第一周环境准备任务

任务目标：搭建linux+nginx+php-fqm+mysql

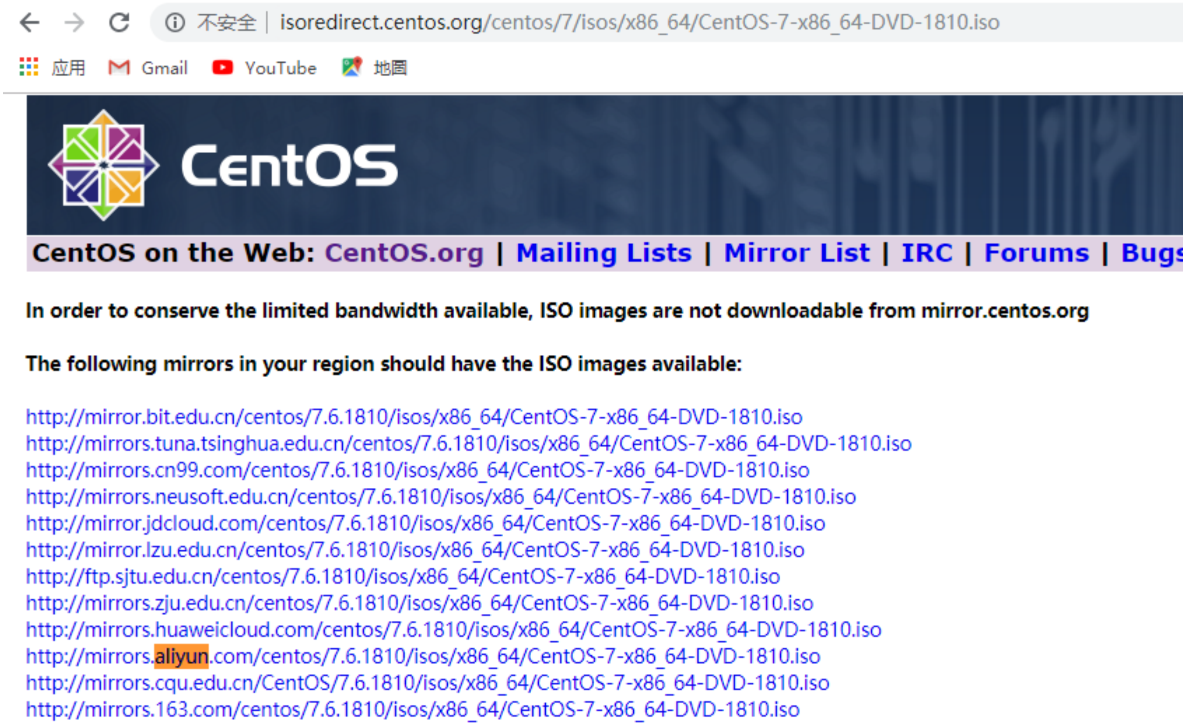
最终目标：能够运行php代码并且可以使用php连接mysql，成功执行mysql的语句。

报告要求：将整个环境的搭建过程进行详细记录，收集网络上的加固文章，学习加固技术，从而思考不加固可能存在的安全问题，对于加固的过程以及对于安全的思考都需要做详细的记录。

拓展任务：除了这个web环境还有其他的环境可以搭建，能力强者可以做更多的练习，比如：基于apache的环境、基于windows server 的iis 环境等。

1 VMware Workstation安装CentOS系统

1.1 CentOS官网下载最新版本的IOS文件，目前最新版本为7.6.1810



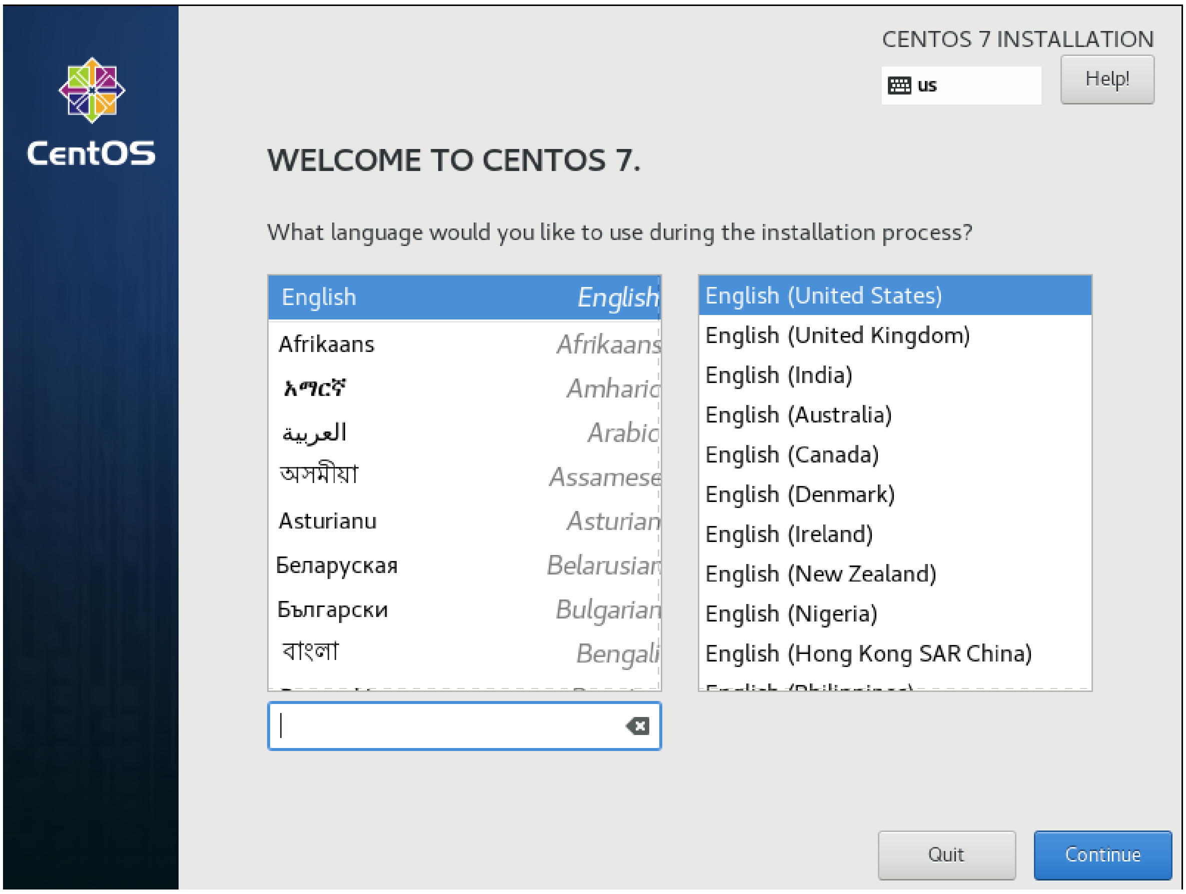
不安全
isoredirect.centos.org/centos/7/isos/x86_64/CentOS-7-x86_64-DVD-1810.iso
应用
Gmail
YouTube
地图
CentOS
CentOS on the Web: CentOS.org | Mailing Lists | Mirror List | IRC | Forums | Bugs

In order to conserve the limited bandwidth available, ISO images are not downloadable from mirror.centos.org

The following mirrors in your region should have the ISO images available:

http://mirror.bit.edu.cn/centos/7.6.1810/isos/x86_64/CentOS-7-x86_64-DVD-1810.iso
http://mirrors.tuna.tsinghua.edu.cn/centos/7.6.1810/isos/x86_64/CentOS-7-x86_64-DVD-1810.iso
http://mirrors.cn99.com/centos/7.6.1810/isos/x86_64/CentOS-7-x86_64-DVD-1810.iso
http://mirrors.neusoft.edu.cn/centos/7.6.1810/isos/x86_64/CentOS-7-x86_64-DVD-1810.iso
http://mirror.jdcloud.com/centos/7.6.1810/isos/x86_64/CentOS-7-x86_64-DVD-1810.iso
http://mirror.lzu.edu.cn/centos/7.6.1810/isos/x86_64/CentOS-7-x86_64-DVD-1810.iso
http://ftp.sjtu.edu.cn/centos/7.6.1810/isos/x86_64/CentOS-7-x86_64-DVD-1810.iso
http://mirrors.zju.edu.cn/centos/7.6.1810/isos/x86_64/CentOS-7-x86_64-DVD-1810.iso
http://mirrors.huaweicloud.com/centos/7.6.1810/isos/x86_64/CentOS-7-x86_64-DVD-1810.iso
http://mirrors.aliyun.com/centos/7.6.1810/isos/x86_64/CentOS-7-x86_64-DVD-1810.iso
http://mirrors.cqu.edu.cn/CentOS/7.6.1810/isos/x86_64/CentOS-7-x86_64-DVD-1810.iso
http://mirrors.163.com/centos/7.6.1810/isos/x86_64/CentOS-7-x86_64-DVD-1810.iso

1.2 在虚拟化软件VMware workstation中安装CentOS操作系统

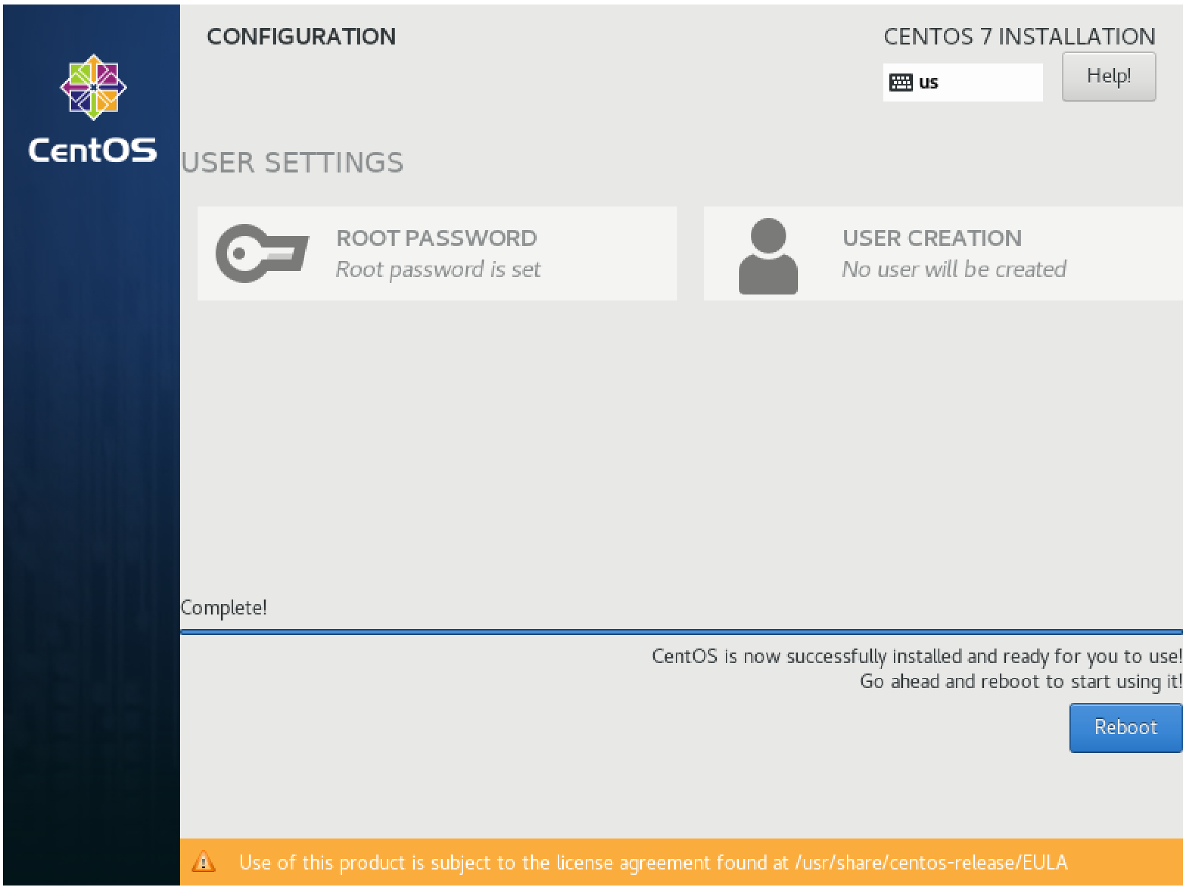


WELCOME TO CENTOS 7.

What language would you like to use during the installation process?

English	English
Afrikaans	Afrikaans
አማርኛ	Amharic
العربية	Arabic
অসমীয়া	Assamese
Asturianu	Asturian
Беларуская	Belarusian
Български	Bulgarian
বাংলা	Bengali

English (United States)
English (United Kingdom)
English (India)
English (Australia)
English (Canada)
English (Denmark)
English (Ireland)
English (New Zealand)
English (Nigeria)
English (Hong Kong SAR China)



USER SETTINGS

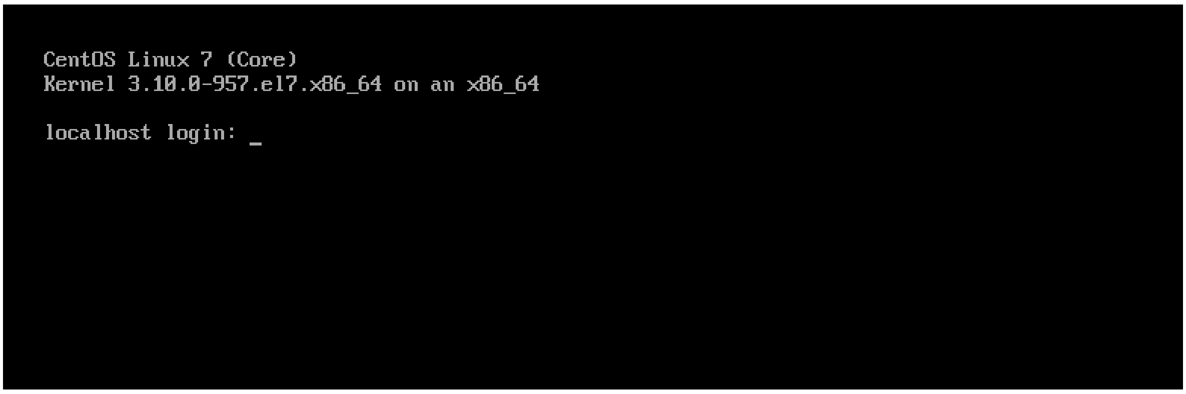
ROOT PASSWORD
Root password is set

USER CREATION
No user will be created

Complete!

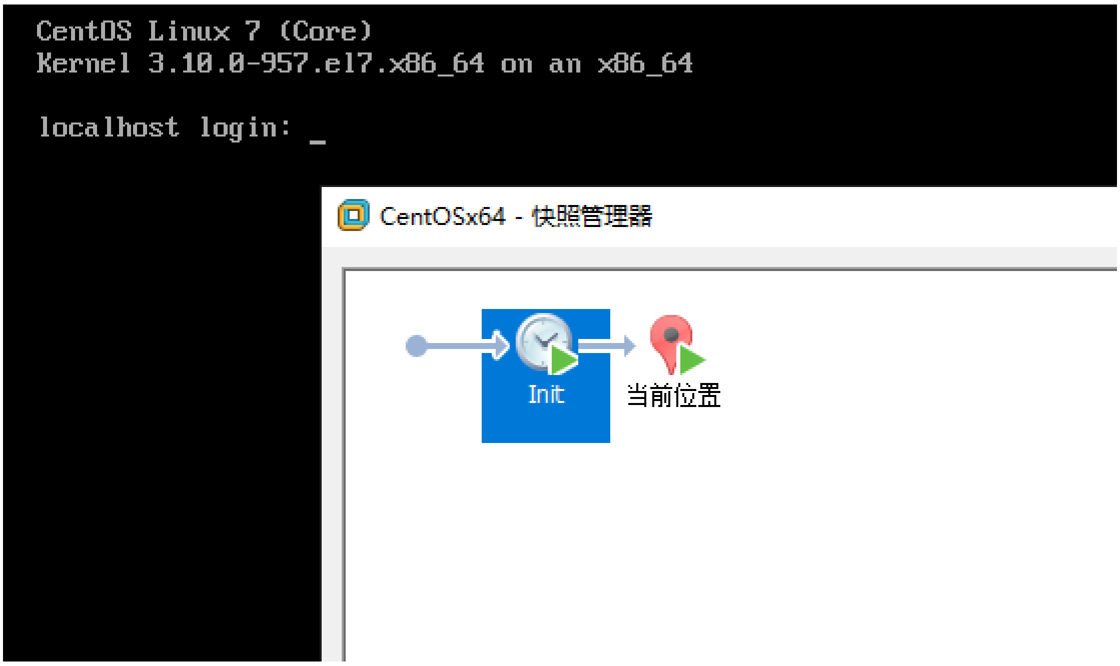
CentOS is now successfully installed and ready for you to use!
Go ahead and reboot to start using it!

⚠ Use of this product is subject to the license agreement found at /usr/share/centos-release/EULA



```
CentOS Linux 7 (Core)
Kernel 3.10.0-957.el7.x86_64 on an x86_64

localhost login: _
```

1.3 创建虚拟机快照做备份

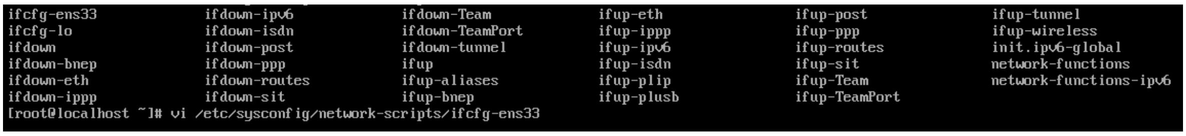


```
CentOS Linux 7 (Core)
Kernel 3.10.0-957.el7.x86_64 on an x86_64

localhost login: _
```

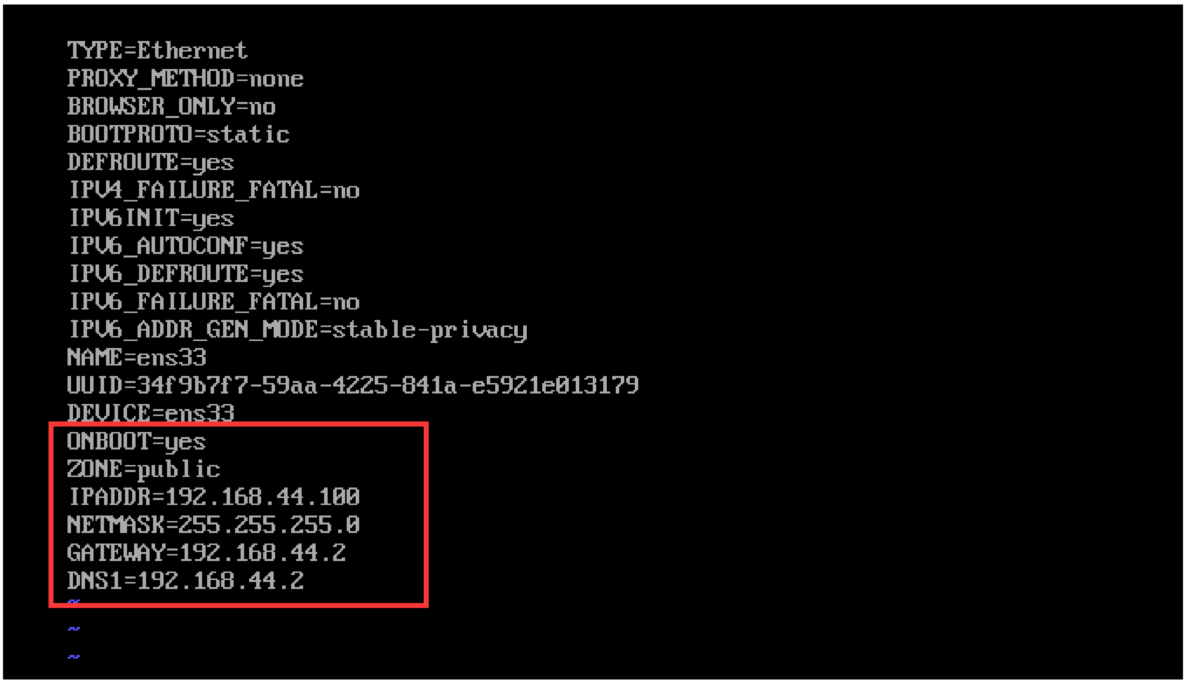
1.4 初始化配置

1. 4.1 IP地址设置

vi /etc/sysconfig/network-scripts/ifcfg-ens33

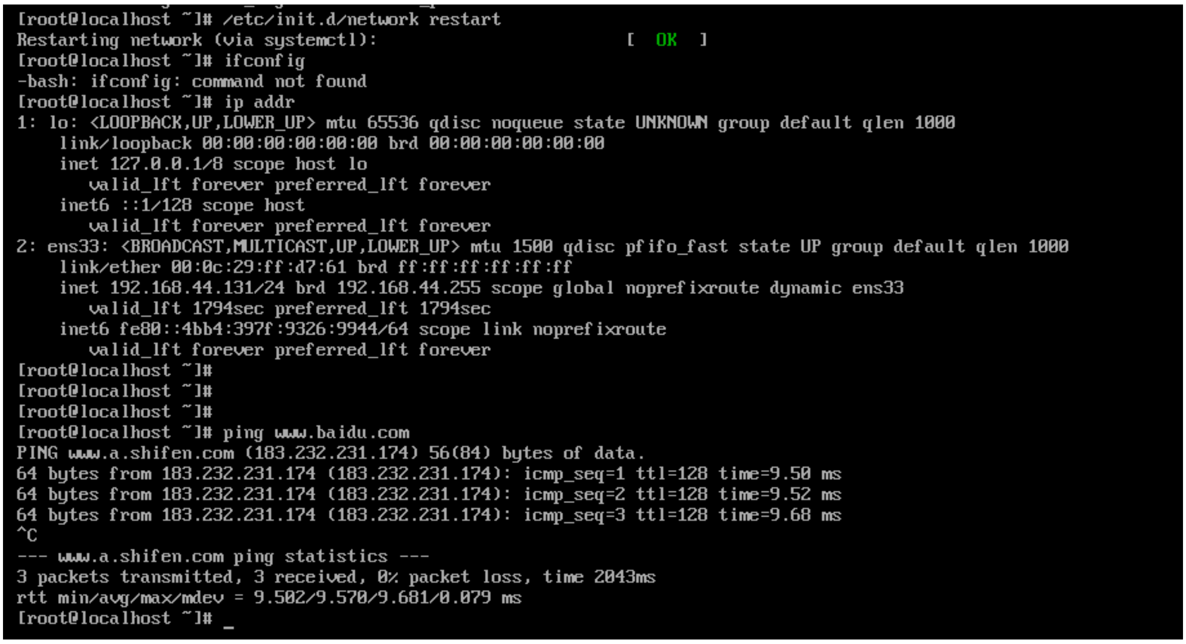


```
ifcfg-ens33         ifdown-ipv6         ifdown-Team         ifup-eth            ifup-post           ifup-tunnel
ifcfg-lo            ifdown-isdn         ifdown-TeamPort     ifup-ippp           ifup-ppp            ifup-wireless
ifdown              ifdown-post         ifdown-tunnel       ifup-ipv6           ifup-routes         init.ipv6-global
ifdown-bnep         ifdown-ppp          ifup                ifup-isdn           ifup-sit            network-functions
ifdown-eth          ifdown-routes       ifup-aliases        ifup-plip           ifup-Team           network-functions-ipv6
ifdown-ippp         ifdown-sit          ifup-bnep           ifup-plusb          ifup-TeamPort
[root@localhost ~]# vi /etc/sysconfig/network-scripts/ifcfg-ens33
```



```
TYPE=Ethernet
PROXY_METHOD=none
BROWSER_ONLY=no
BOOTPROTO=static
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=ens33
UUID=34f9b7f7-59aa-4225-841a-e5921e013179
DEVICE=ens33
ONBOOT=yes
ZONE=public
IPADDR=192.168.44.100
NETMASK=255.255.255.0
GATEWAY=192.168.44.2
DNS1=192.168.44.2
~
~
~
```

