获取IP地址过程。）接着读取该文件中指定的自动应答文件ks.cfg所在位置，根据该位置请求下载该文件。

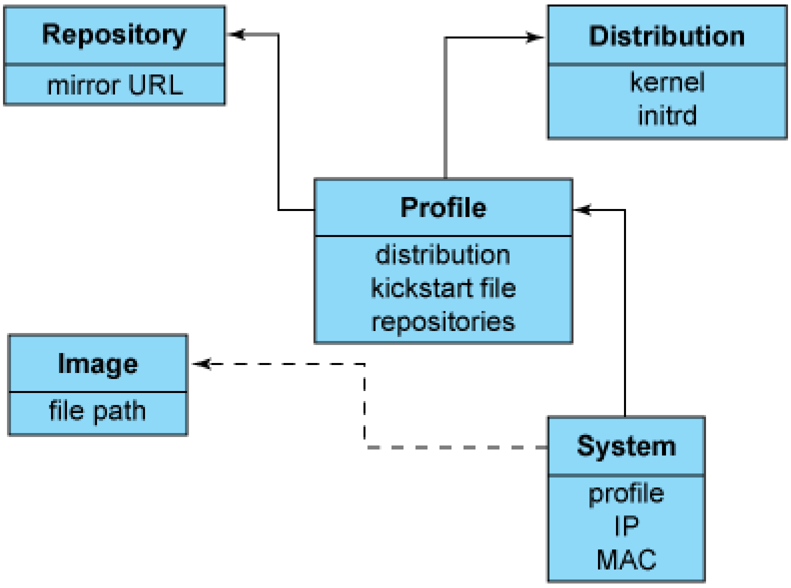
6. Client安装操作系统：将ks.cfg文件下载回来后，通过该文件找到OS Server，并按照该文件的配置请求下载安装过程需要的软件包。

Cobbler

概述

Cobbler由Python语言开发，是对PXE和KickStart的封装，融合很多特性，提供了CLI和Web的管理形式，能更加方便地实行网络安装；Cobbler也提供了API接口，因此使用其它语言也很容易做扩展。Cobbler不仅可以安装物理机，同时也支持KVM、XEN虚拟化、Guest OS的安装；更多的是它还能结合Puppet等集中化管理软件，实现自动化的管理。

组成



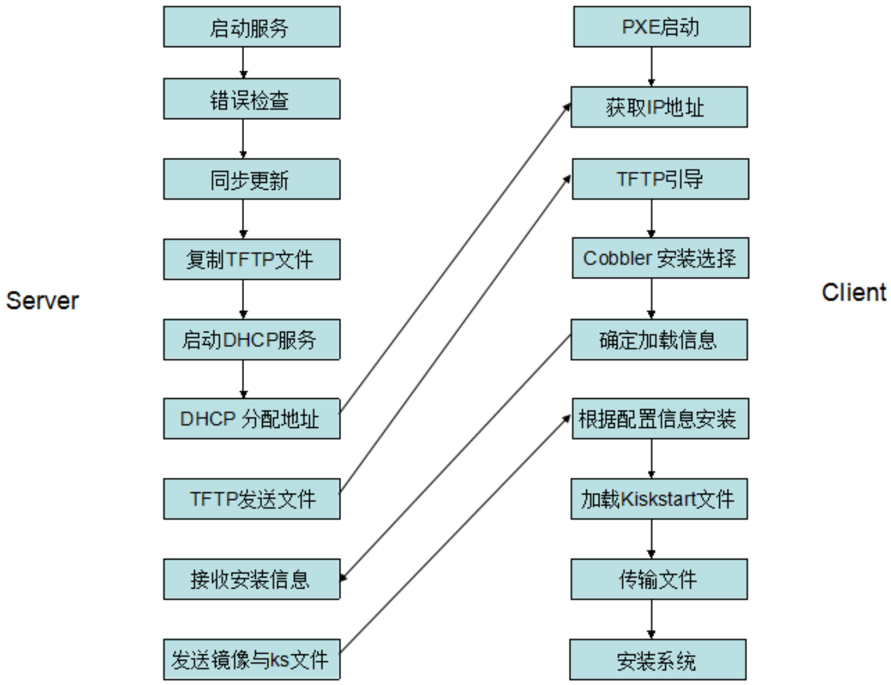
Cobbler的结构基于一组注册的对象，每个对象都是相互关联的实体（该实体指向另一个实体，或者另一个实体指向该实体）。当一个对象指向另一个对象时，它就继承了被指向对象的数据，并可覆盖或添加更多特定信息。对象类型的定义为：

- 发行版（Distribution）：表示一个操作系统，它承载了kernel和initrd的信息，以及内核参数等其它数据；
- 配置文件（Profile）：包含一个发行版、一个KickStart文件以及可能的存储库，还包含更多特定的内核参数等其它数据；
- 系统（System）：包含一个配置文件或一个镜像，还包含IP Address和MAC Address、电源管理（地址、凭据、类型）以及更为专业的数据等信息；
- 存储库（Repository）：保存一个yum或rsync存储库的镜像信息；
- 镜像（Image）：可替换一个包含不属于此类别的文件的发行版对象。

基于注册的对象以及各个对象之间的关联，Cobbler 知道如何更改文件系统以反映具体配置，因为系统配置的内部是抽象的，因此我们可以只关注想要执行的操作。

工作原理

Cobbler 工作原理



Server端：

- 启动Cobbler服务
- 进行Cobbler错误检查，执行cobbler check命令
- 进行配置同步，执行cobbler sync命令
- 复制相关启动文件文件到TFTP目录中
- 启动DHCP服务，提供地址分配
- DHCP服务分配IP地址
- TFTP传输启动文件
- Server端接收安装信息
- Server端发送ISO镜像与Kickstart文件

Client端：

- 客户端以PXE模式启动
- 客户端获取IP地址
- 通过TFTP服务器获取启动文件
- 进入Cobbler安装选择界面
- 客户端确定加载信息
- 根据配置信息准备安装系统
- 加载Kickstart文件

- 传输系统安装的其它文件
- 进行安装系统

小结

- Cobbler可以看作是一个更多功能的PXE，它实现系统安装和PXE+KickStart也差不多，需要的文件和过程大致都一样；
- Cobbler能自动管理DNS/TFTP/DHCP/RSYNC这四个服务（但似乎对TFTP的管理有点bug，需要手动启动TFTP），且Cobbler依赖于HTTPD（PXE支持HTTP/NFS/FTP）；
- 基本的系统安装，Cobbler只需生成一个Distro和一个Profile即可：Distro相当于一个镜像，它提供安装系统过程中所需的一切文件，如vmlinuz,initrd以及rpm包等；Profile的作用是为了自动修改pxelinux.cfg/default文件，每生成或修改一次profile，都会在default文件中修改或追加对应的label；
- 除了Distro/Profile之外，Cobbler还管理System/Images/Repository等，但是用的很少。

