《Ubuntu Server 最佳方案》

篇	章	内容介绍
第 1 篇 拥抱 Ubuntu Server	第 1 章 敲开 Linux Server 的大门 第 2 章 拥抱 Ubuntu Server	介绍了 Linux 及其选型，并提供了 Ubuntu 快速入门指南
第 2 篇 LAMP 服务器	第 3 章 用 Apache 做 Web 服务器 第 4 章 LAMP 服务器之 PHP 篇 第 5 章 LAMP 服务器之 Perl 篇 第 6 章 LAMP 服务器之 Python 篇 第 7 章 Apache Tomcat 架设 第 8 章 最佳代理、反向代理服务器：Squid	介绍了最佳 LAMP 服务器，并对 PHP、Perl、Python、Tomcat 分别进行了详细的介绍。此外，由于代理服务器也属于 Web 范畴，因此本篇中还介绍了最佳代理服务器、反向代理服务器方案（Squid）

续

篇	章	内容介绍
第 3 篇 Mail 服务器	第 9 章 最佳邮件服务器方案 第 10 章 最佳邮件列表：Mailman	介绍了最佳邮件服务器方案（Postfix），该方案不仅支持虚拟用户、虚拟域，还支持 POP3 收信、IMAP 收信、SMTP 认证、TSL 加密、邮件别名和转发、磁盘限额、垃圾邮件过滤，支持病毒防护、Web 邮件界面，基本上涵盖了邮件服务器的方方面面。本篇还介绍了最佳邮件列表方案（Mailman），让您可以创建自己的邮件列表服务器
第 4 篇 文件服务器	第 11 章 最佳 FTP 服务器方案 第 12 章 最佳 NFS 服务器方案 第 13 章 与 Windows 共舞：Samba	介绍了最佳 FTP 服务器方案（PureFTPd）和最佳 NFS 方案，并介绍了与 Windows 环境沟通的方法（Samba）
第 5 篇 虚拟化	第 14 章 最佳虚拟化方案：OpenVZ	介绍了最佳虚拟化方案（OpenVZ），使您可以在一台物理服务器上虚拟几台、十几台甚至上百台 Linux 服务器
第 6 篇 DNS 和 DHCP 服务器	第 15 章 最佳 DNS 服务器：Bind9 第 16 章 DNS 轮询 第 17 章 最佳 DHCP 服务器方案	介绍了最佳 DNS 服务器（Bind9）和最佳 DHCP 方案。如果您管理一个内部网络，这两种服务器不可或缺

第 7 篇 负载均衡和集群	第 18 章 负载均衡、高可用的 Web 集群 第 19 章 负载均衡、高可用的 MySQL 集群	介绍了负载均衡、高可用的最佳 Web 集群方案和最佳 MySQL 数据库集群方案。作为一个 Linux 管理员，您需要在架构设计之初，就能预见未来几年内的需求增长，否则在业务迅速增长、需要添加服务器时，您将手足无措
第 8 篇 远程控制与监控	第 20 章 最佳远程控制方案：SSH 第 21 章 最佳服务器监控方案：Nagios	介绍了最佳远程控制方案（SSH）和最佳监控方案（Nagios）。远程控制最重要的是安全，否则黑客很有可能闯进来，使您失去控制权。监控可以让您及时了解服务器状况，免得总是“救火”
第 9 篇 数据备份与系统安全	第 22 章 最佳 RAID 方案：RAID10 第 23 章 最佳数据安全方案：RAID10+LVM 第 24 章 Ubuntu Server 系统安全	介绍了最佳 RAID 方案（RAID10）、最佳数据安全方案（RAID10+LVM），并介绍了如何使 Ubuntu Server 变得更安全。安全是重中之重，您不仅要学会如何设置防火墙，还要熟知入侵检测和肉鸡检测的方法，以及如何处理被入侵的服务器

目　录

第 2 章

拥抱 Ubuntu Server

2.2　安装 Ubuntu Server

2.2.1　安装前的准备

```
/dev/sdb2    /home    ext3     defaults     0    2
```

```
$ sudo blkid
/dev/sda1: UUID="ac369a10-e335-42b1-a3a5-ce9524c8130b" TYPE="ext3"
/dev/sda5: TYPE="swap" UUID="8f7943ed-6589-41db-90d0-f57a8ad7cdbd"
```

2.2.3　把语言环境变量改为英文

```
$ locale
LANG=zh_CN.UTF-8
LANGUAGE=zh_CN:zh
LC_CTYPE="zh_CN.UTF-8"
LC_NUMERIC="zh_CN.UTF-8"
LC_TIME="zh_CN.UTF-8"
LC_COLLATE="zh_CN.UTF-8"
LC_MONETARY="zh_CN.UTF-8"
LC_MESSAGES="zh_CN.UTF-8"
LC_PAPER="zh_CN.UTF-8"
LC="zh_CN.UTF-8"
LC_ADDRESS="zh_CN.UTF-8"
LC_TELEPHONE="zh_CN.UTF-8"
LC_MEASUREMENT="zh_CN.UTF-8"
LC_IDENTIFICATION="zh_CN.UTF-8"
LC_ALL=
```

```
LANG="zh_CN.UTF-8"
LANGUAGE="zh_CN:zh"
```

```
$ sudo nano /etc/default/locale
```

```
LANG="en_US.UTF-8"
LANGUAGE="en_US:en"
```

```
$ locale
LANG=en_US.UTF-8
LANGUAGE=en_US:en
LC_CTYPE="en_US.UTF-8"
LC_NUMERIC="en_US.UTF-8"
```

```
LC_TIME="en_US.UTF-8"
LC_COLLATE="en_US.UTF-8"
LC_MONETARY="en_US.UTF-8"
LC_MESSAGES="en_US.UTF-8"
LC_PAPER="en_US.UTF-8"
LC="en_US.UTF-8"
LC_ADDRESS="en_US.UTF-8"
LC_TELEPHONE="en_US.UTF-8"
LC_MEASUREMENT="en_US.UTF-8"
LC_IDENTIFICATION="en_US.UTF-8"
LC_ALL=
```

2.2.4 安全补丁、版本升级

```
$ sudo apt-get update
$ sudo apt-get upgrade
```

```
$ sudo apt-get dist-update
```

```
$ sudo do-release-upgrade
```

2.3 Ubuntu 快速入门指南

2.3.3 快速查找文件

1. find 命令

```
$ find /usr/share/doc -name *.txt
```

```
$ find /tmp -name core | xargs /bin/rm -f
```

```
$ find $HOME -mtime 0
```

```
$ find . -perm 664
```

2. locate 命令

```
$ sudo updatedb
```

```
$ locate apt-get
/usr/bin/apt-get
/usr/share/man/es/man8/apt-get.8.gz
/usr/share/man/fr/man8/apt-get.8.gz
/usr/share/man/ja/man8/apt-get.8.gz
/usr/share/man/man8/apt-get.8.gz
```

```
$ locate apt-get -c
5
```

2.3.4　软件包管理

```
$ apt-cache show php5-mysql
Package: php5-mysql
Priority: optional
Section: web
Installed-Size: 236
Maintainer: Ubuntu Core Developers <ubuntu-devel-discuss@lists.ubuntu.com>
Original-Maintainer:  Debian  PHP  Maintainers  <pkg-php-maint@lists.alioth.
debian.or g>
Architecture: i386
Source: php5
Version: 5.2.4-2ubuntu5.3
Replaces: php5-mysqli
Depends: libc6 (>= 2.4), libmysqlclient15off (>= 5.0.27-1), php5-common (=
5.2.4-2 ubuntu5.3), phpapi-20060613+lfs
Conflicts: php5-mysqli
Filename: pool/main/p/php5/php5-mysql_5.2.4-2ubuntu5.3_i386.deb
Size: 65242
MD5sum: 003114b8d97dd35d435763338b3113f7
SHA1: 8d977486b1098c54b54036815398223a191e590d
SHA256: 8d8b301f1a1e85891d5da5c5fdebd9d7c16d7828b4be84640d824e881fe9f1df
Description: MySQL module for php5
 This package provides modules for MySQL database connections directly from
 PHP scripts.  It includes the generic "mysql" module which can be used
 to connect to all versions of MySQL, an improved "mysqli" module for
 MySQL version 4.1 or later, and the pdo_mysql module for use with
 the PHP Data Object extension.
 .
 PHP5 is an HTML-embedded scripting language. Much of its syntax is borrowed
 from C, Java and Perl with a couple of unique PHP-specific features thrown
 in. The goal of the language is to allow web developers to write
 dynamically generated pages quickly.
Bugs: mailto:ubuntu-users@lists.ubuntu.com
Origin: Ubuntu
Task: lamp-server
```

2.3.5 使用 apt 工具

2．/etc/apt/sources.list 文件

```
deb(或 deb-src)   网络地址   主版本代号      软件仓库 1      软件仓库 2      软件仓库 3 ...
```

```
deb http://archive.ubuntu.com/ubuntu/ hardy main restricted
deb-src http://archive.ubuntu.com/ubuntu/ hardy main restricted

deb http://archive.ubuntu.com/ubuntu/ hardy-updates main restricted
deb-src http://archive.ubuntu.com/ubuntu/ hardy-updates main restricted

deb http://archive.ubuntu.com/ubuntu/ hardy universe
deb-src http://archive.ubuntu.com/ubuntu/ hardy universe
deb http://archive.ubuntu.com/ubuntu/ hardy-updates universe
deb-src http://archive.ubuntu.com/ubuntu/ hardy-updates universe

deb http://archive.ubuntu.com/ubuntu/ hardy multiverse
deb-src http://archive.ubuntu.com/ubuntu/ hardy multiverse
deb http://archive.ubuntu.com/ubuntu/ hardy-updates multiverse
deb-src http://archive.ubuntu.com/ubuntu/ hardy-updates multiverse

deb http://security.ubuntu.com/ubuntu hardy-security main restricted
deb-src http://security.ubuntu.com/ubuntu hardy-security main restricted
deb http://security.ubuntu.com/ubuntu hardy-security universe
deb-src http://security.ubuntu.com/ubuntu hardy-security universe
deb http://security.ubuntu.com/ubuntu hardy-security multiverse
deb-src http://security.ubuntu.com/ubuntu hardy-security multiverse
```

```
$ sudo cp /etc/apt/sources.list /etc/apt/sources.list-backup
```

3．apt-get 命令

```
$ sudo apt-get install php5-mysql apache2-mpm-prefork libapache2-mod-php5
```

```
$ sudo apt-get update && sudo apt-get upgrade
```

4．apt-cache 命令

```
$ apt-cache search mysql
```

```
$ apt-cache search mysql | grep server
```

```
$ apt-cache show ssh
```

5．aptitude 命令

```
$ sudo aptitude update
```

```
$ sudo aptitude upgrade
```

```
$ aptitude search mysql | grep server
```

```
$ sudo aptitude clean --purge-unused
```

6．tasksel 命令

```
$ tasksel --task-packages lamp-server
apache2
mysql-client-5.0
libapache2-mod-php5
apache2.2-common
apache2-utils
php5-common
libaprutil1
php5-mysql
libmysqlclient15off
libdbi-perl
mysql-server
libplrpc-perl
mysql-server-5.0
libdbd-mysql-perl
libnet-daemon-perl
libapr1
libxml2
libpcre3
libpq5
apache2-mpm-prefork
mysql-common
```

```
$ tasksel --list-tasks
u dns-server   DNS server
u edubuntu-server      Edubuntu server
u lamp-server  LAMP server
u mail-server  Mail server
i openssh-server       OpenSSH server
u postgresql-server    PostgreSQL database
u print-server  Print server
u samba-server  Samba File server
```

```
$ tasksel install lamp-server
$ tasksel remove lamp-server
```

7．dpkg 命令

```
$ dpkg -l apt
```

```
Desired=Unknown/Install/Remove/Purge/Hold
| Status=Not/Installed/Config-f/Unpacked/Failed-cfg/Half-inst/t-aWait/T-pend
|/ Err?=(none)/Hold/Reinst-required/X=both-problems (Status,Err: uppercase=bad)
||/ Name          Version       Description
+++-=============-==============-============================================
ii  apt           0.7.9ubuntu17  Advanced front-end for dpkg
```

```
$ dpkg -l apache
```

```
No packages found matching apache.
```

```
$ dpkg -L whiptail
```

```
/.
/usr
/usr/bin
/usr/bin/whiptail
/usr/share
/usr/share/doc
/usr/share/doc/whiptail
/usr/share/doc/whiptail/README.whiptail
/usr/share/doc/whiptail/copyright
/usr/share/doc/whiptail/newt.spec.gz
/usr/share/doc/whiptail/changelog.Debian.gz
/usr/share/man
/usr/share/man/man1
/usr/share/man/man1/whiptail.1.gz
```

```
$ dpkg -S /bin/ls
```

```
coreutils: /bin/ls
```

```
$ dpkg -C
```

```
$ man dpkg
```

8．dpkg-reconfigure 命令

```
$ sudo dpkg-reconfigure postfix
```

9．给 apt 设置代理服务器

```
$ export http_proxy=http://yourproxyaddress:proxyport
```

```
$ sudo nano /etc/apt/apt.conf
```

```
Acquire::http::Proxy "http://yourproxyaddress:proxyport";
```

2.3.6　给 Red Hat 用户

1．关于 root 用户

```
$ sudo su
[sudo] password for hiweed:
#
```

2.3.7 Ubuntu 网络配置

1．网络配置文件/etc/network/interfaces

```
# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).

# The loopback network interface
auto lo
iface lo inet loopback

# The primary network interface
auto eth0
iface eth0 inet dhcp
```

```
auto eth0
iface eth0 inet static
    address 192.168.1.10
    netmask 255.255.255.0
    gateway 192.168.1.1
```

```
$ sudo /etc/init.d/networking restart
```

```
$ sudo ifdown eth0
$ sudo ifup eth0
```

2．域名服务器配置文件/etc/resolv.conf

```
search localdomain
nameserver 192.168.1.1
nameserver 202.102.14.68
```

3．/etc/hosts 文件

```
127.0.0.1       localhost
127.0.1.1       ubuntu.localdomain      ubuntu

# The following lines are desirable for IPv6 capable hosts
::1     ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
ff02::3 ip6-allhosts
```

4．TCP/IP 协议简介

```
$ ifconfig
```

```
eth0      Link encap:Ethernet  HWaddr 00:0c:29:f1:fb:b9
          inet addr:192.168.1.140  Bcast:192.168.1.255  Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fef1:fbb9/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:47 errors:0 dropped:0 overruns:0 frame:0
          TX packets:53 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:5967 (5.8 KB)  TX bytes:7288 (7.1 KB)
          Interrupt:17 Base address:0x1400

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
```

6．NTP 时间同步

```
$ sudo nano /etc/cron.daily/timeupdate
```

```
ntpdate ntp.ubuntu.com
```

```
$ sudo chmod 755 /etc/cron.daily/timeupdate
```

```
ntpdate ntp.ubuntu.com pool.ntp.org
```

2.3.8　远程管理 Ubuntu Server

```
$ sudo apt-get install openssh-server
```

```
$ ssh 192.168.1.10 -p 3322
```

```
$ ssh hiweed@192.168.1.10 -p 3322
```

2.3.9 系统更新：apt-get update && apt-get upgrade

```
$ sudo apt-get update && apt-get upgrade
```

第 3 章

用 Apache 做 Web 服务器

3.2 Apache 的安装、配置

3.2.1 Apache 的安装

```
$ sudo apt-get install apache2
```

3.2.2 Apache 的配置

2．Apache 模块

```
$ sudo a2enmod
```

```
Which module would you like to enable?
Your choices are: actions alias asis auth_basic auth_digest authn_alias
authn_anon authn_dbd authn_dbm authn_default authn_file authnz_ldap authz_dbm
authz_default authz_groupfile authz_host authz_owner authz_user autoindex cache
cern_meta cgid c gi charset_lite dav_fs dav dav_lock dbd deflate dir disk_cache
dump_io env expires ext_filter file_cache filter headers ident imagemap include
info ldap log_forensic mem_cache mime mime_magic negotiation php5 proxy_ajp
proxy_balancer proxy_connect proxy_ftp proxy_http proxy rewrite setenvif speling
ssl status substitute suexec u nique_id userdir usertrack version vhost_alias
Module name?
```

```
$ sudo a2dismod
```

```
Which module would you like to disable?
Your choices are: alias auth_basic authn_file authz_default authz_groupfile
authz_ host authz_user autoindex cgi dir env mime negotiation php5 rewrite
setenvif status
Module name?
```

3.2.3　Apache 虚拟主机

1．创建一个新的虚拟主机

```
$ sudo cp /etc/apache2/sites-available/default /etc/apache2/sites-available/
blog. mytest.com
```

```
$ sudo nano /etc/apache2/sites-available/blog.mytest.com
```

```
$ sudo mkdir /var/www/blog.mytest.com
$ echo "<h1>Oh yeah~</h1>" | sudo tee /var/www/blog.mytest.com/index.html
```

```
$ sudo a2dissite default && sudo a2ensite blog.mytest.com
$ sudo /etc/init.d/apache2 restart
```

2．虚拟主机配置详解

```
NameVirtualHost *
<VirtualHost *>
       ServerAdmin webmaster@localhost

       DocumentRoot /var/www/
       <Directory />
              Options FollowSymLinks
              AllowOverride None
       </Directory>
       <Directory /var/www/>
              Options Indexes FollowSymLinks MultiViews
              AllowOverride None
              Order allow,deny
              allow from all
       </Directory>

       ScriptAlias /cgi-bin/ /usr/lib/cgi-bin/
       <Directory "/usr/lib/cgi-bin">
              AllowOverride None
              Options +ExecCGI -MultiViews +SymLinksIfOwnerMatch
              Order allow,deny
              Allow from all
       </Directory>

       ErrorLog /var/log/apache2/error.log

       # Possible values include: debug, info, notice, warn, error, crit,
       # alert, emerg.
       LogLevel warn

       CustomLog /var/log/apache2/access.log combined
       ServerSignature On

   Alias /doc/ "/usr/share/doc/"
```

```
    <Directory "/usr/share/doc/">
        Options Indexes MultiViews FollowSymLinks
        AllowOverride None
        Order deny,allow
        Deny from all
        Allow from 127.0.0.0/255.0.0.0 ::1/128
    </Directory>

</VirtualHost>
```

（1）NameVirtualHost 指令

```
NameVirtualHost 192.168.1.10:8080
```

```
NameVirtualHost *
```

（2）<VirtualHost></VirtualHost>指令

```
<VirtualHost IP 地址[:端口号] [IP 地址[:端口号]] ...>
...
</VirtualHost>
```

```
<VirtualHost 192.168.1.10>
  ServerAdmin webmaster@mytest.com
  DocumentRoot /www/docs/www.mytest.com
  ServerName www.mytest.com
  ErrorLog logs/www.mytest.com-error_log
  TransferLog logs/www.mytest.com-access_log
</VirtualHost>
```

（3）ServerAdmin 指令

```
ServerAdmin E-mail地址
```

```
ServerAdmin webmaster@hiweed.com
```

（4）DocumentRoot 指令

```
DocumentRoot /var/www/blog.mytest.com
```

（5）<Directory></Directory>指令

```
<Directory /var/www/blog.mytest.com>
  ...
</Directory>
```

```
<Directory /var/www/*.mytest.com>
  ... # 将匹配/var/www/目录下所有以.mytest.com 结尾的目录
</Directory>

<Directory ~ "^/var/www/.*/[0-9]{3}">
  ... # 将匹配/var/www/目录下所有由 3 位数字构成的目录
</Directory>
```

（6）Options 指令

```
<Directory /var/www>
Options Indexes FollowSymLinks
</Directory>
```

```
<Directory /var/www/spec>
Options Includes
</Directory>
```

```
<Directory /var/www>
Options Indexes FollowSymLinks
</Directory>

<Directory /var/www/spec>
Options +Includes -Indexes
</Directory>
```

（7）AllowOverride 指令

```
AllowOverride All | None | directive-type [directive-type] ...
```

（9）Allow 指令

```
Allow from all | host | env=env-variable [host | env=env-variable] ...
```

```
Allow from apache.org
Allow from .net example.edu
```

```
Allow from 10.1.2.3
Allow from 192.168.1.104 192.168.1.205
```

```
Allow from 10.1
Allow from 10 172.20 192.168.2
```

```
Allow from 10.1.0.0/255.255.0.0
```

```
Allow from 10.1.0.0/16
```

（11）ErrorLog 指令

```
ErrorLog /var/log/apache/error_log
```

```
ErrorLog "|/usr/local/bin/httpd_errors"
```

（13）CustomLog 指令

```
CustomLog file|pipe format|nickname [env=[!]environment-variable]
```

```
# 使用 nickname
LogFormat "%h %l %u %t \"%r\" %>s %b" common
CustomLog logs/access_log common

# 使用格式字符串
CustomLog logs/access_log "%h %l %u %t \"%r\" %>s %b"
```

（14）ServerSignature 指令

```
Apache/2.2.6 (Ubuntu) Server at blog.mytest.com Port 80
```

（15）Alias 指令

```
Alias URL-path file-path|directory-path
```

```
Alias /doc/ "/usr/share/doc/"
```

3．HTTPS 的实现

```
$ sudo a2enmod ssl
```

```
$ sudo apt-get install openssl
```

```
$ openssl genrsa -des3 -out server.key 1024
Generating RSA private key, 1024 bit long modulus
.........................++++++
......++++++
e is 65537 (0x10001)
Enter pass phrase for server.key:（在这里输入密码，越复杂就越安全）
Verifying - Enter pass phrase for server.key:（再输入一次密码）
```

```
$ openssl genrsa -out server.key 1024
Generating RSA private key, 1024 bit long modulus
.......................++++++
.....................................................................++++++
e is 65537 (0x10001)
```

```
$ openssl req -new -key server.key -out server.csr
```

```
$ openssl x509 -req -days 365 -in server.csr -signkey server.key -out server.crt
```

```
$ sudo cp server.crt /etc/ssl/certs
$ sudo cp server.key /etc/ssl/private
```

```
SSLEngine on

SSLOptions +StrictRequire

SSLCertificateFile /etc/ssl/certs/server.crt
SSLCertificateKeyFile /etc/ssl/private/server.key
```

```
$ sudo /etc/init.d/apache2 restart
```