重启网卡，获取IP地址

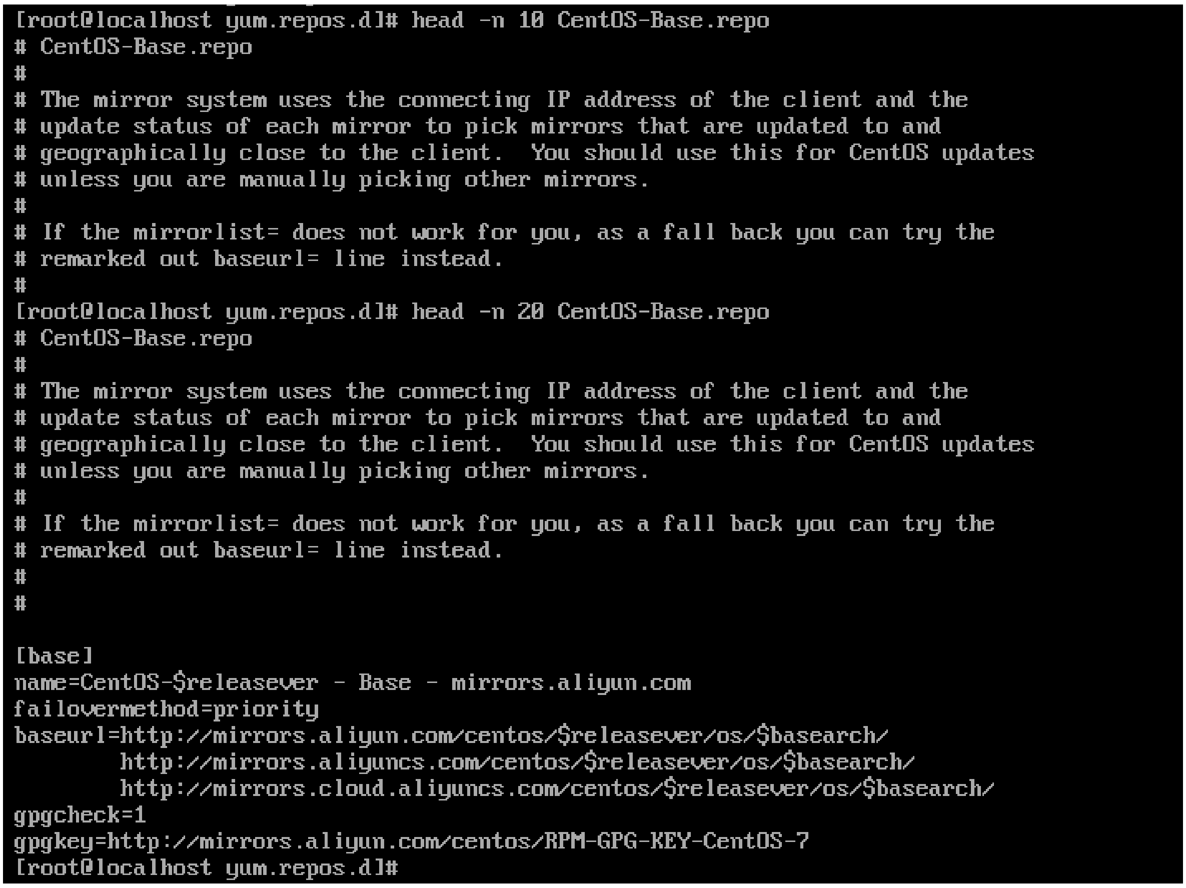


```
[root@localhost ~]# /etc/init.d/network restart
Restarting network (via systemctl):                        [  OK  ]
[root@localhost ~]# ifconfig
-bash: ifconfig: command not found
[root@localhost ~]# ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: ens33: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 00:0c:29:ff:d7:61 brd ff:ff:ff:ff:ff:ff
    inet 192.168.44.131/24 brd 192.168.44.255 scope global noprefixroute dynamic ens33
       valid_lft 1794sec preferred_lft 1794sec
    inet6 fe80::4bb4:397f:9326:9944/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]# ping www.baidu.com
PING www.a.shifen.com (183.232.231.174) 56(84) bytes of data.
64 bytes from 183.232.231.174 (183.232.231.174): icmp_seq=1 ttl=128 time=9.50 ms
64 bytes from 183.232.231.174 (183.232.231.174): icmp_seq=2 ttl=128 time=9.52 ms
64 bytes from 183.232.231.174 (183.232.231.174): icmp_seq=3 ttl=128 time=9.68 ms
^C
--- www.a.shifen.com ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2043ms
rtt min/avg/max/mdev = 9.502/9.570/9.681/0.079 ms
[root@localhost ~]# _
```

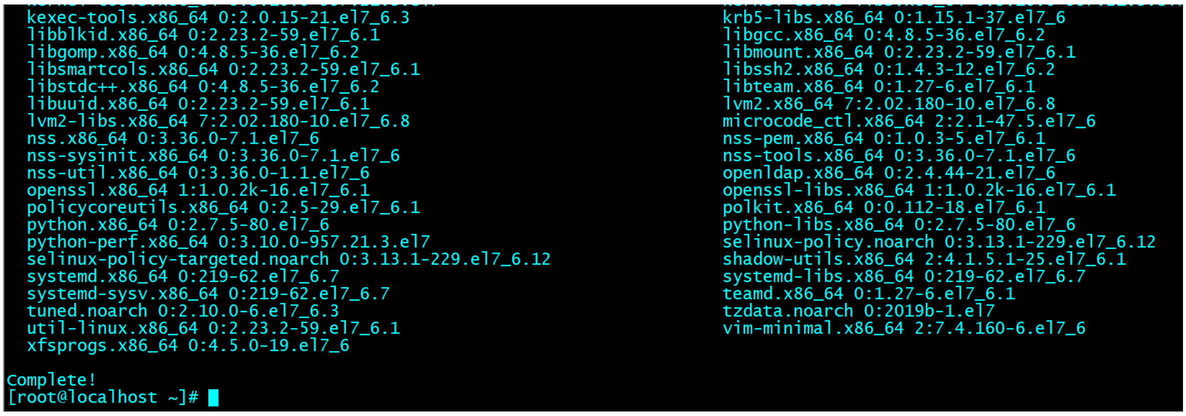
1. 4.2 更换为aliyun源

下载http://mirrors.aliyun.com/repo/Centos-7.repo 文件，替换系统/etc/yum.repos.d/CentOS-Base.repo文件。

```
yum clean all                #清除yum缓存
yum makecache                #重新生成yum缓存
yum update                   #升级所有包同时也升级软件和系统内核
```



```
[root@localhost yum.repos.d]# head -n 10 CentOS-Base.repo
# CentOS-Base.repo
#
# The mirror system uses the connecting IP address of the client and the
# update status of each mirror to pick mirrors that are updated to and
# geographically close to the client.  You should use this for CentOS updates
# unless you are manually picking other mirrors.
#
# If the mirrorlist= does not work for you, as a fall back you can try the
# remarked out baseurl= line instead.
#
[root@localhost yum.repos.d]# head -n 20 CentOS-Base.repo
# CentOS-Base.repo
#
# The mirror system uses the connecting IP address of the client and the
# update status of each mirror to pick mirrors that are updated to and
# geographically close to the client.  You should use this for CentOS updates
# unless you are manually picking other mirrors.
#
# If the mirrorlist= does not work for you, as a fall back you can try the
# remarked out baseurl= line instead.
#
#

[base]
name=CentOS-$releasever - Base - mirrors.aliyun.com
failovermethod=priority
baseurl=http://mirrors.aliyun.com/centos/$releasever/os/$basearch/
        http://mirrors.aliyuncs.com/centos/$releasever/os/$basearch/
        http://mirrors.cloud.aliyuncs.com/centos/$releasever/os/$basearch/
gpgcheck=1
gpgkey=http://mirrors.aliyun.com/centos/RPM-GPG-KEY-CentOS-7
[root@localhost yum.repos.d]#
```

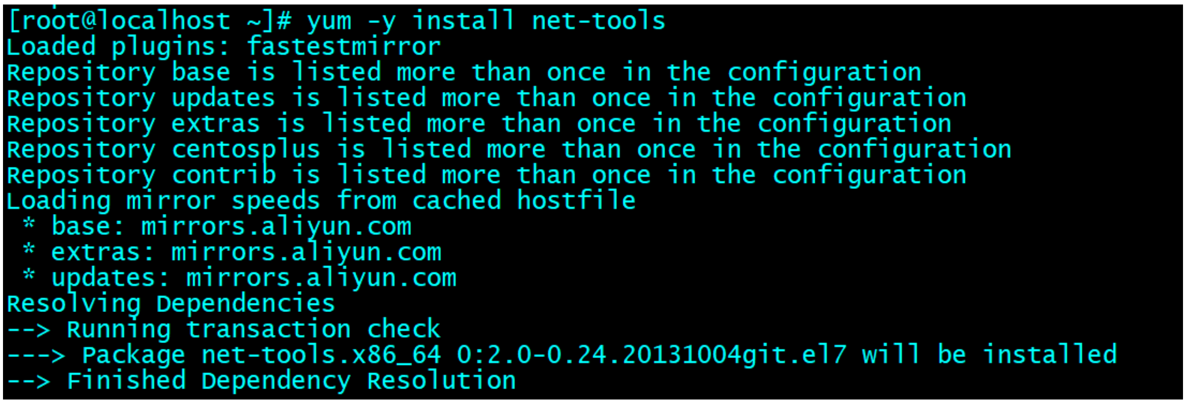


```
  kexec-tools.x86_64 0:2.0.15-21.el7_6.3                                krb5-libs.x86_64 0:1.15.1-37.el7_6
  libblkid.x86_64 0:2.23.2-59.el7_6.1                                   libgcc.x86_64 0:4.8.5-36.el7_6.2
  libgomp.x86_64 0:4.8.5-36.el7_6.2                                     libmount.x86_64 0:2.23.2-59.el7_6.1
  libsmartcols.x86_64 0:2.23.2-59.el7_6.1                               libssh2.x86_64 0:1.4.3-12.el7_6.2
  libstdc++.x86_64 0:4.8.5-36.el7_6.2                                   libteam.x86_64 0:1.27-6.el7_6.1
  libuuid.x86_64 0:2.23.2-59.el7_6.1                                    lvm2.x86_64 7:2.02.180-10.el7_6.8
  lvm2-libs.x86_64 7:2.02.180-10.el7_6.8                                microcode_ctl.x86_64 2:2.1-47.5.el7_6
  nss.x86_64 0:3.36.0-7.1.el7_6                                         nss-pem.x86_64 0:1.0.3-5.el7_6.1
  nss-sysinit.x86_64 0:3.36.0-7.1.el7_6                                 nss-tools.x86_64 0:3.36.0-7.1.el7_6
  nss-util.x86_64 0:3.36.0-1.1.el7_6                                    openldap.x86_64 0:2.4.44-21.el7_6
  openssl.x86_64 1:1.0.2k-16.el7_6.1                                    openssl-libs.x86_64 1:1.0.2k-16.el7_6.1
  policycoreutils.x86_64 0:2.5-29.el7_6.1                               polkit.x86_64 0:0.112-18.el7_6.1
  python.x86_64 0:2.7.5-80.el7_6                                        python-libs.x86_64 0:2.7.5-80.el7_6
  python-perf.x86_64 0:3.10.0-957.21.3.el7                              selinux-policy.noarch 0:3.13.1-229.el7_6.12
  selinux-policy-targeted.noarch 0:3.13.1-229.el7_6.12                  shadow-utils.x86_64 2:4.1.5.1-25.el7_6.1
  systemd.x86_64 0:219-62.el7_6.7                                       systemd-libs.x86_64 0:219-62.el7_6.7
  systemd-sysv.x86_64 0:219-62.el7_6.7                                  teamd.x86_64 0:1.27-6.el7_6.1
  tuned.noarch 0:2.10.0-6.el7_6.3                                       tzdata.noarch 0:2019b-1.el7
  util-linux.x86_64 0:2.23.2-59.el7_6.1                                 vim-minimal.x86_64 2:7.4.160-6.el7_6
  xfsprogs.x86_64 0:4.5.0-19.el7_6

Complete!
[root@localhost ~]# 
```

1. 4.3 安装net-tools组件

因初始系统，默认不能使用ifconfig/netstat/route等命令，个人比较习惯用这些命令，所以安装net-tools组件

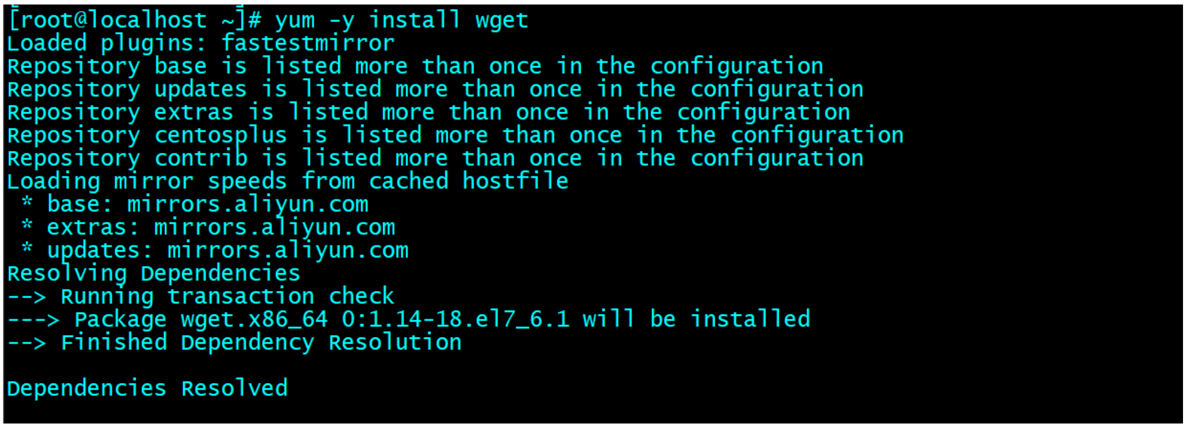
yum -y install net-tools



```
[root@localhost ~]# yum -y install net-tools
Loaded plugins: fastestmirror
Repository base is listed more than once in the configuration
Repository updates is listed more than once in the configuration
Repository extras is listed more than once in the configuration
Repository centosplus is listed more than once in the configuration
Repository contrib is listed more than once in the configuration
Loading mirror speeds from cached hostfile
 * base: mirrors.aliyun.com
 * extras: mirrors.aliyun.com
 * updates: mirrors.aliyun.com
Resolving Dependencies
--> Running transaction check
---> Package net-tools.x86_64 0:2.0-0.24.20131004git.el7 will be installed
--> Finished Dependency Resolution
```

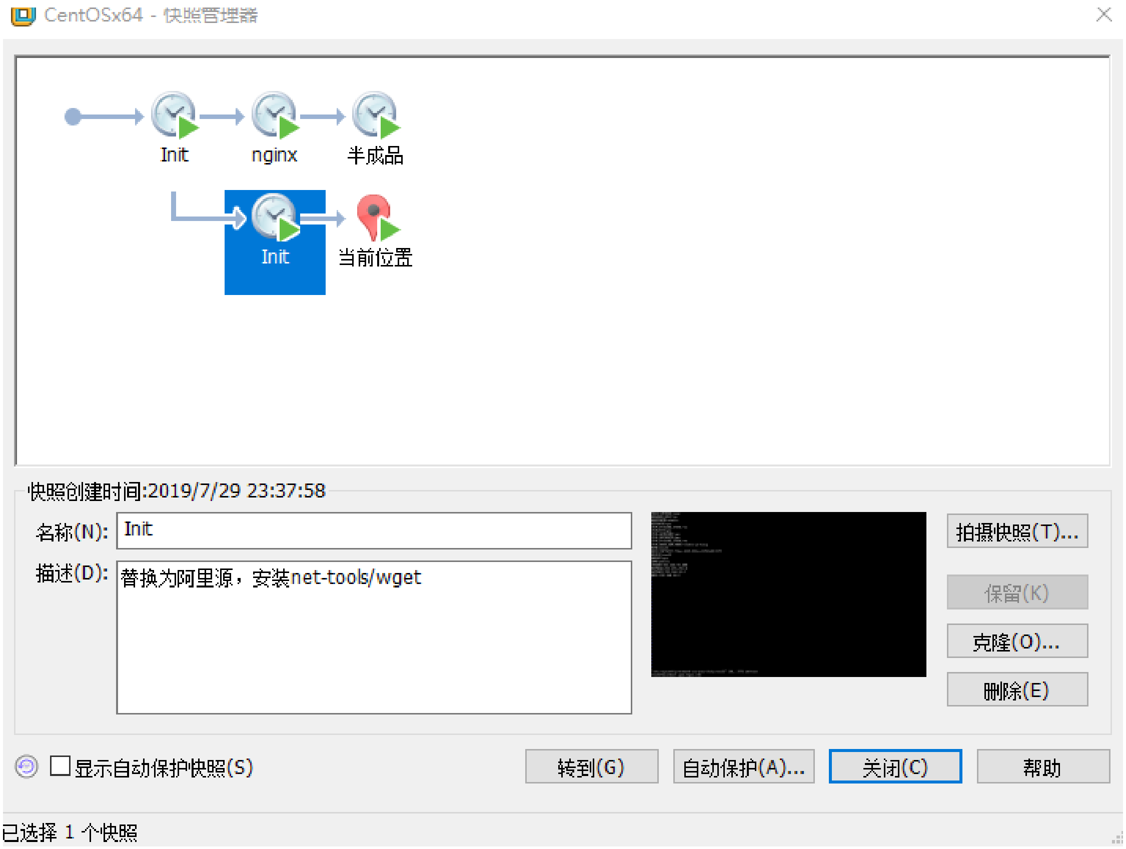
1. 4.4 安装wget

yum -y install wget



```
[root@localhost ~]# yum -y install wget
Loaded plugins: fastestmirror
Repository base is listed more than once in the configuration
Repository updates is listed more than once in the configuration
Repository extras is listed more than once in the configuration
Repository centosplus is listed more than once in the configuration
Repository contrib is listed more than once in the configuration
Loading mirror speeds from cached hostfile
 * base: mirrors.aliyun.com
 * extras: mirrors.aliyun.com
 * updates: mirrors.aliyun.com
Resolving Dependencies
--> Running transaction check
---> Package wget.x86_64 0:1.14-18.el7_6.1 will be installed
--> Finished Dependency Resolution

Dependencies Resolved
```

1. 4.5 创建虚拟机快照



快照创建时间:2019/7/29 23:37:58

名称(N): Init

描述(D): 替换为阿里源，安装net-tools/wget

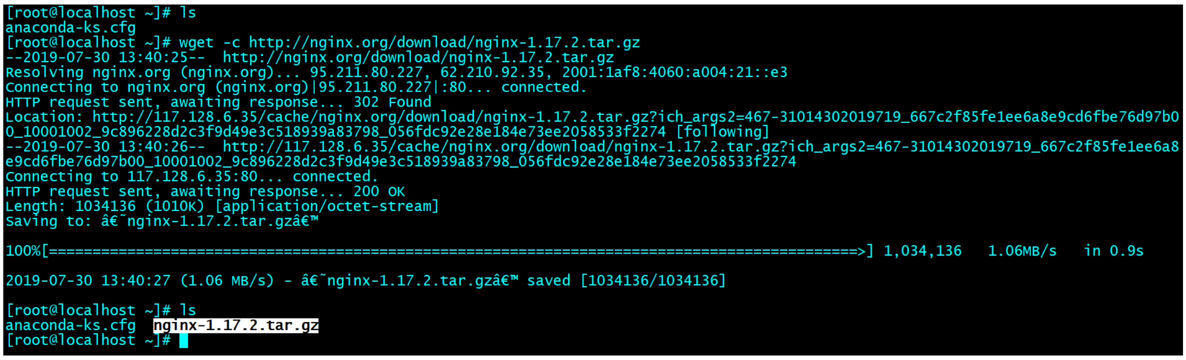
□ 显示自动保护快照(S)

