高可用架构篇

MySQL 源码编译安装（CentOS-6.6+MySQL-5.6）

部署环境

操作系统：CentOS-6.6-x86_64-bin-DVD1.iso
MySQL 版本：mysql-5.6.26.tar.gz
操作用户：root
系统 IP：192.168.1.205
主机名：edu-mysql-01
配置：4 核、4G 内存

一、服务器配置：

1、配置网络

```
# vi /etc/sysconfig/network-scripts/ifcfg-eth0
DEVICE=eth0
BOOTPROTO=static
NM_CONTROLLED=no
ONBOOT=yes
TYPE=Ethernet
HWADDR=00:50:56:a1:12:53
IPADDR=192.168.1.205
NETMASK=255.255.255.0
GATEWAY=192.168.1.1
DNS1=223.5.5.5
DNS2=223.6.6.6
```

2、设置主机名

```
# vi /etc/sysconfig/network
NETWORKING=yes
HOSTNAME=edu-mysql-01
```

3、设置 IP 与主机名的映射

```
# vi /etc/hosts
127.0.0.1 edu-mysql-01
192.168.1.205 edu-mysql-01
```

4、两台数据库服务器的的 selinux 都要 disable
（永久关闭 selinux，请修改/etc/selinux/config，将 SELINUX 改为 disabled）

```
# vi /etc/selinux/config
SELINUX=disabled
```

5、重启操作系统

```
# reboot
```

二、源码安装 MySQL5.6.26：

1、使用下面的命令检查是否安装有 MySQL Server:

```
# rpm -qa | grep mysql
mysql-libs-5.1.73-3.el6_5.x86_64
```

如果是 CentOS7 以上，请使用以下命令查看：

```
# rpm -qa | grep mariadb
mariadb-libs-5.5.41-2.el7_0.x86_64
```

（因为没有 MySQL 服务，因此没必要卸载。mysql-libs 是 MySQL 的必要包）

（如果有的话可通过下面的命令来卸载掉，rpm -e mysql //普通删除模式）

2、改防火墙设置，打开 3306 端口：

```
# vi /etc/sysconfig/iptables
```

增加如下行：

```
## MySQL
-A INPUT -p tcp -m state --state NEW -m tcp --dport 3306 -j ACCEPT
```

重启防火墙：

```
# service iptables restart
```

3、新增 mysql 用户组：

```
# groupadd mysql
```

4、新增 mysql 用户，并添加到 mysql 用户组：

```
# useradd -r -g mysql mysql
```

5、新建 MySQL 执行文件目录(后面会把编译好的 mysql 程序安装到这个目录)：

```
# mkdir -p /usr/local/mysql
```

（-p 参数的作用是：如果最终目录的父目录不存在也会一并创建）

6、新建 MySQL 数据库数据文件目录：

```
# mkdir -p /home/mysql/data
# mkdir -p /home/mysql/logs
# mkdir -p /home/mysql/temp
```

（注意：上面的 logs 及 temp 目录是为了以后将 MySQL 的数据文件与执行程序文件分离，如果你打算设置到不同的路径，注意修改对应的执行命令和数据库初始化脚本。正式生产环境，建议数据目录和日志目录都使用单独的分区来挂载，不同分区属于不同的磁盘或磁盘组。）

7、增加 PATH 环境变量搜索路径：

```
# vi /etc/profile
```

##在 profile 文件末尾增加两行

```
# mysql env param
PATH=/usr/local/mysql/bin:/usr/local/mysql/lib:$PATH
```

```
export PATH
```

使 PATH 搜索路径立即生效：

```
# source /etc/profile
```

8、安装编译 MySQL 需要的依赖包：
（mysql 从 5.5 版本开始，不再使用./configure 编译，而是使用 cmake 编译器，具体的 cmake 编译参数可以参考 mysql 官网文档 http://dev.mysql.com/doc/refman/5.5/en/source-configuration-options.html，安装基本依赖包，先用 yum 安装 cmake、automake 、autoconf ，另 MySQL 5.5.x 需要最少安装的包有：bison,gcc、gcc-c++、ncurses-devel)：

```
# yum install make cmake gcc gcc-c++ bison bison-devel ncurses ncurses-devel autoconf automake
```

9、进入/usr/local/src 目录，上传 mysql-5.6.26.tar.gz 源代码到/usr/local/src 目录：

```
# cd /usr/local/src
```