Cobbler 配置目录说明

配置文件目录 /etc/cobbler

/etc/cobbler/settings : cobbler 主配置文件
/etc/cobbler/iso/: iso模板配置文件
/etc/cobbler/pxe: pxe模板文件
/etc/cobbler/power: 电源配置文件
/etc/cobbler/user.conf: web服务授权配置文件
/etc/cobbler/users.digest: web访问的用户名密码配置文件
/etc/cobbler/dhcp.template : dhcp服务器的的配置模板
/etc/cobbler/dnsmasq.template : dns服务器的配置模板
/etc/cobbler/tftpd.template : tftp服务的配置模板
/etc/cobbler/modules.conf : 模块的配置文件

cobbler 目录介绍

数据目录：

/var/lib/cobbler/config/: 用于存放distros，system，profiles 等信息配置文件
/var/lib/cobbler/triggers/: 用于存放用户定义的cobbler命令
/var/lib/cobbler/kickstart/: 默认存放kickstart文件
/var/lib/cobbler/loaders/: 存放各种引导程序

镜像目录：

/var/www/cobbler/ks_mirror/: 导入的发行版系统的所有数据

/var/www/cobbler/images/ : 导入发行版的kernel和initrd镜像用于远程网络启动

/var/www/cobbler/repo_mirror/: yum仓库存储目录

日志目录：

/var/log/cobbler/installing: 客户端安装日志

/var/log/cobbler/cobbler.log : cobbler日志

cobbler 命令介绍

cobbler check	核对当前设置是否有问题
cobbler list	列出所有的cobbler元素
cobbler report	列出元素的详细信息
cobbler sync	同步配置到数据目录,更改配置最好都要执行下
cobbler reposync	同步yum仓库
cobbler distro	查看导入的发行版系统信息
cobbler system	查看添加的系统信息
cobbler profile	查看配置信息
cobbler 重要的参数	

/etc/cobbler/settings中重要的参数设置

```
default_password_crypted: "$1$gEc7ilpP$pg5iSOj/mlxTxEslhRvyp/"
manage_dhcp：1
manage_tftpd：1
pxe_just_once：1
next_server：< tftp服务器的 IP 地址>
server：<cobbler服务器的 IP 地址>
```

二、安装配置cobbler服务器

实验环境：

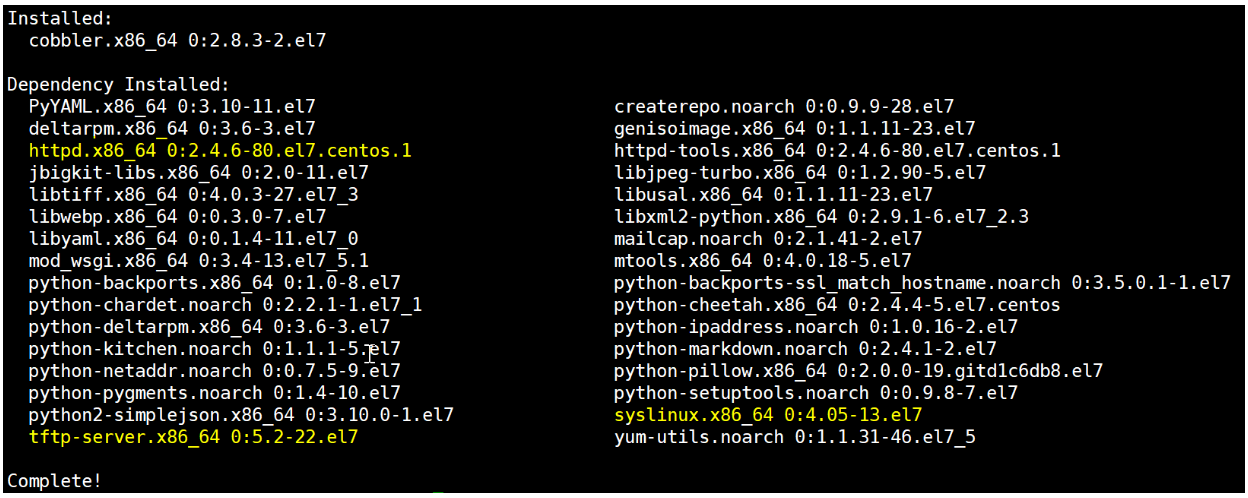
```
[root@cobbler ~]# cat /etc/redhat-release
CentOS Linux release 7.5.1804 (Core)
[root@cobbler ~]# ip addr show ens32
2: ens32: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast
state UP group default qlen 1000
    link/ether 00:0c:29:88:ee:48 brd ff:ff:ff:ff:ff:ff
    inet 192.168.154.150/24 brd 192.168.154.255 scope global noprefixroute ens32
       valid_lft forever preferred_lft forever
    inet6 fe80::8f76:b8a7:4cef:3068/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
```

关闭selinux和防火墙

```
[root@cobbler ~]# sed -i 's/SELINUX=enforcing/SELINUX=disabled/g' /etc/selinux/config
[root@cobbler ~]# systemctl disable firewalld.service
[root@cobbler ~]# systemctl stop firewalld.service
```