已选择 1 个快照

2 nginx安装

2.1 下载nginx安装包

wget -c http://nginx.org/download/nginx-1.17.2.tar.gz

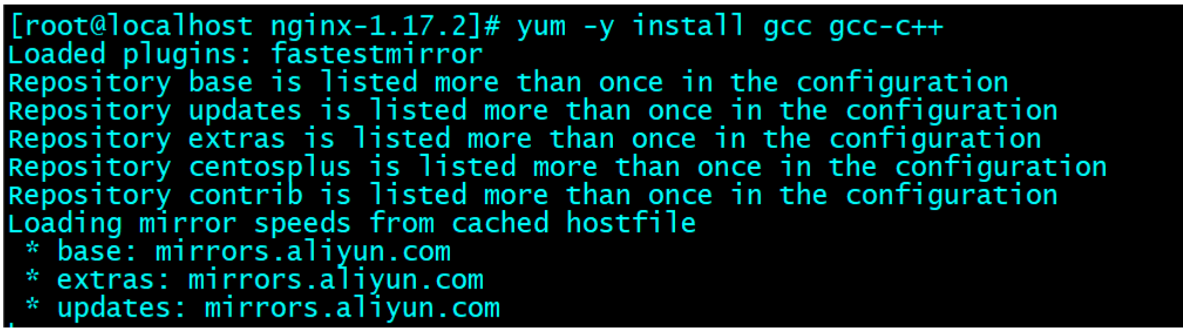


```
[root@localhost ~]# ls
anaconda-ks.cfg
[root@localhost ~]# wget -c http://nginx.org/download/nginx-1.17.2.tar.gz
--2019-07-30 13:40:25--  http://nginx.org/download/nginx-1.17.2.tar.gz
Resolving nginx.org (nginx.org)... 95.211.80.227, 62.210.92.35, 2001:1af8:4060:a004:21::e3
Connecting to nginx.org (nginx.org)|95.211.80.227|:80... connected.
HTTP request sent, awaiting response... 302 Found
Location: http://117.128.6.35/cache/nginx.org/download/nginx-1.17.2.tar.gz?ich_args2=467-31014302019719_667c2f85fe1ee6a8e9cd6fbe76d97b0
0_10001002_9c896228d2c3f9d49e3c518939a83798_056fdc92e28e184e73ee2058533f2274 [following]
--2019-07-30 13:40:26--  http://117.128.6.35/cache/nginx.org/download/nginx-1.17.2.tar.gz?ich_args2=467-31014302019719_667c2f85fe1ee6a8
e9cd6fbe76d97b00_10001002_9c896228d2c3f9d49e3c518939a83798_056fdc92e28e184e73ee2058533f2274
Connecting to 117.128.6.35:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1034136 (1010K) [application/octet-stream]
Saving to: â€˜nginx-1.17.2.tar.gzâ€™

100%[===================================================================================>] 1,034,136   1.06MB/s   in 0.9s

2019-07-30 13:40:27 (1.06 MB/s) - â€˜nginx-1.17.2.tar.gzâ€™ saved [1034136/1034136]

[root@localhost ~]# ls
anaconda-ks.cfg  nginx-1.17.2.tar.gz
[root@localhost ~]# 
```

2.2 安装编译环境以及依赖包

① gcc安装，nginx编译依赖gcc环境

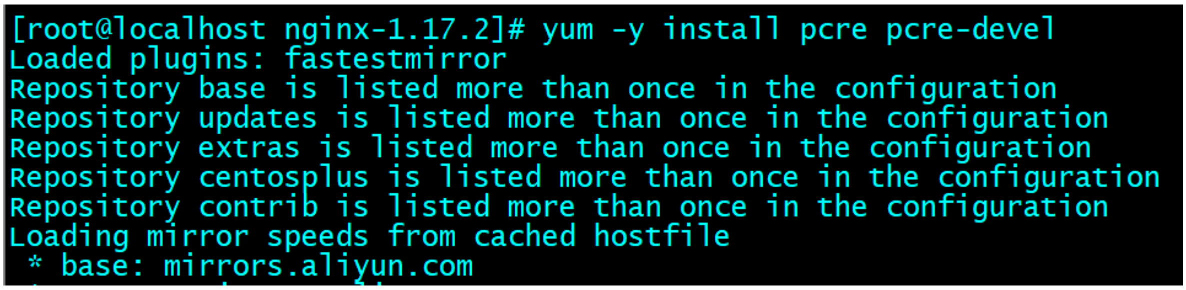
yum -y gcc gcc-c++



```
[root@localhost nginx-1.17.2]# yum -y install gcc gcc-c++
Loaded plugins: fastestmirror
Repository base is listed more than once in the configuration
Repository updates is listed more than once in the configuration
Repository extras is listed more than once in the configuration
Repository centosplus is listed more than once in the configuration
Repository contrib is listed more than once in the configuration
Loading mirror speeds from cached hostfile
 * base: mirrors.aliyun.com
 * extras: mirrors.aliyun.com
 * updates: mirrors.aliyun.com
```

② PCRE pcre-devel库安装，(Perl Compatible Regular Expressions)是一个Perl库，包括perl兼容的正则表达式库。ginx的http模块使用pcre来解析正则表达式。

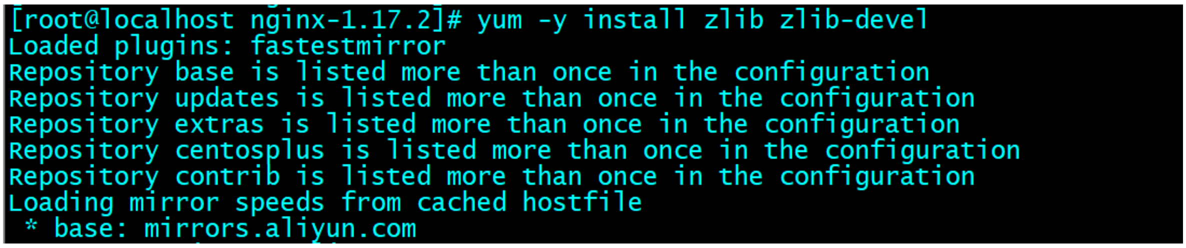
yum -y install pcre pcre-devel



```
[root@localhost nginx-1.17.2]# yum -y install pcre pcre-devel
Loaded plugins: fastestmirror
Repository base is listed more than once in the configuration
Repository updates is listed more than once in the configuration
Repository extras is listed more than once in the configuration
Repository centosplus is listed more than once in the configuration
Repository contrib is listed more than once in the configuration
Loading mirror speeds from cached hostfile
 * base: mirrors.aliyun.com
```

③ zlib安装，该库提供了很多种压缩和解压缩的方式，nginx使用zlib对http包的内容进行gzip。

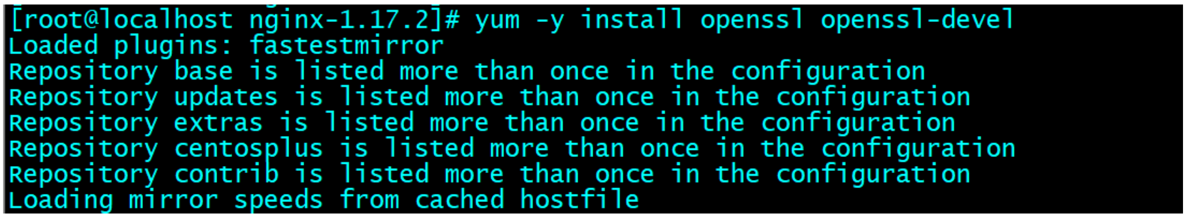
yum -y install zlib zlib-devel



```
[root@localhost nginx-1.17.2]# yum -y install zlib zlib-devel
Loaded plugins: fastestmirror
Repository base is listed more than once in the configuration
Repository updates is listed more than once in the configuration
Repository extras is listed more than once in the configuration
Repository centosplus is listed more than once in the configuration
Repository contrib is listed more than once in the configuration
Loading mirror speeds from cached hostfile
 * base: mirrors.aliyun.com
```

④ openssl安装，一个强大的安全套接字层密码库，囊括主要的密码算法、常用的密钥和证书封装管理功能及SSL协议，并提供丰富的应用程序供测试或其它目的使用。nginx不仅支持http协议，还支持https（即在ssl协议上传输http）。

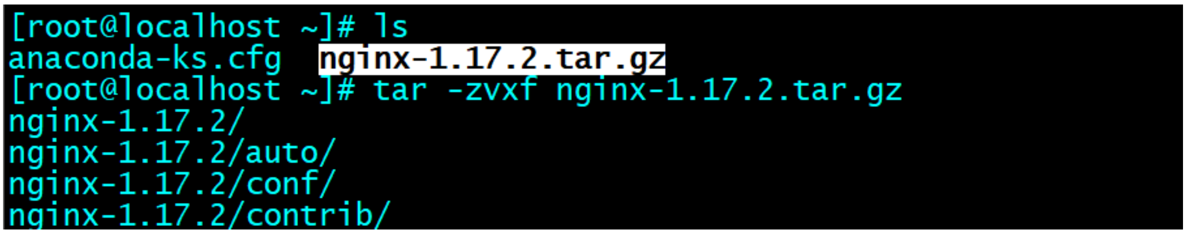
yum -y install openssl openssl-devel



```
[root@localhost nginx-1.17.2]# yum -y install openssl openssl-devel
Loaded plugins: fastestmirror
Repository base is listed more than once in the configuration
Repository updates is listed more than once in the configuration
Repository extras is listed more than once in the configuration
Repository centosplus is listed more than once in the configuration
Repository contrib is listed more than once in the configuration
Loading mirror speeds from cached hostfile
```

2.2 解压源码压缩包

tar -zvxf nginx-1.17.2.tar.gz

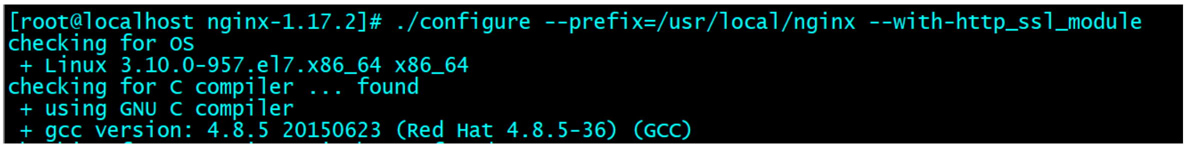


```
[root@localhost ~]# ls
anaconda-ks.cfg  nginx-1.17.2.tar.gz
[root@localhost ~]# tar -zvxf nginx-1.17.2.tar.gz
nginx-1.17.2/
nginx-1.17.2/auto/
nginx-1.17.2/conf/
nginx-1.17.2/contrib/
```

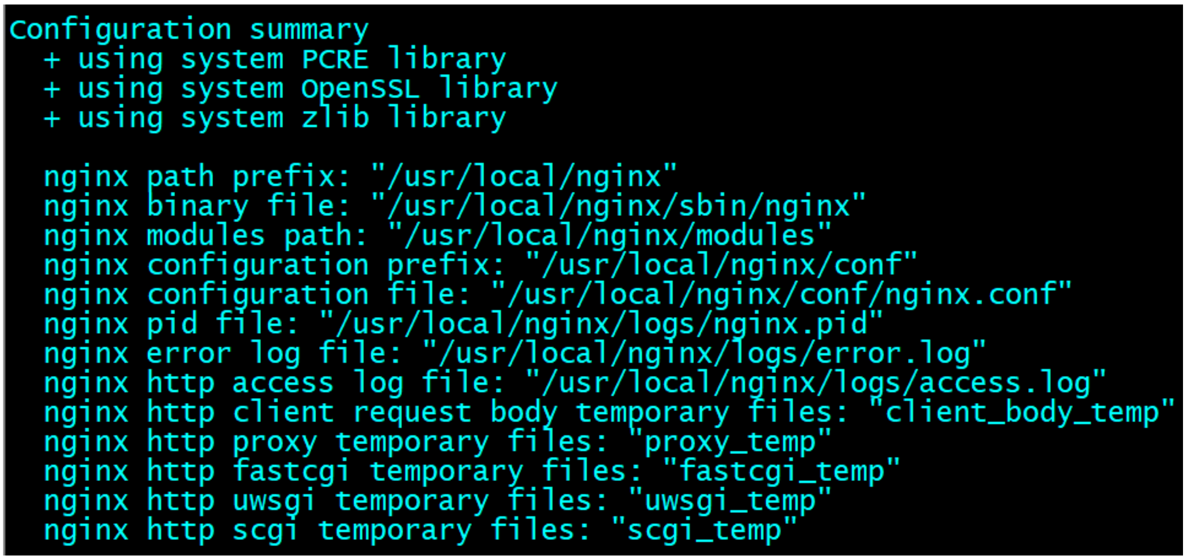
2.3 配置编译参数

cd nginx-1.17.2

./configure --prefix=/usr/local/nginx --with-http_ssl_module



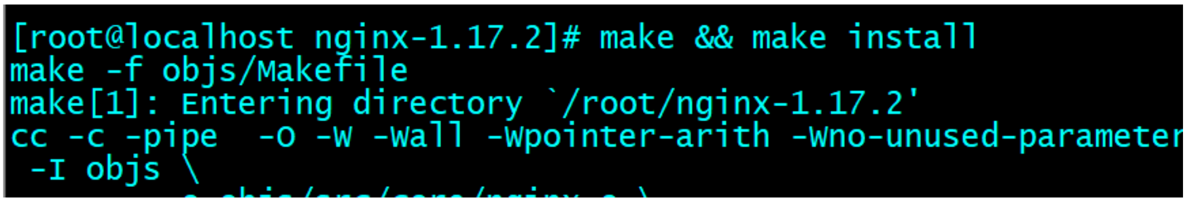
```
[root@localhost nginx-1.17.2]# ./configure --prefix=/usr/local/nginx --with-http_ssl_module
checking for OS
 + Linux 3.10.0-957.el7.x86_64 x86_64
checking for C compiler ... found
 + using GNU C compiler
 + gcc version: 4.8.5 20150623 (Red Hat 4.8.5-36) (GCC)
```



```
Configuration summary
  + using system PCRE library
  + using system OpenSSL library
  + using system zlib library

  nginx path prefix: "/usr/local/nginx"
  nginx binary file: "/usr/local/nginx/sbin/nginx"
  nginx modules path: "/usr/local/nginx/modules"
  nginx configuration prefix: "/usr/local/nginx/conf"
  nginx configuration file: "/usr/local/nginx/conf/nginx.conf"
  nginx pid file: "/usr/local/nginx/logs/nginx.pid"
  nginx error log file: "/usr/local/nginx/logs/error.log"
  nginx http access log file: "/usr/local/nginx/logs/access.log"
  nginx http client request body temporary files: "client_body_temp"
  nginx http proxy temporary files: "proxy_temp"
  nginx http fastcgi temporary files: "fastcgi_temp"
  nginx http uwsgi temporary files: "uwsgi_temp"
  nginx http scgi temporary files: "scgi_temp"
```

2.4 编译并安装

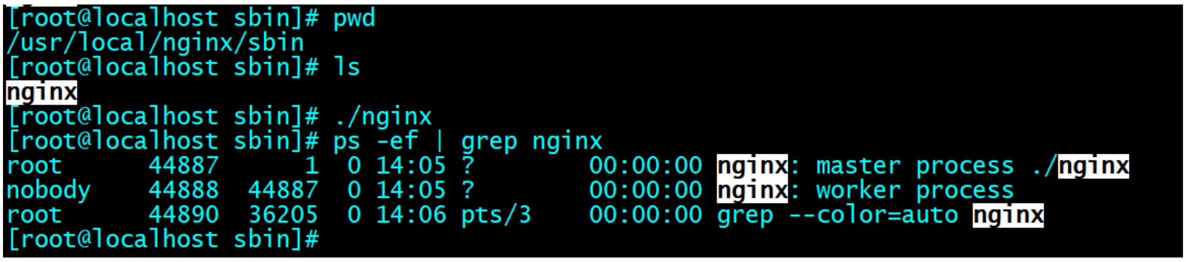
make && make install



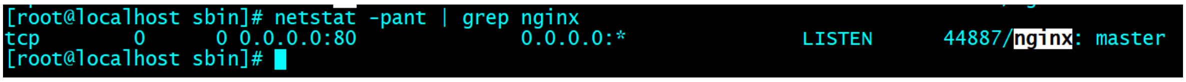
```
[root@localhost nginx-1.17.2]# make && make install
make -f objs/Makefile
make[1]: Entering directory `/root/nginx-1.17.2'
cc -c -pipe  -O -W -Wall -Wpointer-arith -Wno-unused-parameter
 -I objs \
```

2.5 启动nginx

./nginx



```
[root@localhost sbin]# pwd
/usr/local/nginx/sbin
[root@localhost sbin]# ls
nginx
[root@localhost sbin]# ./nginx
[root@localhost sbin]# ps -ef | grep nginx
root      44887      1  0 14:05 ?        00:00:00 nginx: master process ./nginx
nobody    44888  44887  0 14:05 ?        00:00:00 nginx: worker process
root      44890  36205  0 14:06 pts/3    00:00:00 grep --color=auto nginx
[root@localhost sbin]#
```



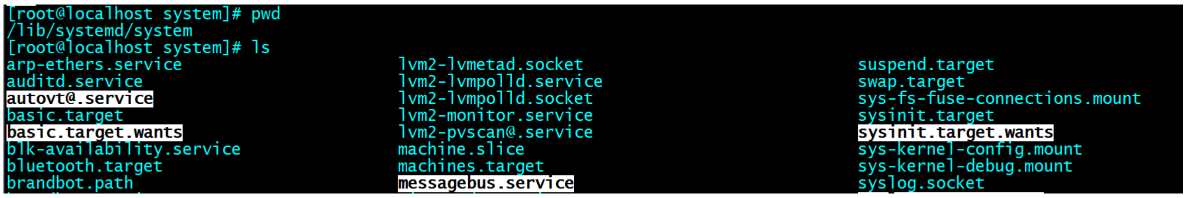
```
[root@localhost sbin]# netstat -pant | grep nginx
tcp        0      0 0.0.0.0:80              0.0.0.0:*               LISTEN      44887/nginx: master
[root@localhost sbin]# 
```

有master、worker两个进程说明启动成功

2.6 设置nginx开机启动

用yum命令安装会自动创建nginx.service文件，使用源码编译安装的，需要手动创建nginx.service服务文件。

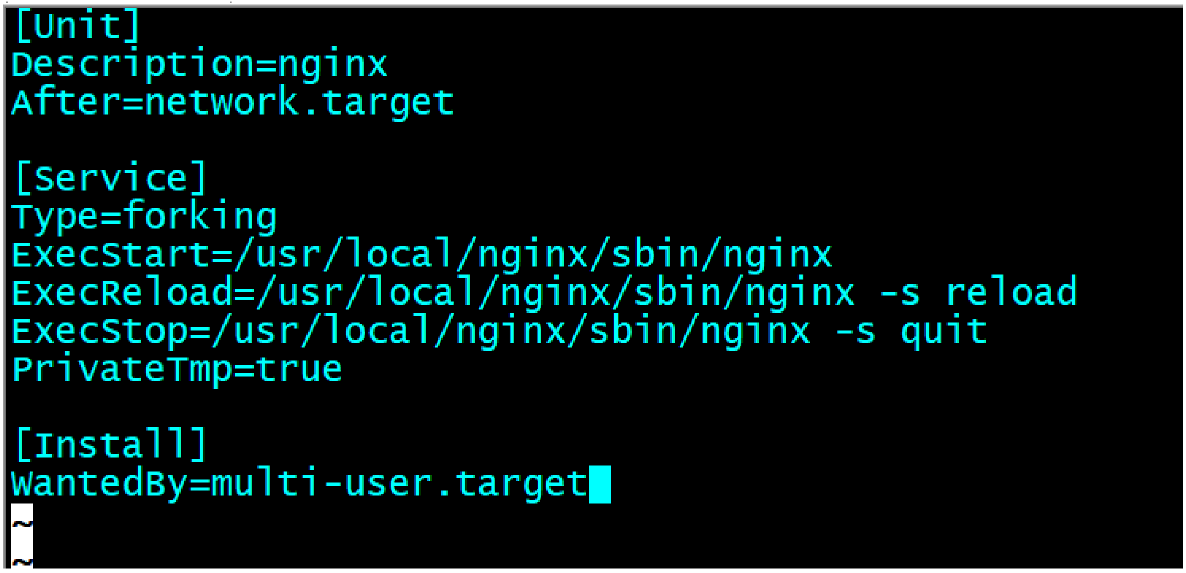
开机没有登陆情况下就能运行的程序，存在系统服务（system）里： cd /lib/systemd/system



```
[root@localhost system]# pwd
/lib/systemd/system
[root@localhost system]# ls
arp-ethers.service                      lvm2-lvmetad.socket                          suspend.target
auditd.service                          lvm2-lvmpolld.service                        swap.target
autovt@.service                         lvm2-lvmpolld.socket                         sys-fs-fuse-connections.mount
basic.target                            lvm2-monitor.service                         sysinit.target
basic.target.wants                      lvm2-pvscan@.service                         sysinit.target.wants
blk-availability.service                machine.slice                                sys-kernel-config.mount
bluetooth.target                        machines.target                              sys-kernel-debug.mount
brandbot.path                           messagebus.service                           syslog.socket
```