10、开始编译安装 mysql-5.6.26：
解压缩源码包：

```
# tar -zxvf mysql-5.6.26.tar.gz
```

进入解压缩源码目录：

```
# cd mysql-5.6.26
```

使用 cmake 源码安装 mysql（如果你打算安装到不同的路径，注意修改下面语句中 /usr/local/mysql 和/home/mysql/data 路径!）

```
[root@edu-mysql-01 mysql-5.6.26]# cmake \
-DCMAKE_INSTALL_PREFIX=/usr/local/mysql \
-DMYSQL_UNIX_ADDR=/usr/local/mysql/mysql.sock \
-DDEFAULT_CHARSET=utf8 \
-DDEFAULT_COLLATION=utf8_general_ci \
-DWITH_MYISAM_STORAGE_ENGINE=1 \
-DWITH_INNOBASE_STORAGE_ENGINE=1 \
-DWITH_ARCHIVE_STORAGE_ENGINE=1 \
-DWITH_BLACKHOLE_STORAGE_ENGINE=1 \
-DWITH_MEMORY_STORAGE_ENGINE=1 \
-DWITH_READLINE=1 \
-DENABLED_LOCAL_INFILE=1 \
-DMYSQL_DATADIR=/home/mysql/data \
-DMYSQL_USER=mysql \
-DMYSQL_TCP_PORT=3306 \
-DENABLE_DOWNLOADS=1
```

上面的这些复制完，回车，然后就开始 cmake 的过程，一般时间不会很长。

配置解释：
-DCMAKE_INSTALL_PREFIX=/usr/local/mysql 设置安装目录
-DMYSQL_DATADIR=/home/mysql/data 设置数据库存放目录
-DMYSQL_UNIX_ADDR=/usr/local/mysql/mysql.sock 设置 UNIX socket 目录
-DMYSQL_USER=mysql 设置运行用户
-DDEFAULT_CHARSET=utf8 设置默认字符集，默认 latin1
-DEFAULT_COLLATION=utf8_general_ci 设置默认校对规则，默认 latin1_general_ci
-DWITH_INNOBASE_STORAGE_ENGINE=1 添加 InnoDB 引擎支持
-DENABLE_DOWNLOADS=1 自动下载可选文件，比如自动下载谷歌的测试包
-DMYSQL_TCP_PORT=3306 设置服务器监听端口，默认 3306
-DSYSCONFDIR=/etc 设置 my.cnf 所在目录，默认为安装目录）

执行过程中会出现：
CMake Error: Problem with tar_extract_all(): Invalid argument
CMake Error: Problem extracting tar: /usr/local/src/mysql-5.6.26/source_downloads/gmock-1.6.0.zip
解决方法：
cd mysql 目录下面会发现有一个 source_downloads 目录，需要解压 unzip gmock-1.6.0.zip,然后再重新执行上述配置过程。当然你也可以去掉-DENABLE_DOWNLOADS=1 这个选项，不编译谷歌的测试包也没有什么问题，但是之前的某些版本会出现无法编译的问题.

11、cmake 结束后开始编译源码，这一步时间会较长，请耐心等待：
```
# make
```

12、安装编译好的程序：
```
# make install
```
（注意：如果需要重装 mysql，在/usr/local/src/mysql-5.6.26 在执行下 make install 就可以了，不需要再 cmake 和 make）

13、清除安装临时文件：
```
# make clean
```

14、修改 mysql 目录拥有者为 mysql 用户：
```
# chown -Rf mysql:mysql /usr/local/mysql
# chown -Rf mysql:mysql /home/mysql
```