4．Apache 排错

```
 [warn] NameVirtualHost *:0 has no VirtualHosts
```

```
apache2: Could not determine the server's fully qualified domain name, using
127.0.0.1 for ServerName
```

```
$ echo "ServerName localhost" | sudo tee /etc/apache2/conf.d/fqdn
```

3.3　Apache 性能优化

3.3.2　优化 Apache 配置

2．优化 MaxClients

```
<IfModule mpm_worker_module>
    StartServers          2
    MaxClients          150
    MinSpareThreads      25
    MaxSpareThreads      75
    ThreadsPerChild      25
    MaxRequestsPerChild   0
</IfModule>
```

```
<IfModule mpm_worker_module>
    StartServers         10
    MaxClients          256
    MinSpareThreads      25
    MaxSpareThreads      75
    ThreadsPerChild      25
    MaxRequestsPerChild   0
</IfModule>
```

```
<IfModule mpm_worker_module>
StartServers         10
ServerLimit          512
    MaxClients           512
    MinSpareThreads      25
    MaxSpareThreads      75
    ThreadsPerChild      25
    MaxRequestsPerChild   0
</IfModule>
```

```
 [error] server reached MaxClients setting, consider raising the MaxClients
setting
```

4．启用压缩

```
$ sudo a2enmod deflate
$ sudo /etc/init.d/apache2 force-reload
```

```
<IfModule mod_deflate.c>
        AddOutputFilterByType DEFLATE text/html text/plain text/xml
</IfModule>
```

```
<IfModule mod_deflate.c>
        SetOutputFilter DEFLATE
SetEnvIfNoCase Request_URI \.(?:gif|jpe?g|png)$ no-gzip  dont-vary
SetEnvIfNoCase Request_URI   \.(?:exe|t?gz|zip|bz2|sit|rar)$ \
                                    no-gzip  dont-vary
SetEnvIfNoCase Request_URI \.pdf$ no-gzip  dont-vary
</IfModule>
```

```
DeflateFilterNote Input input_info
DeflateFilterNote Output output_info
DeflateFilterNote Ratio ratio_info
LogFormat '"%r" %{output_info}n/%{input_info}n (%{ratio_info}n%%)' deflate
CustomLog /var/log/apache2/deflate_log deflate
```

```
"GET /a.html HTTP/1.1" 6508/181296 (3%)
```

6．使用缓存（mod_cache）

（1）mod_disk_cache 示例

```
$ sudo a2enmod disk_cache
```

```
<IfModule mod_disk_cache.c>
   CacheEnable disk /
   CacheRoot /var/www/blog.mytest.com/cache
   CacheDefaultExpire 7200
   CacheMaxExpire 604800
</IfModule>
```

```
CacheEnable disk /
```

```
CacheRoot /var/www/blog.mytest.com/cache
```

```
CacheDefaultExpire 7200


CacheMaxExpire 604800
```

```
$ sudo mkdir /var/www/blog.mytest.com/cache
$ sudo chown www-data.www-data /var/www/blog.mytest.com/cache
```

```
$ sudo /etc/init.d/apache2 restart
```

（2）mod_mem_cache 示例

```
<IfModule mod_mem_cache.c>
   CacheEnable mem /
   CacheDefaultExpire 7200
   CacheMaxExpire 604800
</IfModule>
```

（3）不被 cache 的内容

```
CacheDisable /secure
```

3.4　Apache 压力测试（ab）

```
ab [options] [http[s]://]hostname[:port]/path
```

```
$ ab -n 20000 -c 200  http://localhost/
```

```
This is ApacheBench, Version 2.0.40-dev <$Revision: 1.146 $> apache-2.0
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
Copyright 2006 The Apache Software Foundation, http://www.apache.org/

Benchmarking localhost (be patient)
Completed 2000 requests
Completed 4000 requests
Completed 6000 requests
Completed 8000 requests
Completed 10000 requests
Completed 12000 requests
Completed 14000 requests
Completed 16000 requests
Completed 18000 requests
Finished 20000 requests
//以上为进度指示

Server Software:        Apache/2.2.8
Server Hostname:        localhost
Server Port:            80
```

```
//URL路径
Document Path:          /
//文档长度
Document Length:        45 bytes

//并发数
Concurrency Level:      200
//测试所花的时间
Time taken for tests:   34.12302 seconds
//完成的请求总数
Complete requests:      20000
//失败的请求总数
Failed requests:        0
Write errors:           0
//总共传输的字节数
Total transferred:      7795696 bytes

//总共传输的 HTML 的字节数
HTML transferred:       904140 bytes
//平均每秒钟处理的请求数（mean 是平均的意思）
Requests per second:    588.02 [#/sec] (mean)

//平均每个请求所花的时间，单位是毫秒。这个时间，是每个请求从开始的那个时刻到结束的那个时刻的时间差的平均值
Time per request:       340.123 [ms] (mean)

//每个请求实际运行的平均时间，单位是毫秒。这个时间，是每个请求实际在 CPU 运行时间的平均值。对于并发请求，CPU 并不是同时处理的，而是按照每个请求获得的时间片逐个轮转处理的；所以，上面的时间约等于该时间乘以并发请求数（即 ab 的-c 参数所指定的数值）
Time per request:       1.701 [ms] (mean, across all concurrent requests)

//传输速率，每秒钟收到的千字节（KB）数（如果流量过大，可能导致响应变慢）
Transfer rate:          223.80 [Kbytes/sec] received

//以下的时间详情，Hiweed 不是很了解
Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0  125 212.0    139    9284
Processing:    56  207 336.5    161   11349
Waiting:       45  179 331.5    146   11323
Total:        151  333 400.8    301   11353

//下面的数值，是相应时间内完成的请求的百分比。可以看出，在 301 毫秒内完成了 50%的请求，换句话说，50%的请求的响应时间都小于等于 301 毫秒；99%的请求在 842 毫秒内被响应，最长的响应时间为 11353 毫秒
Percentage of the requests served within a certain time (ms)
  50%    301
  66%    318
  75%    330
  80%    341
  90%    387
  95%    527
  98%    759
  99%    842
 100%  11353 (longest request)
```

3.5　Apache 安全

3.5.2　隐藏敏感信息

```
$ telnet localhost 80
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
HEAD / HTTP/1.0

HTTP/1.1 200 OK
Date: Mon, 03 Nov 2008 01:37:59 GMT
Server: Apache/2.2.8 (Ubuntu) PHP/5.2.4-2ubuntu5.3 with Suhosin-Patch
Last-Modified: Mon, 03 Nov 2008 00:46:59 GMT
ETag: "34943-2d-45abe48d446c0"
Accept-Ranges: bytes
Content-Length: 45
Connection: close
Content-Type: text/html

Connection closed by foreign host.
```

```
ServerTokens Prod
```

```
$ sudo /etc/init.d/apache2 reload
```

```
$ telnet localhost 80
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
HEAD / HTTP/1.0

HTTP/1.1 200 OK
Date: Mon, 03 Nov 2008 02:08:43 GMT
Server: Apache
Last-Modified: Mon, 03 Nov 2008 00:46:59 GMT
ETag: "34943-2d-45abe48d446c0"
Accept-Ranges: bytes
Content-Length: 45
Connection: close
Content-Type: text/html

Connection closed by foreign host.
```

3.5.3　不要以 root 身份运行 Apache

```
$ ps auxf | grep apache
hiweed    5536  0.0  0.2   3004   756 pts/0   S+   21:29   0:00            \_ grep
```

```
apache
root      5420  0.0  2.4  18524  6236 ?        Ss   20:36   0:00 /usr/sbin/ apache2
-k start
www-data  5505  0.0  1.4  18524  3652 ?        S    21:08   0:00  \_ /usr/sbin/
apache2 -k start
www-data  5506  0.0  1.2  18524  3188 ?        S    21:08   0:00  \_ /usr/sbin/
apache2 -k start
www-data  5507  0.0  1.2  18524  3188 ?        S    21:08   0:00  \_ /usr/sbin/
apache2 -k start
www-data  5508  0.0  1.2  18524  3188 ?        S    21:08   0:00  \_ /usr/sbin/
apache2 -k start
www-data  5509  0.0  1.2  18524  3188 ?        S    21:08   0:00  \_ /usr/sbin/
apache2 -k start
```

```
# These need to be set in /etc/apache2/envvars
User ${APACHE_RUN_USER}
Group ${APACHE_RUN_GROUP}
```

```
export APACHE_RUN_USER=www-data
export APACHE_RUN_GROUP=www-data
```

```
$ cat /etc/group|grep www
$ cat /etc/passwd|grep www
```

```
$ sudo groupadd www-data
$ sudo useradd -g www-data www-data
```

```
$ sudo /etc/init.d/apache2 restart
```

3.5.4 密码认证

1. 基本认证

```
$ sudo nano /etc/apache2/sites-available/blog.mytest.com
```

```
<Directory /var/www/blog.mytest.com/private>
       Options Indexes FollowSymLinks MultiViews
       AllowOverride AuthConfig
       Order allow,deny
       allow from all
</Directory>
```

```
$ sudo /etc/init.d/apache2 reload
```

```
$ sudo mkdir /var/www/blog.mytest.com/auth
$ sudo chmod a+rx /var/www/blog.mytest.com/auth
$ cd /var/www/blog.mytest.com/auth
```

```
$ sudo htpasswd -bc private.passwords username password
Adding password for user username
```

```
$ sudo mkdir /var/www/blog.mytest.com/private
$ cd /var/www/blog.mytest.com/private
$ sudo nano .htaccess
```

```
AuthName "Password Needed"
AuthType Basic
AuthUserFile /var/www/blog.mytest.com/auth/private.passwords
Require valid-user
```

2．摘要式认证

```
$ sudo a2enmod auth_digest
$ sudo /etc/init.d/apache2 restart
```

```
AuthType Digest
AuthName "Please Give Your Password"
AuthDigestDomain /var/www/blog.mytest.com/private
AuthUserFile  /var/www/blog.mytest.com/auth/digest.passwords
require valid-user
```

```
$ cd /var/www/blog.mytest.com/private
$ sudo htdigest -c digest.passwords "Please Give Your Password" username
Adding password for username in realm Please Give Your Password.
New password:
Re-type new password:
```

3.5.5　检查文件权限

```
$ sudo chmod 777 index.cgi
```

```
$ sudo chmod 755 index.cgi
```

```
Options FollowSymLinks
AllowOverride None
```

3.5.6 关闭不用的模块

```
$ sudo a2dismod
```

```
Which module would you like to disable?
Your choices are: alias auth_basic authn_file authz_default authz_groupfile authz_ host authz_user autoindex cgi dir env mime negotiation php5 setenvif status
Module name? auth_digest <-- 此处我们输入“auth_digest”
Module auth_digest disabled; run /etc/init.d/apache2 force-reload to fully disable.
```

```
$ sudo /etc/init.d/apache2 force-reload
```

```
 * Reloading web server config apache2                                    [OK]
```

3.5.7 DDoS 攻击防范

1．mod-evasive 的工作原理

```
Nov  3 22:48:50 ubuntu mod_evasive[4255]: Blacklisting address xxx.xxx.xxx.xxx: possible DoS attack.
```

2．mod-evasive 的安装

```
$ sudo apt-get install libapache2-mod-evasive
```

3．mod-evasive 的配置

```
$ sudo nano /etc/apache2/conf.d/evasive
```

```
<IfModule mod_evasive20.c>
    DOSHashTableSize    3097
    DOSPageCount       2
    DOSSiteCount       50
    DOSPageInterval     1
    DOSSiteInterval     1
DOSBlockingPeriod   10

#还可以加入以下备选配置
    DOSEmailNotify      you@yourdomain.com
    DOSSystemCommand    "su - someuser -c '/sbin/... %s ...'"
DOSLogDir           "/var/lock/mod_evasive"

#还可以加入以下的“白名单”配置
DOSWhitelist    127.0.0.1
DOSWhitelist    127.0.0.*
</IfModule>
```

4．DDoS 攻击测试

```
$ cd /usr/share/doc/libapache2-mod-evasive/examples
$ perl test.pl
```

```
HTTP/1.1 200 OK
HTTP/1.1 200 OK
HTTP/1.1 200 OK
HTTP/1.1 403 Forbidden
HTTP/1.1 403 Forbidden
HTTP/1.1 403 Forbidden
HTTP/1.1 403 Forbidden
```

3.6　Apache 日志分析

3.6.1　用 Webalizer 分析 Apache 日志

1．安装 Webalizer

```
$ sudo apt-get install webalizer
```

```
$ sudo webalizer
```

2．配置 Webalizer

```
LogFile /var/log/apache2/access.log.1
```

```
#LogType       clf
```

```
OutputDir /var/www/webalizer
```

```
HostName     xxxxxx
```

```
PageType     htm*
```

3.6.2　用 AWStats 分析 Apache 日志

1．安装 AWStats

```
$ sudo apt-get install awstats
```

```
0,10,20,30,40,50  *  *  *  *  www-data  [  -x  /usr/lib/cgi-bin/awstats.pl  -a  -f
/etc/awsta ts/awstats.conf -a -r /var/log/apache/access.log ] && /usr/lib/cgi-
bin/awstats.pl -config=awstats -update >/dev/null
```

2．配置 Apache

```
$ sudo nano /etc/apache2/awstats.conf
```

```
Alias /awstatsclasses "/usr/share/awstats/lib/"
Alias /awstats-icon/ "/usr/share/awstats/icon/"
Alias /awstatscss "/usr/share/doc/awstats/examples/css"
ScriptAlias /cgi-bin/ /usr/lib/cgi-bin/
ScriptAlias /awstats/ /usr/lib/cgi-bin/
Options ExecCGI -MultiViews +SymLinksIfOwnerMatch
```

```
$ sudo nano /etc/apache2/apache2.conf
```

```
Include /etc/apache2/awstats.conf
```

```
$ sudo /etc/init.d/apache2 reload
```

3．配置 AWStats

```
$ sudo cp /etc/awstats/awstats.conf /etc/awstats/awstats.192.168.1.10.conf
```

```
$ sudo nano /etc/awstats/awstats.192.168.1.10.conf
```

```
LogFile="/var/log/apache2/access.log"
SiteDomain="mytest.com"
```

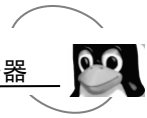
```
$ sudo /usr/bin/perl /usr/lib/cgi-bin/awstats.pl -update -config=192.168.1.10
```

```
0 4 * * * www-data [ -x /usr/lib/cgi-bin/awstats.pl -a -f /etc/awstats/
awstats.conf -a -r /var/log/apache/access.log ] && /usr/lib/cgi-bin/awstats.pl -
config=awstats -update >/dev/null
```

3.6.3 Apache 日志合并

```
$ sudo cp /usr/share/doc/awstats/examples/logresolvemerge.pl /usr/local/bin
```

```
127.0.0.1 - - [02/Nov/2008:20:17:25 -0500] "GET /" 200 45 "-" "-"
127.0.0.1 - - [02/Nov/2008:20:17:26 -0500] "GET /" 200 45 "-" "-"
192.168.1.119 - - [02/Nov/2008:20:18:04 -0500] "GET / HTTP/1.1" 200 45 "-"
192.168.1.119 - - [02/Nov/2008:20:18:04 -0500] "GET /favicon.ico HTTP/1.1" 404
```



```
127.0.0.1 - - [02/Nov/2008:20:17:26 -0500] "GET /" 200 45 "-" "-"
127.0.0.1 - - [02/Nov/2008:20:17:27 -0500] "GET /" 200 45 "-" "-"
192.168.1.119 - - [02/Nov/2008:20:18:05 -0500] "GET / HTTP/1.1" 200 45 "-"
192.168.1.119 - - [02/Nov/2008:20:18:05 -0500] "GET /favicon.ico HTTP/1.1" 404
127.0.0.1 - - [02/Nov/2008:20:18:19 -0500] "KKK" 501 289 "-" "-"
```

```
127.0.0.1 - - [02/Nov/2008:20:17:25 -0500] "GET /" 200 45 "-" "-"
127.0.0.1 - - [02/Nov/2008:20:17:26 -0500] "GET /" 200 45 "-" "-"
127.0.0.1 - - [02/Nov/2008:20:17:27 -0500] "GET /" 200 45 "-" "-"
192.168.1.119 - - [02/Nov/2008:20:18:04 -0500] "GET / HTTP/1.1" 200 45 "-"
192.168.1.119 - - [02/Nov/2008:20:18:04 -0500] "GET /favicon.ico HTTP/1.1" 404
192.168.1.119 - - [02/Nov/2008:20:18:05 -0500] "GET / HTTP/1.1" 200 45 "-"
192.168.1.119 - - [02/Nov/2008:20:18:05 -0500] "GET /favicon.ico HTTP/1.1" 404
127.0.0.1 - - [02/Nov/2008:20:18:19 -0500] "KKK" 501 289 "-" "-"
```

```
$ sudo su -c "logresolvemerge.pl /var/log/webcluster/access_log_server* >
/var/log/ webcluster/access_log_overall"
```

第 4 章

LAMP 服务器之 PHP 篇

4.3 安装 LAMP 相关软件包

4.3.1 LAMP 软件包安装

```
$ sudo apt-get install apache2 libapache2-mod-php5 php5-mysql mysql-server
```

```
New password for the MySQL "root" user: <-- 输入密码
Repeat password for the MySQL "root" user: <-- 再输入一次
```

```
$ mysql -u root
mysql> SET PASSWORD FOR 'root'@'localhost' = PASSWORD('yourpassword');
mysql> SET PASSWORD FOR 'root'@'ubox.mytest.com' = PASSWORD('yourpassword');
```

```
$ sudo apt-get install php5-memcache
```

4.3.2　LAMP 软件包删除

```
$ sudo apt-get remove apache2 apache2-mpm-prefork apache2-utils apache2.2- common
l  ibapache2-mod-php5  libapr1  libaprutil1  libdbd-mysql-perl  libdbi-  perl
libmysqlclie  nt15off  libnet-daemon-perl  libplrpc-perl  libpq5  mysql-client-5.0
mysql-common mys ql-server mysql-server-5.0 php5-common php5-mysql
```

4.4　配置 Apache、MySQL、PHP

4.4.1　MySQL 配置

2．创建 MySQL 数据库

```
DROP TABLE IF EXISTS `users`;
CREATE TABLE `users` (
  `uid` int(10) unsigned NOT NULL default '0',
  `name` varchar(60) NOT NULL default '',
  `pass` varchar(32) NOT NULL default '',
  `mail` varchar(64) default '',
  PRIMARY KEY  (`uid`),
  UNIQUE KEY `name` (`name`)
);

INSERT INTO `users` (`uid`, `name`, `pass`, `mail`) VALUES
(1, 'Hiweed', MD5('passwdHiweed'), 'hiweed@test.com'),
(2, 'Ning', MD5('passwdNing'), 'ning@test.com'),
(3, 'Guoce', MD5('passwdGuoce'), 'guoce@test.com')
```

```
$ mysqladmin -uroot -p create mydb
$ mysql mydb -uroot -p < mydb.sql
```

```
$ mysql mydb -uroot -p
```

```
mysql> select * from users;
+-----+--------+----------------------------------+-----------------+
| uid | name   | pass                             | mail            |
+-----+--------+----------------------------------+-----------------+
|   1 | Hiweed | e2d9dfef9b36eeece2ab0117abd40445 | hiweed@test.com |
|   2 | Ning   | b942fc6f6b0cc6d1a0e665306c6fcc2b | ning@test.com   |
|   3 | Guoce  | aeaa8187b8df25e4f9a291ce2eb00291 | guoce@test.com  |
+-----+--------+----------------------------------+-----------------+
3 rows in set (0.00 sec)
```

```
mysql> quit
Bye
```

3．创建数据库用户并分配权限

```
mysql> GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, INDEX, ALTER ON mydb.* TO
'us ername'@'localhost' IDENTIFIED BY 'password';
mysql> flush privileges;
```

```
mysql> exit
```

4.4.2 PHP 配置

1．PHP 配置文件

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

max_execution_time = 30   ; 单个 PHP 文件的最大运行时间，单位是秒
max_input_time = 60       ; 单个 PHP 文件接收数据花费的最大时间，单位是秒
memory_limit = 16M        ; 单个 PHP 文件可以占用的最大内存
```

2．PHP 测试

```
$ echo "<?php phpinfo(); ?>" | sudo tee /var/www/blog.mytest.com/phpinfo.php
```

3．PHP 排错

```
$ sudo a2enmod php5
$ sudo apache2ctl restart
```

4.6　用 phpMyAdmin 管理 MySQL 数据库

4.6.1　phpMyAdmin 的安装

```
$ sudo apt-get install phpmyadmin
```

```
$ sudo ln -s /usr/share/phpmyadmin /var/www/blog.mytest.com/phpmyadmin
```

4.6.2　phpMyAdmin 排错

```
$ sudo cat /var/lib/phpmyadmin/blowfish_secret.inc.php | grep blowfish_secret >>
/ etc/phpmyadmin/config.inc.php
```

4.7　实例：用 Drupal 快速架设 Blog 网站

4.7.2　获取 Drupal

```
$ sudo rm /var/www/blog.mytest.com/index.html
```

```
$ wget http://ftp.osuosl.org/pub/drupal/files/projects/drupal-6.6.tar.gz
$ tar xfvz drupal-6.6.tar.gz
$ sudo mv drupal-6.6/{*,.htaccess} /var/www/blog.mytest.com
```

4.7.3　为 Drupal 创建 MySQL 数据库和用户

```
$ mysqladmin -uroot -p create drupal6
```

```
$ mysql -uroot -p

mysql> GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, DROP, INDEX, ALTER, CREATE
TE  MPORARY  TABLES,  LOCK  TABLES  ON  drupal6.*  TO  'drupaluser'@'localhost'
IDENTIFIED BY 'yourpassword';

mysql> FLUSH PRIVILEGES;   <-- 刷新权限，使之生效
mysql> \q
```

4.7.4　为 Drupal 配置 PHP

```
memory_limit = 32M        ; 单个 PHP 文件可以占用的最大内存
```

4.7.5 为 Drupal 配置 Apache

```
$ sudo a2enmod rewrite
```

```
<Directory /var/www/blog.mytest.com/>
       Options Indexes FollowSymLinks MultiViews
       AllowOverride all
       Order allow,deny
       allow from all
</Directory>
```