① 创建nginx.service文件

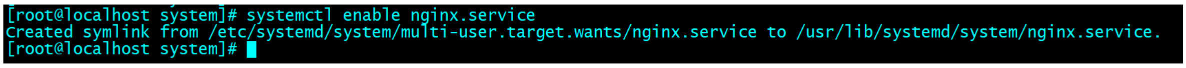
vi /lib/systemd/system/nginx.service



```
[Unit]
Description=nginx
After=network.target

[Service]
Type=forking
ExecStart=/usr/local/nginx/sbin/nginx
ExecReload=/usr/local/nginx/sbin/nginx -s reload
ExecStop=/usr/local/nginx/sbin/nginx -s quit
PrivateTmp=true

[Install]
WantedBy=multi-user.target
~
~
```

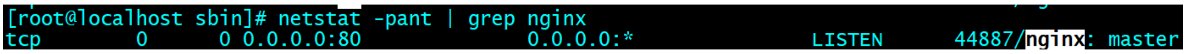
② 设置开机启动

systemctl enable nginx.service



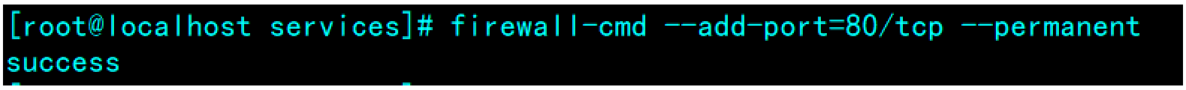
```
[root@localhost system]# systemctl enable nginx.service
Created symlink from /etc/systemd/system/multi-user.target.wants/nginx.service to /usr/lib/systemd/system/nginx.service.
[root@localhost system]# 
```

2.7 开放防火墙端口



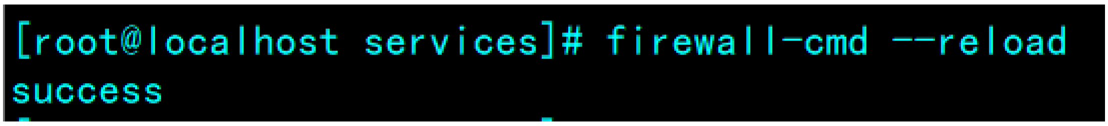
```
[root@localhost sbin]# netstat -pant | grep nginx
tcp        0      0 0.0.0.0:80              0.0.0.0:*               LISTEN      44887/nginx: master
```

开放80端口



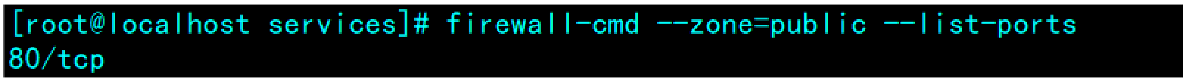
```
[root@localhost services]# firewall-cmd --add-port=80/tcp --permanent
success
```

使配置生效

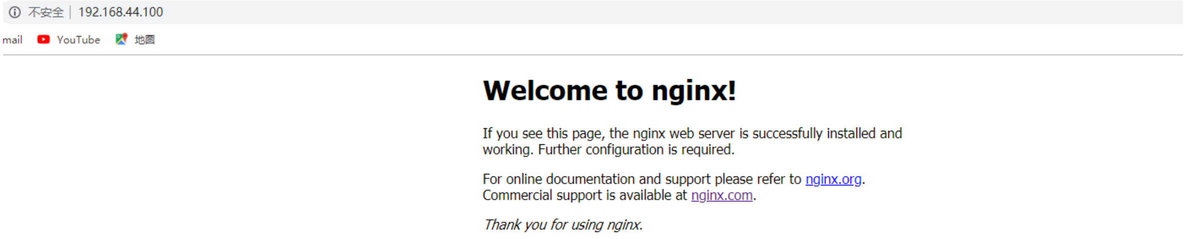


```
[root@localhost services]# firewall-cmd --reload
success
```

查看当前开放的端口



```
[root@localhost services]# firewall-cmd --zone=public --list-ports
80/tcp
```



Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

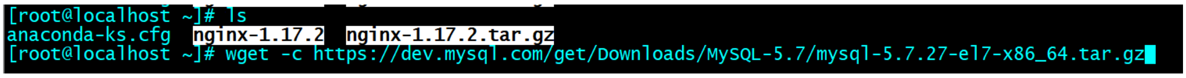
For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

Thank you for using nginx.

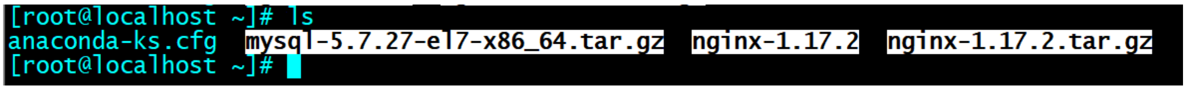
3 mysql安装

3.1 下载mysql安装包

wget -c https://dev.mysql.com/get/Downloads/MySQL-5.7/mysql-5.7.27-el7-x86_64.tar.gz



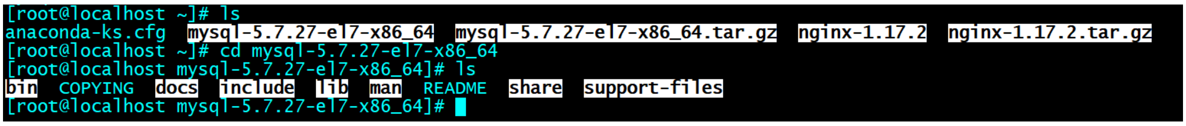
```
[root@localhost ~]# ls
anaconda-ks.cfg  nginx-1.17.2  nginx-1.17.2.tar.gz
[root@localhost ~]# wget -c https://dev.mysql.com/get/Downloads/MySQL-5.7/mysql-5.7.27-el7-x86_64.tar.gz
```



```
[root@localhost ~]# ls
anaconda-ks.cfg  mysql-5.7.27-el7-x86_64.tar.gz  nginx-1.17.2  nginx-1.17.2.tar.gz
[root@localhost ~]# 
```

3.2 解压文件

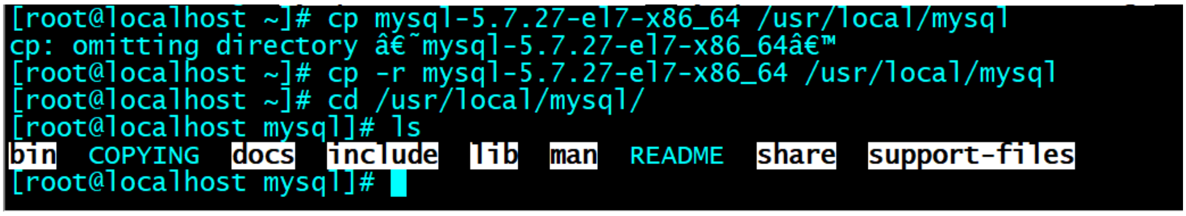
tar -zvxf mysql-5.7.27-el7-x86_64.tar.gz



```
[root@localhost ~]# ls
anaconda-ks.cfg  mysql-5.7.27-el7-x86_64  mysql-5.7.27-el7-x86_64.tar.gz  nginx-1.17.2  nginx-1.17.2.tar.gz
[root@localhost ~]# cd mysql-5.7.27-el7-x86_64
[root@localhost mysql-5.7.27-el7-x86_64]# ls
bin  COPYING  docs  include  lib  man  README  share  support-files
[root@localhost mysql-5.7.27-el7-x86_64]# 
```

将解压文件拷贝到/usr/local/mysql 目录

cp mysql-5.7.27-el7-x86_64 /usr/local/mysql

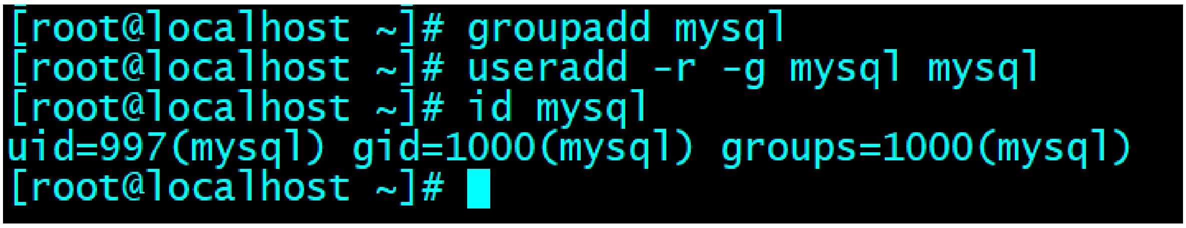


```
[root@localhost ~]# cp mysql-5.7.27-el7-x86_64 /usr/local/mysql
cp: omitting directory â€˜mysql-5.7.27-el7-x86_64â€™
[root@localhost ~]# cp -r mysql-5.7.27-el7-x86_64 /usr/local/mysql
[root@localhost ~]# cd /usr/local/mysql/
[root@localhost mysql]# ls
bin  COPYING  docs  include  lib  man  README  share  support-files
[root@localhost mysql]# 
```

3.3 添加系统mysql组和mysql用户

groupadd mysql

useradd -r -g mysql myslq

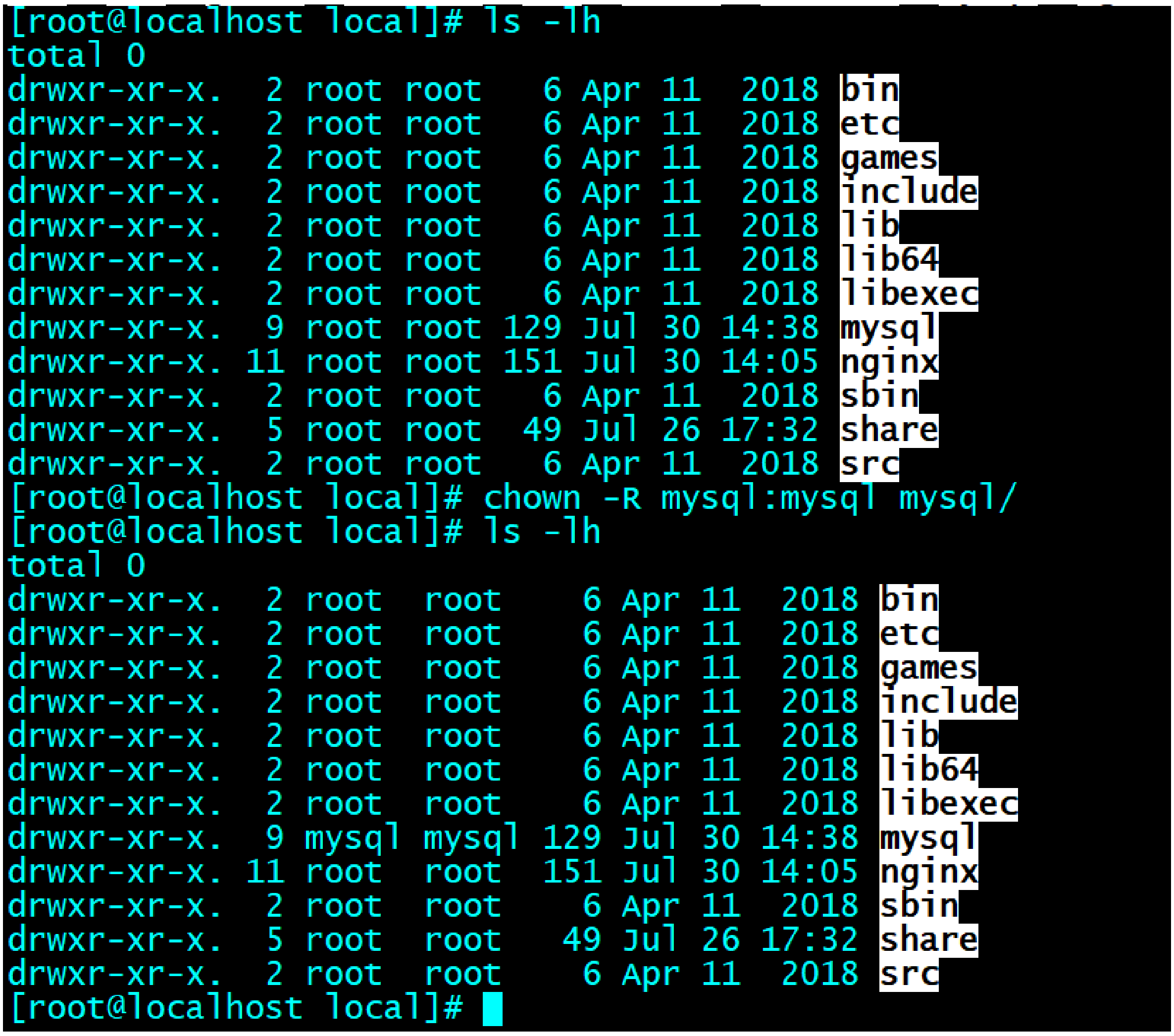


```
[root@localhost ~]# groupadd mysql
[root@localhost ~]# useradd -r -g mysql mysql
[root@localhost ~]# id mysql
uid=997(mysql) gid=1000(mysql) groups=1000(mysql)
[root@localhost ~]# 
```

3.4 安装mysql数据库

修改mysql目录拥有者为mysql用户

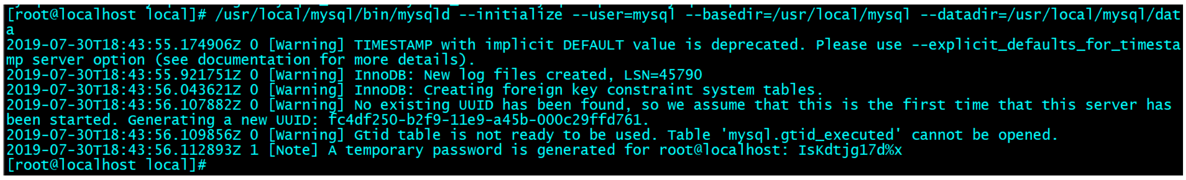
chown -R mysql:mysql mysql/



```
[root@localhost local]# ls -lh
total 0
drwxr-xr-x.  2 root root   6 Apr 11  2018 bin
drwxr-xr-x.  2 root root   6 Apr 11  2018 etc
drwxr-xr-x.  2 root root   6 Apr 11  2018 games
drwxr-xr-x.  2 root root   6 Apr 11  2018 include
drwxr-xr-x.  2 root root   6 Apr 11  2018 lib
drwxr-xr-x.  2 root root   6 Apr 11  2018 lib64
drwxr-xr-x.  2 root root   6 Apr 11  2018 libexec
drwxr-xr-x.  9 root root 129 Jul 30 14:38 mysql
drwxr-xr-x. 11 root root 151 Jul 30 14:05 nginx
drwxr-xr-x.  2 root root   6 Apr 11  2018 sbin
drwxr-xr-x.  5 root root  49 Jul 26 17:32 share
drwxr-xr-x.  2 root root   6 Apr 11  2018 src
[root@localhost local]# chown -R mysql:mysql mysql/
[root@localhost local]# ls -lh
total 0
drwxr-xr-x.  2 root  root    6 Apr 11  2018 bin
drwxr-xr-x.  2 root  root    6 Apr 11  2018 etc
drwxr-xr-x.  2 root  root    6 Apr 11  2018 games
drwxr-xr-x.  2 root  root    6 Apr 11  2018 include
drwxr-xr-x.  2 root  root    6 Apr 11  2018 lib
drwxr-xr-x.  2 root  root    6 Apr 11  2018 lib64
drwxr-xr-x.  2 root  root    6 Apr 11  2018 libexec
drwxr-xr-x.  9 mysql mysql 129 Jul 30 14:38 mysql
drwxr-xr-x. 11 root  root  151 Jul 30 14:05 nginx
drwxr-xr-x.  2 root  root    6 Apr 11  2018 sbin
drwxr-xr-x.  5 root  root   49 Jul 26 17:32 share
drwxr-xr-x.  2 root  root    6 Apr 11  2018 src
[root@localhost local]# 
```

安装

/usr/local/mysql/bin/mysqld --initialize --user=mysql --basedir=/usr/local/mysql --datadir=/usr/local/mysql/data

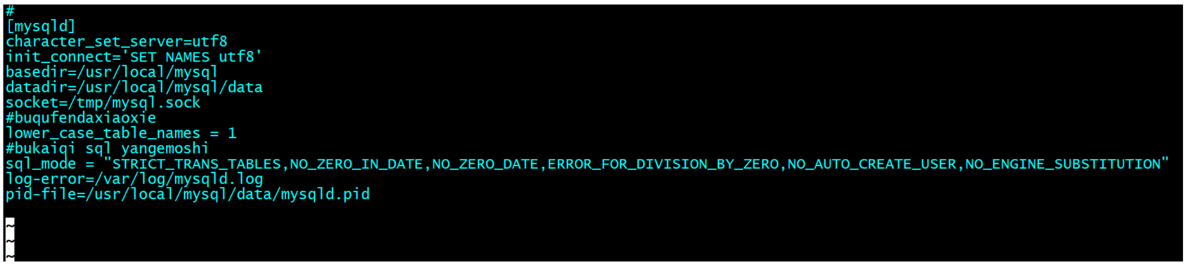


```
[root@localhost local]# /usr/local/mysql/bin/mysqld --initialize --user=mysql --basedir=/usr/local/mysql --datadir=/usr/local/mysql/dat
a
2019-07-30T18:43:55.174906Z 0 [Warning] TIMESTAMP with implicit DEFAULT value is deprecated. Please use --explicit_defaults_for_timesta
mp server option (see documentation for more details).
2019-07-30T18:43:55.921751Z 0 [Warning] InnoDB: New log files created, LSN=45790
2019-07-30T18:43:56.043621Z 0 [Warning] InnoDB: Creating foreign key constraint system tables.
2019-07-30T18:43:56.107882Z 0 [Warning] No existing UUID has been found, so we assume that this is the first time that this server has
been started. Generating a new UUID: fc4df250-b2f9-11e9-a45b-000c29ffd761.
2019-07-30T18:43:56.109856Z 0 [Warning] Gtid table is not ready to be used. Table 'mysql.gtid_executed' cannot be opened.
2019-07-30T18:43:56.112893Z 1 [Note] A temporary password is generated for root@localhost: IsKdtjg17d%x
[root@localhost local]#
```

3.5 配置mysql

配置my.cnf

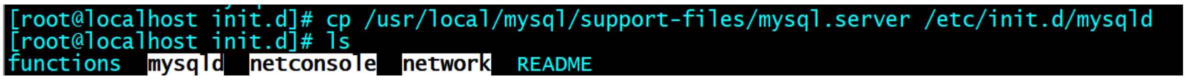
vi /etc/my.cnf



```
#
[mysqld]
character_set_server=utf8
init_connect='SET NAMES utf8'
basedir=/usr/local/mysql
datadir=/usr/local/mysql/data
socket=/tmp/mysql.sock
#buqufendaxiaoxie
lower_case_table_names = 1
#bukaiqi sql yangemoshi
sql_mode = "STRICT_TRANS_TABLES,NO_ZERO_IN_DATE,NO_ZERO_DATE,ERROR_FOR_DIVISION_BY_ZERO,NO_AUTO_CREATE_USER,NO_ENGINE_SUBSTITUTION"
log-error=/var/log/mysqld.log
pid-file=/usr/local/mysql/data/mysqld.pid

~
~
~
```

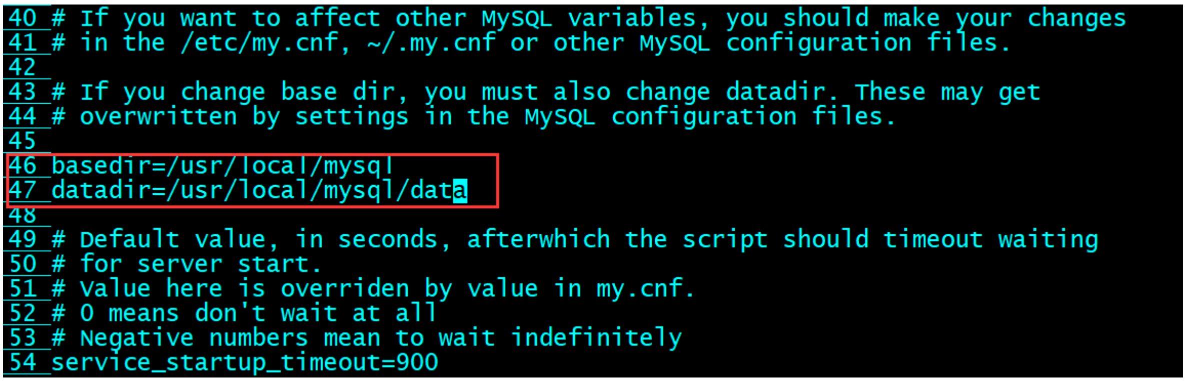
添加开启启动

cp /usr/local/mysql/support-files/mysql.server /etc/init.d/mysqld



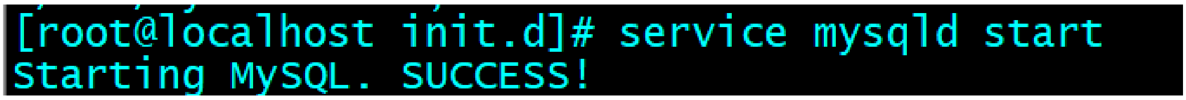
```
[root@localhost init.d]# cp /usr/local/mysql/support-files/mysql.server /etc/init.d/mysqld
[root@localhost init.d]# ls
functions  mysqld  netconsole  network  README
```

修改 vi /etc/init.d/mysqld

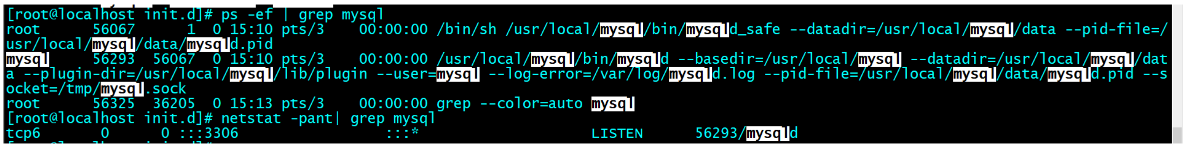


```
# If you want to affect other MySQL variables, you should make your changes
# in the /etc/my.cnf, ~/.my.cnf or other MySQL configuration files.

# If you change base dir, you must also change datadir. These may get
# overwritten by settings in the MySQL configuration files.

basedir=/usr/local/mysql
datadir=/usr/local/mysql/data

# Default value, in seconds, afterwhich the script should timeout waiting
# for server start.
# Value here is overriden by value in my.cnf.
# 0 means don't wait at all
# Negative numbers mean to wait indefinitely
service_startup_timeout=900
```