15、进入 mysql 执行程序的安装路径：
```
# cd /usr/local/mysql
```

16、执行初始化配置脚本，创建系统自带的数据库和表（注意：路径/home/mysql/data 需要换成你自定定义的数据库存放路径）：
```
# scripts/mysql_install_db --user=mysql --basedir=/usr/local/mysql --datadir=/home/mysql/data
Installing MySQL system tables...2015-12-13 15:21:53 0 [Warning] TIMESTAMP with implicit DEFAULT value is deprecated. Please use --explicit_defaults_for_timestamp server option (see
documentation for more details).
2015-12-13 15:21:53 0 [Note] /usr/local/mysql/bin/mysqld (mysqld 5.6.26) starting as process 17362 ...
2015-12-13 15:21:53 17362 [Note] InnoDB: Using atomics to ref count buffer pool pages
2015-12-13 15:21:53 17362 [Note] InnoDB: The InnoDB memory heap is disabled
2015-12-13 15:21:53 17362 [Note] InnoDB: Mutexes and rw_locks use GCC atomic builtins
2015-12-13 15:21:53 17362 [Note] InnoDB: Memory barrier is not used
2015-12-13 15:21:53 17362 [Note] InnoDB: Compressed tables use zlib 1.2.3
2015-12-13 15:21:53 17362 [Note] InnoDB: Using CPU crc32 instructions
2015-12-13 15:21:53 17362 [Note] InnoDB: Initializing buffer pool, size = 128.0M
2015-12-13 15:21:53 17362 [Note] InnoDB: Completed initialization of buffer pool
2015-12-13 15:21:53 17362 [Note] InnoDB: The first specified data file ./ibdata1 did not exist: a new database to be created!
2015-12-13 15:21:53 17362 [Note] InnoDB: Setting file ./ibdata1 size to 12 MB
2015-12-13 15:21:53 17362 [Note] InnoDB: Database physically writes the file full: wait...
2015-12-13 15:21:53 17362 [Note] InnoDB: Setting log file ./ib_logfile101 size to 48 MB
2015-12-13 15:21:53 17362 [Note] InnoDB: Setting log file ./ib_logfile1 size to 48 MB
2015-12-13 15:21:53 17362 [Note] InnoDB: Renaming log file ./ib_logfile101 to ./ib_logfile0
2015-12-13 15:21:53 17362 [Warning] InnoDB: New log files created, LSN=45781
2015-12-13 15:21:53 17362 [Note] InnoDB: Doublewrite buffer not found: creating new
2015-12-13 15:21:53 17362 [Note] InnoDB: Doublewrite buffer created
2015-12-13 15:21:53 17362 [Note] InnoDB: 128 rollback segment(s) are active.
2015-12-13 15:21:53 17362 [Warning] InnoDB: Creating foreign key constraint system tables.
2015-12-13 15:21:53 17362 [Note] InnoDB: Foreign key constraint system tables created
2015-12-13 15:21:53 17362 [Note] InnoDB: Creating tablespace and datafile system tables.
2015-12-13 15:21:53 17362 [Note] InnoDB: Tablespace and datafile system tables created.
2015-12-13 15:21:53 17362 [Note] InnoDB: Waiting for purge to start
2015-12-13 15:21:53 17362 [Note] InnoDB: 5.6.26 started; log sequence number 0
2015-12-13 15:21:53 17362 [Note] Binlog end
2015-12-13 15:21:53 17362 [Note] InnoDB: FTS optimize thread exiting.
2015-12-13 15:21:53 17362 [Note] InnoDB: Starting shutdown...
2015-12-13 15:21:54 17362 [Note] InnoDB: Shutdown completed; log sequence number 1625977
OK

Filling help tables...2015-12-13 15:21:54 0 [Warning] TIMESTAMP with implicit DEFAULT value is deprecated. Please use --explicit_defaults_for_timestamp server option (see documentation for more details).
2015-12-13 15:21:54 0 [Note] /usr/local/mysql/bin/mysqld (mysqld 5.6.26) starting as process 17384 ...
2015-12-13 15:21:54 17384 [Note] InnoDB: Using atomics to ref count buffer pool pages
2015-12-13 15:21:54 17384 [Note] InnoDB: The InnoDB memory heap is disabled
2015-12-13 15:21:54 17384 [Note] InnoDB: Mutexes and rw_locks use GCC atomic builtins
2015-12-13 15:21:54 17384 [Note] InnoDB: Memory barrier is not used
2015-12-13 15:21:54 17384 [Note] InnoDB: Compressed tables use zlib 1.2.3
```

```
2015-12-13 15:21:54 17384 [Note] InnoDB: Using CPU crc32 instructions
2015-12-13 15:21:54 17384 [Note] InnoDB: Initializing buffer pool, size = 128.0M
2015-12-13 15:21:54 17384 [Note] InnoDB: Completed initialization of buffer pool
2015-12-13 15:21:54 17384 [Note] InnoDB: Highest supported file format is Barracuda.
2015-12-13 15:21:54 17384 [Note] InnoDB: 128 rollback segment(s) are active.
2015-12-13 15:21:54 17384 [Note] InnoDB: Waiting for purge to start
2015-12-13 15:21:54 17384 [Note] InnoDB: 5.6.26 started; log sequence number 1625977
2015-12-13 15:21:55 17384 [Note] Binlog end
2015-12-13 15:21:55 17384 [Note] InnoDB: FTS optimize thread exiting.
2015-12-13 15:21:55 17384 [Note] InnoDB: Starting shutdown...
2015-12-13 15:21:56 17384 [Note] InnoDB: Shutdown completed; log sequence number 1625987
OK

To start mysqld at boot time you have to copy
support-files/mysql.server  to the right place for your system

PLEASE REMEMBER TO SET A PASSWORD FOR THE MySQL root USER !
To do so, start the server, then issue the following commands:

  /usr/local/mysql/bin/mysqladmin  -u root password 'new-password'
  /usr/local/mysql/bin/mysqladmin  -u root -h edu-mysql-02  password 'new-password'

Alternatively you can run:

  /usr/local/mysql/bin/mysql_secure_installation

which will also give you the option of removing the test
databases and anonymous user created by default.   This is
strongly recommended for production servers.

See the manual for more instructions.

You can start the MySQL daemon with:

  cd . ; /usr/local/mysql/bin/mysqld_safe  &

You can test the MySQL daemon with mysql-test-run.pl

  cd mysql-test ; perl mysql-test-run.pl

Please report any problems at http://bugs.mysql.com/

The latest information about MySQL is available on the web at
```