```
$ sudo /etc/init.d/apache2 force-reload  <-- 重新装载 Apache2
```

4.7.6 安装 Drupal

```
$ sudo chmod o+w /var/www/blog.mytest.com/sites/default
```

```
$ sudo chmod o-w /var/www/blog.mytest.com/sites/default
```

第 5 章

LAMP 服务器之 Perl 篇

5.1 安装 Perl 模块

```
$ sudo apt-get install libapache2-mod-perl2
```

5.2 配置 cgi-bin 目录

```
ScriptAlias /cgi-bin/ /usr/lib/cgi-bin/
<Directory "/usr/lib/cgi-bin">
       AllowOverride None
       Options +ExecCGI -MultiViews +SymLinksIfOwnerMatch
       Order allow,deny
       Allow from all
</Directory>
```

5.3 Perl 程序测试

```
$ sudo mkdir /usr/lib/cgi-bin/test
$ sudo nano /usr/lib/cgi-bin/test/test.pl
```

```
#!/usr/bin/perl -w

print "Content-type: text/html\n\n";
print "Hello, World.";
```

```
$ sudo chmod a+x /usr/lib/cgi-bin/test/test.pl
```

5.4 用 Perl 访问 MySQL 数据库

```
#!/usr/bin/perl

use DBI;
```

```
# 连接数据库
my $dbh = DBI->connect("DBI:mysql:database=mydb;host=localhost","username","passw
ord", {'RaiseError' => 1});

# 查询
my $sqr = $dbh->prepare("SELECT name, mail FROM users");
$sqr->execute();

# 打印结果
while(my $ref = $sqr->fetchrow_hashref()) {
   print "$ref->{'name'}, $ref->{'mail'}\n";
}

# 关闭数据库连接
$dbh->disconnect();
```

```
$ perl /var/www/dbtest.pl
```

```
Hiweed, hiweed@test.com
Ning, ning@test.com
Guoce, guoce@test.com
```

```
$ sudo cp /var/www/dbtest.pl /usr/lib/cgi-bin/test/
```

```
print "Content-type: text/html\n\n";
```

```
#!/usr/bin/perl

use DBI;

my $dbh = DBI->connect("DBI:mysql:database=mydb;host=localhost","username",
"passw ord", {'RaiseError' => 1});

my $sqr = $dbh->prepare("SELECT name, mail FROM users");
$sqr->execute();

print "Content-type:text/html\n\n";

while(my $ref = $sqr->fetchrow_hashref()) {
   print "$ref->{'name'}, $ref->{'mail'}\n\n";
}

$dbh->disconnect();
```

```
$ sudo chmod 755 /usr/lib/cgi-bin/test/dbtest.pl
```

5.5　CGI 排错

```
#!/usr/bin/perl

print "Content-type: text/html\n\n";
```

```
$ chmod a+x test.pl
```

```
$ chmod 755 test.pl
```

5.6　实例：用 Twiki 假设 Wiki

5.6.1　安装 Twiki

```
$ sudo apt-get install twiki
```

5.6.2　配置 Twiki

```
RedirectMatch /twiki/?$ http://localhost/cgi-bin/twiki/view$1
RedirectMatch /twiki(/([A-Z].*)?)?$ http://localhost/cgi-bin/twiki/view$1
```

3．Twiki 安全

```
$ sudo -u www-data htpasswd /var/lib/twiki/data/.htpasswd TWikiGuest
```

第 6 章

LAMP 服务器之 Python 篇

6.1 安装 mod_python

```
$ sudo apt-get install libapache2-mod-python
```

6.2 配置 Apache

6.2.1 Publisher Handler

```
AddHandler mod_python .py
PythonHandler mod_python.publisher
PythonDebug On
```

```
 [...]
       <Directory /var/www/>
              Options Indexes FollowSymLinks MultiViews
              AllowOverride None
              Order allow,deny
              allow from all
              AddHandler mod_python .py
              PythonHandler mod_python.publisher
              PythonDebug On
       </Directory>
[...]
```

```
$ sudo /etc/init.d/apache2 restart
```

```
$ sudo nano /var/www/test.py
```

```
def index(req):
  return "Hello World";
```

6.2.2 PSP Handler

```
AddHandler mod_python .psp
PythonHandler mod_python.psp
PythonDebug On
```

```
 [...]
       <Directory /var/www/>
              Options Indexes FollowSymLinks MultiViews
              AllowOverride None
              Order allow,deny
              allow from all
              AddHandler mod_python .psp
              PythonHandler mod_python.psp
              PythonDebug On
       </Directory>
[...]
```

```
$ sudo /etc/init.d/apache2 restart
```

```
$ sudo nano /var/www/test.psp
```

```
<html>
<body>
<h1><% req.write("Hello, PSP World") %></h1>
</body>
</html>
```

6.3 让 Python 支持 MySQL

```
$ sudo apt-get install python-mysqldb
```

6.3.1 Python 连接 MySQL 数据库测试

```
$ sudo nano /var/www/dbtest.py
```

```
#!/usr/bin/python

# 导入数据库模块
import MySQLdb

# 连接数据库
db                                                                    =
```

```
MySQLdb.connect(host="localhost",user="username",passwd="password",db="mydb"
)

# 创建一个游标
cursor = db.cursor()

# 执行 SQL 语句
cursor.execute("SELECT name, mail FROM users")

# 获取查询结果（数组）
result = cursor.fetchall()

# 打印查询结果
for record in result:
print record[0] , "-->", record[1]
```

```
$ python /var/www/dbtest.py
```

```
Hiweed --> hiweed@test.com
Ning --> ning@test.com
Guoce --> guoce@test.com
```

6.3.2　Python 的 CGI 程序

```
print "Content-type:text/html\n"
```

```
#!/usr/bin/python

import MySQLdb
db                                                                    =
MySQLdb.connect(host="localhost",user="username",passwd="password",db="mydb"
)
cursor = db.cursor()
cursor.execute("SELECT name, mail FROM users")
result = cursor.fetchall()

print "Content-type:text/html\n"

for record in result:
print record[0] , "-->", record[1]
```

```
$ sudo cp /var/www/dbtest.py /usr/lib/cgi-bin/test/
```

```
$ sudo chmod 755 /usr/lib/cgi-bin/test/dbtest.py
```

6.4 实例：用 Django 开发 Web 应用程序

6.4.1 安装 Django

```
$ sudo apt-get install python-django
```

6.4.2 创建自己的 Django 项目

```
$ cd ~
$ django-admin startproject mysite
```

```
mysite/
    init__.py          <-- 该文件告诉 Python，此目录是一个 Python Package
    manage.py          <-- 本项目的命令行管理工具
    settings.py        <-- 本项目的配置文件
    urls.py            <-- 用以设置 URL 的对应关系和样式
```

6.4.3 运行 Django 开发服务器

```
$ cd ~/mysite
$ manage.py runserver 192.168.1.10:8000
```

```
Validating models...
0 errors found.

Django version 0.96.1, using settings 'mysite.settings'
Development server is running at http://192.168.1.10:8000/
Quit the server with CONTROL-C.
```

6.4.4 连接 MySQL 数据库

```
DATABASE_ENGINE = 'mysql'
DATABASE_NAME = 'mydb'
DATABASE_USER = 'username'
DATABASE_PASSWORD = 'password'
DATABASE_HOST = 'localhost'
```

```
$ python manage.py syncdb
```

```
$ mysql -uusername -ppassword mydb
mysql> show tables;
```

```
+----------------------------+
| Tables_in_mydb             |
+----------------------------+
| auth_group                 |
```

```
| auth_group_permissions     |
| auth_message               |
| auth_permission            |
| auth_user                  |
| auth_user_groups           |
| auth_user_user_permissions |
| django_content_type        |
| django_session             |
| django_site                |
| users                      |
+----------------------------+
11 rows in set (0.00 sec)
```

6.5　实例：用 MoinMoin 实现 Wiki

6.5.1　安装 MoinMoin

```
$ sudo apt-get install python-moinmoin
```

6.5.2　创建 MoinMoin 实例

1．创建 Wiki 实例

```
$ cd /usr/share/moin/
```

```
$ sudo cp -R data mywiki
```

```
$ sudo cp -R underlay mywiki
```

```
$ sudo cp server/moin.cgi mywiki
```

```
$ sudo chown -R www-data.www-data mywiki
```

```
$ sudo chmod -R ug+rwX mywiki
$ sudo chmod -R o-rwx mywiki
```

2．将实例添加到 MoinMoin 中

```
$ sudo nano /etc/moin/mywiki.py
```

```
data_dir = '/org/mywiki/data/'
```

```
data_dir = '/usr/share/moin/mywiki/data'
```

3．配置 Apache

```
### moin
  ScriptAlias /mywiki "/usr/share/moin/mywiki/moin.cgi"
  alias /wiki "/usr/share/moin/htdocs"
  <Directory /usr/share/moin/htdocs>
  Order allow,deny
  allow from all
  </Directory>
### end moin
```

```
$ sudo /etc/init.d/apache2 restart
```

6.5.3 MoinMoin 权限控制

```
#acl hiweed:read,write All:read
```

1．语法

```
#acl   [+-]User[,SomeGroup,...]:[right[,right,...]]   [[+-]OtherUser:...]   [[+-]
Truste d:...] [[+-]Known:...] [[+-]All:...] [Default]
```

2．定义组

```
#acl hiweed:read,write,admin,delete,revert  All:read
 * hiweed
 * shanghao
 * xiaoning
```

3．组权限

```
#acl AdminGroup:read,write,revert  All:read
```

6.6 Python Web 应用的性能优化

6.6.3 mod-wsgi 的安装

```
$ sudo apt-get remove --purge libapache2-mod-python
```

```
$ sudo nano /etc/apache2/sites-available/default
```

```
#     AddHandler mod_python .py
```

```
#     PythonHandler mod_python.publisher
#     PythonDebug On
```

```
$ sudo apt-get install libapache2-mod-wsgi
```

第 7 章 Apache Tomcat 架设

7.1 安装 Tomcat

```
$ sudo apt-get install sun-java5-jdk tomcat5.5 tomcat5.5-admin
```

```
JAVA_HOME=/usr/lib/jvm/java-1.5.0-sun
```

```
$ sudo /etc/init.d/tomcat5.5 start
```

```
$ sudo /etc/init.d/tomcat5.5 stop
$ sudo /etc/init.d/tomcat5.5 restart
```

```
$ java -version
```

7.2 配置 Tomcat

```
$ sudo nano /var/lib/tomcat5.5/conf/tomcat-users.xml
```

```
<?xml version='1.0' encoding='UTF-8'>
<tomcat-users>
<role rolename="manager"/>
<role rolename="admin"/>
<user username="hiweed" password="HiPass" roles="admin,manager"/>
</tomcat-users>
```

7.3 Tomcat 和 Apache 的整合：mod_jk

7.3.1　mod_jk 的安装

```
$ sudo apt-get install libapache2-mod-jk
```

7.3.2　mod_jk 的配置

```
$ sudo nano /etc/libapache2-mod-jk/workers.properties
```

```
workers.tomcat_home=/usr/share/tomcat5.5
workers.java_home=/usr/lib/jvm/java-1.5.0-sun
ps=/
worker.list=worker1
worker.ajp13_worker.port=8180
worker.ajp13_worker.host=localhost
worker.ajp13_worker.type=ajp13
worker.ajp13_worker.lbfactor=1
worker.loadbalancer.type=lb
worker.loadbalancer.balance_workers=ajp13_worker
```

```
$ sudo nano /etc/apache2/apache.conf
```

```
# 告诉 JK 到哪里去找 workers.properties
JkWorkersFile /etc/libapache2-mod-jk/workers.properties

# 定义 JK 日志的位置
JkLogFile /var/log/apache2/mod_jk.log

# 设置 JK 日志的级别 [debug/error/info]
JkLogLevel info

# 设置 Log 的格式
JkLogStampFormat "[%a %b %d %H:%M:%S %Y] "

# JK 选项
JkOptions +ForwardKeySize +ForwardURICompat -ForwardDirectories

# 设置请求格式
JkRequestLogFormat "%w %V %T"
```

```
$ sudo nano /etc/apache2/sites-available/default
```

```
jkMount /* worker1
```

```
$ sudo /etc/init.d/apache2 restart
```

7.4 Tomcat 安全

7.4.1 保护 shutdown 端口

```
<Server port="8005" shutdown="SHUTDOWN">
```

7.4.2　修改默认错误页面

```
<error-page>
  <exception-type>java.lang.Throwable</exception-type>
  <location>/error.jsp</location>
</error-page>
```

7.4.4　Manager WebApp 安全

```
$ sudo nano /etc/tomcat5.5/Catalina/localhost/manager.xml
```

```
<Valve className="org.apache.catalina.valves.RemoteAddrValve"
       allow="192.168.1.*" />
```

```
<Valve className="org.apache.catalina.valves.RemoteHostValve"
       allow="*.localdomain.com" />
```

第 8 章

最佳代理、反向代理服务器：Squid

8.1 Squid 安装

```
$ sudo apt-get install squid
```

```
FATAL: Could not determine fully qualified hostname.  Please set 'visible_
hostname'
```

8.2 为 Squid 配置主机名

```
$ sudo cp /etc/squid/squid.conf /etc/squid/squid.conf.backup
$ sudo chmod a-w /etc/squid/squid.conf.backup
```

```
$ cd /etc/squid/
$ sudo cat squid.conf.backup | grep -v ^$ | grep -v ^# | sudo tee squid.conf
```

```
$ sudo nano /etc/squid/squid.conf
```

```
visible_hostname ubproxy
```

```
$ sudo /etc/init.d/squid restart
```

8.3 访问控制列表

```
acl name type value1 value2 ...
```

例如：

```
acl NormalUsers src 192.168.1.0/24, 192.168.2.0/24
```

```
acl NormalUsers src 192.168.1.0/24
acl NormalUsers src 192.168.2.0/24
```

```
http_access deny NormalUser
```

8.4　正向代理

8.4.1　设置端口号

```
http_port 8888
```

8.4.2　禁止某些 IP 地址上网

```
acl WorkShop src 192.168.1.0-192.168.2.0/24
```

```
acl WorkShop src 192.168.1.0/24
acl WorkShop src 192.168.2.0/24
```

```
acl WorkShop src 192.168.1.0/24, 192.168.2.0/24
```

```
http_access deny WorkShop
```

8.4.3　禁止在某时间段上网

```
acl NormalUsers src 192.168.1.0/24
acl WorkingHours time D 09:00-10:00
http_access deny !WorkingHours NormalUsers
```

```
http_access allow NormalUsers WorkingHours
```

8.4.4　个别网站的控制

```
$ sudo nano /etc/squid/allowedSites.list
```

```
hiweed.com
aixingzou.cn
```

```
$ sudo nano /etc/squid/deniedSites.list
```

```
www.illegalsite.com
abcdef.com
```

```
acl office_network src 192.168.1.0/24
acl GoodSites dstdomain "/etc/squid/allowedSites.list"
acl BadSites  dstdomain "/etc/squid/denySites.list"
```

```
http_access deny BadSites
http_access allow office_network GoodSites
```

8.4.5 用 NCSA 做密码认证

```
$ sudo touch /etc/squid/auth-password
$ sudo chmod o+r /etc/squid/auth-password
```

```
$ sudo htpasswd /etc/squid/auth-password username
New password:
Re-type new password:
Adding password for user username
```

```
$ dpkg -L squid | grep ncsa_auth
/usr/lib/squid/ncsa_auth
```

```
# 定义认证程序和密码文件的位置
auth_param basic program /usr/lib/squid/ncsa_auth /etc/squid/auth-password
# 定义派生认证进程的数量
auth_param basic children 5
# 要求输入用户名和密码时显示的信息
auth_param basic realm Please Login First
# 每隔 2 小时就重新认证一次
auth_param basic credentialsttl 2 hours
# 大小写敏感：关闭（对用户名不区分大小写）
auth_param basic casesensitive off

acl ncsa_users proxy_auth REQUIRED
http_access allow ncsa_users
```

8.4.6 透明代理的设置

1．服务器网卡配置

```
$ cat /etc/network/interfaces
auto eth1
iface eth1 inet static
address 192.168.1.10
netmask 255.255.255.0
network 192.168.1.0
broadcast 192.168.1.255
```

3．Squid 的透明代理配置

```
http_port 192.168.1.10:3128 transparent
```

4．iptables 防火墙的配置

```
$ iptables --list
```

```
Chain INPUT (policy ACCEPT)
target     prot opt source               destination

Chain FORWARD (policy ACCEPT)
target     prot opt source               destination

Chain OUTPUT (policy ACCEPT)
target     prot opt source               destination
```

```
$ sudo iptables -t nat -A PREROUTING -i eth1 -p tcp \
      --dport 80 -j REDIRECT --to-port 3128
$ sudo iptables -A INPUT -j ACCEPT -m state \
      --state NEW,ESTABLISHED,RELATED -i eth1 -p tcp \
      --dport 3128
$ sudo iptables -A OUTPUT -j ACCEPT -m state \
      --state NEW,ESTABLISHED,RELATED -o eth0 -p tcp \
      --dport 80
$ sudo iptables -A INPUT -j ACCEPT -m state \
      --state ESTABLISHED,RELATED -i eth0 -p tcp \
      --sport 80
$ sudo iptables -A OUTPUT -j ACCEPT -m state \
      --state ESTABLISHED,RELATED -o eth1 -p tcp \
      --sport 80
```

```
$ iptables -L
```

```
Chain INPUT (policy ACCEPT)
target     prot opt source               destination
ACCEPT     tcp  --  anywhere             anywhere      state   NEW,RELATED,ESTABLIS
HED tcp dpt:3128
ACCEPT     tcp  --  anywhere             anywhere      state    RELATED,ESTABLISHED
tcp spt:www

Chain FORWARD (policy ACCEPT)
target     prot opt source               destination

Chain OUTPUT (policy ACCEPT)
target     prot opt source               destination
ACCEPT     tcp  --  anywhere             anywhere      state   NEW,RELATED,ESTABLIS
HED tcp dpt:www
ACCEPT     tcp  --       anywhere        anywhere      stateRELATED,ESTABLISHED
tcp spt:www
```

5．保存 iptables 规则

```
$ sudo sh -c "iptables-save > /etc/iptables.rules"
```

```
  pre-up iptables-restore < /etc/iptables.rules
```

```
post-down iptables-save -c > /etc/iptables.rules
```

```
auto eth1
iface eth1 inet static
    address 192.168.1.10
    netmask 255.255.255.0
    network 192.168.1.0
    broadcast 192.168.1.255
    pre-up iptables-restore < /etc/iptables.rules
    post-down iptables-save -c > /etc/iptables.rules
```

8.5 反向代理

8.5.1 Squid 反向代理单个后台 Web 服务器

1．Web 和 Squid 在同一台机器上

```
http_port 80 vhost vport
cache_peer 127.0.0.1 parent 81 0 no-query originserver
```

2．Web 和 Squid 在不同的机器上

```
http_port 80 vhost vport
cache_peer 221.214.14.185 parent 80 0 no-query originserver
```

8.5.2 Squid 反向代理多个后台 Web 服务器

```
192.168.1.10   news.163.com
192.168.1.10   news.baidu.com
192.168.1.10   news.google.com
```

```
202.108.9.79     news.163.com
61.135.163.87    news.baidu.com
209.85.175.99    news.google.com
```

```
acl ServerIPs dst 202.108.9.79 61.135.163.87 209.85.175.99
acl ServerDomains dstdomain  news.163.com news.baidu.com news.google.com

always_direct allow ServerDomains
never_direct allow !ServerDomains
http_access allow ServerIPs
http_access allow ServerDomains
```

8.6　Squid 排错

8.6.1　Squid 运行状态检查

```
$ sudo squid -NCd1
2009/06/22 09:56:26| Squid is already running!  Process ID 4832
```

8.7　使用 SquidGuard

8.7.2　安装 SquidGuard

```
$ sudo apt-get install squidguard
```

8.7.3　SquidGuard 基本配置

1．创建简单的 SquidGuard 配置文件

```
$ sudo mv /etc/squid/squidGuard.conf /etc/squid/squidGuard.conf-orig
$ sudo nano /etc/squid/squidGuard.conf
```

```
#
# CONFIG FILE FOR SQUIDGUARD
#

dbhome /var/lib/squidguard/db/blacklists
logdir /var/log/squid

dest spyware {
       domainlist spyware/domains
       urllist spyware/urls
}

acl {
       default {
              pass !spyware all
              redirect http://192.168.1.10/block.html
       }
}
```

2．准备黑名单

```
$ sudo su
```

```
# cd /var/lib/squidguard/db/
```

```
# wget http://squidguard.mesd.k12.or.us/blacklists.tgz
```

```
# tar xfvz blacklists.tgz
```

```
# chown proxy:proxy -R /var/lib/squidguard/db/*
```

```
# find /var/lib/squidguard/db -type f | xargs chmod 644
# find /var/lib/squidguard/db -type d | xargs chmod 755
```

```
# sudo -u proxy squidGuard -C all
```

3．测试黑名单数据库

```
$ sudo su
# echo "http://hiweed.com / - - GET" | squidGuard -d
2009-03-20 04:24:31 [5371] init domainlist /var/lib/squidguard/db/blacklists/
spywa re/domains
2009-03-20 04:24:31 [5371] loading dbfile /var/lib/squidguard/db/blacklists/
spywar e/domains.db
2009-03-20 04:24:31 [5371] init urllist /var/lib/squidguard/db/blacklists/
spyware/ urls
2009-03-20 04:24:31 [5371] loading dbfile /var/lib/squidguard/db/blacklists/
spywar e/urls.db
2009-03-20 04:24:31 [5371] squidGuard 1.2.0 started (1237537471.949)
2009-03-20 04:24:31 [5371] squidGuard ready for requests (1237537471.953)