启动mysql

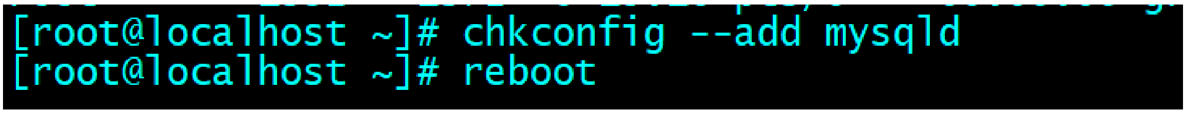


```
[root@localhost init.d]# service mysqld start
Starting MySQL. SUCCESS!
```



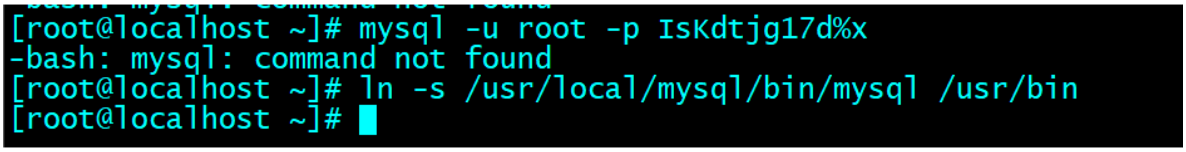
```
[root@localhost init.d]# ps -ef | grep mysql
root      56067      1  0 15:10 pts/3    00:00:00 /bin/sh /usr/local/mysql/bin/mysqld_safe --datadir=/usr/local/mysql/data --pid-file=/
usr/local/mysql/data/mysqld.pid
mysql     56293  56067  0 15:10 pts/3    00:00:00 /usr/local/mysql/bin/mysqld --basedir=/usr/local/mysql --datadir=/usr/local/mysql/dat
a --plugin-dir=/usr/local/mysql/lib/plugin --user=mysql --log-error=/var/log/mysqld.log --pid-file=/usr/local/mysql/data/mysqld.pid --s
ocket=/tmp/mysql.sock
root      56325  36205  0 15:13 pts/3    00:00:00 grep --color=auto mysql
[root@localhost init.d]# netstat -pant| grep mysql
tcp6       0      0 :::3306                 :::*                    LISTEN      56293/mysqld
```

加入开机启动



```
[root@localhost ~]# chkconfig --add mysqld
[root@localhost ~]# reboot
```

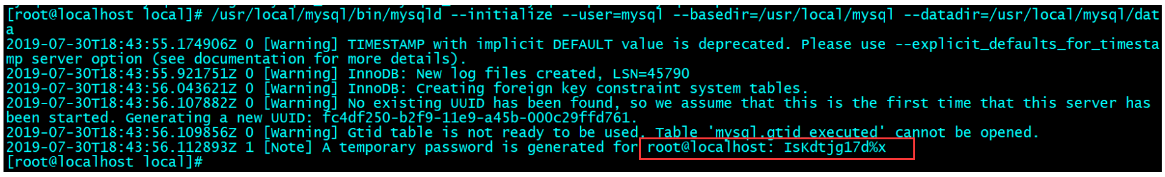
创建软连接



```
[root@localhost ~]# mysql -u root -p IsKdtjg17d%x
-bash: mysql: command not found
[root@localhost ~]# ln -s /usr/local/mysql/bin/mysql /usr/bin
[root@localhost ~]# 
```

修改初始化myslq密码

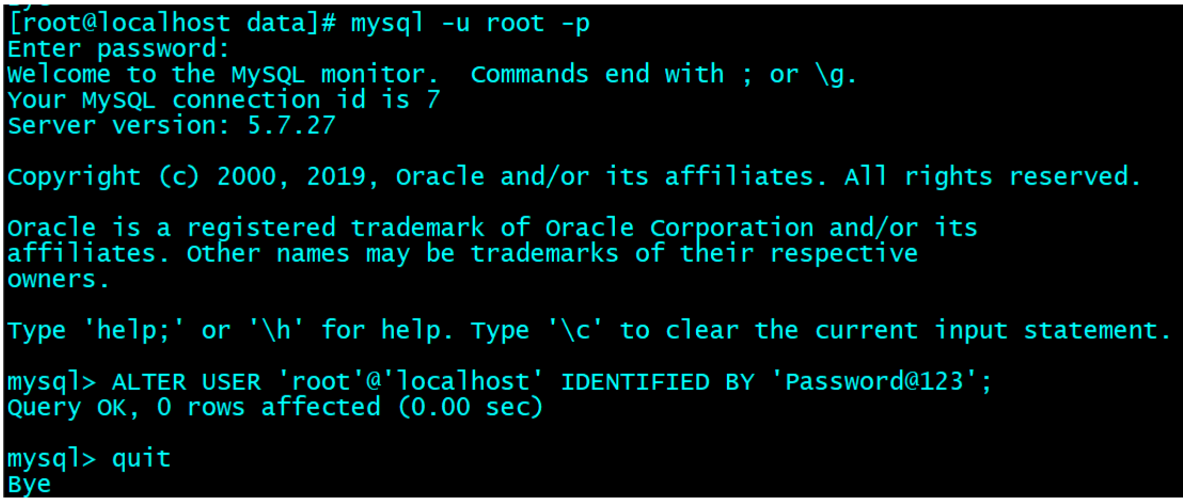
安装mysql的时候会生成一个随机的密码



```
[root@localhost local]# /usr/local/mysql/bin/mysqld --initialize --user=mysql --basedir=/usr/local/mysql --datadir=/usr/local/mysql/dat
a
2019-07-30T18:43:55.174906Z 0 [Warning] TIMESTAMP with implicit DEFAULT value is deprecated. Please use --explicit_defaults_for_timesta
mp server option (see documentation for more details).
2019-07-30T18:43:55.921751Z 0 [Warning] InnoDB: New log files created, LSN=45790
2019-07-30T18:43:56.043621Z 0 [Warning] InnoDB: Creating foreign key constraint system tables.
2019-07-30T18:43:56.107882Z 0 [Warning] No existing UUID has been found, so we assume that this is the first time that this server has
been started. Generating a new UUID: fc4df250-b2f9-11e9-a45b-000c29ffd761.
2019-07-30T18:43:56.109856Z 0 [Warning] Gtid table is not ready to be used. Table 'mysql.gtid_executed' cannot be opened.
2019-07-30T18:43:56.112893Z 1 [Note] A temporary password is generated for root@localhost: IsKdtjg17d%x
[root@localhost local]#
```

修改root密码

ALTER USER 'root'@'localhost' IDENTIFIED BY 'Password@123';



```
[root@localhost data]# mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 7
Server version: 5.7.27

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> ALTER USER 'root'@'localhost' IDENTIFIED BY 'Password@123';
Query OK, 0 rows affected (0.00 sec)

mysql> quit
Bye
```
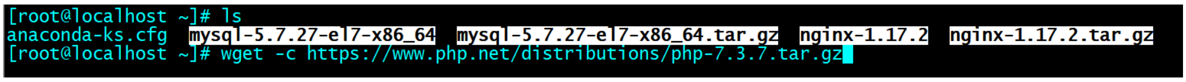

4 php

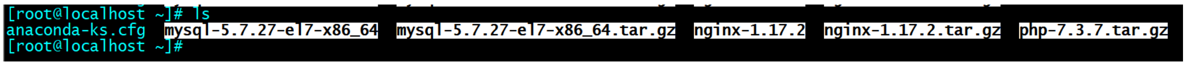
php-fqm，只用与PHP，是一个PHPFastCGI管理器，CGI(公共网关接口),是外部应用程序（CGI程序）与Web服务器之间的接口标准，是在CGI程序和Web服务器之间传递信息的过程。

4.1 下载php安装包

wget -c https://www.php.net/distributions/php-7.3.7.tar.gz



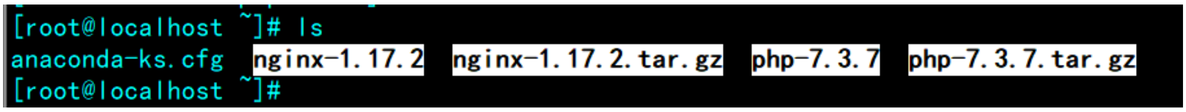
```
[root@localhost ~]# ls
anaconda-ks.cfg  mysql-5.7.27-el7-x86_64  mysql-5.7.27-el7-x86_64.tar.gz  nginx-1.17.2  nginx-1.17.2.tar.gz
[root@localhost ~]# wget -c https://www.php.net/distributions/php-7.3.7.tar.gz
```



```
[root@localhost ~]# ls
anaconda-ks.cfg  mysql-5.7.27-el7-x86_64  mysql-5.7.27-el7-x86_64.tar.gz  nginx-1.17.2  nginx-1.17.2.tar.gz  php-7.3.7.tar.gz
[root@localhost ~]#
```

4.2 解压

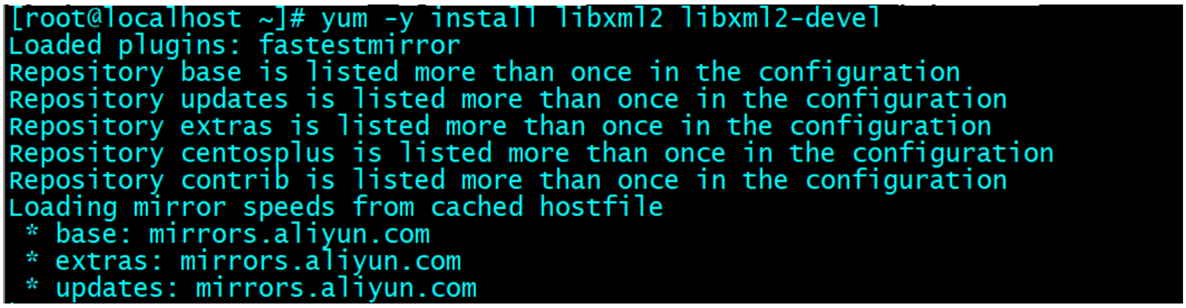
tar -xvzf php-7.3.7.tar.gz



```
[root@localhost ~]# ls
anaconda-ks.cfg  nginx-1.17.2  nginx-1.17.2.tar.gz  php-7.3.7  php-7.3.7.tar.gz
[root@localhost ~]#
```

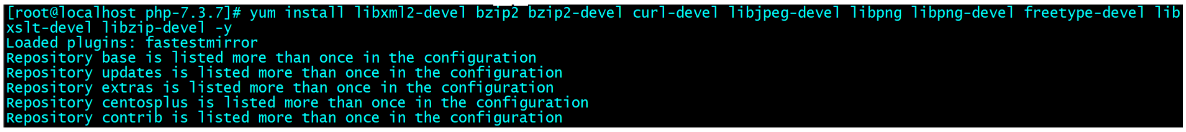
4.3 安装依赖包

yum -y install libxml2 libxml2-devel



```
[root@localhost ~]# yum -y install libxml2 libxml2-devel
Loaded plugins: fastestmirror
Repository base is listed more than once in the configuration
Repository updates is listed more than once in the configuration
Repository extras is listed more than once in the configuration
Repository centosplus is listed more than once in the configuration
Repository contrib is listed more than once in the configuration
Loading mirror speeds from cached hostfile
 * base: mirrors.aliyun.com
 * extras: mirrors.aliyun.com
 * updates: mirrors.aliyun.com
```

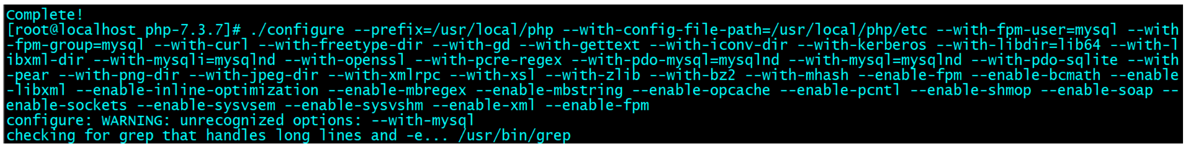
yum install libxml2-devel bzip2 bzip2-devel curl-devel libjpeg-devel libpng libpng-devel freetype-devel libxslt-devel libzip-devel -y



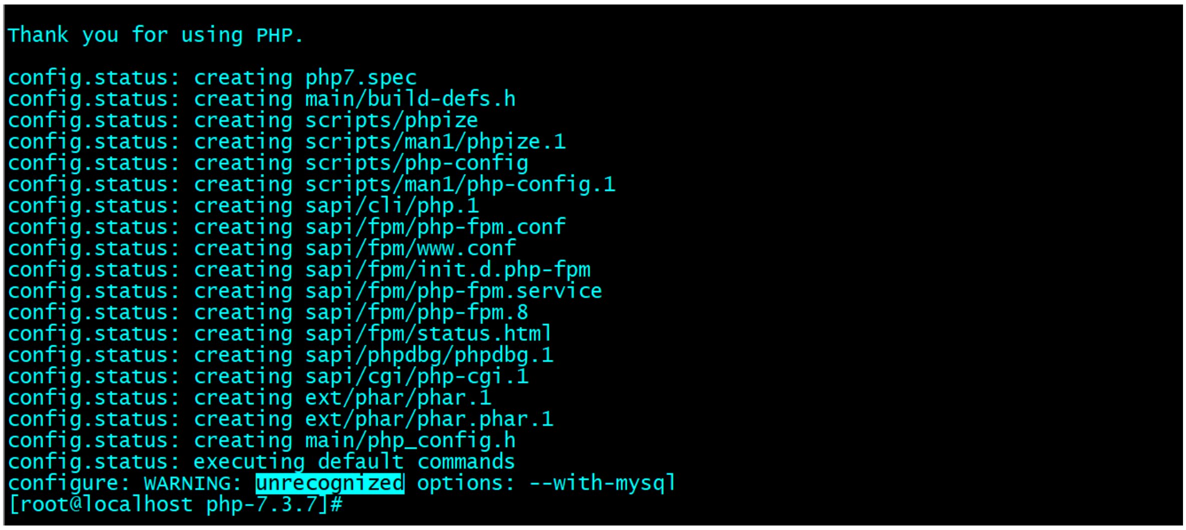
```
[root@localhost php-7.3.7]# yum install libxml2-devel bzip2 bzip2-devel curl-devel libjpeg-devel libpng libpng-devel freetype-devel lib
xslt-devel libzip-devel -y
Loaded plugins: fastestmirror
Repository base is listed more than once in the configuration
Repository updates is listed more than once in the configuration
Repository extras is listed more than once in the configuration
Repository centosplus is listed more than once in the configuration
Repository contrib is listed more than once in the configuration
```

4.4 参数配置

./configure --prefix=/usr/local/php --with-config-file-path=/usr/local/php/etc --with-fpm-user=mysql --with-fpm-group=mysql --with-curl --with-freetype-dir --with-gd --with-gettext --with-iconv-dir --with-kerberos --with-libdir=lib64 --with-libxml-dir --with-mysqli=mysqlnd --with-openssl --with-pcre-regex --with-pdo-mysql=mysqlnd --with-mysql=mysqlnd --with-pdo-sqlite --with-pear --with-png-dir --with-jpeg-dir --with-xmlrpc --with-xsl --with-zlib --with-bz2 --with-mhash --enable-fpm --enable-bcmath --enable-libxml --enable-inline-optimization --enable-mbregex --enable-mbstring --enable-opcache --enable-pcntl --enable-shmop --enable-soap --enable-sockets --enable-sysvsem --enable-sysvshm --enable-xml --enable-fpm

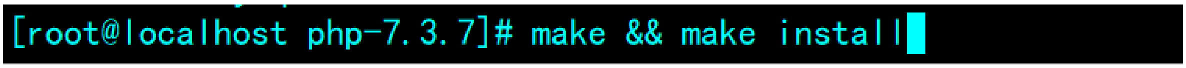


```
Complete!
[root@localhost php-7.3.7]# ./configure --prefix=/usr/local/php --with-config-file-path=/usr/local/php/etc --with-fpm-user=mysql --with
-fpm-group=mysql --with-curl --with-freetype-dir --with-gd --with-gettext --with-iconv-dir --with-kerberos --with-libdir=lib64 --with-l
ibxml-dir --with-mysqli=mysqlnd --with-openssl --with-pcre-regex --with-pdo-mysql=mysqlnd --with-mysql=mysqlnd --with-pdo-sqlite --with
-pear --with-png-dir --with-jpeg-dir --with-xmlrpc --with-xsl --with-zlib --with-bz2 --with-mhash --enable-fpm --enable-bcmath --enable
-libxml --enable-inline-optimization --enable-mbregex --enable-mbstring --enable-opcache --enable-pcntl --enable-shmop --enable-soap --
enable-sockets --enable-sysvsem --enable-sysvshm --enable-xml --enable-fpm
configure: WARNING: unrecognized options: --with-mysql
checking for grep that handles long lines and -e... /usr/bin/grep
```

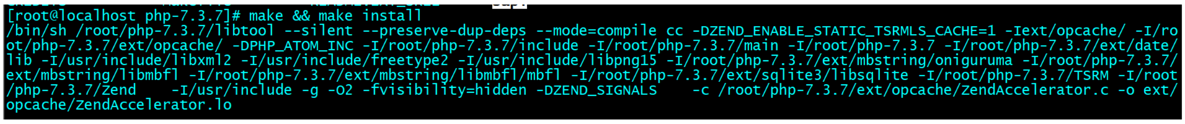


```
Thank you for using PHP.

config.status: creating php7.spec
config.status: creating main/build-defs.h
config.status: creating scripts/phpize
config.status: creating scripts/man1/phpize.1
config.status: creating scripts/php-config
config.status: creating scripts/man1/php-config.1
config.status: creating sapi/cli/php.1
config.status: creating sapi/fpm/php-fpm.conf
config.status: creating sapi/fpm/www.conf
config.status: creating sapi/fpm/init.d.php-fpm
config.status: creating sapi/fpm/php-fpm.service
config.status: creating sapi/fpm/php-fpm.8
config.status: creating sapi/fpm/status.html
config.status: creating sapi/phpdbg/phpdbg.1
config.status: creating sapi/cgi/php-cgi.1
config.status: creating ext/phar/phar.1
config.status: creating ext/phar/phar.phar.1
config.status: creating main/php_config.h
config.status: executing default commands
configure: WARNING: unrecognized options: --with-mysql
[root@localhost php-7.3.7]#
```

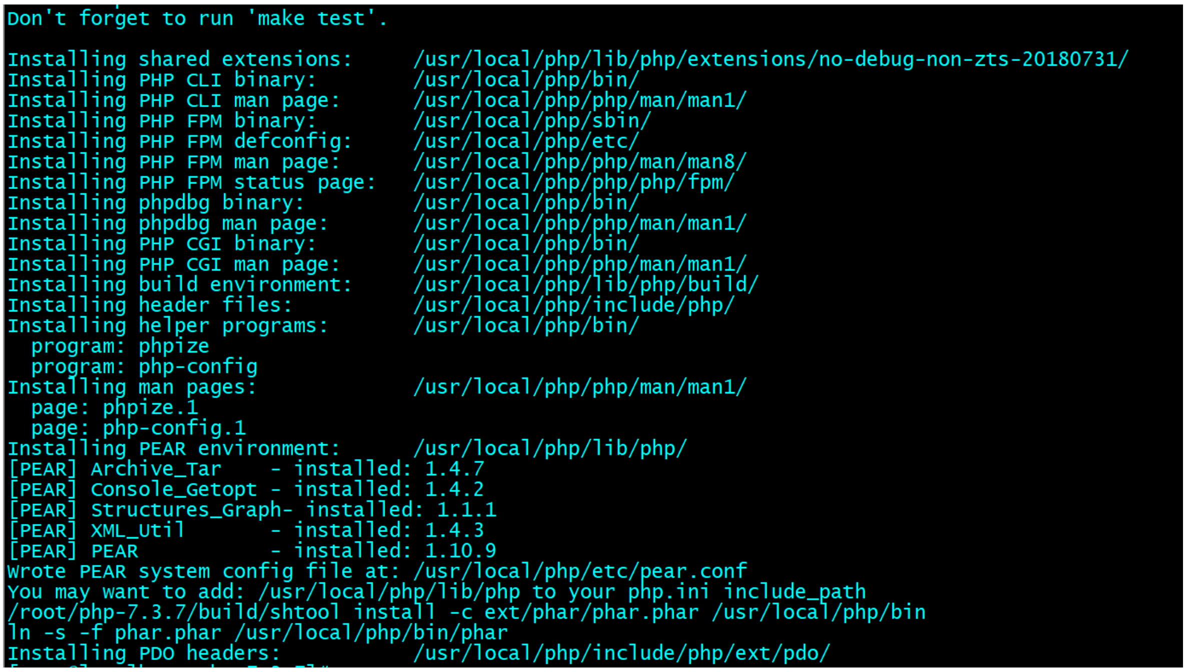
4.5 安装



```
[root@localhost php-7.3.7]# make && make install
```



```
[root@localhost php-7.3.7]# make && make install
/bin/sh /root/php-7.3.7/libtool --silent --preserve-dup-deps --mode=compile cc -DZEND_ENABLE_STATIC_TSRMLS_CACHE=1 -Iext/opcache/ -I/ro
ot/php-7.3.7/ext/opcache/ -DPHP_ATOM_INC -I/root/php-7.3.7/include -I/root/php-7.3.7/main -I/root/php-7.3.7 -I/root/php-7.3.7/ext/date/
lib -I/usr/include/libxml2 -I/usr/include/freetype2 -I/usr/include/libpng15 -I/root/php-7.3.7/ext/mbstring/oniguruma -I/root/php-7.3.7/
ext/mbstring/libmbfl -I/root/php-7.3.7/ext/mbstring/libmbfl/mbfl -I/root/php-7.3.7/ext/sqlite3/libsqlite -I/root/php-7.3.7/TSRM -I/root
/php-7.3.7/Zend    -I/usr/include -g -O2 -fvisibility=hidden -DZEND_SIGNALS    -c /root/php-7.3.7/ext/opcache/ZendAccelerator.c -o ext/
opcache/ZendAccelerator.lo
```