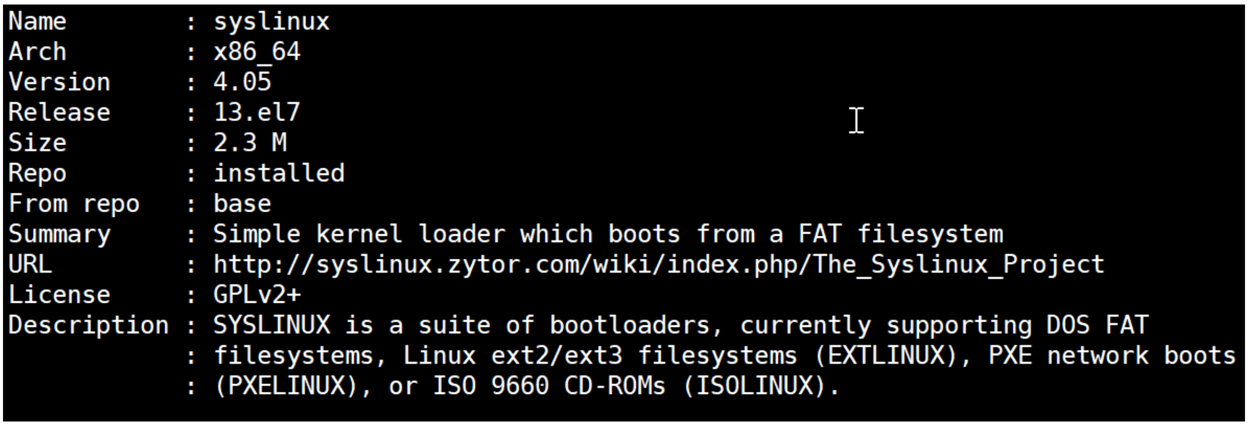
1、安装程序包

```
[root@cobbler ~]# yum install epel-release -y  #需要安装epel源
[root@cobbler ~]# yum install cobbler -y     #安装cobbler ,同时也安装了其它一些所需程序包
```



```
Installed:
  cobbler.x86_64 0:2.8.3-2.el7

Dependency Installed:
  PyYAML.x86_64 0:3.10-11.el7                            createrepo.noarch 0:0.9.9-28.el7
  deltarpm.x86_64 0:3.6-3.el7                            genisoimage.x86_64 0:1.1.11-23.el7
  httpd.x86_64 0:2.4.6-80.el7.centos.1                   httpd-tools.x86_64 0:2.4.6-80.el7.centos.1
  jbigkit-libs.x86_64 0:2.0-11.el7                       libjpeg-turbo.x86_64 0:1.2.90-5.el7
  libtiff.x86_64 0:4.0.3-27.el7_3                        libusal.x86_64 0:1.1.11-23.el7
  libwebp.x86_64 0:0.3.0-7.el7                           libxml2-python.x86_64 0:2.9.1-6.el7_2.3
  libyaml.x86_64 0:0.1.4-11.el7_0                        mailcap.noarch 0:2.1.41-2.el7
  mod_wsgi.x86_64 0:3.4-13.el7_5.1                       mtools.x86_64 0:4.0.18-5.el7
  python-backports.x86_64 0:1.0-8.el7                    python-backports-ssl_match_hostname.noarch 0:3.5.0.1-1.el7
  python-chardet.noarch 0:2.2.1-1.el7_1                  python-cheetah.x86_64 0:2.4.4-5.el7.centos
  python-deltarpm.x86_64 0:3.6-3.el7                     python-ipaddress.noarch 0:1.0.16-2.el7
  python-kitchen.noarch 0:1.1.1-5.el7                    python-markdown.noarch 0:2.4.1-2.el7
  python-netaddr.noarch 0:0.7.5-9.el7                    python-pillow.x86_64 0:2.0.0-19.gitd1c6db8.el7
  python-pygments.noarch 0:1.4-10.el7                    python-setuptools.noarch 0:0.9.8-7.el7
  python2-simplejson.x86_64 0:3.10.0-1.el7               syslinux.x86_64 0:4.05-13.el7
  tftp-server.x86_64 0:5.2-22.el7                        yum-utils.noarch 0:1.1.31-46.el7_5

Complete!
```

syslinux 这个包提供了PXE安装所需要的pxelinux.0等文件



```
Name        : syslinux
Arch        : x86_64
Version     : 4.05
Release     : 13.el7
Size        : 2.3 M
Repo        : installed
From repo   : base
Summary     : Simple kernel loader which boots from a FAT filesystem
URL         : http://syslinux.zytor.com/wiki/index.php/The_Syslinux_Project
License     : GPLv2+
Description : SYSLINUX is a suite of bootloaders, currently supporting DOS FAT
            : filesystems, Linux ext2/ext3 filesystems (EXTLINUX), PXE network boots
            : (PXELINUX), or ISO 9660 CD-ROMs (ISOLINUX).
```

没有安装DHCP,所以需要另外安装

```
[root@cobbler ~]# yum install dhcp -y
```

2、启动安装的服务

```
[root@cobbler ~]# systemctl enable httpd.service
[root@cobbler ~]# systemctl start httpd.service
[root@cobbler ~]# systemctl enable tftp.socket
[root@cobbler ~]# systemctl start tftp.socket
```

```
[root@cobbler ~]# systemctl enable cobblerd.service
[root@cobbler ~]# systemctl start cobblerd.service
```

3、执行cobbler环境检查

```
[root@cobbler ~]# cobbler check
The following are potential configuration items that you may want to fix:

1 : The 'server' field in /etc/cobbler/settings must be set to something other than
localhost, or kickstarting features will not work.  This should be a resolvable hostname or
IP for the boot server as reachable by all machines that will use it.
2 : For PXE to be functional, the 'next_server' field in /etc/cobbler/settings must be set to
something other than 127.0.0.1, and should match the IP of the boot server on the PXE
network.
3 : SELinux is enabled. Please review the following wiki page for details on ensuring
cobbler works correctly in your SELinux environment:
    https://github.com/cobbler/cobbler/wiki/Selinux
4 : change 'disable' to 'no' in /etc/xinetd.d/tftp
5 : Some network boot-loaders are missing from /var/lib/cobbler/loaders, you may run
'cobbler get-loaders' to download them, or, if you only want to handle x86/x86_64
netbooting, you may ensure that you have installed a *recent* version of the syslinux
package installed and can ignore this message entirely.  Files in this directory, should you
want to support all architectures, should include pxelinux.0, menu.c32, elilo.efi, and
yaboot. The 'cobbler get-loaders' command is the easiest way to resolve these
requirements.
6 : enable and start rsyncd.service with systemctl
7 : debmirror package is not installed, it will be required to manage debian deployments
and repositories
8 : ksvalidator was not found, install pykickstart
9 : The default password used by the sample templates for newly installed machines
(default_password_crypted in /etc/cobbler/settings) is still set to 'cobbler' and should be
changed, try: "openssl passwd -1 -salt 'random-phrase-here' 'your-password-here'" to
generate new one
10 : fencing tools were not found, and are required to use the (optional) power
management features. install cman or fence-agents to use them

Restart cobblerd and then run 'cobbler sync' to apply changes.
```

意思如下：

1、/etc/cobbler/settings中的“server”字段必须设置为localhost以外的地址，否则kickstarting特性将不起作用。其应该是一个可解析的主机名或IP，所有机器都可达的地址。

2、为了使PXE正常工作，必须将/etc/cobbler/settings中的“next_server”字段设置为除127.0.0.1之外的其他字段，并且应该与PXE网络上的引导服务器的IP匹配。

3、SELinux已启用。请查看下面的Wiki页面以确保在您的SELinux环境下cobbler可以正确工作；

4、 在/etc/xinetd.d/tftp文件中将 'disable' 设置为 'no'；

5、一些网络引导加载程序在/var/lib/cobbler/loaders中丢失，您可以运行“cobbler get-loaders”来下载它们，如果您只想处理x86/x86_64 网络引导，确保您已经安装了最近的syslinux包，安装后可以忽略此消息。如果希望支持所有体系结构，则此目录中的文件应该包括pxelinux.0、menu.c32、elilo.efi和yaboot。“cobbler get-loaders”命令是解决这些需求最简单的方法。