2009-03-20 04:24:31 [5371] squidGuard stopped (1237537471.955)
```

```
# exit
```

4．准备 block.html

```
$ sudo nano /var/www/block.html
```

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<html>
 <head>
   <meta http-equiv="Expires" content="0">
   <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
   <title>请勿访问非法网站
   </title>
```

```
  </head>
  <body bgcolor=#000000 text=#FFFFFF>
    <p>
      <br>
      <br>
      <br>
    </p>
    <table border=0 width=100% bgcolor=#FF0000 height=1>
      <tr><td> </td>
      </tr>
    </table>
    <p>
      <br>
    </p>
    <p align=center>
      <font size=10>禁止访问
      </font>
    </p>
    <p>
      <br>
    </p>
    <table border=0 width=100% bgcolor=#FF0000 height=1>
      <tr><td> </td>
      </tr>
    </table>
    <p align=right>
      <a href=http://hiweed.com style="text-decoration:none; font-stretch:wider">
        <font   style="font-weight:900;   font-size:125%"   color=#FFFFFF   size=
"4">hiweed. com</a>
    </p>
  </body>
</html>
```

5．让 Squid 使用 SquidGuard

```
$ sudo nano /etc/squid/squid.conf
```

```
redirect_program /usr/bin/squidGuard
```

```
$ sudo /etc/init.d/squid reload
```

7．黑名单或配置更新

```
$ sudo -u proxy squidGuard -C all
```

```
$ echo "http://hiweed.com / - - GET" | sudo squidGuard -d
```

```
2009-03-20  10:28:49  [5310]  syntax  error  in  configfile  /etc/squid/squidGuard.
```

```
conf line 14
```

```
$ sudo /etc/init.d/squid reload
```

8.7.4 SquidGuard 高级配置

1. 禁止使用 IP 地址访问 Web

```
$ sudo nano /etc/squid/squidGuard.conf
```

```
acl {
       default {
              pass !in-addr !spyware  all
              redirect http://192.168.1.10/block.html
       }
}
```

:

```
$ echo "http://hiweed.com / - - GET" | sudo squidGuard -d
```

```
$ sudo /etc/init.d/squid reload
```

2. 设置时间段

```
$ sudo nano /etc/squid/squidGuard.conf
```

```
time afterwork {
       weekly  sat sun                 # 周六、周日
       weekly  mtwhf  18:00-24:00      # 周一至周五的下班时间
       date    *.01.01                 # 每年的元旦
}
```

```
src admin {
       ip 192.168.1.0/24
}
```

```
acl {
       admin within afterwork {
              pass all
       }
       else {
```

```
        pass !in-addr !spyware all
    }
    default {
        pass none
        redirect http://192.168.1.10/block.html
    }
}
```

```
$ echo "http://hiweed.com / - - GET" | sudo squidGuard -d
```

```
$ sudo /etc/init.d/squid reload
```

3．启用所有黑名单

```
#
# CONFIG FILE FOR SQUIDGUARD
#

dbhome /var/lib/squidguard/db/blacklists
logdir /var/log/squid

time afterwork {
    weekly  sat sun                 # 周六、周日
    weekly  mtwhf  18:00-24:00      # 周一至周五的下班时间
    date    *.01.01                 # 每年的元旦
}

dest ads {
    domainlist     ads/domains
    urllist        ads/urls
}

dest aggressive {
    domainlist     aggressive/domains
    urllist        aggressive/urls
}

dest audio-video {
    domainlist     audio-video/domains
    urllist        audio-video/urls
}
dest drugs {
    domainlist     drugs/domains
    urllist        drugs/urls
}

dest gambling {
    domainlist     gambling/domains
    urllist        gambling/urls
}


dest hacking {
    domainlist     hacking/domains
```

```
        urllist         hacking/urls
}

dest mail {
        domainlist      mail/domains
}

dest porn {
        domainlist      porn/domains
        urllist         porn/urls
}

dest proxy {
        domainlist      proxy/domains
        urllist         proxy/urls
}

dest redirector {
        domainlist      redirector/domains
        urllist         redirector/urls
}

dest spyware {
        domainlist      spyware/domains
        urllist         spyware/urls
}

dest suspect {
        domainlist      suspect/domains
        urllist         suspect/urls
}


dest violence {
        domainlist      violence/domains
        urllist         violence/urls
}

dest warez{
        domainlist      warez/domains
        urllist         warez/urls
}

src admin {
        ip 192.168.1.0/24
}

acl {
        admin within afterwork {
                pass all
        }
        else {
                pass  !in-addr  !ads  !aggressive  !audio-video  !drugs  !gambling  !
hacking
!mail !porn !proxy !redirector !spyware !suspect !violence !warez all
        }
        default {
                pass none
                redirect http://192.168.1.10/block.html
```

```
        }
}
```

第 9 章

最佳邮件服务器方案

9.1 安装所有相关软件

9.1.1 安装服务器软件

```
$ sudo apt-get install postfix-mysql mysql-server dovecot-pop3d dovecot-imapd
amav isd-new libclass-dbi-mysql-perl
```

```
New password for the MySQL "root" user: <-- 输入密码
Repeat password for the MySQL "root" user: <-- 再次输入密码
Create directories for web-based administration? <-- 选择 No
General type of mail configuration: <-- 选择 Internet Site
System mail name: <-- 输入 DNS 全名（ubox.mytest.com）
SSL certificate required <-- 选择 Ok
Web server to reconfigure automatically: <-- 选择 apache2
```

9.1.2 安装内容过滤软件

```
$ sudo apt-get install SpamAssassin clamav-daemon razor pyzor cpio arj zoo
 nomarch lzop cabextract pax lha unrar
```

9.1.3 安装其他软件

```
$ sudo apt-get install squirrelmail squirrelmail-locales php5-imap
```

```
$ sudo apt-get install openssl
```

```
$ sudo apt-get install phpmyadmin  telnet mutt mailx
```

9.2 为 Postfix 准备数据库

9.2.1 创建数据库 maildb

```
$ mysql -uroot -p
```

```
mysql> create database maildb;
```

```
mysql>    GRANT    SELECT,    INSERT,    UPDATE,    DELETE    ON    maildb.*    TO
'mailadmin'@'localhost' IDENTIFIED BY 'mailadminPassword';
mysql>    GRANT    SELECT,    INSERT,    UPDATE,    DELETE    ON    maildb.*    TO
'mailadmin'@'localhost. localdomain' IDENTIFIED BY 'mailadminPassword';
mysql> FLUSH PRIVILEGES;
```

9.2.2 为数据库 maildb 创建数据表

```
mysql> use maildb;
```

1. 创建虚拟域表 virtual_domains

```
mysql> CREATE TABLE `virtual_domains` (
id INT NOT NULL AUTO_INCREMENT PRIMARY KEY,
name VARCHAR(50) NOT NULL
) TYPE=MyISAM;
```

```
mysql> INSERT INTO virtual_domains (name)
VALUES  ('mytest.com'),
       ('dongyouji.cn');
```

2. 创建虚拟用户表 virtual_users

```
mysql> CREATE TABLE `virtual_users` (
id int(11) NOT NULL AUTO_INCREMENT PRIMARY KEY,
domain_id INT(11) NOT NULL,
user VARCHAR(40) NOT NULL,
password VARCHAR(32) NOT NULL,
quota INT(10) DEFAULT '102400',
CONSTRAINT UNIQUE_EMAIL UNIQUE (domain_id,user),
FOREIGN KEY (domain_id) REFERENCES virtual_domains(id) ON DELETE CASCADE
) TYPE=MyISAM;
```

```
mysql> INSERT INTO virtual_users (domain_id, user, password, quota)
VALUES  (1, 'bajie', MD5('bajiePassword'), 10240),
```

```
        (1, 'wukong', MD5('wukongPassword'), 102400),
        (2, 'tangseng', MD5('tangsengPassword'), 1048576),
        (1, 'spams', MD5('spamsPassword'), 1024);
```

3．创建别名表 virtual_aliases

```
mysql> CREATE TABLE `virtual_aliases` (
id int(11) NOT NULL AUTO_INCREMENT PRIMARY KEY,
domain_id INT(11) NOT NULL,
source VARCHAR(40) NOT NULL,
destination VARCHAR(80) NOT NULL,
FOREIGN KEY (domain_id) REFERENCES virtual_domains(id) ON DELETE CASCADE
) TYPE=MyISAM;
```

```
mysql> INSERT INTO virtual_aliases (domain_id, source, destination)
VALUES  (2, 'tangseng', 'tang.sanzang@gmail.com'),
        (1, 'bajie', 'bajie@mytest.com'),
        (1, 'bajie', 'zhu_bajie@yahoo.com'),
        (1, '', 'spams@mytest.com');
```

9.2.3 为数据库 maildb 创建视图

```
mysql> SELECT CONCAT(virtual_users.user, '@', virtual_domains.name) AS email,
vir tual_users.password
FROM virtual_users
LEFT JOIN virtual_domains ON virtual_users.domain_id=virtual_domains.id;
```

```
+----------------------+----------------------------------+
| email                | password                         |
+----------------------+----------------------------------+
| bajie@mytest.com     | 00e28675230f4c9b16666098941e5d6d |
| wukong@mytest.com    | 407dbf9a4ca5a9906332ff0ea9c330fb |
| tangseng@dongyouji.cn | 3dbc34bca13af30ed7aa2769ee468b40 |
| spams@mytest.com     | 946bfb68686ed81aa5b0c58bb2633175 |
+----------------------+----------------------------------+
```

1. 创建用户视图 view_users

```
mysql> CREATE VIEW view_users AS
SELECT CONCAT(u.user, '@', virtual_domains.name) AS email, u.password
FROM virtual_users u
LEFT JOIN virtual_domains ON u.domain_id=virtual_domains.id;
```

```
mysql> SELECT * FROM view_users WHERE email LIKE 'bajie%';
+-----------------+----------------------------------+
| email           | password                         |
+-----------------+----------------------------------+
| bajie@mytest.com | 00e28675230f4c9b16666098941e5d6d |
+-----------------+----------------------------------+
```

2. 创建别名视图 view_virtual_aliases

```
mysql> CREATE VIEW view_aliases AS
SELECT  CONCAT(virtual_aliases.source,  '@',  virtual_domains.name)  AS  email,
destin ation
FROM virtual_aliases
LEFT JOIN virtual_domains ON virtual_aliases.domain_id=virtual_domains.id;
```

```
mysql>  SELECT * FROM view_aliases;
+--------------------+-----------------------+
```

```
| email                | destination             |
+----------------------+-------------------------+
| tangseng@mytest.com | tang.sanzang@gmail.com |
| bajie@mytest.com     | bajie@mytest.com       |
| bajie@mytest.com     | zhu_bajie@yahoo.com    |
| @mytest.com          | spams@mytest.com       |
+----------------------+-------------------------+
```

9.3　配置 Postfix

9.3.1　Postfix 与 MySQL 的关联配置

```
$ sudo mkdir /etc/postfix/mysql/
```

1．虚拟域 virtual_mailbox_domains 配置

```
$ sudo nano /etc/postfix/mysql/domains.cf
```

```
user = mailadmin
password = mailadminPassword
hosts = 127.0.0.1
dbname = maildb
query = SELECT 1 FROM virtual_domains WHERE name='%s'
```

```
$ sudo postconf -e virtual_mailbox_domains=mysql:/etc/postfix/mysql/domains.cf
```

```
$ postmap -q mytest.com mysql:/etc/postfix/mysql/domains.cf
1
```

```
postmap: warning: connect to mysql server 127.0.0.1: Access denied for user
'mailadmin'@'localhost' (using password: YES)
```

```
postmap: warning: connect to mysql server 127.0.0.1: Can't connect to MySQL
server on '127.0.0.1'
```

```
bind-address            = 127.0.0.1
```

2．信箱映射 virtual_mailbox_maps 配置

```
$ sudo nano /etc/postfix/mysql/mailbox-maps.cf
```

```
user = mailadmin
```

```
password = mailadminPassword
hosts = 127.0.0.1
dbname = maildb
query = SELECT 1 FROM view_users WHERE email='%s'
```

```
$ postmap -q bajie@mytest.com mysql:/etc/postfix/mysql/mailbox-maps.cf
1
```

```
$ sudo postconf -e virtual_mailbox_maps=mysql:/etc/postfix/mysql/mailbox-maps.cf
```

```
$ sudo groupadd -g 5000 vmail
$ sudo useradd -g vmail -u 5000 vmail -d /var/mail/virtual -m
```

```
$ sudo postconf -e virtual_uid_maps=static:5000
$ sudo postconf -e virtual_gid_maps=static:5000
```

3．别名映射 virtual_alias_maps 配置（一）

```
$ sudo nano /etc/postfix/mysql/alias-maps.cf
```

```
user = mailadmin
password = mailadminPassword
hosts = 127.0.0.1
dbname = maildb
query = SELECT destination FROM view_aliases WHERE email='%s'
```

```
$ postmap -q bajie@mytest.com mysql:/etc/postfix/mysql/alias-maps.cf
bajie@mytest.com,zhu_bajie@yahoo.com
```

```
$ sudo postconf -e virtual_alias_maps=mysql:/etc/postfix/mysql/alias-maps.cf
```

4．别名映射 virtual_alias_maps 配置（二：实验）

```
$ mysql maildb -u root -p
```

```
mysql> DELETE FROM `virtual_aliases`;
```

```
mysql> INSERT INTO virtual_aliases (domain_id, source, destination)
VALUES (1, '', 'hiweedtest@gmail.com');
mysql> exit
```

```
$ mail bajie@mytest.com
Subject: hi bajie, this is wukong          <-- 输入邮件主题
ni ge bi ma wen!                           <-- 输入正文
.                                          <-- 输入“.”结束正文
Cc:                                        <-- “抄送”地址，可以留空，直接回车
```

```
$ sudo tail /var/log/mail.log
```

```
Dec  7 23:16:36 mail postfix/smtp[8990]: 5304F42BA5: to=<hiweedtest@gmail.com>,
orig_to=<bajie@mytest.com>, relay=gmail-smtp-in.l.google.com[209.85.143.114]:25,
delay=32,  delays=0.28/0.09/0.47/31,  dsn=2.0.0,  status=sent  (250  2.0.0  OK
1228709789 i6si27692tid.5)
```

```
Dec   7  23:22:45  mail  postfix/smtp[9005]:  9656542BA7:  to=<hiweed@126.com>,
orig_to=  <bajie@mytest.com>,  relay=126.mxmail.netease.com[220.181.15.135]:25,
delay=0.42,   delays=0.06/0.01/0.27/0.08,   dsn=5.0.0,   status=bounced   (host
126.mxmail.netease.co       m[220.181.15.135]       said:       550       MI:SPF
mx5,I8mowLC7KBAUoTxJxeflWQ--.47417S2                                  1228710164
http://mail.163.com/help/help_spam_16.htm?ip=1020372198&hostid=mx5&time=12287101
64 (in reply to MAIL FROM command))
```

```
$ ls /var/mail/virtual/
```

```
$ sudo postconf -e virtual_alias_maps=
```

```
$ mail bajie@mytest.com
Subject: hi bajie, test 2                  <-- 输入邮件主题
Bajie, ni ge bi ma wen!                    <-- 输入正文
Test 2, Hehe.
.                                          <-- 输入“.”结束正文
Cc:                                        <-- “抄送”地址，可以留空，直接回车
```

```
Dec   8  00:19:31  mail  postfix/qmgr[8873]:  0AE9542BA7:  from=<root@ubox.mytest.
```

```
com>, size=302, nrcpt=1 (queue active)
Dec  8 00:19:32 mail postfix/pipe[9067]: 0AE9542BA7: to=<bajie@mytest.com>,
relay= dovecot, delay=1.6, delays=0.67/0.65/0/0.31, dsn=2.0.0, status=sent
(delivered via dovecot service)
```

```
$ sudo mutt -f /var/mail/virtual/mytest.com/bajie/Maildir
```

5．别名映射 virtual_alias_maps 配置（三：“自己给自己”）

```
$ sudo nano /etc/postfix/mysql/email2email.cf
```

```
user = mailadmin
password = mailadminPassword
hosts = 127.0.0.1
dbname = maildb
query = SELECT email FROM view_users WHERE email='%s'
```

```
$ postmap -q bajie@mytest.com mysql:/etc/postfix/mysql/email2email.cf
bajie@mytest.com
```

```
$ sudo postconf -e virtual_alias_maps=mysql:/etc/postfix/mysql/alias-maps.cf,
mysq l:/etc/postfix/mysql/email2email.cf
```

6．修改配置文件权限

```
$ sudo chgrp postfix /etc/postfix/mysql/*.*
$ sudo chmod u=rw,g=r,o= /etc/postfix/mysql/*.*
```

9.3.2 让 Postfix 使用 Dovecot 分发邮件

```
$ sudo nano /etc/postfix/master.cf
```

```
dovecot   unix  -       n       n       -       -       pipe
   flags=DRhu user=vmail:vmail argv=/usr/lib/dovecot/deliver -d ${recipient}
```

```
$ sudo postfix reload
```

```
$ sudo postconf -e virtual_transport=dovecot
```

```
$ sudo postconf -e dovecot_destination_recipient_limit=1
```

9.4　配置 Dovecot

9.4.1　配置 dovecot.conf

```
$ sudo cp /etc/dovecot/dovecot.conf /etc/dovecot/dovecot.conf-orig
$ sudo nano /etc/dovecot/dovecot.conf
```

1．全局部分配置

```
protocols = imap imaps pop3 pop3s
```

```
mail_location = maildir:/var/mail/virtual/%d/%n/Maildir
```

```
ssl_cert_file = /etc/ssl/certs/ssl-cert-snakeoil.pem
ssl_key_file = /etc/ssl/private/ssl-cert-snakeoil.key
ssl_disable = no
disable_plaintext_auth = no
```

2．auth default 部分配置

```
mechanisms = plain login
```

```
passdb sql {
  [...]
    args = /etc/dovecot/dovecot-sql.conf
  [...]
}
```

```
userdb static {
  [...]
    args = uid=5000 gid=5000 home=/var/mail/virtual/%d/%n allow_all_users=
yes
  [...]
}
```

```
socket listen {
    master {
        path = /var/run/dovecot/auth-master
        mode = 0600
        user = vmail
    }

    client {
        path = /var/spool/postfix/private/auth
        mode = 0660
        user = postfix
        group = postfix
    }
```

```
}
```

3．protocol lda 部分配置

```
protocol lda {
  [...]
    log_path = /var/mail/virtual/dovecot-deliver.log
    auth_socket_path = /var/run/dovecot/auth-master
    postmaster_address = postmaster@mytest.com
  [...]
}
```

至此，/etc/dovecot/dovecot.conf 就修改完了。

9.4.2 配置 dovecot-sql.conf

```
$ sudo nano /etc/dovecot/dovecot-sql.conf
```

```
driver = mysql
connect = host=127.0.0.1 dbname=maildb user=mailadmin password=
mailadminPassword
default_pass_scheme = PLAIN-MD5
password_query = SELECT email as user, password FROM view_users WHERE email='%u';
```

9.4.3 修改配置文件权限

```
$ sudo chgrp vmail /etc/dovecot/dovecot.conf
$ sudo chmod g+r /etc/dovecot/dovecot.conf
```

9.4.4 重新启动 Dovecot

```
$ sudo /etc/init.d/dovecot restart
```

```
dovecot: Dovecot v1.0.rc15 starting up
dovecot: auth-worker(default): mysql: Connected to 127.0.0.1 (maildb)
```

9.5 用 Telnet 进行 SMTP/POP3/IMAP 测试

9.5.1 SMTP 测试

1．用 Telnet 通过 SMTP 发送一封邮件

```
$ telnet localhost smtp
```

```
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
```

```
220 ubox.mytest.com ESMTP Postfix (Ubuntu)
```

```
ehlo mytest.com
```

```
250-ubox.mytest.com
250-PIPELINING
250-SIZE 10240000
250-VRFY
250-ETRN
250-ENHANCEDSTATUSCODES
250-8BITMIME
250 DSN
```

```
mail from:<tangseng@mytest.com>
```

```
250 2.1.0 Ok
```

```
rcpt to:<bajie@mytest.com>
```

```
250 2.1.5 Ok
```

```
data
```

```
354 End data with <CR><LF>.<CR><LF>
```

```
Subject: Hi Bajie, ni hai huo zhe ma?
```

```
Hi BiMaWen,

Wo shi ni HouGe ya!
Wo chao gu pei le, ni zen me yang a?

Bu luo suo le, hui tou jian!

HouGe
.
```

```
250 2.0.0 Ok: queued as 9F7F642BA9
```

```
quit
```

2．检查 Postfix 日志

```
$ sudo tail /var/log/mail.log
```

```
Dec  8 09:15:41 mail postfix/qmgr[9260]: 9F7F642BA9: from=<tangseng@mytest.com>,
s iæ=486, nrcpt=1 (queue active)
Dec  8 09:15:42 mail postfix/pipe[18711]: 9F7F642BA9: to=<bajie@mytest.com>,
relay  =dovecot,  delay=20,  delays=19/0.04/0/0.26,  dsn=2.0.0,  status=sent
(delivered via d ovecot service)
```

3．检查用户的 Maildir

```
$ sudo find /var/mail/virtual/mytest.com/bajie/Maildir
/var/mail/virtual/mytest.com/bajie/Maildir
/var/mail/virtual/mytest.com/bajie/Maildir/new
/var/mail/virtual/mytest.com/bajie/Maildir/new/1228743306.P18619Q0M520619.ubox
/var/mail/virtual/mytest.com/bajie/Maildir/dovecot.index
/var/mail/virtual/mytest.com/bajie/Maildir/dovecot-uidlist
/var/mail/virtual/mytest.com/bajie/Maildir/tmp
/var/mail/virtual/mytest.com/bajie/Maildir/cur
/var/mail/virtual/mytest.com/bajie/Maildir/dovecot.index.log
```

```
$ sudo mutt -f /var/mail/virtual/mytest.com/bajie/Maildir
```