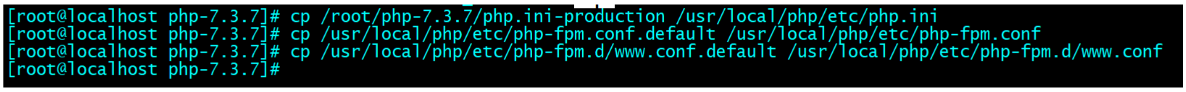
```
Don't forget to run 'make test'.

Installing shared extensions:     /usr/local/php/lib/php/extensions/no-debug-non-zts-20180731/
Installing PHP CLI binary:        /usr/local/php/bin/
Installing PHP CLI man page:      /usr/local/php/php/man/man1/
Installing PHP FPM binary:        /usr/local/php/sbin/
Installing PHP FPM defconfig:     /usr/local/php/etc/
Installing PHP FPM man page:      /usr/local/php/php/man/man8/
Installing PHP FPM status page:   /usr/local/php/php/php/fpm/
Installing phpdbg binary:         /usr/local/php/bin/
Installing phpdbg man page:       /usr/local/php/php/man/man1/
Installing PHP CGI binary:        /usr/local/php/bin/
Installing PHP CGI man page:      /usr/local/php/php/man/man1/
Installing build environment:     /usr/local/php/lib/php/build/
Installing header files:          /usr/local/php/include/php/
Installing helper programs:       /usr/local/php/bin/
  program: phpize
  program: php-config
Installing man pages:             /usr/local/php/php/man/man1/
  page: phpize.1
  page: php-config.1
Installing PEAR environment:      /usr/local/php/lib/php/
[PEAR] Archive_Tar    - installed: 1.4.7
[PEAR] Console_Getopt - installed: 1.4.2
[PEAR] Structures_Graph- installed: 1.1.1
[PEAR] XML_Util       - installed: 1.4.3
[PEAR] PEAR           - installed: 1.10.9
Wrote PEAR system config file at: /usr/local/php/etc/pear.conf
You may want to add: /usr/local/php/lib/php to your php.ini include_path
/root/php-7.3.7/build/shtool install -c ext/phar/phar.phar /usr/local/php/bin
ln -s -f phar.phar /usr/local/php/bin/phar
Installing PDO headers:           /usr/local/php/include/php/ext/pdo/
```

4.6 配置

cp /root/php-7.3.7/php.ini-production /usr/local/php/etc/php.ini

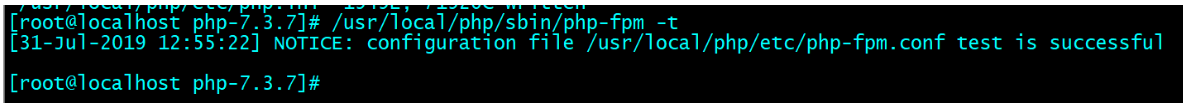
cp /usr/local/php/etc/php-fpm.conf.default /usr/local/php/etc/php-fpm.conf

cp /usr/local/php/etc/php-fpm.d/www.conf.default /usr/local/php/etc/php-fpm.d/www.conf



```
[root@localhost php-7.3.7]# cp /root/php-7.3.7/php.ini-production /usr/local/php/etc/php.ini
[root@localhost php-7.3.7]# cp /usr/local/php/etc/php-fpm.conf.default /usr/local/php/etc/php-fpm.conf
[root@localhost php-7.3.7]# cp /usr/local/php/etc/php-fpm.d/www.conf.default /usr/local/php/etc/php-fpm.d/www.conf
[root@localhost php-7.3.7]#
```

测试php-fpm

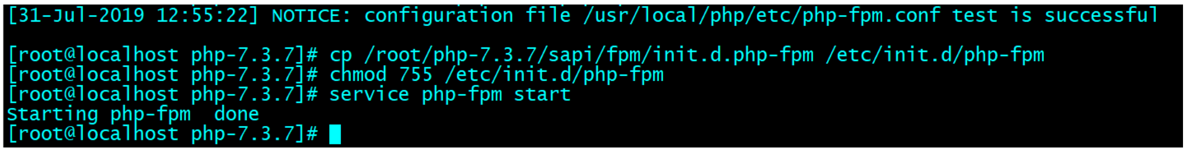


```
[root@localhost php-7.3.7]# /usr/local/php/sbin/php-fpm -t
[31-Jul-2019 12:55:22] NOTICE: configuration file /usr/local/php/etc/php-fpm.conf test is successful

[root@localhost php-7.3.7]#
```

拷贝启动文件

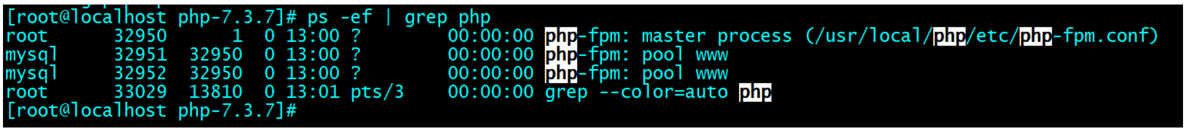
cp /root/php-7.3.7/sapi/fpm/init.d.php-fpm /etc/init.d/php-fpm

chmod php-fpm start



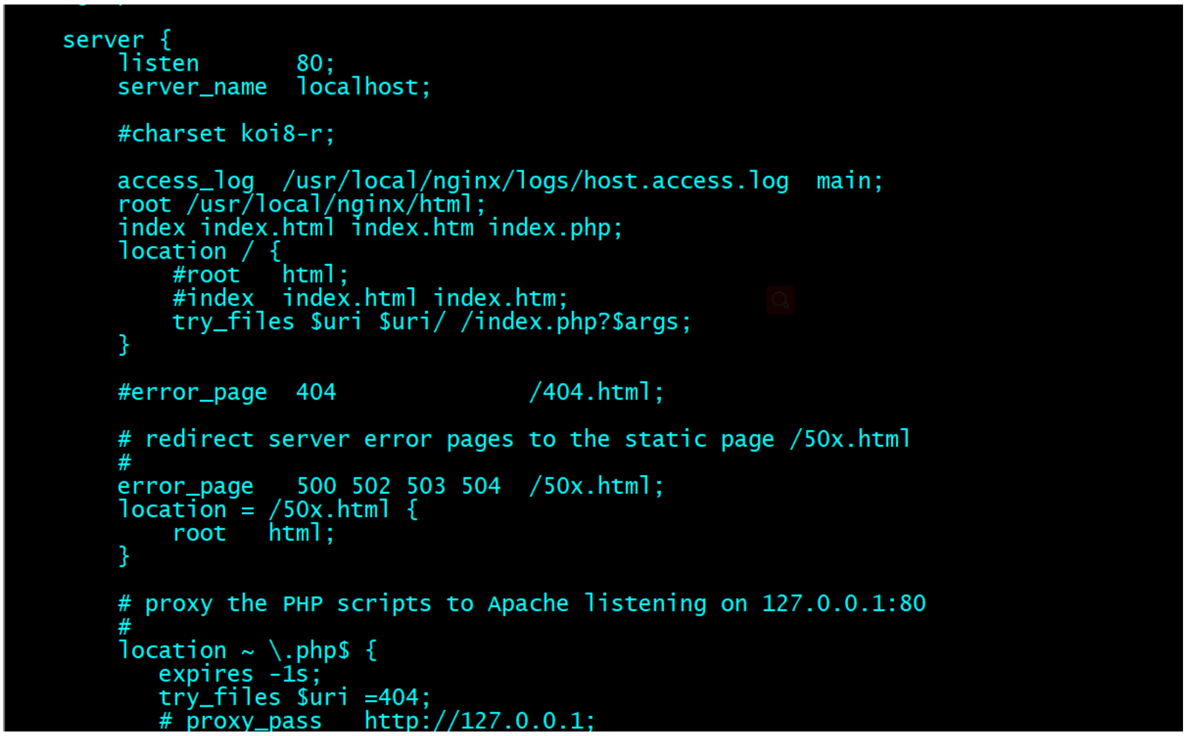
```
[31-Jul-2019 12:55:22] NOTICE: configuration file /usr/local/php/etc/php-fpm.conf test is successful

[root@localhost php-7.3.7]# cp /root/php-7.3.7/sapi/fpm/init.d.php-fpm /etc/init.d/php-fpm
[root@localhost php-7.3.7]# chmod 755 /etc/init.d/php-fpm
[root@localhost php-7.3.7]# service php-fpm start
Starting php-fpm  done
[root@localhost php-7.3.7]#
```

查询启动状态



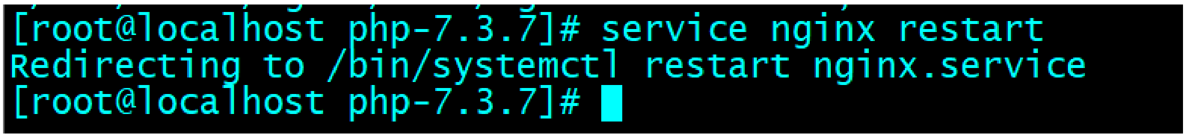
```
[root@localhost php-7.3.7]# ps -ef | grep php
root      32950      1  0 13:00 ?        00:00:00 php-fpm: master process (/usr/local/php/etc/php-fpm.conf)
mysql     32951  32950  0 13:00 ?        00:00:00 php-fpm: pool www
mysql     32952  32950  0 13:00 ?        00:00:00 php-fpm: pool www
root      33029  13810  0 13:01 pts/3    00:00:00 grep --color=auto php
[root@localhost php-7.3.7]#
```

配置nginx可解析.php文件



```
    server {
        listen       80;
        server_name  localhost;

        #charset koi8-r;

        access_log  /usr/local/nginx/logs/host.access.log  main;
        root /usr/local/nginx/html;
        index index.html index.htm index.php;
        location / {
            #root   html;
            #index  index.html index.htm;
            try_files $uri $uri/ /index.php?$args;
        }

        #error_page  404              /404.html;

        # redirect server error pages to the static page /50x.html
        #
        error_page   500 502 503 504  /50x.html;
        location = /50x.html {
            root   html;
        }

        # proxy the PHP scripts to Apache listening on 127.0.0.1:80
        #
        location ~ \.php$ {
           expires -1s;
           try_files $uri =404;
           # proxy_pass   http://127.0.0.1;
```

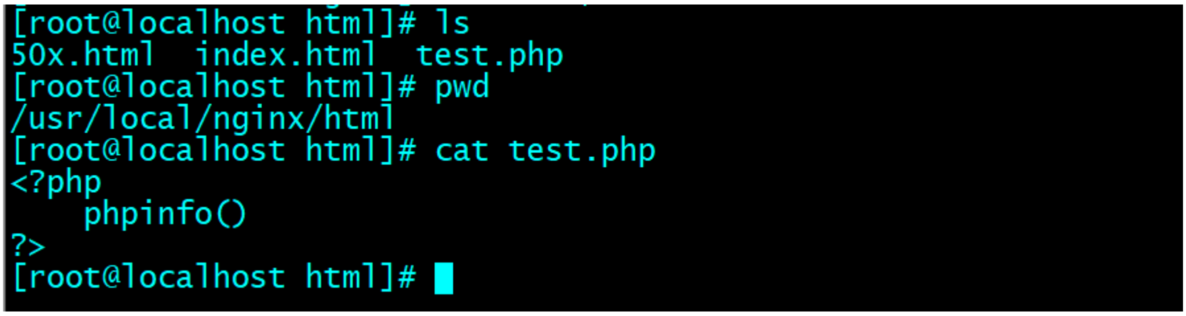
重启nginx



```
[root@localhost php-7.3.7]# service nginx restart
Redirecting to /bin/systemctl restart nginx.service
[root@localhost php-7.3.7]# 
```

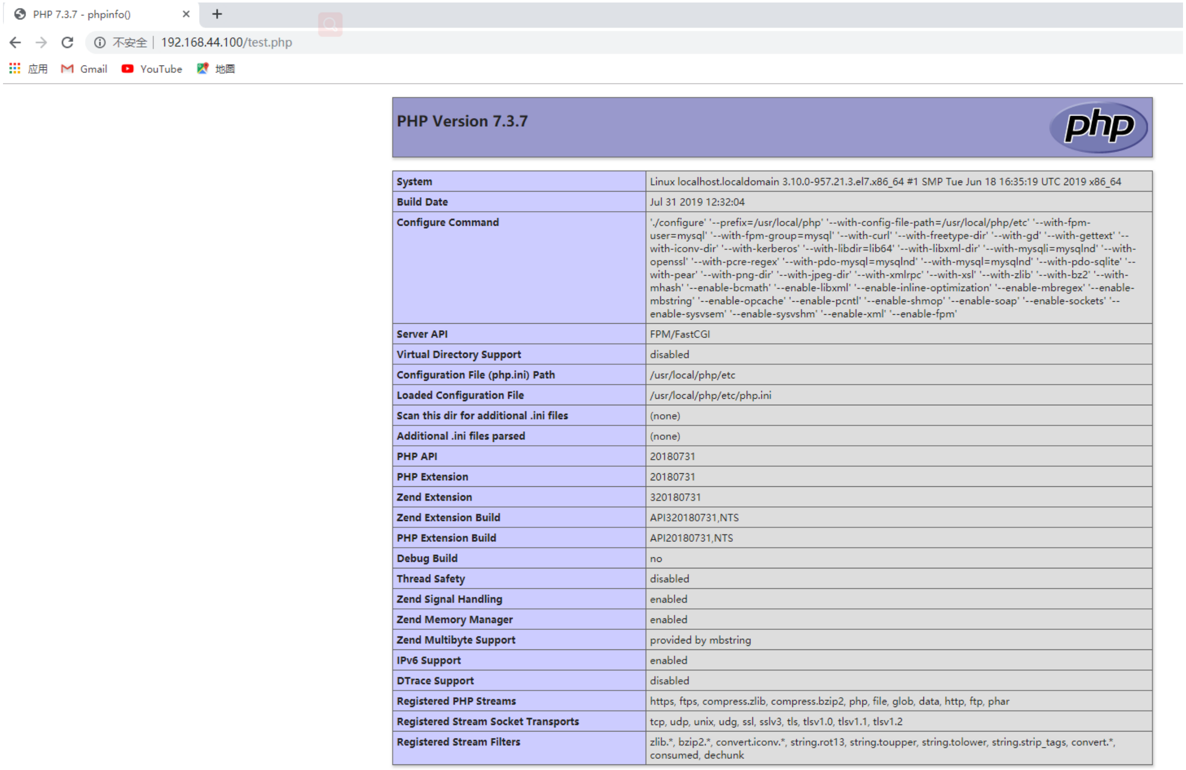
测试

vi /usr/local/nginx/html/test.php



```
[root@localhost html]# ls
50x.html  index.html  test.php
[root@localhost html]# pwd
/usr/local/nginx/html
[root@localhost html]# cat test.php
<?php
    phpinfo()
?>
[root@localhost html]# 
```

得到php配置说明nginx解析php成功



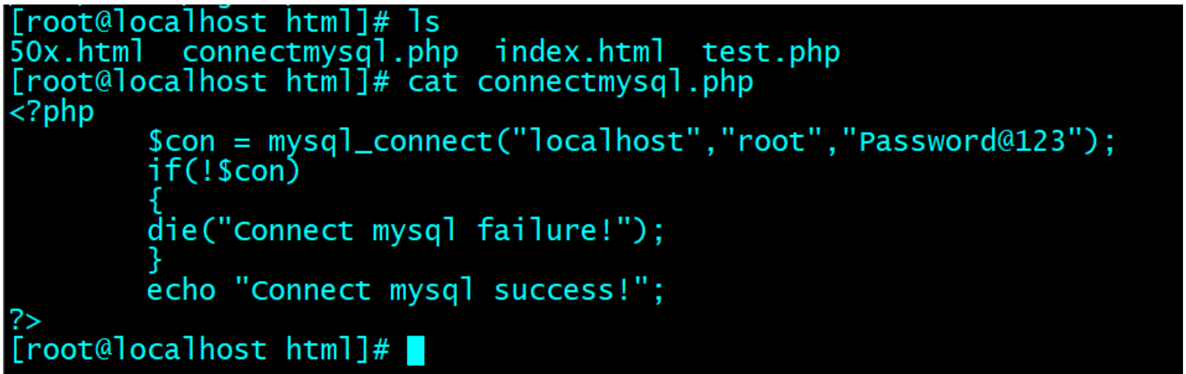
PHP Version 7.3.7

System	Linux localhost.localdomain 3.10.0-957.21.3.el7.x86_64 #1 SMP Tue Jun 18 16:35:19 UTC 2019 x86_64
Build Date	Jul 31 2019 12:32:04
Configure Command	'./configure' '--prefix=/usr/local/php' '--with-config-file-path=/usr/local/php/etc' '--with-fpm-user=mysql' '--with-fpm-group=mysql' '--with-curl' '--with-freetype-dir' '--with-gd' '--with-gettext' '--with-iconv-dir' '--with-kerberos' '--with-libdir=lib64' '--with-libxml-dir' '--with-mysqli=mysqlnd' '--with-openssl' '--with-pcre-regex' '--with-pdo-mysql=mysqlnd' '--with-mysql=mysqlnd' '--with-pdo-sqlite' '--with-pear' '--with-png-dir' '--with-jpeg-dir' '--with-xmlrpc' '--with-xsl' '--with-zlib' '--with-bz2' '--with-mhash' '--enable-bcmath' '--enable-libxml' '--enable-inline-optimization' '--enable-mbregex' '--enable-mbstring' '--enable-opcache' '--enable-pcntl' '--enable-shmop' '--enable-soap' '--enable-sockets' '--enable-sysvsem' '--enable-sysvshm' '--enable-xml' '--enable-fpm'
Server API	FPM/FastCGI
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/usr/local/php/etc
Loaded Configuration File	/usr/local/php/etc/php.ini
Scan this dir for additional .ini files	(none)
Additional .ini files parsed	(none)
PHP API	20180731
PHP Extension	20180731
Zend Extension	320180731
Zend Extension Build	API320180731,NTS
PHP Extension Build	API20180731,NTS
Debug Build	no
Thread Safety	disabled
Zend Signal Handling	enabled
Zend Memory Manager	enabled
Zend Multibyte Support	provided by mbstring
IPv6 Support	enabled
DTrace Support	disabled
Registered PHP Streams	https, ftps, compress.zlib, compress.bzip2, php, file, glob, data, http, ftp, phar
Registered Stream Socket Transports	tcp, udp, unix, udg, ssl, sslv3, tls, tlsv1.0, tlsv1.1, tlsv1.2
Registered Stream Filters	zlib.*, bzip2.*, convert.iconv.*, string.rot13, string.toupper, string.tolower, string.strip_tags, convert.*, consumed, dechunk

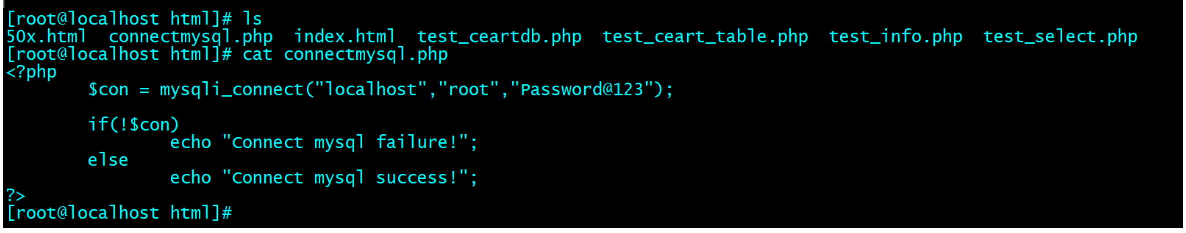
5 php连接mysql的语句

测试代码

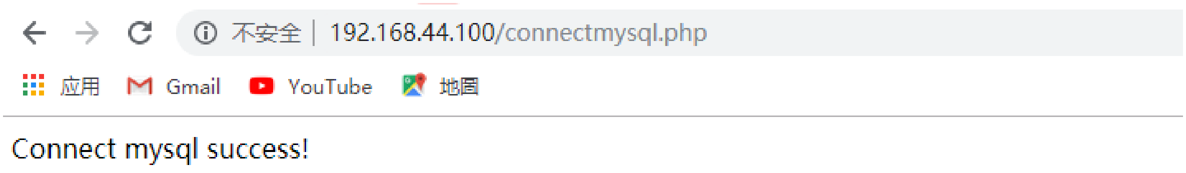
连接数据库



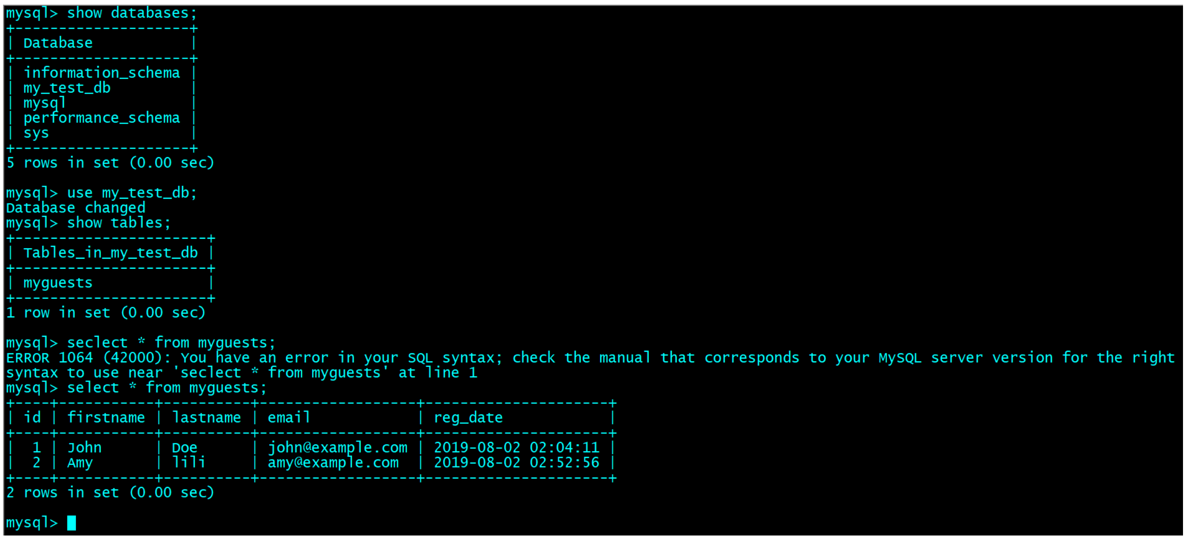
```
[root@localhost html]# ls
50x.html  connectmysql.php  index.html  test.php
[root@localhost html]# cat connectmysql.php
<?php
        $con = mysql_connect("localhost","root","Password@123");
        if(!$con)
        {
        die("Connect mysql failure!");
        }
        echo "Connect mysql success!";
?>
[root@localhost html]# 
```