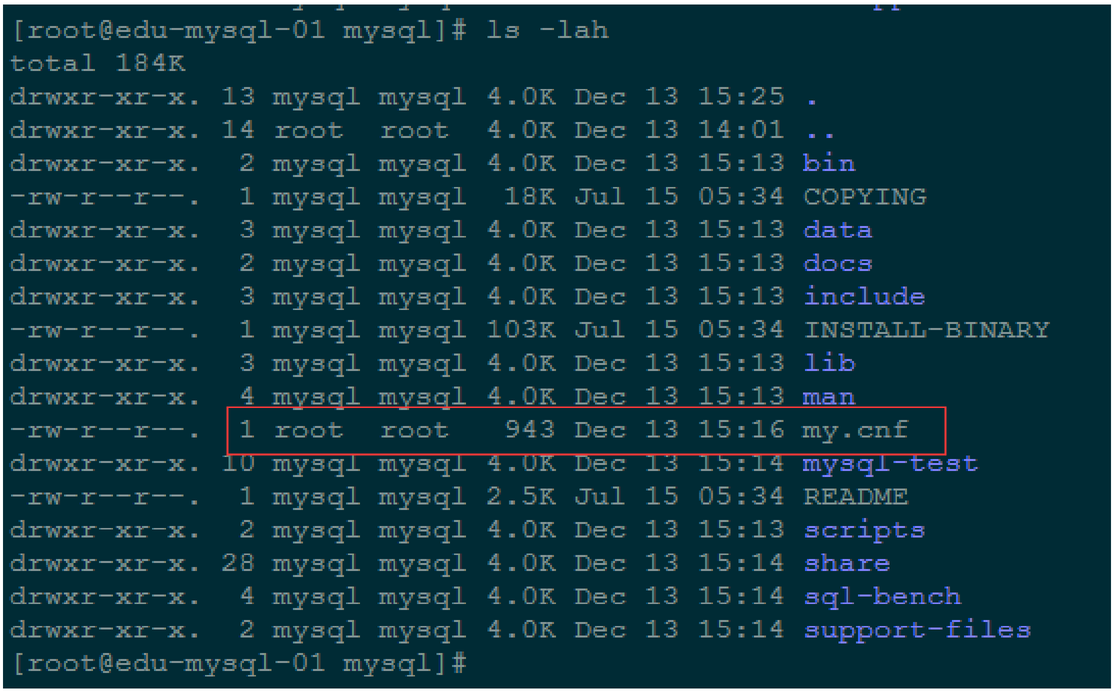
http://www.mysql.com

Support MySQL by buying support/licenses at http://shop.mysql.com

New default config file was created as /usr/local/mysql/my.cnf and
will be used by default by the server when you start it.
You may edit this file to change server settings

WARNING: Default config file /etc/my.cnf exists on the system
This file will be read by default by the MySQL server
If you do not want to use this, either remove it, or use the
--defaults-file argument to mysqld_safe when starting the server