9.5.2 测试 POP3

```
$ telnet localhost pop3
```

```
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
+OK Dovecot ready.
```

```
user bajie@mytest.com
```

```
+OK
```

```
pass bajiePassword
```

```
+OK Logged in.
```

```
List
```

```
+OK 2 messages:
1 371
2 503
.
```

```
retr 2
```

```
+OK 503 octets
Return-Path: <tangseng@mytest.com>
Delivered-To: bajie@mytest.com
Received: from mytest.com (localhost [127.0.0.1])
       by ubox.mytest.com (Postfix) with ESMTP id 9F7F642BA9
       for <bajie@mytest.com>; Mon,  8 Dec 2008 09:15:22 -0500 (EST)
Subject: Hi Bajie, ni hai huo zhe ma?
Message-Id: <20081208141526.9F7F642BA9@ubox.mytest.com>
Date: Mon,  8 Dec 2008 09:15:22 -0500 (EST)
From: tangseng@mytest.com
To: undisclosed-recipients:;

Hi BiMaWen,

Wo shi ni HouGe ya!
Wo chao gu pei le, ni zen me yang a?

Bu luo suo le, hui tou jian!

HouGe
.
```

```
quit
```

```
+OK Logging out.
Connection closed by foreign host.
```

9.5.3 测试 IMAP

```
$ telnet localhost imap2
```

```
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
* OK Dovecot ready.
```

```
1 login bajie@mytest.com bajiePassword
```

```
1 OK Logged in.
```

```
2 list "" "*"
```

```
* LIST (\HasChildren) "." "INBOX"
2 OK List completed.
```

```
3 select "INBOX"
```

```
* FLAGS (\Answered \Flagged \Deleted \Seen \Draft)
* OK [PERMANENTFLAGS (\Answered \Flagged \Deleted \Seen \Draft \*)] Flags permitted.
* 2 EXISTS
* 0 RECENT
* OK [UIDVALIDITY 1228713572] UIDs valid
* OK [UIDNEXT 4] Predicted next UID
3 OK [READ-WRITE] Select completed.
```

```
4 fetch 2 all
```

于是，Dovecot一边收信，一边将大概信息告诉你：

```
* 3 FETCH (FLAGS (\Seen) INTERNALDATE "08-Dec-2008 09:15:42 -0500" RFC822.SIZE 554 ENVELOPE ("Mon, 8 Dec 2008 09:15:22 -0500 (EST)" "Hi Bajie, ni hai huo zhe ma?" ((N IL NIL "tangseng" "mytest.com")) ((NIL NIL "tangseng" "mytest.com")) ((NIL NIL "ta ngseng" "mytest.com")) ((NIL NIL "undisclosed-recipients" NIL)(NIL NIL "" "MISSING_ DOMAIN")(NIL NIL NIL NIL)) NIL NIL NIL "<20081208141526.9F7F642BA9@ubox.mytest.co m>"))
4 OK Fetch completed.
```

```
5 fetch 2 body[]
```

```
* 2 FETCH (BODY[] {554}
Return-Path: <tangseng@mytest.com>
Delivered-To: bajie@mytest.com
Received: from mytest.com (localhost [127.0.0.1])
       by ubox.mytest.com (Postfix) with ESMTP id 9F7F642BA9
       for <bajie@mytest.com>; Mon,  8 Dec 2008 09:15:22 -0500 (EST)
Subject: Hi Bajie, ni hai huo zhe ma?
Message-Id: <20081208141526.9F7F642BA9@ubox.mytest.com>
Date: Mon,  8 Dec 2008 09:15:22 -0500 (EST)
From: tangseng@mytest.com
To: undisclosed-recipients:;

Hi BiMaWen,

Wo shi ni HouGe ya!
Wo chao gu pei le, ni zen me yang a?

Bu luo suo le, hui tou jian!

HouGe
)
5 OK Fetch completed.
```

```
6 logout
```

```
* BYE Logging out
6 OK Logout completed.
Connection closed by foreign host.
```

9.6　用 Thunderbird 进行 SMTP/POP3/IMAP 测试

9.6.2　修改 hosts 文件

```
192.168.1.10    ubox.mytest.com
```

9.7　实现 SMTP 认证

```
mynetworks = 127.0.0.0/8 [::ffff:127.0.0.0]/104 [::1]/128
```

9.7.1 配置 Postfix

```
$ sudo postconf -e smtpd_sasl_type=dovecot
$ sudo postconf -e smtpd_sasl_path=private/auth
$ sudo postconf -e smtpd_sasl_auth_enable=yes
$ sudo postconf -e smtpd_recipient_restrictions=permit_mynetworks,permit_sasl_
aut henticated,reject_unauth_destination
```

9.7.2 用 Telnet 测试 SMTP 认证

```
$ perl -MMIME::Base64 -e \
   'print encode_base64("bajie\@mytest.com\0bajie\@mytest.com\0password")';
```

```
$ sudo telnet localhost smtp
```

```
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
220 ubox.mytest.com ESMTP Postfix (Ubuntu)
```

```
ehlo mytest.com
```

```
250-ubox.mytest.com
250-PIPELINING
250-SIZE 10240000
250-VRFY
250-ETRN
250-AUTH PLAIN LOGIN
250-ENHANCEDSTATUSCODES
250-8BITMIME
250 DSN
```

```
auth plain YmFqaWVAbXl0ZXN0LmNvbQBiYWppZUBteXRlc3QuY29tAGJhamllUGFzc3dvcmQ=
```

```
235 2.7.0 Authentication successful
```

```
quit
```

```
221 2.0.0 Bye
```

9.7.3　用 Thunderbird 测试 SMTP 认证

```
$ sudo tail -f /var/log/mail.log
```

```
Dec  8 21:06:10 mail postfix/smtpd[19476]: 4FDA342BA9: client=unknown[192.168.1.
11 9], sasl_method=PLAIN, sasl_username=bajie@mytest.com
...
Dec  8 21:06:10 mail postfix/qmgr[19473]: 4FDA342BA9: from=<bajie@mytest.com>,
siz e=499, nrcpt=1 (queue active)
...
Dec  8 21:06:42 mail postfix/smtp[19489]: 4FDA342BA9: to=<hiweed@gmail.com>,
relay          =gmail-smtp-in.l.google.com[209.85.143.27]:25,          delay=32,
delays=0.12/0.18/0.45/31, dsn=5.7.1, status=bounced ...
```

```
smtpd_tls_cert_file=/etc/ssl/certs/ssl-cert-snakeoil.pem
smtpd_tls_key_file=/etc/ssl/private/ssl-cert-snakeoil.key
smtpd_use_tls=yes
```

9.8　强迫用户使用 TLS 加密连接 SMTP

```
$ sudo postconf -e smtpd_tls_security_level=encrypt
```

9.9　使用自己创建的安全证书

```
$    sudo    openssl    req    -new    -x509    -days    3650    -nodes    -out
     /etc/ssl/certs/mytest.com.pem    -keyout /etc/ssl/private/mytest.com.key
```

```
Country Name (2 letter code) [AU]:CN
State or Province Name (full name) [Some-State]:Shandong
Locality Name (eg, city) []:Qingdao
Organization Name (eg, company) [Internet Widgits Pty Ltd]:Hiweed Linux Ltd
Organizational Unit Name (eg, section) []:Devel Dept.
Common Name (eg, YOUR name) []:ubox.mytest.com      <-- 重要! 这里输入DNS 全名
Email Address []:postmaster@mytest.com
```

```
$ sudo postconf -e smtpd_tls_cert_file=/etc/ssl/certs/mytest.com.pem
$ sudo postconf -e smtpd_tls_key_file=/etc/ssl/private/mytest.com.key
```

```
$ sudo nano /etc/dovecot/dovecot.conf
```

```
ssl_cert_file = /etc/ssl/certs/mytest.com.pem
ssl_key_file = /etc/ssl/private/mytest.com.key
```

```
$ sudo /etc/init.d/dovecot restart
```

9.10 利用 Dovecot 实现 Quota（磁盘限额）

9.10.1 启用 quota 插件

```
$ sudo nano /etc/dovecot/dovecot.conf
```

```
protocol imap {
  [...]
  mail_plugins = quota imap_quota
  mail_plugin_dir = /usr/lib/dovecot/modules/imap
  [...]
}
protocol pop3 {
  [...]
  mail_plugins = quota
  mail_plugin_dir = /usr/lib/dovecot/modules/pop3
  [...]
}
protocol lda {
  [...]
  mail_plugins = quota
  mail_plugin_dir = /usr/lib/dovecot/modules/lda
  [...]
}
```

9.10.2　配置 quota

1．全局 quota 配置

```
$ sudo nano /etc/dovecot/dovecot.conf
```

```
plugin {
  [...]
  quota = maildir:storage=102400:messages=1000
  [...]
}
```

```
quota = maildir:storage=1048576
```

2．个别用户的 quota 配置

```
$ sudo nano /etc/dovecot/dovecot.conf
```

```
 [...]
  userdb sql {
    args = /etc/dovecot/dovecot-sql.conf
  }

  userdb static {
[...]
```

```
$ sudo nano /etc/dovecot/dovecot-sql.conf
```

```
user_query = SELECT  '/var/mail/virtual/%d/%n/Maildir' AS home, 'vmail' AS uid,
'v mail' AS gid, concat('maildir:storage=', quota) AS quota FROM users WHERE
user = '%n'
```

```
$ sudo /etc/init.d/dovecot restart
```

9.11 垃圾邮件、病毒过滤

9.11.1 配置 SpamAssassin

```
$ sudo nano /etc/spamassassin/local.cf
```

```
bayes_auto_expire 0
```

```
use_pyzor 1
pyzor_path /usr/bin/pyzor

use_razor2 1
razor_config /etc/razor/razor-agent.conf

use_bayes 1
use_bayes_rules 1
bayes_auto_learn 1
```

```
$ spamassassin --lint
```

```
$ sudo sa-update --no-gpg
```

9.11.2 配置 AMaViSd

1. 启用内容过滤

```
$ sudo nano /etc/amavis/conf.d/15-content_filter_mode
```

```
use strict;
@bypass_virus_checks_maps = (
   \%bypass_virus_checks, \@bypass_virus_checks_acl, \$bypass_virus_checks_re);
@bypass_spam_checks_maps = (
   \%bypass_spam_checks, \@bypass_spam_checks_acl, \$bypass_spam_checks_re);
1;  # ensure a defined return
```

2. 修改 Debian 默认配置

```
$ sudo nano /etc/amavis/conf.d/20-debian_defaults
```

```
 [...]
$final_spam_destiny      = D_PASS;
[...]
```

```
$sa_spam_subject_tag = '***SPAM*** ';
```

```
$sa_tag_level_deflt  = 2.0;
```

```
$sa_tag2_level_deflt = 6.31;
```

```
$sa_kill_level_deflt = 6.31;
```

```
$banned_filename_re = new_RE(
[...]
  qr'\.[^./]*\.(exe|vbs|pif|scr|bat|cmd|com|cpl|dll)\.?$'i,
[...]
  qr'.\.(exe|vbs|pif|scr|bat|cmd|com|cpl)$'i, # banned extension - basic
[...]
  qr'^\.(exe-ms)$',                           # banned file(1) types

);
```

3．QUARANTINEDIR 设置

```
#$QUARANTINEDIR = "$MYHOME/virusmails";
$QUARANTINEDIR = undef ;
```

```
$ sudo nano /etc/cron.daily/clean-amavis
```

```
#!/bin/bash

if [ -d /var/lib/amavis/virusmails/ ]; then
  find /var/lib/amavis/virusmails/ -mtime +7 | xargs rm -rf
fi

exit 0
```

```
$ sudo chmod +x /etc/cron.daily/clean-amavis
```

4．域名搜索配置

```
$ sudo nano /etc/amavis/conf.d/50-user
```

```
@lookup_sql_dsn = (
    ['DBI:mysql:database=maildb;host=127.0.0.1;port=3306',
     'mailadmin',
     'mailadminPassword']);
```

```
$sql_select_policy = 'SELECT name FROM virtual_domains WHERE CONCAT("@",name) IN
(%k)';
```

```
$ sudo chmod o= /etc/amavis/conf.d/50-user
```

```
$ sudo /etc/init.d/amavis restart
```

5．使 AMaViSd 能和 ClamAV 通话

```
$ sudo adduser clamav amavis
```

```
$ sudo /etc/init.d/clamav-daemon restart
$ sudo /etc/init.d/clamav-freshclam restart
```

9.11.3 配置 Postfix，将邮件交给 AMaViSd 过滤

1．为 Postfix 创建 smtp-amavis 服务

```
$ sudo netstat -nap | grep 10024
```

```
tcp      0      0 127.0.0.1:10024       0.0.0.0:*           LISTEN      6014/amavisd
(maste
```

```
$ sudo nano /etc/postfix/master.cf
```

```
smtp-amavis unix -      -       n     -      2  smtp
    -o smtp_data_done_timeout=1200
    -o smtp_send_xforward_command=yes
    -o disable_dns_lookups=yes
-o max_use=20
```

```
$ sudo postconf -e content_filter=smtp-amavis:[127.0.0.1]:10024
```

2．为 Postfix 创建 10025 服务

```
$ sudo nano /etc/postfix/master.cf
```

```
127.0.0.1:10025 inet n  -       -     -       -  smtpd
    -o content_filter=
    -o local_recipient_maps=
```

```
    -o relay_recipient_maps=
    -o smtpd_restriction_classes=
    -o smtpd_delay_reject=no
    -o smtpd_tls_security_level=
    -o smtpd_client_restrictions=permit_mynetworks,reject
    -o smtpd_helo_restrictions=
    -o smtpd_sender_restrictions=
    -o smtpd_recipient_restrictions=permit_mynetworks,reject
    -o smtpd_data_restrictions=reject_unauth_pipelining
    -o smtpd_end_of_data_restrictions=
    -o mynetworks=127.0.0.0/8
    -o smtpd_error_sleep_time=0
    -o smtpd_soft_error_limit=1001
    -o smtpd_hard_error_limit=1000
    -o smtpd_client_connection_count_limit=0
    -o smtpd_client_connection_rate_limit=0
    -o receive_override_options=no_header_body_checks,no_unknown_recipient_ checks
    -o local_header_rewrite_clients=
```

```
$ sudo postconf -e receive_override_options=no_address_mappings
```

```
$ sudo /etc/init.d/postfix restart
```

```
$ sudo netstat -tap
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address  Foreign Address State  PID/Program name
tcp       0      0 localhost:10024  *:*            LISTEN   26386/amavisd (mast
tcp       0      0 localhost:10025  *:*            LISTEN   26308/master
[...]
```

9.11.4 垃圾邮件测试

```
XJS*C4JDBQADN1.NSBN3*2IDNEN*GTUBE-STANDARD-ANTI-UBE-TEST-EMAIL*C.34X
```

```
$ sendmail bajie@mytest.com < /usr/share/doc/SpamAssassin/examples/sample-spam.
Tx t
```

```
X-Virus-Scanned: Debian amavisd-new at ubox.mytest.com
X-Spam-Flag: NO
X-Spam-Score: 3.229
X-Spam-Level: ***
X-Spam-Status: No, score=3.229 tagged_above=0 required=6.31 tests=[ALL_TRUSTED=-
1.44, DATE_IN_PAST_12_24=1.77,   TVD_SPACE_RATIO=2.899]
```

```
X-Virus-Scanned: Debian amavisd-new at ubox.mytest.com
X-Spam-Flag: YES
X-Spam-Score: 1003.029
X-Spam-Level: ************************************************************
X-Spam-Status: Yes, score=1003.029 tagged_above=0 required=6.31   tests=[ALL_TRUST
ED=-1.44, AWL=0.200, DATE_IN_PAST_12_24=1.77,  GTUBE=1000, RAZOR2_CF_RANGE_51_100=0.
 5, RAZOR2_CF_RANGE_E4_51_100=1.5,   RAZOR2_CHECK=0.5]
```

9.11.5 非法附件测试

```
BANNED message from you (multipart/mixed | application/x- msdownload,
 .exe,exefile. exe)
```

```
BANNED message from you (multipart/mixed | application/octet-
stream,.zip,filename. zip | .empty,filename.BAT)
```

9.11.6 将 Spam 自动转存到“垃圾”文件夹

1. 在服务器端实现 Spam 自动转存

```
$ sudo nano /etc/dovecot/dovecot.conf
```

```
protocol lda {
  [...]
  mail_plugins = quota cmusieve
  global_script_path = /var/mail/virtual/spam-move.sieve
  [...]
}
```

```
$ sudo nano /var/mail/virtual/spam-move.sieve
```

```
require ["fileinto"];
if header :contains "X-Spam-Flag" ["YES"] {
  fileinto "Junkmail";
  stop;
}
```

```
$ sudo /etc/init.d/dovecot restart
```

3．Spam 自动转存测试

```
$ sendmail bajie@mytest.com < /usr/share/doc/spamassassin/examples/sample-
spam.tx t
```

```
deliver(bajie@mytest.com): 2008-12-11 14:17:59 Info: msgid=<GTUBE1.
1010101@exampl e.net>: saved mail to Junkmail
```

9.12 Webmail 的实现

9.12.1 配置 SquirrelMail

```
$ sudo squirrelmail-configure
```

```
SquirrelMail Configuration : Read: config.php (1.4.0)
---------------------------------------------------------
Main Menu --
1.  Organization Preferences
2.  Server Settings
3.  Folder Defaults
4.  General Options
5.  Themes
6.  Address Books
7.  Message of the Day (MOTD)
8.  Plugins
9.  Database
10. Languages

D.  Set pre-defined settings for specific IMAP servers

C   Turn color on
S   Save data
Q   Quit

Command >>
```

```
SquirrelMail Configuration : Read: config.php (1.4.0)
---------------------------------------------------------
Language preferences
1.  Default Language      : zh_CN
2.  Default Charset       : gb2312
3.  Enable lossy encoding  : false

R   Return to Main Menu
C   Turn color on
S   Save data
Q   Quit
```

```
$ sudo nano /var/lib/locales/supported.d/local
```

```
zh_CN GB2312
```

```
$ sudo dpkg-reconfigure locales
```

```
$ sudo ln -s /etc/squirrelmail/apache.conf /etc/apache2/conf.d/squirrelmail.
```

```
conf
```

```
$ sudo /etc/init.d/apache restart
```

9.13 修改系统别名/etc/aliases

```
login: hiweed
password:
Linux mail 2.6.24-22-server #1 SMP Mon Nov 24 19:14:19 UTC 2008 i686
[...]
No mail. (或者： You have new mail.)
hiweed@ubox:~$
```

```
$ mail
```

```
Mail version 8.1.2 01/15/2001.  Type ? for help.
"/var/mail/hiweed": 2 messages 2 new
>N  1 hiweed@mail.mytes  Tue Dec  9 05:13   14/459   hi hiweed
 N  2 hiweed@mail.mytes  Tue Dec  9 05:13   14/453   a? ha?
&
```

```
$ sudo nano /etc/aliases
```

```
 [...]
Postmaster: root
root:    hiweed@mytest.com
[...]
```

```
$ sudo newaliases
```

```
$ sudo /etc/init.d/postfix restart
```

9.14 Web管理工具

9.14.1 安装 Virtual Mail Manager

```
$ cd ~
$ wget http://www.grs-service.ch/pub/grs_mailmgr_v1_6.tgz
$ sudo mkdir /var/www/mailadmin/
$ cd /var/www/mailadmin/
$ sudo tar xfvz /home/hiweed/grs_mailmgr_v1_6.tgz
```

```
$ sudo cp conf/cnf_main_template.php conf/cnf_main.php
$ sudo nano conf/cnf_main.php
```

```
$grs_db_name     = 'maildb';// database name
$grs_db_host     = 'localhost';     // database server
$grs_db_username = 'mailadmin';           // database user
$grs_db_password = 'mailadminPassword';  // database password
```

```
$ mysql maildb -u root -p
```

```
mysql> CREATE TABLE `domain_admins` (
  `id` int(11) NOT NULL auto_increment,
  `domain_id` int(11) NOT NULL,
  `user_id` int(11) NOT NULL,
  PRIMARY KEY  (`id`)
) ENGINE=MyISAM  DEFAULT CHARSET=latin1 AUTO_INCREMENT=1 ;
```

```
mysql> INSERT INTO `maildb`.`domain_admins` (
`id` ,
`domain_id` ,
`user_id`
)
VALUES (
NULL , '1', '1'
);
```

```
mysql> CREATE TABLE `languages` (
  `id` int(3) NOT NULL auto_increment,
  `name` varchar(50) NOT NULL,
  `active` tinyint(1) NOT NULL,
  PRIMARY KEY  (`id`)
) ENGINE=MyISAM  DEFAULT CHARSET=latin1 AUTO_INCREMENT=3 ;


mysql> INSERT INTO `languages` (`id`, `name`, `active`) VALUES
(1, 'English', 1),
(2, 'Deutsch', 1);

mysql> exit
```

```
$ wget  http://www.grs-service.ch/pub/scripts/sql_3.txt
$ mysql maildb < sql_3.txt -u root -p
```

第 10 章 最佳邮件列表：Mailman

10.1 安装 Mailman

```
$ sudo apt-get install apache2 postfix mailman
```

```
* Site list for mailman (usually named mailman) missing.
* Please create it; until then, mailman will refuse to start.
```

10.2 配置 Mailman

10.2.1 修改主机名

```
$ sudo nano /etc/hostname
```

```
lists
```

```
$ sudo /etc/init.d/hostname.sh
```

```
192.168.1.10    lists.mytest.com
```

10.2.2 配置 Apache

```
$ sudo ln -s /etc/mailman/apache.conf /etc/apache2/sites-enabled/mailman
```

```
$ ls -l /etc/apache2/sites-enabled/mailman
lrwxrwxrwx 1 root root 24 2009-03-22 22:28 /etc/apache2/sites-enabled/mailman ->
/ etc/mailman/apache.conf
```

```
$ sudo /etc/init.d/apache2 restart
```

10.2.3 配置 Postfix

1．配置 main.cf

```
$ sudo nano /etc/postfix/main.cf
```

```
myhostname = lists
[...]
mydestination = lists, localhost.localdomain, , localhost
```

```
relay_domains = lists.mytest.com
transport_maps = hash:/etc/postfix/transport
mailman_destination_recipient_limit = 1
```