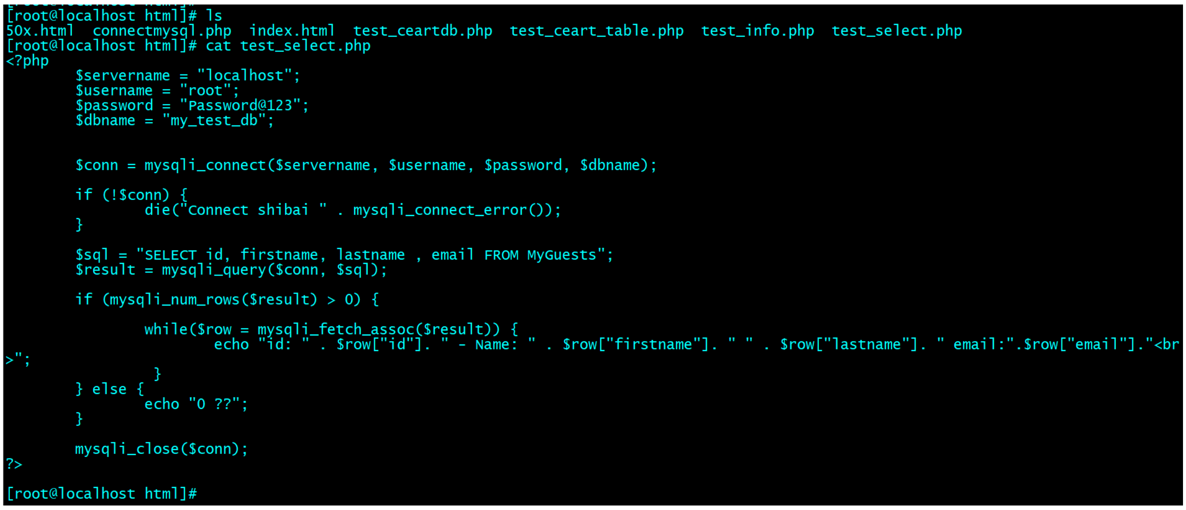
```
[root@localhost html]# ls
50x.html  connectmysql.php  index.html  test_ceartdb.php  test_ceart_table.php  test_info.php  test_select.php
[root@localhost html]# cat connectmysql.php
<?php
        $con = mysqli_connect("localhost","root","Password@123");

        if(!$con)
                echo "Connect mysql failure!";
        else
                echo "Connect mysql success!";
?>
[root@localhost html]#
```



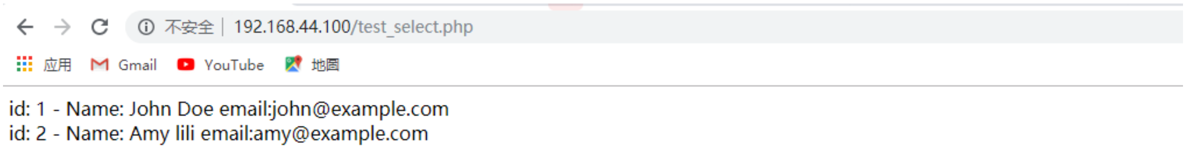
Connect mysql success!



```
mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| my_test_db         |
| mysql              |
| performance_schema |
| sys                |
+--------------------+
5 rows in set (0.00 sec)

mysql> use my_test_db;
Database changed
mysql> show tables;
+----------------------+
| Tables_in_my_test_db |
+----------------------+
| myguests             |
+----------------------+
1 row in set (0.00 sec)

mysql> seclect * from myguests;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right
syntax to use near 'seclect * from myguests' at line 1
mysql> select * from myguests;
+----+-----------+----------+-------------------+---------------------+
| id | firstname | lastname | email             | reg_date            |
+----+-----------+----------+-------------------+---------------------+
|  1 | John      | Doe      | john@example.com  | 2019-08-02 02:04:11 |
|  2 | Amy       | lili     | amy@example.com   | 2019-08-02 02:52:56 |
+----+-----------+----------+-------------------+---------------------+
2 rows in set (0.00 sec)

mysql> 
```



```
[root@localhost html]# ls
50x.html  connectmysql.php  index.html  test_ceartdb.php  test_ceart_table.php  test_info.php  test_select.php
[root@localhost html]# cat test_select.php
<?php
        $servername = "localhost";
        $username = "root";
        $password = "Password@123";
        $dbname = "my_test_db";


        $conn = mysqli_connect($servername, $username, $password, $dbname);

        if (!$conn) {
                die("Connect shibai " . mysqli_connect_error());
        }

        $sql = "SELECT id, firstname, lastname , email FROM MyGuests";
        $result = mysqli_query($conn, $sql);

        if (mysqli_num_rows($result) > 0) {

                while($row = mysqli_fetch_assoc($result)) {
                        echo "id: " . $row["id"]. " - Name: " . $row["firstname"]. " " . $row["lastname"]. " email:".$row["email"]."<br
>";
                 }
        } else {
                echo "0 ??";
        }

        mysqli_close($conn);
?>

[root@localhost html]#
```



id: 1 - Name: John Doe email:john@example.com
id: 2 - Name: Amy lili email:amy@example.com

5 安全加固

在进行渗透测试的时候，攻击者一定会进行各种类型的扫描，扫描服务器对外开放的端口、服务以及相应服务的版本号，根据这些信息，攻击者能更有针对性的进行渗透，减少不必要的对外开放的端口、服务，屏蔽回显标识能避免暴露更多的信息给攻击者，增加攻击者的攻击成本，可以用以下的手段进行加固：

5.1 操作系统加固

开启系统防火墙，只开放必要的端口，这里以我的实验环境为例子，对外只开放80、22端口；**

service firewalld start #开启防火墙

systemctl start firewalld.service #开机自动启动

service firewalld status #查看当前防火墙运行状态

firewall-cmd --list-all #查看防火墙状态

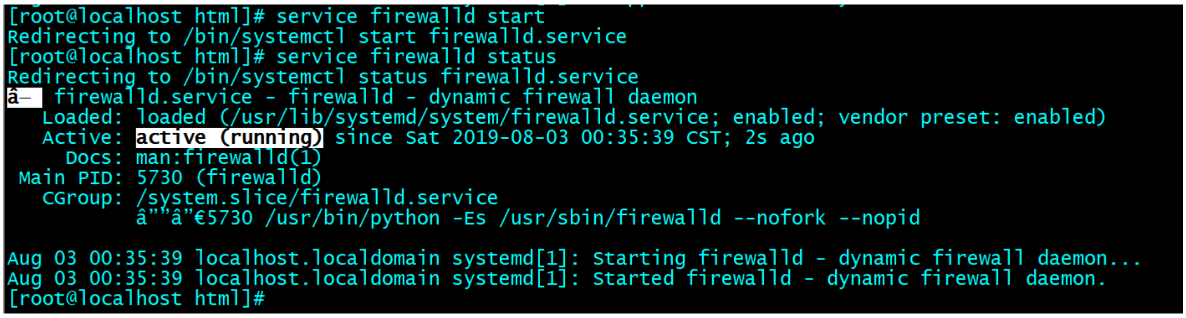
firewall-cmd --list-ports #查看当前开放的端口

firewall-cmd --list-service #查看当前开放的服务

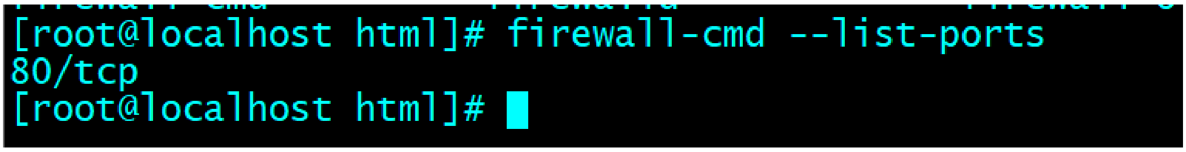
firewall-cmd --reload #更新防火墙规则

firewall-cmd --remove-service=dhcpv6-client #阻止服务

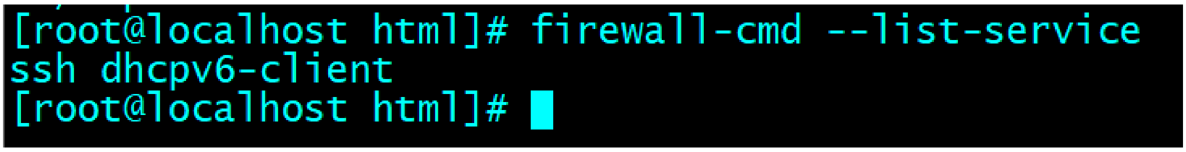
firewall-cmd --remove-port=80/tcp #阻止端口



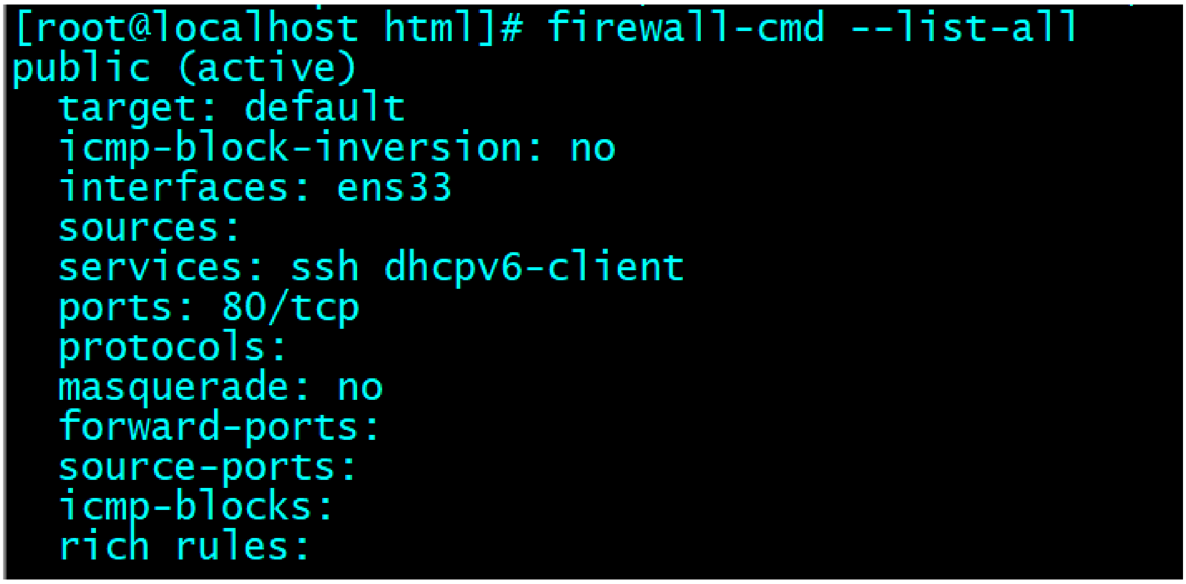
```
[root@localhost html]# service firewalld start
Redirecting to /bin/systemctl start firewalld.service
[root@localhost html]# service firewalld status
Redirecting to /bin/systemctl status firewalld.service
â— firewalld.service - firewalld - dynamic firewall daemon
   Loaded: loaded (/usr/lib/systemd/system/firewalld.service; enabled; vendor preset: enabled)
   Active: active (running) since Sat 2019-08-03 00:35:39 CST; 2s ago
     Docs: man:firewalld(1)
 Main PID: 5730 (firewalld)
   CGroup: /system.slice/firewalld.service
           â””â”€5730 /usr/bin/python -Es /usr/sbin/firewalld --nofork --nopid

Aug 03 00:35:39 localhost.localdomain systemd[1]: Starting firewalld - dynamic firewall daemon...
Aug 03 00:35:39 localhost.localdomain systemd[1]: Started firewalld - dynamic firewall daemon.
[root@localhost html]#
```



```
[root@localhost html]# firewall-cmd --list-ports
80/tcp
[root@localhost html]# 
```



```
[root@localhost html]# firewall-cmd --list-service
ssh dhcpv6-client
[root@localhost html]# 
```

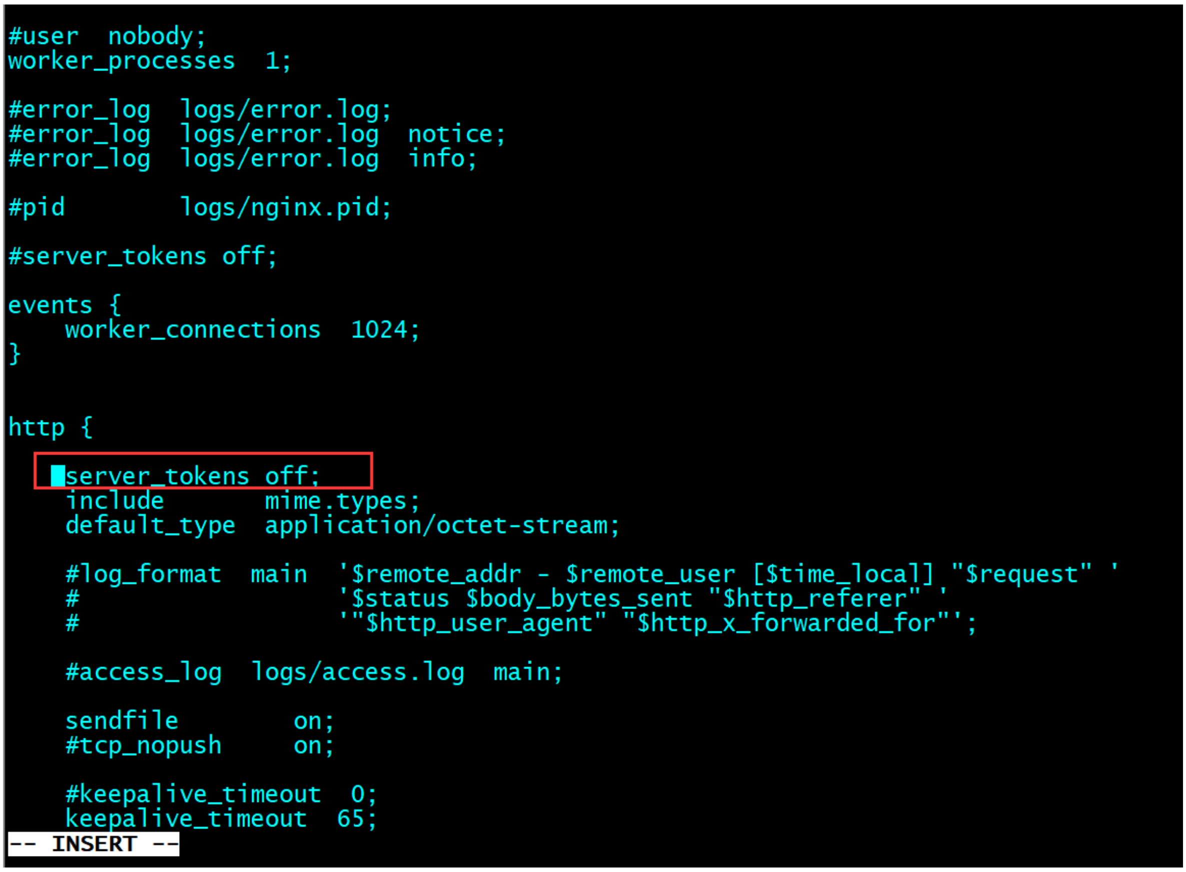


```
[root@localhost html]# firewall-cmd --list-all
public (active)
  target: default
  icmp-block-inversion: no
  interfaces: ens33
  sources:
  services: ssh dhcpv6-client
  ports: 80/tcp
  protocols:
  masquerade: no
  forward-ports:
  source-ports:
  icmp-blocks:
  rich rules:
```

5.1 nginx安全加固

1 隐藏nginx版本号

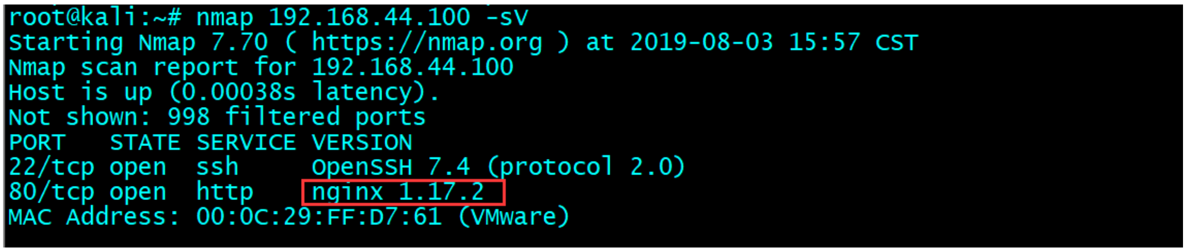
修改nginx配置文件



```
#user  nobody;
worker_processes  1;

#error_log  logs/error.log;
#error_log  logs/error.log  notice;
#error_log  logs/error.log  info;

#pid        logs/nginx.pid;

#server_tokens off;

events {
    worker_connections  1024;
}


http {

    server_tokens off;
    include       mime.types;
    default_type  application/octet-stream;

    #log_format  main  '$remote_addr - $remote_user [$time_local] "$request" '
    #                  '$status $body_bytes_sent "$http_referer" '
    #                  '"$http_user_agent" "$http_x_forwarded_for"';

    #access_log  logs/access.log  main;

    sendfile        on;
    #tcp_nopush     on;

    #keepalive_timeout  0;
    keepalive_timeout  65;
-- INSERT --
```

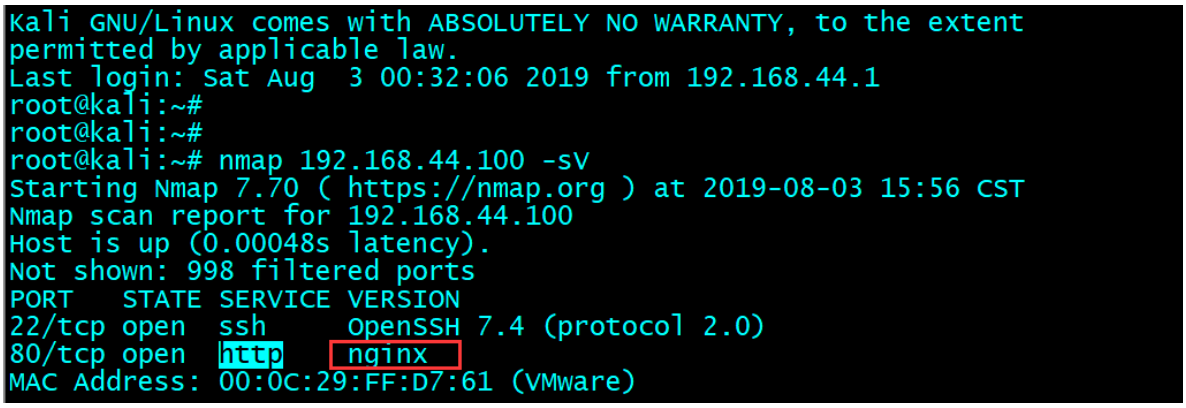
使用nmap进行验证

未修改前



```
root@kali:~# nmap 192.168.44.100 -sV
Starting Nmap 7.70 ( https://nmap.org ) at 2019-08-03 15:57 CST
Nmap scan report for 192.168.44.100
Host is up (0.00038s latency).
Not shown: 998 filtered ports
PORT   STATE SERVICE VERSION
22/tcp open  ssh     OpenSSH 7.4 (protocol 2.0)
80/tcp open  http    nginx 1.17.2
MAC Address: 00:0C:29:FF:D7:61 (VMware)
```