6、使用systemctl命令开启rsyncd.service服务并设置开机自启

7、debmirror包没有安装，它用来管理Debian系统的部署和存储库

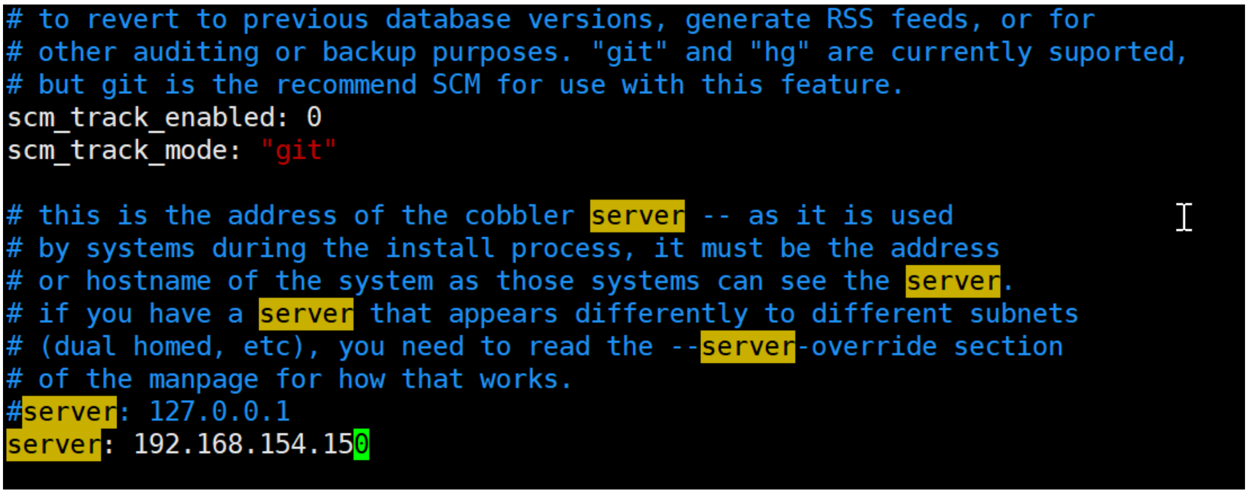
8、ksvalidator没有发现，要安装pykickstart

9、新安装的机器的默认密码设置为cobbler，你可以使用"openssl passwd -1 -salt 'random-phrase-here' 'your-password-here'"得到新得密码

10、fencing tools 没有找到，它被用来电源管理功能（可选），安装cman或者fence-agents 来使用

4、根据提示来一步一步的解决问题

第一个问题：编辑/etc/cobbler/settings文件



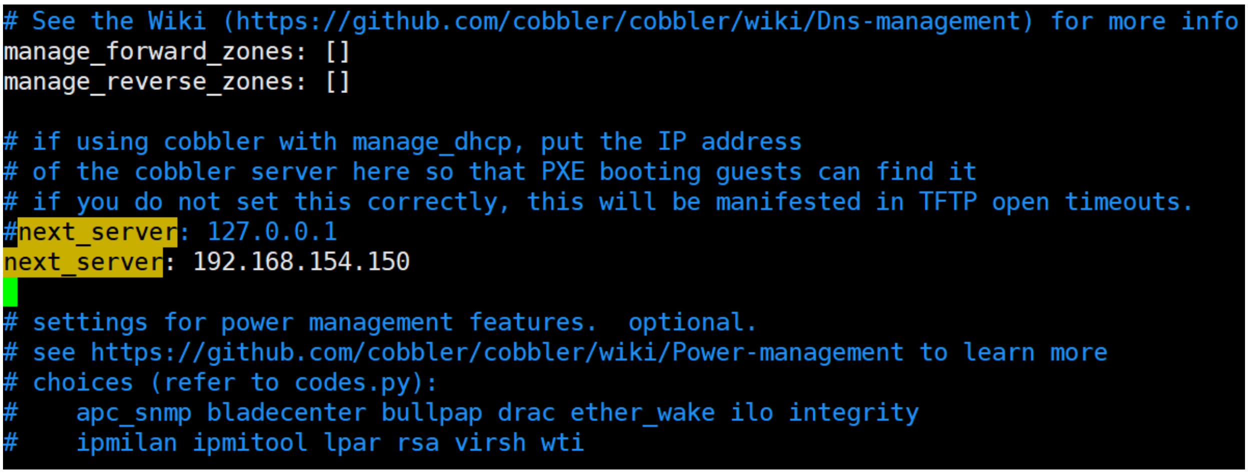
```
# to revert to previous database versions, generate RSS feeds, or for
# other auditing or backup purposes. "git" and "hg" are currently suported,
# but git is the recommend SCM for use with this feature.
scm_track_enabled: 0
scm_track_mode: "git"

# this is the address of the cobbler server -- as it is used
# by systems during the install process, it must be the address
# or hostname of the system as those systems can see the server.
# if you have a server that appears differently to different subnets
# (dual homed, etc), you need to read the --server-override section
# of the manpage for how that works.
#server: 127.0.0.1
server: 192.168.154.150
```

重启服务并重新检查：会发现第一个问题已经没有提示了

[root@cobbler ~]# systemctl restart cobblerd.service

[root@cobbler ~]# cobbler check

解决第二个问题：next_server要设置到正确的地址，因为现在是安装到同一台服务器上，设置相同地址即可，编辑/etc/cobbler/settings文件



```
# See the Wiki (https://github.com/cobbler/cobbler/wiki/Dns-management) for more info
manage_forward_zones: []
manage_reverse_zones: []

# if using cobbler with manage_dhcp, put the IP address
# of the cobbler server here so that PXE booting guests can find it
# if you do not set this correctly, this will be manifested in TFTP open timeouts.
#next_server: 127.0.0.1
next_server: 192.168.154.150

# settings for power management features.  optional.
# see https://github.com/cobbler/cobbler/wiki/Power-management to learn more
# choices (refer to codes.py):
#    apc_snmp bladecenter bullpap drac ether_wake ilo integrity
#    ipmilan ipmitool lpar rsa virsh wti
```

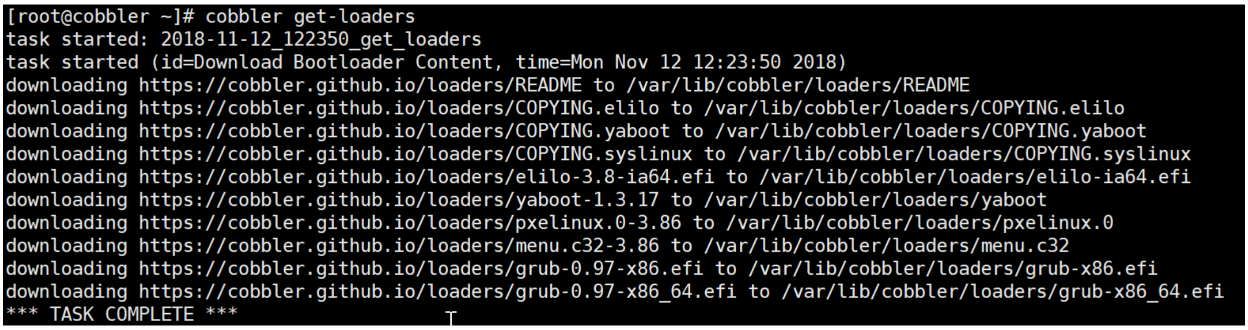
[root@cobbler ~]# systemctl restart cobblerd.service