2．配置 master.cf

```
mailman   unix  -       n       n       -       -       pipe
  flags=FR user=list argv=/usr/lib/mailman/bin/postfix-to-mailman.py
  ${nexthop} ${user}
```

3．配置 transport

```
$ sudo nano /etc/postfix/transport
```

```
lists.mytest.com     mailman:
```

```
$ sudo postmap -v /etc/postfix/transport
```

```
[...]
postmap: dict_eval: const  lists
postmap: dict_eval: const  localdomain
postmap: dict_eval: const  Postfix
[...]
postmap: dict_eval: const  lists, localhost.localdomain, , localhost
postmap: dict_eval: expand $myhostname -> lists
[...]
postmap: dict_eval: const  lists.mytest.com
postmap: dict_eval: expand $relay_domains -> lists.mytest.com
[...]
postmap: inet_addr_local: configured 2 IPv4 addresses
postmap: open hash /etc/postfix/transport
postmap: Compiled against Berkeley DB: 4.6.21?
postmap: Run-time linked against Berkeley DB: 4.6.21?
```

```
$ sudo /etc/init.d/postfix restart
```

10.2.4　创建默认邮件列表

```
$ sudo newlist mailman
```

```
Enter the email of the person running the list:hiweed@hiweed.com<--输入你的 E-mail地
址
Initial mailman password: <-- 输入密码
To finish creating your mailing list, you must edit your /etc/aliases (or
equivalent) file by adding the following lines, and possibly running the
`newaliases' program:

## mailman mailing list
mailman:            "|/var/lib/mailman/mail/mailman post mailman"
mailman-admin:       "|/var/lib/mailman/mail/mailman admin mailman"
mailman-bounces:     "|/var/lib/mailman/mail/mailman bounces mailman"
mailman-confirm:     "|/var/lib/mailman/mail/mailman confirm mailman"
mailman-join:       "|/var/lib/mailman/mail/mailman join mailman"
mailman-leave:       "|/var/lib/mailman/mail/mailman leave mailman"
mailman-owner:       "|/var/lib/mailman/mail/mailman owner mailman"
mailman-request:     "|/var/lib/mailman/mail/mailman request mailman"
mailman-subscribe:    "|/var/lib/mailman/mail/mailman subscribe mailman"
mailman-unsubscribe:  "|/var/lib/mailman/mail/mailman unsubscribe mailman"

Hit enter to notify mailman owner...
```

```
$ sudo nano /etc/mailman/mm_cfg.py
```

```
#---------------------------------------------------------
# Default domain for email addresses of newly created MLs
DEFAULT_EMAIL_HOST = 'lists.mytest.com'
#---------------------------------------------------------
# Default host for web interface of newly created MLs
DEFAULT_URL_HOST   = 'lists.mytest.com'
#---------------------------------------------------------
```

```
$ sudo /etc/init.d/mailman start
```

10.3　管理 Mailman

10.3.2　通过命令行管理 Mailman

1．创建邮件列表

```
$ sudo newlist listname1
```

2．显示所有邮件列表

```
$ sudo list_lists
```

```
2 matching mailing lists found:
    Listname1 - [no description available]
      Mailman - [no description available]
```

3．删除邮件列表

```
$ sudo rmlist -a listname1

To finish removing your mailing list, you must edit your /etc/aliases (or
equivalent) file by removing the following lines, and possibly running the
`newaliases' program:

## listname1 mailing list
listname1:                "|/var/lib/mailman/mail/mailman post listname1"
listname1-admin:          "|/var/lib/mailman/mail/mailman admin listname1"
listname1-bounces:        "|/var/lib/mailman/mail/mailman bounces listname1"
listname1-confirm:        "|/var/lib/mailman/mail/mailman confirm listname1"
listname1-join:           "|/var/lib/mailman/mail/mailman join listname1"
listname1-leave:          "|/var/lib/mailman/mail/mailman leave listname1"
listname1-owner:          "|/var/lib/mailman/mail/mailman owner listname1"
listname1-request:        "|/var/lib/mailman/mail/mailman request listname1"
listname1-subscribe:      "|/var/lib/mailman/mail/mailman subscribe listname1"
listname1-unsubscribe:    "|/var/lib/mailman/mail/mailman unsubscribe listname1"

Removing list info
Removing private archives
Removing private archives
Removing public archives
listname1 public archives not found as /var/lib/mailman/archives/public/
listname1.mbox
```

4．添加成员

```
$ cat mylist.txt
hiweedleng@163.com
hiweedleng@126.com
kanakaleng@yeah.net
```

```
$ sudo add_members --regular-members-file=mylist.txt --welcome-msg=y mailman
已订阅：hiweedleng@163.com
已订阅：hiweedleng@126.com
已订阅：kanakaleng@yeah.net
```

```
$ tail /var/log/mail.log
```

5．显示成员

```
$ sudo list_members mailman
hiweedleng@163.com
hiweedleng@126.com
kanakaleng@yeah.net
```

6．克隆成员

```
$ sudo clone_member --remove hiweedtest@163.com hiweedNew@163.com
processing mailing list: mailman
   clone address added: hiweedNew@163.com
   original address removed: hiweedtest@163.com
```

7．搜索成员

```
$ sudo find_member hiweedtest@163.com
hiweed@163.com found in:
    mailman
```

8．删除成员

```
$ sudo remove_members --file=remove.txt listname1
```

```
$ sudo remove_members --fromall hiweedtest@163.com
```

9．同步成员

```
$ sudo sync_members -f mylist.txt mailman
Added  : hiweedtest@163.com
Removed: hiweedNew@163.com
```

第 11 章 最佳 FTP 服务器方案

11.3 Pure-FTPd 的安装、配置

11.3.1 安装 Pure-FTPd

```
$ sudo apt-get install pure-ftpd-mysql mysql-server
```

11.3.2 配置 Pure-FTPd

1．添加用户和组

```
$ sudo groupadd -g 2001 ftpgroup
$ sudo useradd -u 2001 -s /bin/false -d /dev/null -c "Pure-FTPd User" -g ftpgroup
f tpuser
```

2．Chroot 设置

```
$ sudo sh -c "echo 'yes' > /etc/pure-ftpd/conf/ChrootEveryone"
```

3．手工创建用户目录

```
$ sudo sh -c "echo 'No' > /etc/pure-ftpd/conf/CreateHomeDir"
```

4．为 Pure-FTPd 创建 MySQL 数据库

```
$ mysql -u root -p
```

```
mysql> CREATE DATABASE ftpusers;
```

```
mysql> GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, DROP ON ftpusers.* TO
'ftpadm in'@'localhost' IDENTIFIED BY 'ftpadminPassword';

mysql> GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, DROP ON ftpusers.* TO
'ftpadm in'@'localhost.localdomain' IDENTIFIED BY 'ftpadminPassword';

mysql> FLUSH PRIVILEGES;
```

```
mysql> USE ftpusers;

mysql> CREATE TABLE IF NOT EXISTS `users` (
  `User` varchar(16) NOT NULL default '',
  `Password` varchar(32) NOT NULL default '',
  `Uid` int(11) NOT NULL,
  `Gid` int(11) NOT NULL,
  `Dir` varchar(128) NOT NULL default '',
  `QuotaFiles` int(10) NOT NULL default '500',
  `QuotaSize` int(10) NOT NULL default '30',
  `ULBandwidth` int(10) NOT NULL default '80',
  `DLBandwidth` int(10) NOT NULL default '80',
  `Ipaddress` varchar(15) NOT NULL default '*',
  `Comment` tinytext,
  `Status` enum('0','1') NOT NULL default '1',
  `ULRatio` smallint(5) NOT NULL default '1',
  `DLRatio` smallint(5) NOT NULL default '1',
  PRIMARY KEY  (`User`),
  UNIQUE KEY `User` (`User`)
) ENGINE=MyISAM DEFAULT CHARSET=latin1;

mysql> quit
```

5．配置 Pure-FTPd 的 mysql.conf

```
$ sudo mv /etc/pure-ftpd/db/mysql.conf /etc/pure-ftpd/db/mysql.conf_orig
```

```
$ sudo nano /etc/pure-ftpd/db/mysql.conf
```

```
MYSQLServer    127.0.0.1
MYSQLSocket    /var/run/mysqld/mysqld.sock
MYSQLUser     ftpadmin
MYSQLPassword  ftpadminPassword
MYSQLDatabase  ftpusers
MYSQLCrypt     md5
MYSQLGetPW       SELECT Password FROM users WHERE User="\L" AND Status="1" AND
(Ipaddress = "*" OR Ipaddress LIKE "\R")
MYSQLGetUID       SELECT Uid FROM users WHERE User="\L" AND Status="1" AND
(Ipaddress = "*" OR Ipaddress LIKE "\R")
MYSQLGetGID       SELECT Gid FROM users WHERE User="\L" AND Status="1" AND
(Ipaddress = "*" OR Ipaddress LIKE "\R")
MYSQLGetDir       SELECT Dir FROM users WHERE User="\L" AND Status="1" AND
(Ipaddress = "*" OR Ipaddress LIKE "\R")
MySQLGetQTAFS  SELECT QuotaFiles FROM users WHERE User="\L" AND Status="1" AND
(Ipaddress = "*" OR Ipaddress LIKE "\R")
MySQLGetQTASZ  SELECT QuotaSize FROM users WHERE User="\L" AND Status="1" AND
(Ipaddress = "*" OR Ipaddress LIKE "\R")
MySQLGetRatioUL SELECT ULRatio FROM users WHERE User="\L" AND Status="1" AND
(Ipaddress = "*" OR Ipaddress LIKE "\R")
MySQLGetRatioDL SELECT DLRatio FROM users WHERE User="\L" AND Status="1" AND
(Ipaddress = "*" OR Ipaddress LIKE "\R")
```

```
MySQLGetBandwidthUL SELECT ULBandwidth FROM users WHERE User="\L" AND Status="1"
AND (Ipaddress = "*" OR Ipaddress LIKE "\R")
MySQLGetBandwidthDL SELECT DLBandwidth FROM users WHERE User="\L" AND Status="1"
AND (Ipaddress = "*" OR Ipaddress LIKE "\R")
```

```
$ sudo chmod g=o= /etc/pure-ftpd/db/mysql.conf
```

```
$ sudo /etc/init.d/pure-ftpd-mysql restart
```

11.4　实现 FTP 用户的 Web 管理

11.4.1　安装 User manager for PureFTPd

```
$ cd ~
$ wget http://machiel.generaal.net/files/pureftpd/ftp_v2.1.tar.gz
$ cd /var/www
$ sudo tar xfvz ~/ftp_v2.1.tar.gz
```

11.4.2　配置 User manager for PureFTPd

```
$ sudo nano /var/www/ftp/config.php
```

```
 [...]
  $LANG = "Chinese";
  $LocationImages =  "images";
  $DBHost = "127.0.0.1";
  $DBLogin = "ftpadmin";
  $DBPassword = "ftpadminPassword";
  $DBDatabase = "ftpusers";
  $FTPAddress = "ubox.mytest.com:21";
  $DEFUserID = "2001";
  $DEFGroupID = "2001";
  $UsersFile = "/etc/passwd";
  $GroupFile = "/etc/group";
  $StyleSheet = "style/default.css.php";
  $EnableQuota = 1;
  $EnableRatio = 1;
[...]
```

11.4.3　设置 User manager for PureFTPd 管理员

```
$ mysql -u root -p
```

```
mysql> USE ftpusers;

mysql> CREATE TABLE IF NOT EXISTS `admin` (
  `Username` varchar(35) NOT NULL default '',
  `Password` char(32)  NOT NULL default '',
  PRIMARY KEY  (`Username`)
) ENGINE=MyISAM DEFAULT CHARSET=latin1;
```

```
INSERT INTO `admin` (`Username`, `Password`) VALUES
('ftpadmin', MD5('ftpadminPassword'));

mysql> quit
```

11.5 Pure-FTPd 配置选项介绍

11.5.3 字符串型配置选项

1. 任意字符串

```
ftp.ubox.org - jedi [13/Dec/2009:19:36:39] "GET /ftp/linux.tar.bz2" 200 21809338
```

11.6 实现 TLS 认证

11.6.1 证书设置

```
$ sudo openssl req -x509 -nodes -newkey rsa:1024 -keyout /etc/ssl/private/pure-
ftpd.pem -out /etc/ssl/private/pure-ftpd.pem
```

11.6.2　服务器的 TLS 设置

```
$ sudo sh -c "echo '2' > /etc/pure-ftpd/conf/TLS"
```

```
$ sudo /etc/init.d/pure-ftpd-mysql restart
```

11.7　FXP 协议支持

```
$ sudo sh -c "echo 'Yes' > /etc/pure-ftpd/conf/AllowUserFXP"
$ sudo /etc/init.d/pure-ftpd-mysql restart
```

11.8　允许匿名访问

11.8.1　Pure-FTPd 设置

```
$ sudo sh -c "echo 'No' > /etc/pure-ftpd/conf/NoAnonymous"
```

```
$ sudo sh -c "echo 'Yes' > /etc/pure-ftpd/conf/AnonymousCantUpload"
```

```
$ sudo sh -c "echo 'Yes' > /etc/pure-ftpd/conf/AnonymousCanCreateDirs"
```

```
$ sudo sh -c "echo 'Yes' > /etc/pure-ftpd/conf/AnonymousOnly"
```

```
$ sudo /etc/init.d/pure-ftpd-mysql restart
```

11.8.2　添加系统用户

```
$ sudo groupadd ftp
$ sudo useradd ftp -s /bin/false -d /var/ftp -m -c "anonymous ftp" -g ftp
```

第 12 章

最佳 NFS 服务器方案

12.2 NFS 服务器的安装及配置

12.2.2 安装 NFS 服务器软件

```
$ sudo apt-get install nfs-kernel-server nfs-common portmap nis
```

12.2.3 Portmap 安全

```
$ sudo nano /etc/hosts.deny
```

```
portmap mountd nfsd statd lockd rquotad : ALL
```

```
$ sudo nano /etc/hosts.allow
```

```
portmap mountd nfsd statd lockd rquotad : 192.168.1.10 192.168.1.100
portmap ypserv ypbind : 192.168.1.10 192.168.1.100
```

```
$ sudo /etc/init.d/portmap restart
```

12.2.4 NIS 服务器配置

```
$ sudo nano /etc/default/nis
```

```
NISSERVER=master
```

```
$ sudo nano /etc/yp.conf
```

```
domain mytest.com server ubox.mytest.com
```

```
host 192.168.1.100
host 192.168.1.101
host 192.168.1.102
[...]
```

```
myclients (hibox,,) (client2,,) ...
```

```
$ sudo /usr/lib/yp/ypinit -m
```

```
failed to send 'clear' to local ypserv: RPC: Program not registeredUpdating
shadow.byname...
```

```
$ sudo /etc/init.d/nis restart
```

```
$ sudo make -C /var/yp
```

12.2.5　用/etc/exports 配置共享目录

```
$ sudo nano /etc/exports
```

```
/home    *(rw,async,no_subtree_check)
```

```
/home    192.168.1.0/24(rw,sync,insecure,no_subtree_check)
```

```
/var/lib hibox(rw,sync,no_subtree_check)  sbox(ro,sync,no_subtree_check)
```

```
$ sudo /etc/init.d/nfs-kernel-server restart
```

12.3　NFS 客户端的安装及配置

12.3.2 安装 NFS 客户端

```
$ sudo apt-get install nfs-common portmap nis
```

```
$ sudo dpkg-reconfigure nis
```

12.3.3 配置 NFS 客户端

1．Portmap 安全设置

```
$ sudo nano /etc/hosts.deny
```

```
portmap : ALL
```

```
$ sudo nano /etc/hosts.allow
```

```
portmap : 192.168.1.10
```

2．配置名字服务

```
$ sudo nano /etc/passwd
```

```
+::::::
```

```
$ sudo nano /etc/group
```

```
+:::
```

```
$ sudo nano /etc/passwd
```

```
+::::::::
```

3．修改/etc/yp.conf

```
$ sudo nano /etc/yp.conf
```

```
ypserver 192.168.1.10
```

```
$ sudo /etc/init.d/nis restart
```

4．NFS 挂载

```
$ sudo mount 192.168.1.10:/home /home
```

```
$ sudo nano /etc/fstab
```

```
192.168.1.10:/home /home nfs rsiæ=8192,wsiæ=8192,timeo=14,intr
```

第 13 章

与 Windows 共舞：Samba

13.2 安装 Samba 并测试

13.2.1 安装 Samba

```
$ sudo apt-get install samba
```

13.3 Samba 配置

13.3.1 最简单的 Samba 配置

```
$ sudo mv /etc/samba/smb.conf /etc/samba/smb.conf-orig
```

```
$ sudo nano /etc/samba/smb.conf
```

```
 [global]
security=share

[myshare]
path=/usr/share/doc/samba
public=yes
```

```
$ testparm
```

```
Load smb config files from /etc/samba/smb.conf
Processing section "[myshare]"
Loaded services file OK.
Server role: ROLE_STANDALONE
Press enter to see a dump of your service definitions

[global]
       security = SHARE

[myshare]
       path = /usr/share/doc/samba
```

```
       guest ok = Yes
```

```
$ sudo /etc/init.d/samba restart
```

13.3.2 Samba 的安全认证

```
$ sudo nano /etc/samba/smb.conf
```

```
 [global]
security=user

[myshare]
path=/usr/share/doc/samba
valid users=hiweed
public=no
```

```
$ sudo /etc/init.d/samba restart
```

1．在 Ubuntu 中创建用户

```
$ sudo adduser hiweed
Adding user `hiweed' ...
Adding new group `hiweed' (1001) ...
Adding new user `hiweed' (1001) with group `hiweed' ...
Creating home directory `/home/hiweed' ...
Copying files from `/etc/skel' ...
Enter new UNIX password:                                    <-- 输入密码
Retype new UNIX password:                                   <-- 再次输入密码
passwd: password updated successfully
Changing the user information for hiweed
Enter the new value, or press ENTER for the default
       Full Name []: Hiweed Leng                            <-- 输入用户全名（可选）
       Room Number []:                                      <-- 输入房间号码（可选）
       Work Phone []:                                       <-- 输入工作电话号码（可选）
       Home Phone []:                                       <-- 输入家庭电话号码（可选）
       Other []:
Is the information correct? [y/N]                           <-- 按 y 键确认
```

2．在 Samba 中创建用户

```
$ sudo smbpasswd -a hiweed
New SMB password:                <-- 创建 Samba密码
Retype new SMB password:         <-- 再次输入密码
Added user hiweed.
```

```
$ sudo /etc/init.d/samba restart
```

4．Samba 用户密码修改

```
$ sudo smbpasswd hiweed
```

```
New SMB password:                    <-- 输入新密码
Retype new SMB password:             <-- 再次输入新密码
```

13.3.4　文件写入实验

```
$ sudo nano /etc/samba/smb.conf
```

```
 [global]
security=user

[myshare]
path=/usr/share/doc/samba
valid users=hiweed
writeable=yes
public=no
```

```
$ sudo /etc/init.d/samba restart
```

```
$ ls /usr/share/doc/ -l |grep sam
```

```
drwxr-xr-x 2 root root 4096 2009-03-25 23:01 samba
```

```
$ sudo nano /etc/samba/smb.conf
```

```
 [global]
security=user

[myshare]
path=/home/hiweed
valid users=hiweed
writeable=yes
public=no
```

```
$ sudo /etc/init.d/samba restart
```

```
$ ls -l
```

```
-rw-r--r-- 1 hiweed hiweed 70 2009-10-13 03:17 mylist.txt
-rwxr--r-- 1 hiweed hiweed 70 2009-10-13 03:17 复件 mylist.txt
```

```
$ sudo chown hiweed -R /path/to/your/directory
```

13.4 基本的家目录共享方案

13.4.1　创建私人目录

```
$ ls -al /etc/skel
total 20
drwxr-xr-x  2 root root 4096 2009-03-31 16:17 .
drwxr-xr-x 69 root root 4096 2009-03-31 02:11 ..
-rw-r--r--  1 root root  220 2008-05-12 14:33 .bash_logout
-rw-r--r--  1 root root 2940 2008-05-12 14:33 .bashrc
-rw-r--r--  1 root root  586 2008-05-12 14:33 .profile
```

```
$ sudo mkdir /etc/skel/personal
$ ls -l /etc/skel
total 4
drwxr-xr-x 2 root root 4096 2009-03-31 16:23 personal
```

```
$ sudo chmod g=,o= /etc/skel/personal
$ ls -l /etc/skel
total 4
drwx------ 2 root root 4096 2009-03-31 16:29 personal
```

13.4.2　创建新用户

1．创建系统用户

```
$ sudo adduser shangning
Adding user `shangning' ...
Adding new group `shangning' (1002) ...
Adding new user `shangning' (1002) with group `shangning' ...
Creating home directory `/home/shangning' ...
Copying files from `/etc/skel' ...        <-- 系统正在复制/etc/skel/目录下的内容
Enter new UNIX password:                  <-- 请输入密码
Retype new UNIX password:                 <-- 请再次输入密码
passwd: password updated successfully
Changing the user information for shangning
Enter the new value, or press ENTER for the default
       Full Name []:                      <-- 这里你可以输入用户的全名（可选）
       Room Number []:
       Work Phone []:
       Home Phone []:
       Other []:
Is the information correct? [y/N] y       <-- 按 y 键确认
```

```
total 4
drwx------ 2 shangning shangning 4096 2009-03-31 16:34 personal
```

```
$ ls -l /home/shangning/personal/
```

```
ls: cannot open directory /home/shangning/personal/: Permission denied
```

2．将用户加入 Samba

```
$ sudo smbpasswd -a shangning
```

```
New SMB password:                    <-- 请输入密码
Retype new SMB password:             <-- 再次输入密码
Added user shangning.
```

13.4.3 配置 Samba

1．最简单的[homes]共享配置

```
$ sudo mv /etc/samba/smb.conf /etc/samba/conf.conf-backup
$ sudo nano /etc/samba/smb.conf
```

```
[global]
workgroup = HIWEEDGROUP

[homes]
guest ok = no
read only = no
```

```
$ sudo /etc/init.d/samba restart
```

```
$ sudo nano /etc/samba/smb.conf
```

```
[global]
workgroup = HIWEEDGROUP

[homes]
browseable = no
guest ok = no
read only = no
```

```
$ sudo /etc/init.d/samba restart
```