17、初始化脚本在/usr/local/mysql/下生成了配置文件 my.cnf，需要更改该配置文件的所有者：
# ls -lah



```
[root@edu-mysql-01 mysql]# ls -lah
total 184K
drwxr-xr-x. 13 mysql mysql 4.0K Dec 13 15:25 .
drwxr-xr-x. 14 root  root  4.0K Dec 13 14:01 ..
drwxr-xr-x.  2 mysql mysql 4.0K Dec 13 15:13 bin
-rw-r--r--.  1 mysql mysql  18K Jul 15 05:34 COPYING
drwxr-xr-x.  3 mysql mysql 4.0K Dec 13 15:13 data
drwxr-xr-x.  2 mysql mysql 4.0K Dec 13 15:13 docs
drwxr-xr-x.  3 mysql mysql 4.0K Dec 13 15:13 include
-rw-r--r--.  1 mysql mysql 103K Jul 15 05:34 INSTALL-BINARY
drwxr-xr-x.  3 mysql mysql 4.0K Dec 13 15:13 lib
drwxr-xr-x.  4 mysql mysql 4.0K Dec 13 15:13 man
-rw-r--r--.  1 root  root   943 Dec 13 15:16 my.cnf
drwxr-xr-x. 10 mysql mysql 4.0K Dec 13 15:14 mysql-test
-rw-r--r--.  1 mysql mysql 2.5K Jul 15 05:34 README
drwxr-xr-x.  2 mysql mysql 4.0K Dec 13 15:13 scripts
drwxr-xr-x. 28 mysql mysql 4.0K Dec 13 15:14 share
drwxr-xr-x.  4 mysql mysql 4.0K Dec 13 15:14 sql-bench
drwxr-xr-x.  2 mysql mysql 4.0K Dec 13 15:14 support-files
[root@edu-mysql-01 mysql]#
```

[root@edu-mysql-01 mysql] # chown -Rf mysql:mysql /usr/local/mysql/my.cnf

18、注意：

（1）Tips：在启动 MySQL 服务时，会按照一定次序搜索 my.cnf，先在/etc 目录下找，找不到则会搜索 mysql 程序目录下是否有 my.cnf

（2）需要注意 CentOS 6 版操作系统的最小安装完成后，即使没有安装 mysql，在/etc 目录下也会存在一个 my.cnf 文件，建议将此文件更名为其他的名字，否则该文件会干扰源码安装的 MySQL 的正确配置，造成无法启动。修改/etc/my.cnf 操作如下：

可以：mv /etc/my.cnf /etc/my.cnf.bak

也可以：删除掉*/etc/my.cnf* 这个文件：rm /etc/my.cnf

如果你需要用于生产环境，不要急着做下面的 mysql 启动操作。建议把上一步骤中 mysql 初

始化生成的/usr/local/mysql/my.cnf 删除，然后把你优化好的 mysql 配置文件 my.cnf 放到/etc 下。（这是做 mysql 主从复制和 mysql 优化的经验！）

（我们这里使用/etc/my.cnf）

19、编辑/etc/my.cnf:

```
# vi my.cnf
[client]
port = 3306
socket = /usr/local/mysql/mysql.sock

[mysqld]
character-set-server = utf8
collation-server  = utf8_general_ci

skip-external-locking
skip-name-resolve

user = mysql
port = 3306
basedir = /usr/local/mysql
datadir = /home/mysql/data
tmpdir = /home/mysql/temp
# server_id = .....
socket = /usr/local/mysql/mysql.sock
log-error = /home/mysql/logs/mysql_error.log
pid-file  = /home/mysql/mysql.pid

open_files_limit  = 10240

back_log = 600
max_connections=500
max_connect_errors = 6000
wait_timeout=605800

#open_tables = 600
#table_cache = 650
#opened_tables = 630

max_allowed_packet = 32M

sort_buffer_size = 4M
join_buffer_size  = 4M
thread_cache_size = 300
```

```
query_cache_type = 1
query_cache_size = 256M
query_cache_limit = 2M
query_cache_min_res_unit = 16k

tmp_table_size = 256M
max_heap_table_size = 256M

key_buffer_size = 256M
read_buffer_size = 1M
read_rnd_buffer_size = 16M
bulk_insert_buffer_size = 64M

lower_case_table_names=1

default-storage-engine = INNODB

innodb_buffer_pool_size  = 2G
innodb_log_buffer_size  = 32M
innodb_log_file_size  = 128M
innodb_flush_method  = O_DIRECT

#####################
thread_concurrency = 32
long_query_time= 2
slow-query-log  = on
slow-query-log-file  = /home/mysql/logs/mysql-slow.log

[mysqldump]
quick
max_allowed_packet = 32M

[mysqld_safe]
log-error=/var/log/mysqld.log
pid-file=/var/run/mysqld/mysqld.pid
```