[root@cobbler ~]# cobbler check

TFTP服务要开启，需要修改配置文件/etc/xinetd.d/tftp，因为现在使用的是centos7系统，所以前面已经开启。

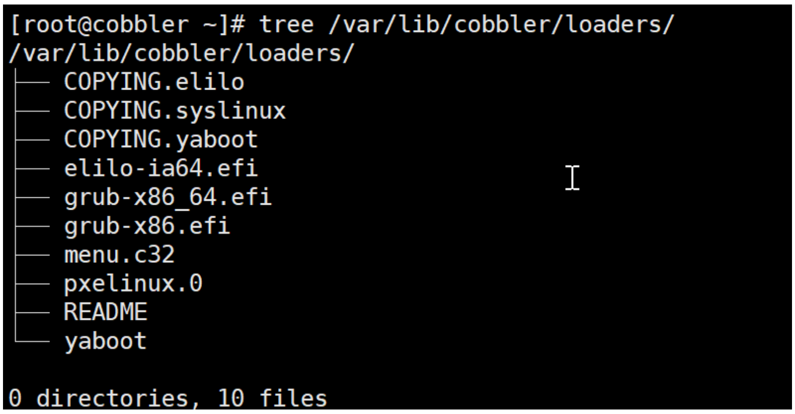
在/var/lib/cobbler/loaders目录下少了一些必要的文件，用'cobbler get-loaders' 命令来获取，这时候需要主机联网下载

[root@cobbler ~]# cobbler get-loaders



```
[root@cobbler ~]# cobbler get-loaders
task started: 2018-11-12_122350_get_loaders
task started (id=Download Bootloader Content, time=Mon Nov 12 12:23:50 2018)
downloading https://cobbler.github.io/loaders/README to /var/lib/cobbler/loaders/README
downloading https://cobbler.github.io/loaders/COPYING.elilo to /var/lib/cobbler/loaders/COPYING.elilo
downloading https://cobbler.github.io/loaders/COPYING.yaboot to /var/lib/cobbler/loaders/COPYING.yaboot
downloading https://cobbler.github.io/loaders/COPYING.syslinux to /var/lib/cobbler/loaders/COPYING.syslinux
downloading https://cobbler.github.io/loaders/elilo-3.8-ia64.efi to /var/lib/cobbler/loaders/elilo-ia64.efi
downloading https://cobbler.github.io/loaders/yaboot-1.3.17 to /var/lib/cobbler/loaders/yaboot
downloading https://cobbler.github.io/loaders/pxelinux.0-3.86 to /var/lib/cobbler/loaders/pxelinux.0
downloading https://cobbler.github.io/loaders/menu.c32-3.86 to /var/lib/cobbler/loaders/menu.c32
downloading https://cobbler.github.io/loaders/grub-0.97-x86.efi to /var/lib/cobbler/loaders/grub-x86.efi
downloading https://cobbler.github.io/loaders/grub-0.97-x86_64.efi to /var/lib/cobbler/loaders/grub-x86_64.efi
*** TASK COMPLETE ***
```

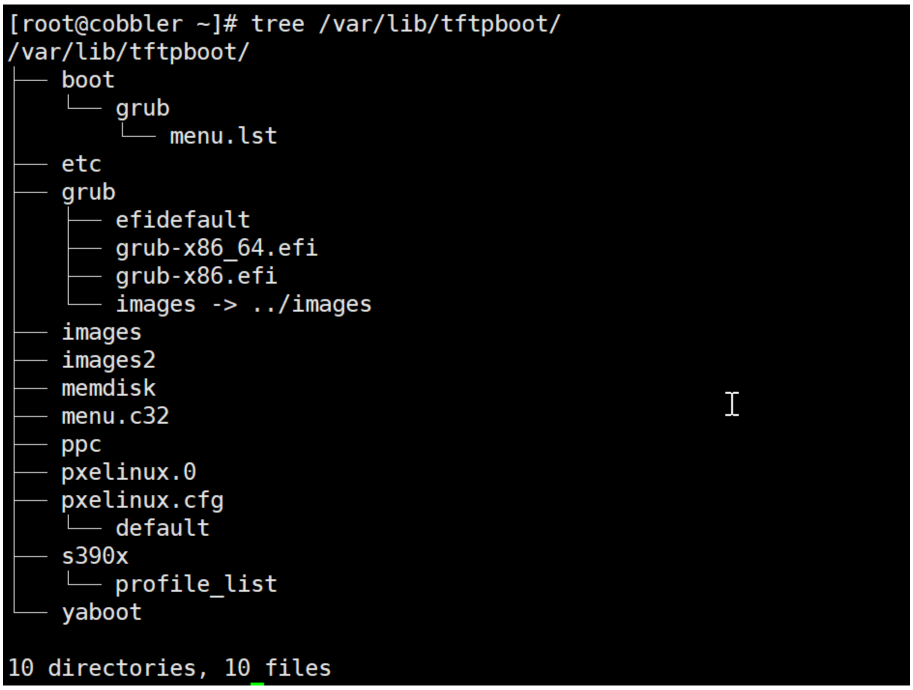
查看/var/lib/cobbler/loaders目录，可以看到下载的文件



```
[root@cobbler ~]# tree /var/lib/cobbler/loaders/
/var/lib/cobbler/loaders/
├── COPYING.elilo
├── COPYING.syslinux
├── COPYING.yaboot
├── elilo-ia64.efi
├── grub-x86_64.efi
├── grub-x86.efi
├── menu.c32
├── pxelinux.0
├── README
└── yaboot

0 directories, 10 files
```

执行数据同步

[root@cobbler ~]# cobbler sync

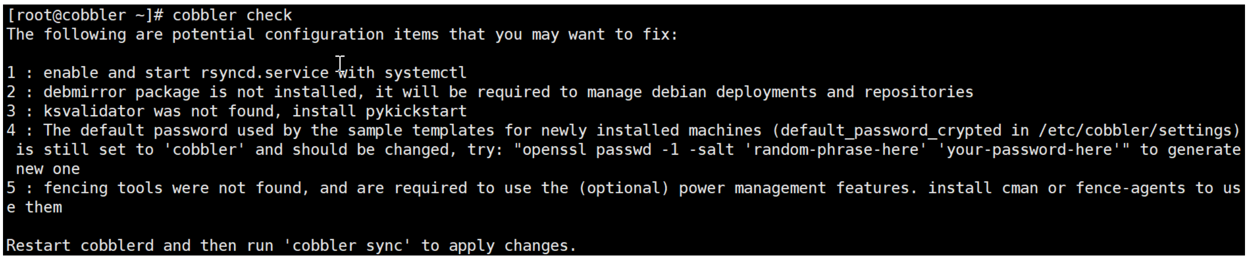


```
[root@cobbler ~]# tree /var/lib/tftpboot/
/var/lib/tftpboot/
├── boot
│   └── grub
│       └── menu.lst
├── etc
├── grub
│   ├── efidefault
│   ├── grub-x86_64.efi
│   ├── grub-x86.efi
│   └── images -> ../images
├── images
├── images2
├── memdisk
├── menu.c32
├── ppc
├── pxelinux.0
├── pxelinux.cfg
│   └── default
├── s390x
│   └── profile_list
└── yaboot

10 directories, 10 files
```