13.5 其他共享方案

13.5.1 共享光驱

```
$ sudo nano /etc/fstab
```

```
/dev/scd0       /cdrom   udf,iso9660 user,noauto,exec,utf8 0       0
```

```
$ sudo nano /etc/samba/smb.conf
```

```
 [cdrom]
read only = yes
locking = no
path = /cdrom
guest ok = no
preexec = /bin/mount /cdrom
postexec = /bin/umount /cdrom
```

```
$ sudo /etc/init.d/samba restart
```

13.5.2　小组共享

1．创建财务组

```
$ sudo addgroup caiwu
```

```
Adding group `caiwu' (GID 1003) ...
Done.
```

2．将用户加入财务组

```
$ sudo adduser hiweed caiwu
```

```
Adding user `hiweed' to group `caiwu' ...
Adding user hiweed to group caiwu
Done.
```

3．创建共享目录

```
$ sudo mkdir /home/samba/caiwu -p
```

4．配置 Samba

```
$ sudo nano /etc/samba/smb.conf
```

```
[caiwu]
  comment = 闲人免进 —— 财务部
  path = /home/samba/caiwu
  read only = no
  guest ok = no
  browseable = yes
  create mask = 0660
  directory mask = 0770
  valid users = @caiwu
  force group = caiwu
```

```
$ sudo /etc/init.d/samba restart
```

5．设置目录权限

```
$ sudo chgrp caiwu /home/samba/caiwu/
```

```
$ sudo chmod 770 /home/samba/caiwu/
```

第 14 章

最佳虚拟化方案：OpenVZ

14.2 安装 OpenVZ

14.2.1 安装前的准备

```
$ sudo ln -sf /bin/bash /bin/sh
```

```
$ sudo /etc/init.d/apparmor stop
$ sudo update-rc.d -f apparmor remove
$ sudo apt-get remove apparmor apparmor-utils
```

14.2.2 安装 OpenVZ

```
$ sudo apt-get install linux-openvz vzctl vzquota
```

14.2.3 配置 OpenVZ

1. 内核参数调整

```
$ sudo nano /etc/sysctl.conf
```

```
 [...]
net.ipv4.conf.all.rp_filter=1
net.ipv4.icmp_echo_ignore_broadcasts=1
net.ipv4.conf.default.forwarding=1
net.ipv4.conf.default.proxy_arp = 0
net.ipv4.ip_forward=1
kernel.sysrq = 1
net.ipv4.conf.default.send_redirects = 1
net.ipv4.conf.all.send_redirects = 0
net.ipv4.conf.eth0.proxy_arp=1
[...]
```

```
$ sudo sysctl -p
```

2．修改 VE 全局配置

```
$ sudo nano /etc/vz/vz.conf
```

```
 [...]
NEIGHBOUR_DEVS=all
[...]
```

3．修改 vps.basic 配置文件

```
$ sudo nano /etc/vz/conf/ve-vps.basic.conf-sample
```

```
 [...]
KMEMSIZE="213770490:268435456"
PRIVVMPAGES="655360:696320"
NUMPROC="480:480"
TCPSNDBUF="4703360:4703360"
TCPRCVBUF="4703360:4703360"
DGRAMRCVBUF="462144:462144"
NUMOTHERSOCK="1000:1000"
DISKSPACE="20485760:21530240"
DISKINODES="2000000:2200000"
[...]
```

```
CAPABILITY="CHOWN:on DAC_READ_SEARCH:on SETGID:on SETUID:on NET_BIND_ SERVICE:on
NET_ADMIN:on SYS_CHROOT:on SYS_NICE:on"
```

4．重新启动服务器

```
$ sudo reboot
```

```
$ uname -r
2.6.24-19-openvz
```

14.3　虚拟机的基本操作

14.3.1　虚拟机的创建

1．下载操作系统模板

```
$ wget http://download.openvz.org/template/precreated/old/ubuntu-8.04-i386-minimal.tar.
$ sudo mv ubuntu-8.04-i386-minimal.tar.gz /var/lib/vz/template/cache/
```

2．创建虚拟机

```
$ sudo vzctl create 101 --ostemplate ubuntu-8.04-i386-minimal
```

3．修改虚拟机配置

```
$ sudo vzctl set 101 --hostname test.mytest.com --save
$ sudo vzctl set 101 --ipadd 192.168.1.200 --save
```

```
$ sudo vzctl set 101 --numothersock 480 --save
```

```
$ sudo vzctl set 101 --nameserver 202.102.128.68 --nameserver 202.102.134.68
-sav e
```

```
$ man vzctl
```

14.3.2 虚拟机的启停

1．启动虚拟机

```
$ sudo vzctl start 101
```

2．进入/退出虚拟机

```
$ sudo vzctl enter 101
```

```
$ exit
```

3．停止虚拟机

```
$ sudo vzctl stop 101
```

4．删除虚拟机

```
$ sudo vzctl destroy 101
```

14.4　vzctl 用法详解

14.4.1　vzctl 基本用法

```
vzctl [flags] 子命令 虚拟机编号 [参数 1] [参数 2] [参数 3...]
```

14.4.2　创建虚拟机

```
vzctl [flags] create veid --ostemplate name [--config name] [--private path] [--root path] [--ipadd addr] [--hostname name]
```

14.4.3　虚拟机的启停等操作

```
vzctl [flags] start | stop | restart | enter | destroy | mount | umount | status | veid
```

```
VEID 虚拟机编号 是否存在 是否加载 是否运行
```

14.4.4　设置虚拟机参数

```
vzctl [flags] set veid [要设置的选项、值] [--save]
```

3．资源限制选项

```
vzctl set veid --privvmpages 5M:6M
```

14.4.5 其他命令和参数

```
vzctl [flags] exec | exec2 veid command [arg ...]
```

```
$ vzctl exec 1000 /bin/ls -la
```

```
$ vzctl exec 1000 'ls -l / | sort'
```

```
vzctl runscript veid <script>
```

```
vzctl --help | --version
```

14.6 VE 的备份与恢复

14.6.1　安装 vzdump

```
$     wget     http://www.proxmox.com/cms_proxmox/cms/upload/vzdump/vzdump_1.1-1_
all.deb
```

```
$ sudo dpkg -i vzdump_1.1-1_all.deb
```

```
$ sudo apt-get -f install
```

14.6.2　vzdump 的用法

```
vzdump 选项 [--all | VEID]
```

14.6.3 备份 VE

```
$ sudo vzdump 777
```

```
$ sudo vzdump --suspend 777
```

```
$ sudo vzdump --suspend --all --mailto root
```

```
$ sudo vzdump --dumpdir /path/to/backup --snapshot 777
```

14.6.4 恢复 VE

```
$ sudo vzdump --restore /path/to/vzdump-777.tar 600
```

14.7 OpenVZ 排错

```
$ cat /proc/user_beancounters
```

```
uid resource     held     maxheld     barrier      limit         failcnt
230: kmemsize    122605002527479021377049021377049 0
 lockedpages     0           0           256          256           0
 privvmpages     180676      473024      655360       696320        0
 shmpages        16          2928        21504        21504         0
 dummy           0           0           0            0             0
 numproc         143         287         360          480           88
 physpages       135350      401356      0            2147483647    0
 vmguarpages     0           0           33792        2147483647    0
 oomguarpages    135350      401356      26112        2147483647    0
 numtcpsock      93          342         360          360           0
 numflock        43          133         188          206           0
 numpty          1           4           16           16            0
 numsiginfo      0           148         256          256           0
 tcpsndbuf       584704      4011648     4703360      4703360       0
 tcprcvbuf       559488      3383488     4703360      4703360       0
 othersockbuf    507520      1132416     1126080      2097152       3055
 dgramrcvbuf     0           337600      462144       462144        0
 numothersock    324         724         1000         1000          43
 dcachesize      507150      841995      3409920      3624960       0
 numfile         3720        7871        9312         9312          0
 dummy           0           0           0            0             0
 dummy           0           0           0            0             0
 dummy           0           0           0            0             0
 numiptent       10          10          128          128           0
```

第 15 章

最佳 DNS 服务器：Bind9

15.1 安装 Bind9

```
$ sudo apt-get install bind9 dnsutils bind9-doc
```

15.3 配置 Bind9

15.3.1 Bind9 配置文件介绍

```
directory "/var/cache/bind";
```

15.3.2 DNS 记录类型

1．A 记录

```
www     IN    A     192.168.1.10
```

2．别名记录（CNAME）

```
www     IN    A     192.168.1.10
mail    IN    CNAME  www
```

3．MX 记录

```
       IN    MX     mail.mytest.com.
mail   IN    A      192.168.1.100
```

4．NS 记录

```
       IN    NS     ns.mytest.com.
ns   IN    A      192.168.1.200
```

15.3.3 DNS 缓存服务器的配置

1．转发配置

```
$ sudo nano /etc/bind/named.conf.options
```

```
forwarders {
              202.102.128.68;
```

```
            202.102.134.68;
};
```

```
$ sudo /etc/init.d/bind9 restart
```

2．测试

```
$ sudo nano /etc/resolv.conf
```

```
search mytest.com
nameserver 192.168.1.10
```

```
$ dig google.com
```

```
; <<>> DiG 9.4.2-P2 <<>> google.com
;; global options:  printcmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 52542
;; flags: qr rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 4, ADDITIONAL: 0

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

;; ANSWER SECTION:
google.com.           125     IN      A       74.125.67.100
google.com.           125     IN      A       209.85.171.100
google.com.           125     IN      A       74.125.45.100

;; AUTHORITY SECTION:
google.com.           324418  IN      NS      ns1.google.com.
google.com.           324418  IN      NS      ns2.google.com.
google.com.           324418  IN      NS      ns3.google.com.
google.com.           324418  IN      NS      ns4.google.com.

;; Query time: 29 msec
;; SERVER: 192.168.1.10#53(192.168.1.10)
;; WHEN: Tue Feb 10 04:32:30 2009
;; MSG SIZE  rcvd: 148
```

15.3.4 主 DNS 服务器的配置

1．创建正向 Zone 文件

```
$ sudo nano /etc/bind/named.conf.local
```

```
zone "mytest.com" {
    type master;
    file "db.mytest.com";
};
```

```
$ sudo cp /etc/bind/db.local /var/cache/bind/db.mytest.com
```

```
$ sudo nano /var/cache/bind/db.mytest.com
```

```
;
; BIND data file for mytest.com
;
$TTL    604800
@       IN      SOA     mytest.com. root.mytest.com. (
                              1         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                         604800 )       ; Negative Cache TTL
;
@       IN      NS      ns.
@       IN      A       192.168.1.10
ns      IN      A       192.168.1.10
ubox    IN      A       192.168.1.10
www     IN      CNAME   ubox
@       IN      AAAA    ::1
```

```
$ sudo /etc/init.d/bind9 restart
```

2．创建反向 Zone 文件

```
$ sudo nano /etc/bind/named.conf.local
```

```
zone "1.168.192.in-addr.arpa" {
   type master;
      file "reverse/db.192.168.1";
};
```

```
$ sudo mkdir /var/cache/bind/reverse/
$ sudo cp /etc/bind/db.127 /var/cache/bind/reverse/db.192.168.1
```

```
$ sudo nano /var/cache/bind/reverse/db.192.168.1
```

```
;
; BIND reverse data file for 192.168.1
;
$TTL    604800
@       IN      SOA     ns.mytest.com. root.mytest.com. (
```

```
                        1         ; Serial
                   604800         ; Refresh
                    86400         ; Retry
                  2419200         ; Expire
                   604800 )       ; Negative Cache TTL
;
@       IN      NS      ns.
125     IN      PTR     ns.mytest.com
125     IN      PTR     ubox.mytest.com
125     IN      PTR     www.mytest.com
```

```
$ sudo /etc/init.d/bind9 restart
```

3．测试

```
$ ping mytest.com
```

```
$ dig www.mytest.com
$ dig 1.168.192.in-addr.arpa. AXFR
```

```
$ named-checkzone mytes.com db.mytest.com
```

```
$ named-checkzone mytes.com reverse/db.192.168.1
```

15.3.5 从 DNS 服务器的配置

1．主服务器的配置

```
$ sudo nano /etc/bind/named.conf.local
```

```
zone "mytest.com" {
       type master;
       file "db.mytest.com";
       allow-transfer {192.168.1.100;};
};

zone "1.168.192.in-addr.arpa" {
       type master;
       file "reverse/db.192.168.1";
       allow-transfer {192.168.1.100;};
};
```

2．从服务器的配置

```
$ sudo apt-get install bind9 dnsutils
```

```
$ sudo mkdir /var/cache/bind/reverse
$ sudo chown bind.bind /var/cache/bind/reverse/
```

```
$ sudo nano /etc/bind/named.conf.local
```

```
zone "mytest.com" {
       type slave;
       file "db.mytest.com";
       masters {192.168.1.125;};
};

zone "1.168.192.in-addr.arpa" {
       type slave;
       file "reverse/db.192.168.1";
       masters {192.168.1.125;};
};
```

```
$ sudo /etc/init.d/bind9 restart
```

```
$ ls /var/cache/bind/ -R
```

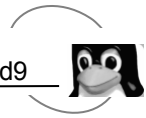
```
/var/cache/bind/:
db.mytest.com  reverse

/var/cache/bind/reverse:
db.192.168.1
```

```
$ sudo tail -n50 /var/log/syslog
```

```
named[4801]: zone mytest.com/IN: sending notifies (serial 6)
named[4801]: zone 1.168.192.in-addr.arpa/IN: Transfer started.
named[4801]:  transfer  of  '1.168.192.in-addr.arpa/IN'  from  192.168.1.125#53:
connected using 192.168.1.140#58618
named[4801]: zone 1.168.192.in-addr.arpa/IN: transferred serial 1
named[4801]: transfer of '1.168.192.in-addr.arpa/IN' from 192.168.1.125#53: end
of transfer
named[4801]: zone 1.168.192.in-addr.arpa/IN: sending notifies (serial 1)
```

15.4 让 Bind9 运行在 Chroot 环境

```
$ sudo /etc/init.d/bind9 stop
```



15.4.1　创建 Chroot 环境

```
$ sudo mkdir /var/lib/bind/etc
$ sudo mkdir /var/lib/bind/dev
$ sudo mkdir -p /var/lib/bind/var/run/bind/run
```

```
$ sudo mv /etc/bind /var/lib/bind/etc/
$ sudo mv /var/cache/bind/ /var/lib/bind/var/cache/
```

```
$ sudo ln -s /var/lib/bind/etc/bind /etc/bind
```

```
$ sudo mknod /var/lib/bind/dev/null c 1 3
$ sudo mknod /var/lib/bind/dev/random c 1 8
$ sudo chmod 666 /var/lib/bind/dev/null /var/lib/bind/dev/random
```

```
$ sudo cp /etc/localtime /var/lib/bind/etc/
```

```
$ sudo chown -R bind:bind /var/lib/bind/var/*
$ sudo chown -R bind:bind /var/lib/bind/etc/bind
```

15.4.2 Bind9 配置

```
$ sudo nano /etc/default/bind9
```

```
OPTIONS="-u bind -t /var/lib/bind"
```

15.4.3 日志路径设置

```
$ sudo nano /etc/default/syslogd
```

```
SYSLOGD=" -a /var/lib/bind/dev/log"
```

15.4.4 测试

```
$ sudo /etc/init.d/bind9 start
```

15.5 Bind9 排错

15.5.1 DNS 测试

1．/etc/resolv.conf

```
nameserver  192.168.1.10
nameserver  192.168.1.100
```

2．ping 工具

```
$ ping mytest.com
```

```
PING mytest.com (192.168.1.10) 56(84) bytes of data.
64 bytes from ns (192.168.1.10): icmp_seq=1 ttl=64 time=0.800 ms
64 bytes from ns (192.168.1.10): icmp_seq=2 ttl=64 time=0.803 ms
64 bytes from ns (192.168.1.10): icmp_seq=3 ttl=64 time=0.794 ms
64 bytes from ns (192.168.1.10): icmp_seq=4 ttl=64 time=0.810 ms
```

3．dig 工具

```
$ dig -x 127.0.0.1
```

```
;; Query time: 1 msec
;; SERVER: 192.168.1.10#53(192.168.1.10)
```

```
$ dig ubuntu.com
```

```
;; Query time: 47 msec
;; SERVER: 192.168.1.10#53(192.168.1.10)
```

```
;; Query time: 1 msec
```

4．named-checkzone 工具

```
$ named-checkzone mytest.com /etc/bind/db.mytest.com
```

```
zone mytest.com/IN: loaded serial 5
OK
```

```
$ named-checkzone mytest.com /etc/bind/db.192.168.1
```

```
zone mytest.com/IN: loaded serial 5
OK
```

15.5.2　日志文件

```
logging {
    category default { default_syslog; default_debug; };
    category unmatched { null; };
};
```

```
$ sudo nano /etc/bind/named.conf.local
```

```
logging {
   channel query.log {
      file "/var/log/query.log";
      severity debug 3;
};
   category queries { query.log; };
};
```

```
$ sudo touch /var/log/query.log
$ sudo chown bind /var/log/query.log
```

```
$ sudo nano /etc/apparmor.d/usr.sbin.named
```

```
/var/log/query.log w,
```

```
$ cat /etc/apparmor.d/usr.sbin.named | sudo apparmor_parser -r
```

```
$ sudo /etc/init.d/bind9 restart
```

第 16 章 DNS 轮询

16.4 DNS 轮询的测试

```
$ nslookup
> server 192.168.1.10
> www.mytest.net
Name:    www.mytest.net
Address: 192.168.1.1
Name:    www.mytest.net
Address: 192.168.1.2
Name:    www.mytest.net
Address: 192.168.1.3
Name:    www.mytest.net
Address: 192.168.1.4
```

第 17 章

最佳 DHCP 服务器方案

17.3 安装 DHCP 服务器软件

```
$ sudo apt-get install dhcp3-server
```

```
On what network interfaces should the DHCP server listen? <-- 输入eth0
```

```
Please configure the DHCP server as soon as the installation finishes. <-- Ok
The version 3 DHCP server is now non-authoritative by default <-- Ok
```

```
* Starting DHCP server dhcpd3                                          [fail]
invoke-rc.d: initscript dhcp3-server, action "start" failed.
```

17.4　配置 DHCP 服务器

17.4.1　网络环境介绍

```
$ cat /etc/network/interfaces
```

```
auto lo
iface lo inet loopback

auto eth0
iface eth0 inet static
       address 192.168.1.10
       gateway 192.168.1.1
       netmask 255.255.255.0
```

17.4.2　DHCP 配置

```
$ sudo mv /etc/dhcp3/dhcpd.conf /etc/dhcp3/dhcpd.conf-back
```

```
$ sudo touch /etc/dhcp3/dhcpd.conf
```

```
$ sudo nano /etc/dhcp3/dhcpd.conf
```

```
default-lease-time 600;
max-lease-time 7200;

option subnet-mask 255.255.255.0;
option broadcast-address 192.168.1.255;
option routers 192.168.1.1;
option domain-name-servers 192.168.1.10, 192.168.1.100;
option domain-name "mytest.com";

subnet 192.168.1.0 netmask 255.255.255.0 {
range 192.168.1.20 192.168.1.99;
range 192.168.1.150 192.168.1.240;
}
```

```
$ sudo /etc/init.d/dhcp3-server start
```

17.4.3　测试

```
$ cat /etc/network/interfaces
```

```
# The primary network interface
auto eth0
```

```
iface eth0 inet dhcp
```

```
$ sudo /etc/init.d/networking restart
```

```
 [...]
DHCPOFFER of 192.168.1.240 from 192.168.1.10
[...]
DHCPACK of 192.168.1.240 from 192.168.1.10
```

```
$ ifconfig eth0
```

```
eth0      Link encap:Ethernet  HWaddr 00:0c:29:57:6b:21
          inet addr:192.168.1.240  Bcast:192.168.1.255  Mask:255.255.255.0
[...]
```

```
$ cat /etc/resolv.conf
```

```
search mytest.com
nameserver 192.168.1.10
nameserver 192.168.1.100
```

17.5 DHCP 排错

```
$ ps aux | grep dhcpd
```

```
dhcpd     5373  0.0  2.0   2868  1272 ?        Ss   21:40   0:00 /usr/sbin/dhcpd3 -q
-pf /var/run/dhcp3-server/dhcpd.pid -cf /etc/dhcp3/dhcpd.conf
```

```
$ sudo netstat -uap | grep dhcpd
```

```
udp       0     0 *:bootps                *:*                                 5373/dhcpd3
```

```
$ sudo tail -n 100 /var/log/syslog | grep dhc
```

```
$ sudo cat /var/lib/dhcp3/dhcpd.leases
```

```
[...]
lease 192.168.1.240 {
  starts 5 2009/02/13 04:43:45;
  ends 5 2009/02/13 04:53:45;
  binding state active;
  next binding state free;
  hardware ethernet 00:0c:29:57:6b:21;
```

```
}
[...]
```

第 18 章 负载均衡、高可用的 Web 集群

18.3 架构的实现

18.3.1 Web 服务器的安装及配置

1．安装 Apache2

```
$ sudo apt-get install apache2
```

2．修改 apache2.conf

```
$ sudo nano /etc/apache2/apache2.conf
```

```
[...]
#LogFormat "%h %l %u %t \"%r\" %>s %b \"%{Referer}i\" \"%{User-Agent}i\""
combined
LogFormat "%{X-Forwarded-For}i %l %u %t \"%r\" %>s %b \"%{Referer}i\" \"%{User-
Age nt}i\"" combined
[...]
```

3．创建文件 check.txt

```
$ sudo touch /var/www/check.txt
```

4．修改虚拟主机配置

```
$ sudo nano /etc/apache2/sites-available/default
```

```
[...]
SetEnvIf Request_URI "^/check\.txt$" dontlog
CustomLog /var/log/apache2/access.log combined env=!dontlog
[...]
```

```
$ sudo /etc/init.d/apache2 restart
```