修改后

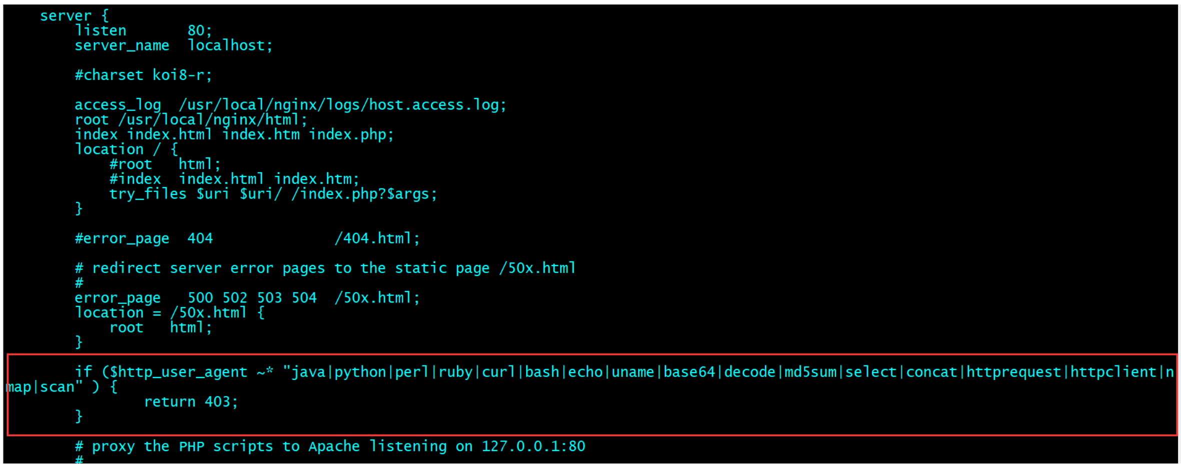


```
Kali GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Sat Aug  3 00:32:06 2019 from 192.168.44.1
root@kali:~#
root@kali:~#
root@kali:~# nmap 192.168.44.100 -sV
Starting Nmap 7.70 ( https://nmap.org ) at 2019-08-03 15:56 CST
Nmap scan report for 192.168.44.100
Host is up (0.00048s latency).
Not shown: 998 filtered ports
PORT   STATE SERVICE VERSION
22/tcp open  ssh     OpenSSH 7.4 (protocol 2.0)
80/tcp open  http    nginx
MAC Address: 00:0C:29:FF:D7:61 (VMware)
```

2 过滤user-agent

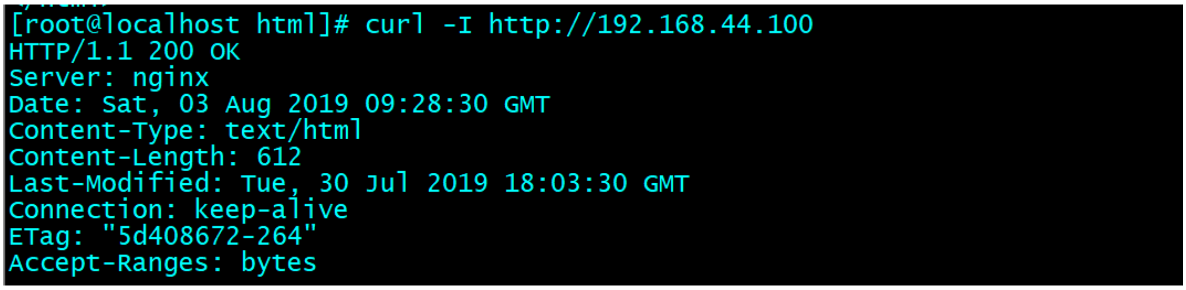
user-agent 也即浏览器标识，每个正常的web请求都包含用户的浏览器信息，除非经过伪装，恶意扫描工具一般都会在user-agent里留下某些特征字眼，比如scan，nmap等。我们可以用正则匹配这些字眼，从而达到过滤的目的，请根据需要调整。

配置nginx.conf



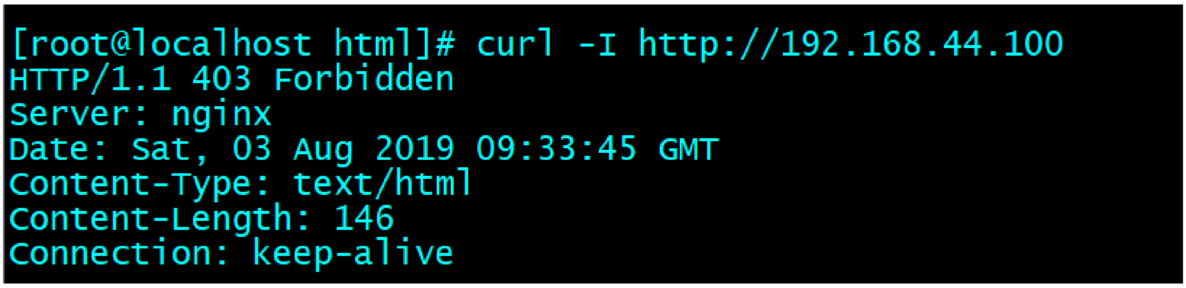
```
    server {
        listen       80;
        server_name  localhost;

        #charset koi8-r;

        access_log  /usr/local/nginx/logs/host.access.log;
        root /usr/local/nginx/html;
        index index.html index.htm index.php;
        location / {
            #root   html;
            #index  index.html index.htm;
            try_files $uri $uri/ /index.php?$args;
        }

        #error_page  404              /404.html;

        # redirect server error pages to the static page /50x.html
        #
        error_page   500 502 503 504  /50x.html;
        location = /50x.html {
            root   html;
        }

        if ($http_user_agent ~* "java|python|perl|ruby|curl|bash|echo|uname|base64|decode|md5sum|select|concat|httprequest|httpclient|n
map|scan" ) {
                return 403;
        }
        # proxy the PHP scripts to Apache listening on 127.0.0.1:80
        #
```

配置前效果



```
[root@localhost html]# curl -I http://192.168.44.100
HTTP/1.1 200 OK
Server: nginx
Date: Sat, 03 Aug 2019 09:28:30 GMT
Content-Type: text/html
Content-Length: 612
Last-Modified: Tue, 30 Jul 2019 18:03:30 GMT
Connection: keep-alive
ETag: "5d408672-264"
Accept-Ranges: bytes
```

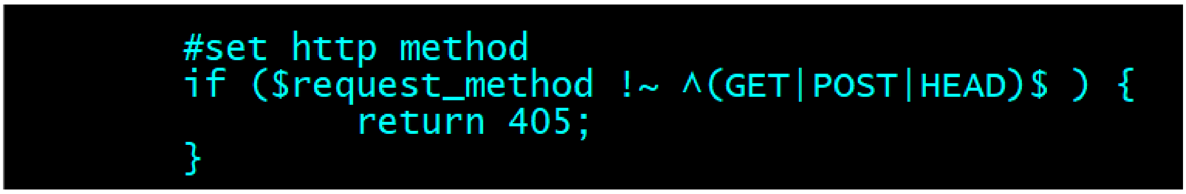
配置后效果



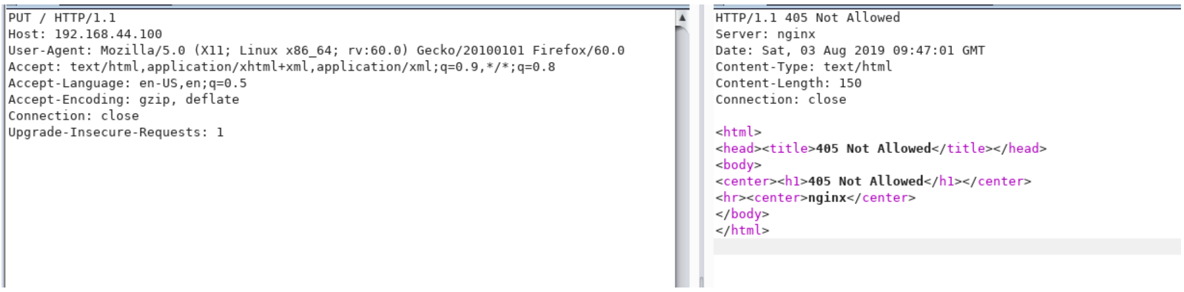
```
[root@localhost html]# curl -I http://192.168.44.100
HTTP/1.1 403 Forbidden
Server: nginx
Date: Sat, 03 Aug 2019 09:33:45 GMT
Content-Type: text/html
Content-Length: 146
Connection: keep-alive
```

3 封杀特定的http方法和行为

配置nginx.conf



```
        #set http method
        if ($request_method !~ ^(GET|POST|HEAD)$ ) {
                return 405;
        }
```



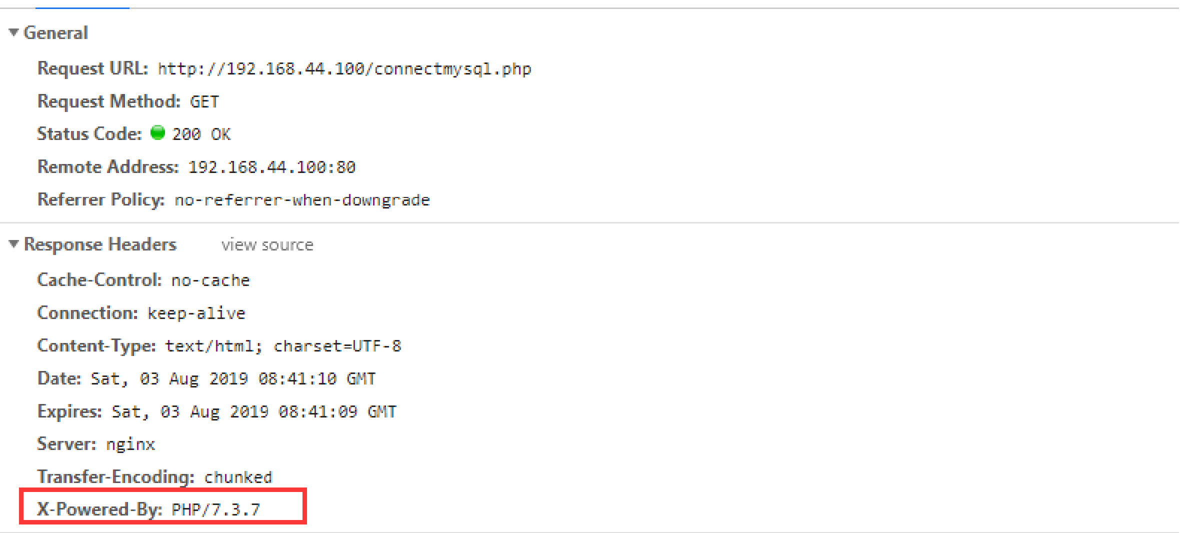
```
PUT / HTTP/1.1
Host: 192.168.44.100
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:60.0) Gecko/20100101 Firefox/60.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: close
Upgrade-Insecure-Requests: 1
```

```
HTTP/1.1 405 Not Allowed
Server: nginx
Date: Sat, 03 Aug 2019 09:47:01 GMT
Content-Type: text/html
Content-Length: 150
Connection: close

<html>
<head><title>405 Not Allowed</title></head>
<body>
<center><h1>405 Not Allowed</h1></center>
<hr><center>nginx</center>
</body>
</html>
```

5.2 php安全加固

1 隐藏PHP版本号

PHP 配置默认允许服务器在 HTTP 响应头 `X-Powered-By` 中显示安装在服务器上的 PHP 版本，如下所示：

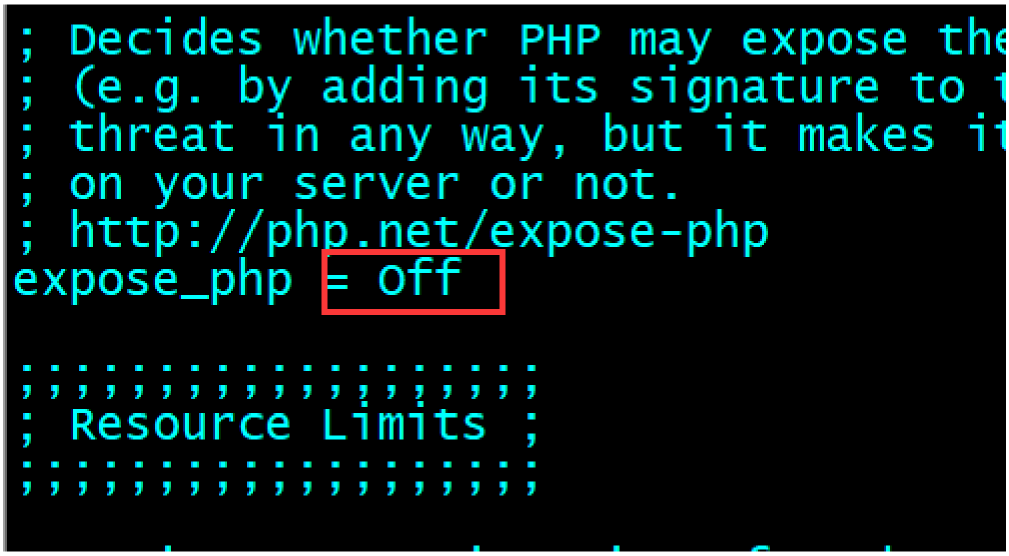


```
▼ General
    Request URL: http://192.168.44.100/connectmysql.php
    Request Method: GET
    Status Code: ● 200 OK
    Remote Address: 192.168.44.100:80
    Referrer Policy: no-referrer-when-downgrade
▼ Response Headers     view source
    Cache-Control: no-cache
    Connection: keep-alive
    Content-Type: text/html; charset=UTF-8
    Date: Sat, 03 Aug 2019 08:41:10 GMT
    Expires: Sat, 03 Aug 2019 08:41:09 GMT
    Server: nginx
    Transfer-Encoding: chunked
    X-Powered-By: PHP/7.3.7
```

可以对PHP版本号进行隐藏，避免暴露已知版本存在的漏洞

修改php配置文件，把expose_php 设置成Off

vi /usr/local/php/etc/php.ini

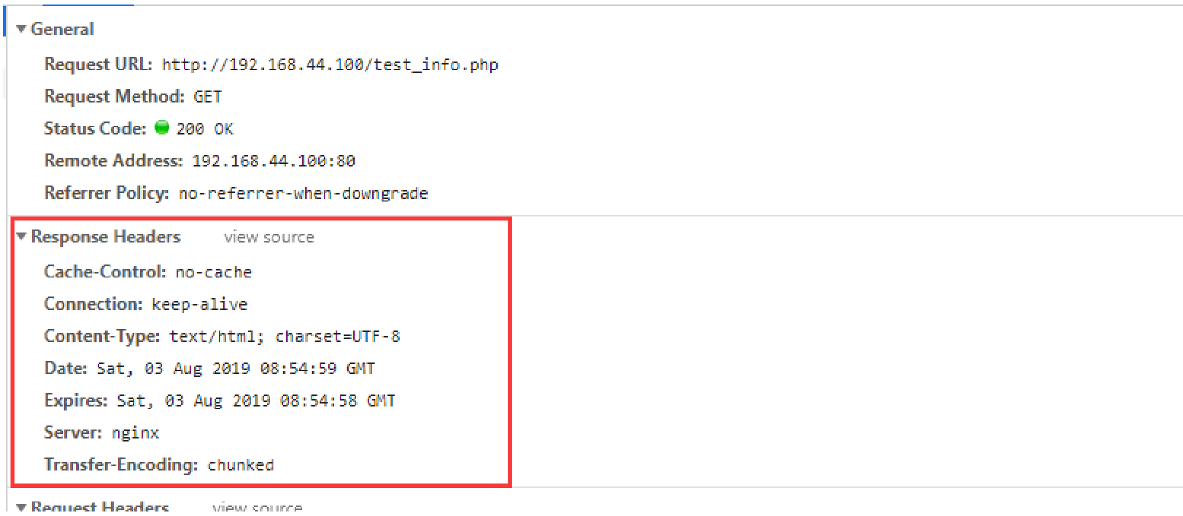


```
; Decides whether PHP may expose the
; (e.g. by adding its signature to t
; threat in any way, but it makes it
; on your server or not.
; http://php.net/expose-php
expose_php = Off

;;;;;;;;;;;;;;;;;;;
; Resource Limits ;
;;;;;;;;;;;;;;;;;;;
```

重启php-fpm/nginx服务

service php-fpm restart

service nginx restart



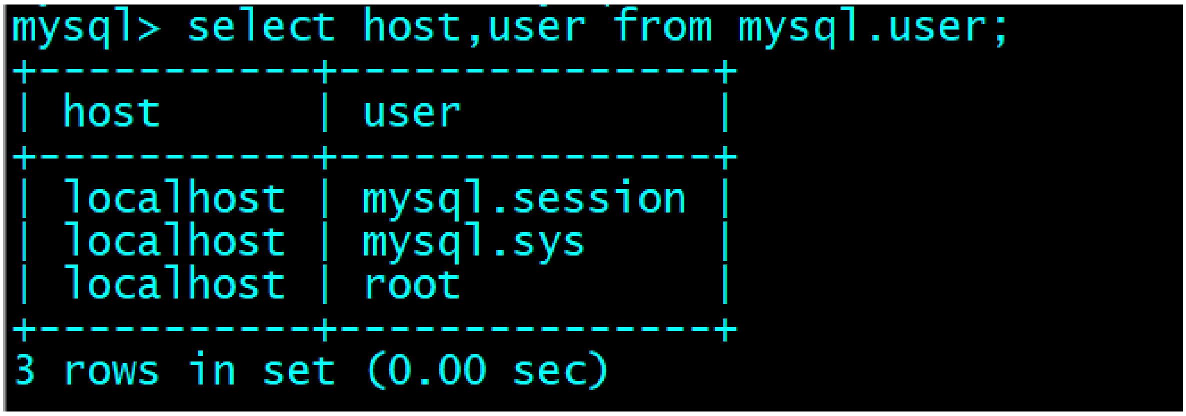
Request URL: http://192.168.44.100/test_info.php
Request Method: GET
Status Code: ● 200 OK
Remote Address: 192.168.44.100:80
Referrer Policy: no-referrer-when-downgrade

Cache-Control: no-cache
Connection: keep-alive
Content-Type: text/html; charset=UTF-8
Date: Sat, 03 Aug 2019 08:54:59 GMT
Expires: Sat, 03 Aug 2019 08:54:58 GMT
Server: nginx
Transfer-Encoding: chunked

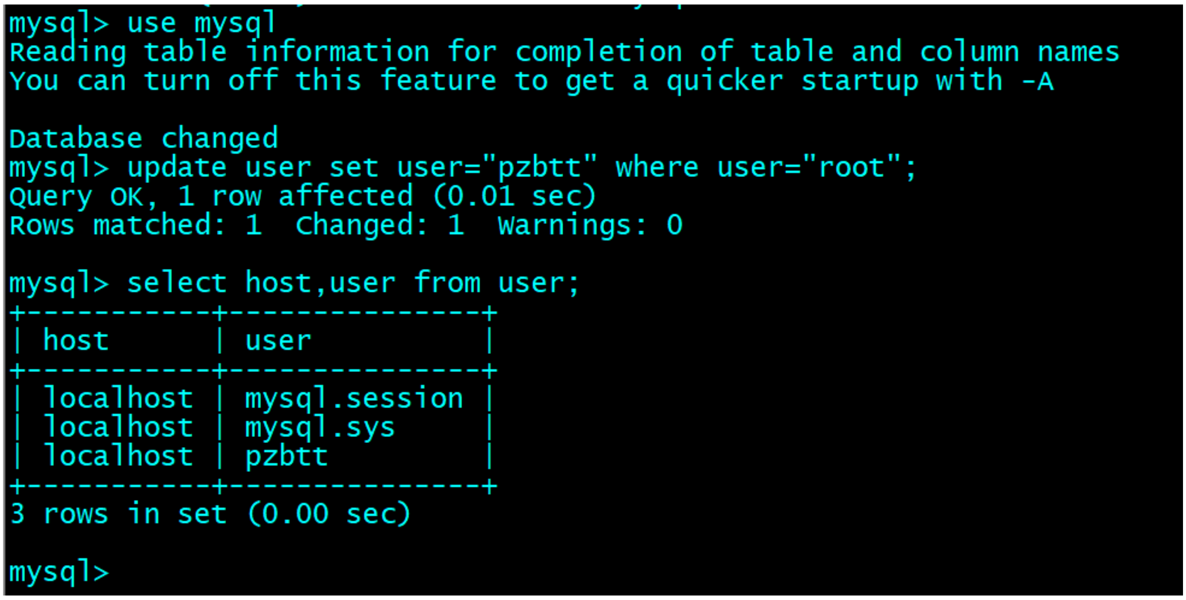
5.3 mysql安全加固

1 改变默认mysqlg管理员账号

系统 MySQL 的管理员名称是 root,而一般情况下,数据库管理员都没进行修改,这一定程度上对系统用户穷举的恶意行为提供了便利,此时修改为复杂的用户名,请不要在设定为 admin 或者 administraror 的形式,因为它们也在易猜的用户字典中。



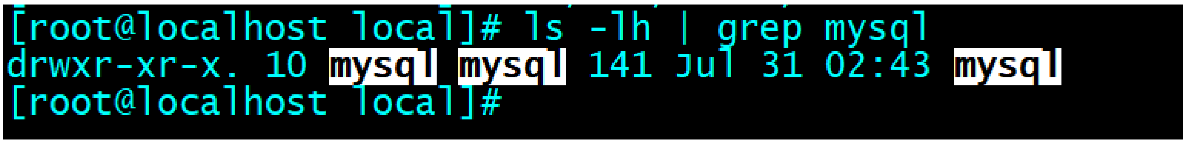
```
mysql> select host,user from mysql.user;
+-----------+---------------+
| host      | user          |
+-----------+---------------+
| localhost | mysql.session |
| localhost | mysql.sys     |
| localhost | root          |
+-----------+---------------+
3 rows in set (0.00 sec)
```



```
mysql> use mysql
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> update user set user="pzbtt" where user="root";
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select host,user from user;
+-----------+---------------+
| host      | user          |
+-----------+---------------+
| localhost | mysql.session |
| localhost | mysql.sys     |
| localhost | pzbtt         |
+-----------+---------------+
3 rows in set (0.00 sec)

mysql>
```

2 用户目录权限设置（安装mysql时已经设置好）

限制其他用户对数据库文件的访问权限



```
[root@localhost local]# ls -lh | grep mysql
drwxr-xr-x. 10 mysql mysql 141 Jul 31 02:43 mysql
[root@localhost local]#
```