[root@cobbler ~]# systemctl restart cobblerd.service

[root@cobbler ~]# cobbler check

可以看到好多问题已经解决



```
[root@cobbler ~]# cobbler check
The following are potential configuration items that you may want to fix:

1 : enable and start rsyncd.service with systemctl
2 : debmirror package is not installed, it will be required to manage debian deployments and repositories
3 : ksvalidator was not found, install pykickstart
4 : The default password used by the sample templates for newly installed machines (default_password_crypted in /etc/cobbler/settings)
 is still set to 'cobbler' and should be changed, try: "openssl passwd -1 -salt 'random-phrase-here' 'your-password-here'" to generate
 new one
5 : fencing tools were not found, and are required to use the (optional) power management features. install cman or fence-agents to us
e them

Restart cobblerd and then run 'cobbler sync' to apply changes.
```

第一条：开启rsyncd.service 服务，没有使用这个服务，在此忽略

第二条：是针对debian发行版的系统配置，在此忽略

第三条：ksvalidator命令用于检查ks文件语法错误，安装pykickstart

[root@cobbler ~]# yum install pykickstart -y

[root@cobbler ~]# rpm -qf \`which ksvalidator \`

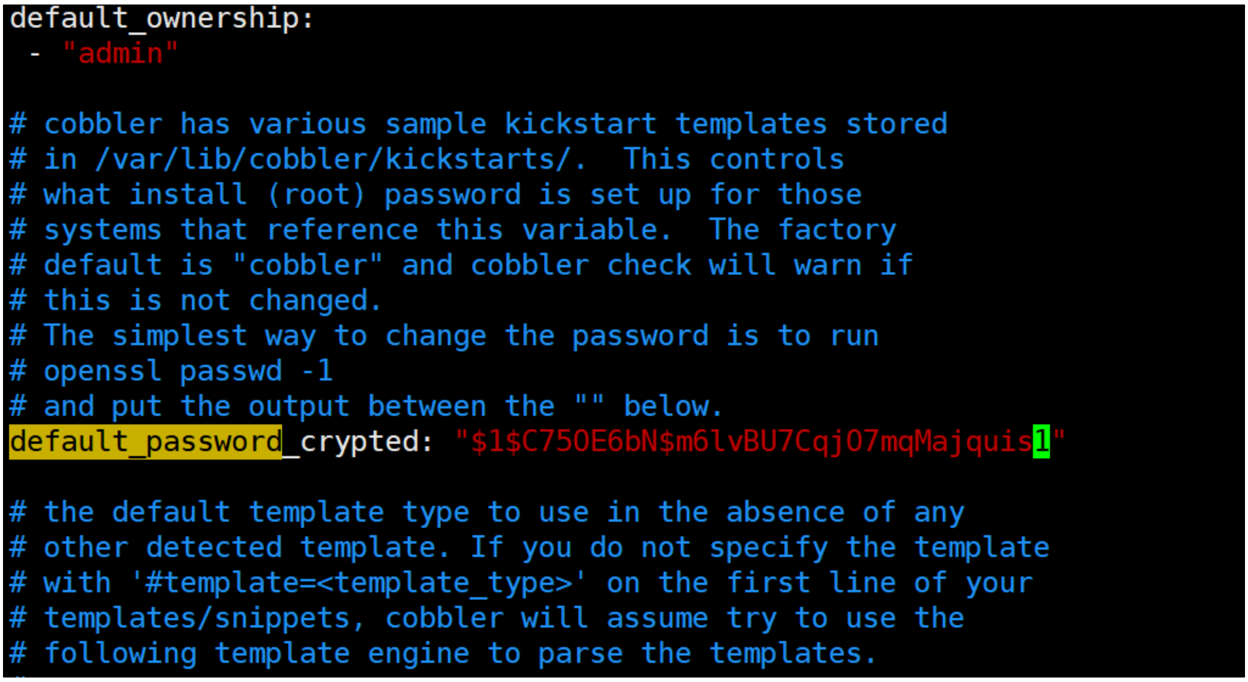
pykickstart-1.99.66.18-1.el7.noarch

第四条：修改kickstart文件的默认口令

[root@cobbler ~]# openssl passwd -1 123456

$1$C75OE6bN$m6lvBU7CqjO7mqMajquis1

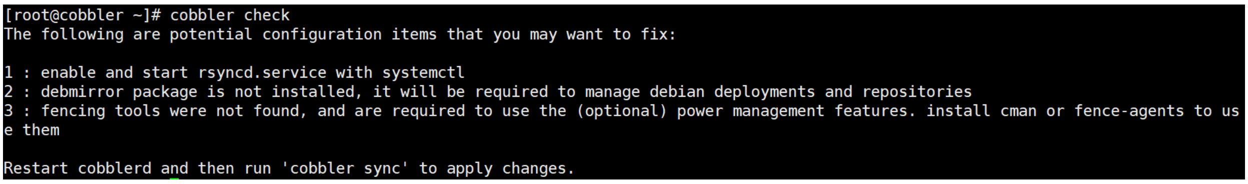
[root@cobbler ~]# vim /etc/cobbler/settings



```
default_ownership:
 - "admin"

# cobbler has various sample kickstart templates stored
# in /var/lib/cobbler/kickstarts/.  This controls
# what install (root) password is set up for those
# systems that reference this variable.  The factory
# default is "cobbler" and cobbler check will warn if
# this is not changed.
# The simplest way to change the password is to run
# openssl passwd -1
# and put the output between the "" below.
default_password_crypted: "$1$C750E6bN$m6lvBU7Cqj07mqMajquis1"

# the default template type to use in the absence of any
# other detected template. If you do not specify the template
# with '#template=<template_type>' on the first line of your
# templates/snippets, cobbler will assume try to use the
# following template engine to parse the templates.
```

[root@cobbler ~]# systemctl restart cobblerd.service

[root@cobbler ~]# cobbler check



```
[root@cobbler ~]# cobbler check
The following are potential configuration items that you may want to fix:

1 : enable and start rsyncd.service with systemctl
2 : debmirror package is not installed, it will be required to manage debian deployments and repositories
3 : fencing tools were not found, and are required to use the (optional) power management features. install cman or fence-agents to us
e them

Restart cobblerd and then run 'cobbler sync' to apply changes.
```

最后一条是电源相关问题，忽略

如果想修改这些错误，可以使用以下命令：

[root@cobbler ~]# systemctl enable rsyncd.service

[root@cobbler ~]# systemctl start rsyncd.service

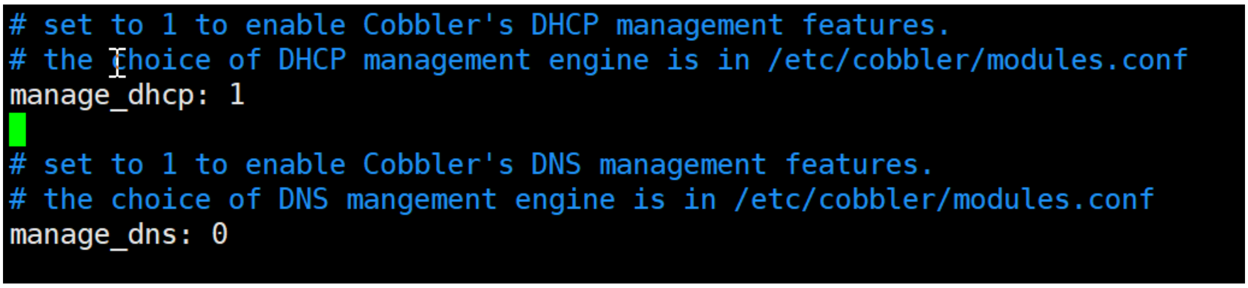
[root@cobbler ~]# yum install fence-agents -y