20、复制服务启动脚本：

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

21、启动 MySQL 服务：

```
# service mysql start
Starting MySQL.. SUCCESS!
```

（初次启动会在/usr/local/mysql 目录下生成 mysql.sock 文件）

22、设置 MySQL 开机自动启动服务：

```
# chkconfig mysql on
```

设置 MySQL 数据库 root 用户的本地登录密码（初始用户没有密码）：

```
# mysqladmin -u root password ’roncoo’
```

23、登录并修改 MySQL 用户 root 的密码：

```
# mysql -uroot -p
Enter password:
Welcome to the MySQL monitor.   Commands end with ; or \g.
Your MySQL connection id is 2
Server version: 5.6.26-log Source distribution

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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>
mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
| test               |
+--------------------+
4 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
```

修改 root 用户密码：

```
mysql> update user set Password = password('roncoo.com') where User='root';
Query OK, 4 rows affected (0.00 sec)
Rows matched: 5   Changed: 4   Warnings: 0

mysql> flush privileges;
```

```
Query OK, 0 rows affected (0.00 sec)
```

允许 root 远程登录，设置远程登录密码：www.roncoo.com

```
mysql> use mysql;
mysql>GRANT ALL PRIVILEGES ON *.* TO 'root'@'%' IDENTIFIED BY 'www.roncoo.com' WITH GRANT OPTION;
mysql> flush privileges;
mysql> exit;
```

注意：真实生产环境，应用操作不要使用 root 用户。

重新登录

```
[root@edu-mysql-01 ~]# mysql -uroot -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 9
Server version: 5.6.26-log Source distribution

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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>
```

24、运行安全设置脚本，强烈建议生产服务器使用（可选）：

```
[root@edu-mysql-01 ~]# /usr/local/mysql/bin/mysql_secure_installation
    NOTE: RUNNING ALL PARTS OF THIS SCRIPT IS RECOMMENDED FOR ALL MySQL
          SERVERS IN PRODUCTION USE!  PLEASE READ EACH STEP CAREFULLY!

    In order to log into MySQL to secure it, we'll need the current
    password for the root user.  If you've just installed MySQL, and
    you haven't set the root password yet, the password will be blank,
    so you should just press enter here.

    Enter current password for root (enter for none):   ----->此处输入 root 密码
    OK, successfully used password, moving on...

    Setting the root password ensures that nobody can log into the MySQL
    root user without the proper authorisation.
```

```
You already have a root password set, so you can safely answer 'n'.

Change the root password? [Y/n] n     -----> 上已为 root 设置了密码，此处可输 n
 ... skipping.

By default, a MySQL installation has an anonymous user, allowing anyone
to log into MySQL without having to have a user account created for
them.  This is intended only for testing, and to make the installation
go a bit smoother.  You should remove them before moving into a
production environment.

Remove anonymous users? [Y/n] Y     ------> 删除匿名用户
 ... Success!

Normally, root should only be allowed to connect from 'localhost'.  This
ensures that someone cannot guess at the root password from the network.

Disallow root login remotely? [Y/n] n     -----> 一般不允许 root 远程登录，可添加普通用户，
然后设置允许远程登录
 ... skipping.

By default, MySQL comes with a database named 'test' that anyone can
access.  This is also intended only for testing, and should be removed
before moving into a production environment.

Remove test database and access to it? [Y/n] Y     -----> 删除 test 库及相应权限
 - Dropping test database...
 ... Success!
 - Removing privileges on test database...
 ... Success!

Reloading the privilege tables will ensure that all changes made so far
will take effect immediately.

Reload privilege tables now? [Y/n] Y -----> 重新加载权限表使设置生效
 ... Success!

All done!  If you've completed all of the above steps, your MySQL
installation should now be secure.
Thanks for using MySQL!
Cleaning up...
```

25、重启服务器，检测 mysql 是否能开机自动启动：

```
[root@edu-mysql-01 ~]# reboot
```