5、配置DHCP服务

1）、编辑配置文件：

[root@cobbler ~]# vim /etc/cobbler/settings

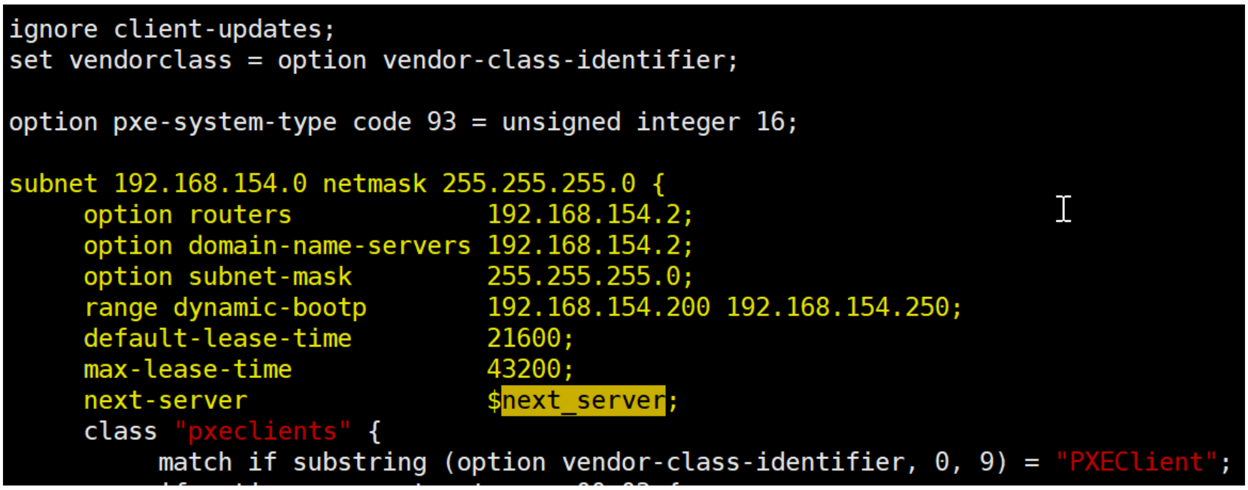
manage_dhcp: 1 设置为1，表示启动cobbler DHCP管理特性



```
# set to 1 to enable Cobbler's DHCP management features.
# the choice of DHCP management engine is in /etc/cobbler/modules.conf
manage_dhcp: 1

# set to 1 to enable Cobbler's DNS management features.
# the choice of DNS mangement engine is in /etc/cobbler/modules.conf
manage_dns: 0
```

2）、改cobbler提供的dhcp配置文件模板，根据自己实际情况更改即可

vim /etc/cobbler/dhcp.template



```
ignore client-updates;
set vendorclass = option vendor-class-identifier;

option pxe-system-type code 93 = unsigned integer 16;

subnet 192.168.154.0 netmask 255.255.255.0 {
     option routers             192.168.154.2;
     option domain-name-servers 192.168.154.2;
     option subnet-mask         255.255.255.0;
     range dynamic-bootp        192.168.154.200 192.168.154.250;
     default-lease-time         21600;
     max-lease-time             43200;
     next-server                $next_server;
     class "pxeclients" {
          match if substring (option vendor-class-identifier, 0, 9) = "PXEClient";
```

3）、同步DHCP配置文件

```
[root@cobbler ~]# systemctl restart cobblerd.service
[root@cobbler ~]# cobbler sync
[root@cobbler ~]# cat /etc/dhcp/dhcpd.conf   可以看到配置文件已经生成
```

4）、开启DHCP服务

```
[root@cobbler ~]# systemctl enable dhcpd.service
[root@cobbler ~]# systemctl restart dhcpd.service
```

6、建立cobbler yum源 （安装系统的源）

通过挂载系统盘的方式导入安装源

```
[root@cobbler ~]# mount /dev/cdrom  /media/   #挂载centos7.5光盘
[root@cobbler ~]# cobbler import --path=/media --name=Centos-7.5-x86_64 --arch=x86_64
[root@cobbler ~]# cobbler distro list   #查看对应的distribution
   Centos-7.5-x86_64
```

镜像会被自动导入到/var/www/cobbler/ks_mirror,后续通过http的方式获取安装源；

默认情况下，cobbler还会生成一个最小化安装的kickstart文件，默认是/var/lib/cobbler/kickstarts/sample_end.ks。

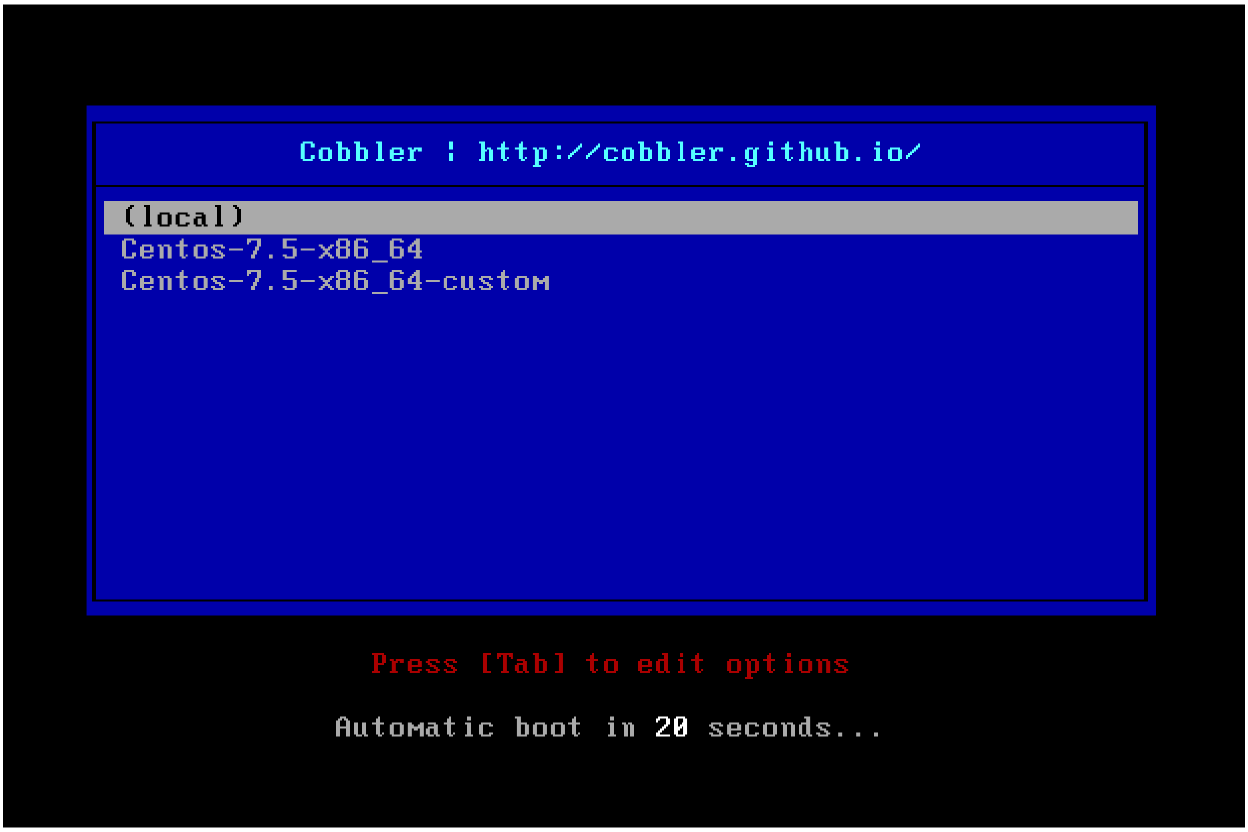
如果想要自定义的kickstart文件，可进行如下操作：centos7.5-ks.cfg为自定义的文件

```
[root@cobbler ~]# cp centos7.5-ks.cfg /var/lib/cobbler/kickstarts/
[root@cobbler ~]# cobbler profile list
   Centos-7.5-x86_64
[root@cobbler ~]# cobbler profile add --name=Centos-7.5-x86_64-custom --distro=Centos-7.5-x86_64 --kickstart=/var/lib/cobbler/kickstarts/centos7.5-ks.cfg
[root@cobbler ~]# cobbler profile list
   Centos-7.5-x86_64
```

Centos-7.5-x86_64-custom

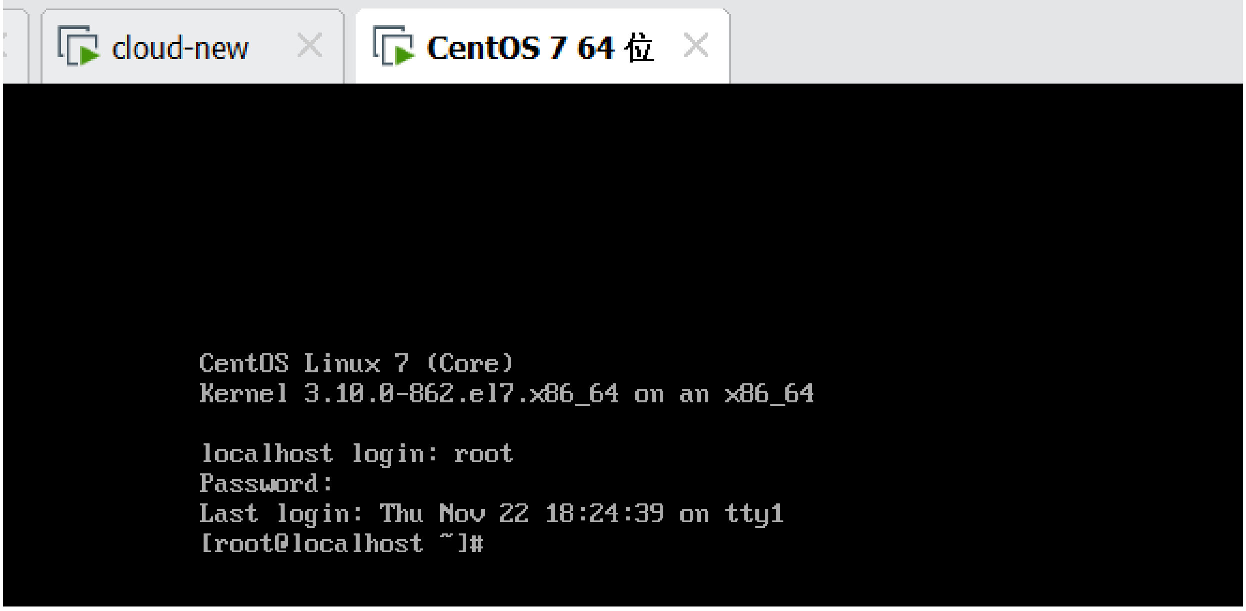
还可以添加其它的cobbler安装源，例如centos6等，方法相同

7、测试安装Centos7.5 ，成功



```
Cobbler | http://cobbler.github.io/

(local)
Centos-7.5-x86_64
Centos-7.5-x86_64-custom

Press [Tab] to edit options

Automatic boot in 20 seconds...
```

安装成功：



```
CentOS Linux 7 (Core)
Kernel 3.10.0-862.el7.x86_64 on an x86_64

localhost login: root
Password:
Last login: Thu Nov 22 18:24:39 on tty1
[root@localhost ~]#
```

8、cobbler-web管理

1）安装程序包

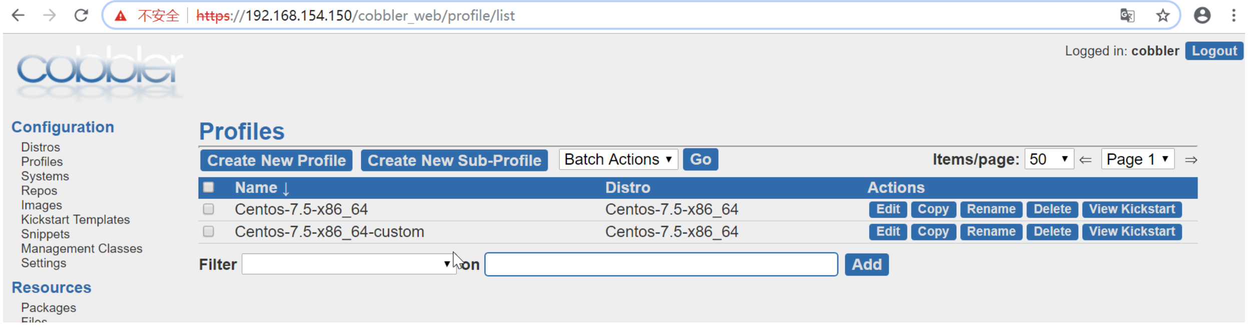
[root@cobbler ~]# yum install -y cobbler-web

2）重启httpd服务

```
[root@cobbler ~]# systemctl restart httpd.service
```

3）访问：https://192.168.154.150/cobbler_web

默认 用户名 ： cobbler 密码 ： cobbler



Profiles

	Name ↓	Distro	Actions
□	Centos-7.5-x86_64	Centos-7.5-x86_64	Edit Copy Rename Delete View Kickstart
□	Centos-7.5-x86_64-custom	Centos-7.5-x86_64	Edit Copy Rename Delete View Kickstart