18.3.2 HAProxy 的安装及配置

1．安装 HAProxy

```
$ sudo apt-get install haproxy
```

2．配置 haproxy.cfg

```
$ sudo mv /etc/haproxy.cfg /etc/haproxy.cfg-back
$ sudo nano /etc/haproxy.cfg
```

```
global
       log 127.0.0.1   local0
       log 127.0.0.1   local1 notice
       maxconn 4096
       user haproxy
       group haproxy

defaults
       log     global
       mode    http
       option  httplog
       option  dontlognull
       retries 3
       redispatch
       maxconn 2000
       contimeout      5000
       clitimeout      50000
       srvtimeout      50000

listen webfarm 192.168.1.14:80
      mode http
      stats enable
      stats auth admin:password
      balance roundrobin
      cookie JSESSIONID prefix
      option httpclose
      option forwardfor
      option httpchk HEAD /check.txt HTTP/1.0
      server webA 192.168.1.12:80 cookie A check
      server webB 192.168.1.13:80 cookie B check
```

3．修改/etc/sysctl.conf

```
$ sudo nano /etc/sysctl.conf
```

```
net.ipv4.ip_nonlocal_bind=1
```

```
$ sudo sysctl -p
```

4．让 HAProxy 自动启动

```
$ sudo nano /etc/default/haproxy
```

```
# Set ENABLED to 1 if you want the init script to start haproxy.
ENABLED=1
# Add extra flags here.
#EXTRAOPTS="-de -m 16"
```

18.3.3 Keepalived 的安装及配置

1．安装 Keepalived

```
$ sudo apt-get install keepalived
```

2．配置 Keepalived

```
$ sudo nano /etc/keepalived/keepalived.conf
```

```
vrrp_script chk_haproxy {
       script "killall -0 haproxy"
       interval 2                  # 每 2 秒钟检查一次
       weight 2
}

vrrp_instance VI_1 {
       interface eth0
       state MASTER
       virtual_router_id 51
       priority 101                 # 101 为“主”，100 为“从”
       virtual_ipaddress {
           192.168.1.14
       }
       track_script {
           chk_haproxy
       }
}
```

```
$ sudo /etc/init.d/keepalived start
```

```
$ sudo nano /etc/keepalived/keepalived.conf
```

```
vrrp_script chk_haproxy {
       script "killall -0 haproxy"
       interval 2                  # 每 2 秒钟检查一次
       weight 2
}

vrrp_instance VI_1 {
       interface eth0
       state MASTER
       virtual_router_id 51
       priority 100                 # 101 为“主”，100 为“从”
       virtual_ipaddress {
           192.168.1.14
       }
       track_script {
           chk_haproxy
       }
}
```

```
$ sudo /etc/init.d/keepalived start
```

```
$ ip addr sh eth0
```

```
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast qlen 1000
    link/ether 00:0c:29:4e:67:1a brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.10/24 brd 192.168.1.255 scope global eth0
    inet 192.168.1.14/24 brd 192.168.1.255 scope global secondary eth0
```

```
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast qlen 1000
    link/ether 00:0c:29:34:d7:7e brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.11/24 brd 192.168.1.255 scope global eth0
```

```
$ sudo /etc/init.d/haproxy start
```

18.4　测试

18.4.2　负载均衡节点故障模拟

```
$ sudo /etc/init.d/keepalived stop
```

```
$ ping 192.168.1.14
[...]
64 bytes from 192.168.1.14: icmp_seq=20 ttl=64 time=0.901 ms
64 bytes from 192.168.1.14: icmp_seq=21 ttl=64 time=217 ms
From 192.168.1.11 icmp_seq=22 Destination Host Unreachable
64 bytes from 192.168.1.14: icmp_seq=23 ttl=64 time=1961 ms
64 bytes from 192.168.1.14: icmp_seq=24 ttl=64 time=975 ms
```

18.5 HAProxy 的 Web 统计页面

```
stats enable
stats auth admin:password
```

第 19 章 负载均衡、高可用的 MySQL 集群

19.2 管理节点（MGM）的安装及配置

19.2.1 安装 MySQL

```
$ sudo apt-get update install mysql-server
```

19.2.2 配置 ndb_mgmd.cnf

```
$ sudo nano /etc/mysql/ndb_mgmd.cnf
```

```
[NDBD DEFAULT]
NoOfReplicas=2

[MYSQLD DEFAULT]
[NDB_MGMD DEFAULT]
[TCP DEFAULT]

[NDB_MGMD]    # 管理节点
HostName=192.168.1.10    # 本机（管理节点）的 IP 地址

[NDBD]    # 存储节点 1
HostName=192.168.1.13
DataDir=/var/lib/mysql-cluster
BackupDataDir=/var/lib/mysql-cluster/backup

[NDBD]    # 存储节点 2
HostName=192.168.1.14
DataDir=/var/lib/mysql-cluster
BackupDataDir=/var/lib/mysql-cluster/backup

# 有几个存储节点，就写几行[MYSQLD]
[MYSQLD]
[MYSQLD]
```

```
$ sudo /etc/init.d/mysql-ndb-mgm start
```

19.3 存储节点（NDB）的安装及配置

19.3.1 安装 MySQL

```
$ sudo apt-get update install mysql-server
```

```
$ sudo /etc/init.d/mysql stop
```

19.3.2 配置 my.cnf

```
$ sudo mv /etc/mysql/my.cnf /etc/mysql/my.cnf-back
```

```
$ sudo nano /etc/mysql/my.cnf
```

```
 [client]
socket = /var/run/mysqld/mysqld.sock
port    = 3306

[mysqld]
ndbcluster
ndb-connectstring=192.168.1.10   # 管理节点的 IP 地址
default-storage-engine=NDBCLUSTER

[mysql_cluster]
ndb-connectstring=192.168.1.10   # 管理节点的 IP 地址
```

```
$ sudo /etc/init.d/mysql-ndb start-initial
```

```
 * Starting MySQL NDB Data Node ndbd                                   error=2350
2009-02-15 22:20:55 [ndbd] INFO     -- Error handler restarting system
2009-02-15 22:20:55 [ndbd] INFO     -- Error handler shutdown completed -
exiting
sphase=0
exit=-1
```

```
$ ps aux|grep ndb|grep -v grep
```

```
$ sudo /etc/init.d/mysql start
```

19.4　阶段测试

19.4.1　集群连接状态测试

```
$ ndb_mgm
```

```
-- NDB Cluster -- Management Client --
ndb_mgm>
```

```
ndb_mgm> show
```

```
Connected to Management Server at: localhost:1186
Cluster Configuration
---------------------
[ndbd(NDB)]     2 node(s)
id=2    @192.168.1.13  (Version: 5.0.51, Nodegroup: 0)
id=3    @192.168.1.14  (Version: 5.0.51, Nodegroup: 0, Master)

[ndb_mgmd(MGM)] 1 node(s)
id=1    @192.168.1.10  (Version: 5.0.51)

[mysqld(API)]   2 node(s)
id=4    @192.168.1.13  (Version: 5.0.51)
id=5    @192.168.1.14  (Version: 5.0.51)
```

```
ndb_mgm> quit
```

19.4.2　测试

1. 数据同步测试

```
$ mysql -u root -p
```

```
mysql> CREATE DATABASE clustertest;
Query OK, 1 row affected (0.24 sec)

mysql> USE clustertest;
Database changed

mysql> CREATE TABLE testtable (Count INT) ENGINE=NDBCLUSTER;
Query OK, 0 rows affected (0.24 sec)
```

```
mysql> INSERT INTO testtable () VALUES (1);
Query OK, 1 row affected (0.00 sec)

mysql> SELECT * FROM testtable;
+-------+
| Count |
+-------+
|     1 |
+-------+
1 row in set (0.00 sec)
```

```
$ mysql -u root -p
```

```
mysql> CREATE DATABASE clustertest;
Query OK, 1 row affected (0.24 sec)

mysql> USE clustertest;
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> SELECT * FROM testtable;
+-------+
| Count |
+-------+
|     1 |
+-------+
1 row in set (0.03 sec)
```

```
mysql> INSERT INTO testtable () VALUES (2);
Query OK, 1 row affected (0.23 sec)

mysql> quit
Bye
```

```
mysql> SELECT * FROM testtable;
+-------+
| Count |
+-------+
|     2 |
|     1 |
```

```
+-------+
2 rows in set (0.00 sec)

mysql> quit
Bye
```

2．故障模拟测试

```
$ sudo /etc/init.d/mysql-ndb stop
```

```
$ ndb_mgm
-- NDB Cluster -- Management Client --
ndb_mgm> show
Connected to Management Server at: localhost:1186
Cluster Configuration
---------------------
[ndbd(NDB)]     2 node(s)
id=2 (not connected, accepting connect from 192.168.1.13)
id=3    @192.168.1.14  (Version: 5.0.51, Nodegroup: 0, Master)

[ndb_mgmd(MGM)] 1 node(s)
id=1    @192.168.1.10  (Version: 5.0.51)

[mysqld(API)]   2 node(s)
id=4    @192.168.1.13  (Version: 5.0.51)
id=5    @192.168.1.14  (Version: 5.0.51)
```

```
ndb_mgm> quit
```

```
$ mysql -u root -p
```

```
mysql> USE clustertest;
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> SELECT * FROM testtable;
+-------+
| Count |
+-------+
|     2 |
|     1 |
+-------+
2 row in set (0.03 sec)
```

```
mysql> INSERT INTO testtable () VALUES (3);
Query OK, 1 row affected (0.89 sec)
```

```
mysql> SELECT * FROM testtable;
+-------+
| Count |
+-------+
|     1 |
|     2 |
|     3 |
+-------+
3 rows in set (0.00 sec)

mysql> quit
Bye
```

```
$ sudo /etc/init.d/mysql-ndb start
$ mysql -u root -p
```

```
mysql> USE clustertest;
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> SELECT * FROM testtable;
+-------+
| Count |
+-------+
|     2 |
|     3 |
|     1 |
+-------+
3 rows in set (0.00 sec)

mysql> quit
Bye
```

19.5　实现负载均衡

19.5.2　让内核支持 IPVS

```
$ sudo modprobe ip_vs_dh
$ sudo modprobe ip_vs_ftp
$ sudo modprobe ip_vs
$ sudo modprobe ip_vs_lblc
$ sudo modprobe ip_vs_lblcr
$ sudo modprobe ip_vs_lc
$ sudo modprobe ip_vs_nq
$ sudo modprobe ip_vs_rr
```

```
$ sudo modprobe ip_vs_sed
$ sudo modprobe ip_vs_sh
$ sudo modprobe ip_vs_wlc
$ sudo modprobe ip_vs_wrr
```

```
$ sudo nano /etc/modules
```

```
ip_vs_dh
ip_vs_ftp
ip_vs
ip_vs_lblc
ip_vs_lblcr
ip_vs_lc
ip_vs_nq
ip_vs_rr
ip_vs_sed
ip_vs_sh
ip_vs_wlc
ip_vs_wrr
```

```
$ sudo nano /etc/sysctl.conf
```

```
net.ipv4.ip_forward = 1
```

```
$ sudo sysctl -p
```

19.5.3 安装 heartbeat、ldirectord 等软件

下面我们来安装 heartbeat、ldirectord，以及要用到的其他软件。在 mysql-lb1.mytest.com 和 mysql-lb2.mytest.com 上，执行下面的命令：

```
$ sudo apt-get install heartbeat ldirectord
$ sudo apt-get install libdbi-perl libdbd-mysql-perl libmysqlclient15-dev
```

19.5.4 配置 heartbeat

```
$ sudo nano /etc/hosts
```

```
127.0.0.1       localhost
192.168.1.11      mysql-lb1.mytest.com    mysql-lb1
192.168.1.12      mysql-lb2.mytest.com    mysql-lb2
```

```
$ sudo nano /etc/ha.d/ha.cf
```

```
logfacility       local0
bcast       eth0
mcast eth0 225.0.0.1 694 1 0
auto_failback off
node       mysql-lb1
node       mysql-lb2
respawn hacluster /usr/lib/heartbeat/ipfail
apiauth ipfail gid=haclient uid=hacluster
```

```
$ suod nano /etc/ha.d/haresources
```

```
mysql-lb1       \
       ldirectord::ldirectord.cf \
       LVSSyncDaemonSwap::master \
       IPaddr2::192.168.1.15/24/eth0/192.168.1.255
```

```
$ sudo nano /etc/ha.d/authkeys
```

```
auth 3
3 md5 A46fsdgCH
```

```
$ sudo chmod 600 /etc/ha.d/authkeys
```

19.5.5　配置 ldirectord

```
$ sudo nano /etc/ha.d/ldirectord.cf
```

```
# Global Directives
checktimeout=10
checkinterval=2
autoreload=no
logfile="local0"
quiescent=yes
virtual = 192.168.1.15:3306
       service = mysql
       real = 192.168.1.13:3306 gate
       real = 192.168.1.14:3306 gate
       checktype = negotiate
       login = "ldirector"
       passwd = "ldirectorpassword"
       database = "ldirectordb"
       request = "SELECT * FROM connectioncheck"
       scheduler = wrr
```

```
$ sudo update-rc.d -f ldirectord remove
$ sudo update-rc.d -f heartbeat remove
$ sudo update-rc.d heartbeat start 90 2 3 4 5 . stop 05 0 1 6 .
```

19.5.6 NDB 节点配置

1．为 ldirector 创建数据库

```
$ mysql -u root -p
```

```
mysql> GRANT ALL ON ldirectordb.* TO 'ldirector'@'%' IDENTIFIED BY
'ldirectorpassw ord';
mysql> FLUSH PRIVILEGES;
mysql> CREATE DATABASE ldirectordb;
mysql> USE ldirectordb;
mysql> CREATE TABLE connectioncheck (Status INT) ENGINE=NDBCLUSTER;
mysql> INSERT INTO connectioncheck () VALUES (1);
mysql> quit
```

```
$ mysql -u root -p
```

```
mysql> GRANT ALL ON ldirectordb.* TO 'ldirector'@'%' IDENTIFIED BY
'ldirectorpassw ord';
mysql> FLUSH PRIVILEGES;
mysql> CREATE DATABASE ldirectordb;
mysql> quit
```

2．设置 IP 路由

```
$ sudo apt-get install iproute
```

```
$ sudo nano /etc/sysctl.conf
```

```
net.ipv4.conf.all.arp_ignore = 1
net.ipv4.conf.eth0.arp_ignore = 1
net.ipv4.conf.all.arp_announce = 2
net.ipv4.conf.eth0.arp_announce = 2
```

```
$ sudo sysctl -p
```

3．设置虚拟 IP 地址

```
$ sudo nano /etc/network/interfaces
```

```
auto lo:0
iface lo:0 inet static
  address 192.168.1.15
  netmask 255.255.255.255
  pre-up sysctl -p > /dev/null
```

```
$ sudo ifup lo:0
```

19.5.7　测试

```
$ sudo /etc/init.d/ldirectord stop
$ sudo /etc/init.d/heartbeat start
```

```
$ sudo reboot
```

1．ldirectord 状态检查

```
$ ldirectord ldirectord.cf status
```

```
ldirectord for /etc/ha.d/ldirectord.cf is running with pid: 4584
```

```
ldirectord is stopped for /etc/ha.d/ldirectord.cf
```

2．虚拟 IP 状态检查

```
$ ip addr sh eth0
```

```
2: eth0: <BROADCAST,MULTICAST,UP> mtu 1500 qdisc pfifo_fast qlen 1000
    link/ether 00:16:3e:45:fc:f8 brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.11/24 brd 192.168.0.255 scope global eth0
    inet 192.168.1.15/24 brd 192.168.0.255 scope global secondary eth0
```

```
2: eth0: <BROADCAST,MULTICAST,UP> mtu 1500 qdisc pfifo_fast qlen 1000
    link/ether 00:16:3e:16:c1:4e brd ff:ff:ff:ff:ff:ff
inet 192.168.1.12/24 brd 192.168.0.255 scope global eth0
```

3．IPVS 状态检查

```
$ sudo ipvsadm -L -n
```

```
IP Virtual Server version 1.2.1 (size=4096)
Prot LocalAddress:Port Scheduler Flags
  -> RemoteAddress:Port          Forward Weight ActiveConn InActConn
TCP  192.168.1.15:3306 wrr
  -> 192.168.1.13:3306           Route   1      0          0
  -> 192.168.1.14:3306           Route   1      0          0
```

```
IP Virtual Server version 1.2.1 (size=4096)
Prot LocalAddress:Port Scheduler Flags
  -> RemoteAddress:Port          Forward Weight ActiveConn InActConn
```

```
$ sudo /etc/ha.d/resource.d/LVSSyncDaemonSwap master status
```

```
master running
(ipvs_syncmaster pid: 4704)
```

```
master stopped
(ipvs_syncbackup pid: 1440)
```

4．MySQL 测试

```
$ mysql -h 192.168.1.15 -u ldirector -p
```

5．故障模拟测试

```
$ ping 192.168.1.15
[...]
64 bytes from 192.168.1.15: icmp_seq=22 ttl=64 time=0.416 ms
64 bytes from 192.168.1.15: icmp_seq=23 ttl=64 time=0.901 ms
64 bytes from 192.168.1.15: icmp_seq=24 ttl=64 time=217 ms
From 192.168.1.11: icmp_seq=25 Redirect Host(New nexthop: 192.168.1.15)
From 192.168.1.11 icmp_seq=26 Destination Host Unreachable
[...]
64 bytes from 192.168.1.15: icmp_seq=50 ttl=64 time=1961 ms
64 bytes from 192.168.1.15: icmp_seq=51 ttl=64 time=975 ms
```

第 20 章

最佳远程控制方案：SSH

20.1 关于公钥认证

20.1.1 为什么要用公钥认证

```
$ grep sshd /var/log/auth.log.0
```

```
sshd[15738]: Failed password for root from x.x.x.x port 57087 ssh2
sshd[15740]: Address x.x.x.x maps to server.xxxxxx.com, but this does not map
back to the address - POSSIBLE BREAK-IN ATTEMPT!
sshd[15740]: (pam_unix) authentication failure; logname= uid=0 euid=0 tty=ssh
ruser= rhost=x.x.x.x user=root
```

20.2 SSH 的安装

20.2.1 安装 SSH 服务器和客户端

```
$ sudo apt-get install openssh-server
```

```
$ sudo apt-get install openssh-client
```

20.2.2 测试

```
$ ssh localhost
```

```
$ exit
```

20.3　SSH 配置

20.3.1　生成密钥对

```
$ ssh-keygen -t rsa -C "Hiweed's Key"
```

```
Generating public/private rsa key pair.
Enter file in which to save the key (/home/hiweed/.ssh/id_rsa): <-- 回车确认
Enter passphrase (empty for no passphrase): <-- 输入密码
Enter same passphrase again: <-- 再次输入密码
Your identification has been saved in /home/hiweed/.ssh/id_rsa.
Your public key has been saved in /home/hiweed/.ssh/id_rsa.pub.
The key fingerprint is:
fd:eb:41:f7:11:ec:7d:38:5d:e1:40:53:50:8b:0e:56 Hiweed's Key
```

20.3.2　将公钥复制到服务器

```
$ ssh-copy-id -i .ssh/id_rsa.pub hiweed@192.168.1.10
```

20.3.3　SSH 登录测试

1．从 Linux 登录

```
$ ssh hiweed@192.168.1.10
```

```
$ ssh -i .ssh/id_rsa hiweed@192.168.1.10
```

20.3.4　SSH 服务器配置

```
$ sudo cp /etc/ssh/sshd_config /etc/ssh/sshd_config.back
$ sudo nano /etc/ssh/sshd_config
```

```
PermitRootLogin yes
PasswordAuthentication yes
UsePAM yes
```

```
PermitRootLogin no
PasswordAuthentication no
UsePAM no
```

```
$ sudo /etc/init.d/ssh restart
```

20.4 SSH 小技巧

20.4.1 用 scp 远程复制文件

1．将本地文件复制到 SSH 服务器

```
$ scp file1 file2 [...] username@mytest.com:
```

2．将 SSH 服务器文件复制到本地

```
$ scp username@mytest.com:/path/to/file .
```

3．两台 SSH 服务器之间复制文件

```
$ scp username@mytest.com:/path/to/file username@yourname.org:/path/to/file
```

4．复制所有文件

```
$ scp * username@mytest.com:/path/to/
```

```
$ scp -r username@mytest.com:/path/to/ .
```

5．使用公钥

```
$ scp -i /path/to/private.key username@mytest.com:/path/to/ .
```

6．限制带宽

```
$ scp -l 256 username@mytest.com:/path/to/file.tar.gz .
```

20.4.2 在客户端上指定命令

```
$ ssh mytest.com 'echo $PATH'
/usr/local/bin:/usr/bin:/bin:/usr/bin/X11:/usr/games
```

```
$ ssh mytest.com env
Enter passphrase for key '/home/hiweed/.ssh/id_rsa':
SHELL=/bin/bash
SSH_CLIENT=192.168.1.12 47143 22
USER=hiweed
MAIL=/var/mail/hiweed
PATH=/usr/local/bin:/usr/bin:/bin:/usr/bin/X11:/usr/games
PWD=/home/hiweed
SHLVL=1
HOME=/home/hiweed
LOGNAME=hiweed
```

```
SSH_CONNECTION=192.168.1.12 47143 192.1681.1.10 22
_=/usr/bin/env
```

20.4.3　在服务器上限制所执行的命令

```
command="/path/to/some/command args..." ssh-rsa ......(key)......
```

```
$ nano -w ~/.ssh/authorized_keys
```

```
command="ls / > files.list" ssh-rsa yHCBA8quGjcd1U9FXv/X19eSQQk4uLdw4eSqSfwV6m
G6ri
37Aha8k6dSJmtJ9OSFqnZYK6iXW5Iv1c2hGilHYfKl9zTMH00EMaAAAB3NzaC1yc2EAAAABIwAAAQEA3+
QaDcFzr30fO24pLg2UQOuLNRxYKFcEGd9J36Ubbp5gR2IcgHhIWtgjn1R8iaMWbS0mUiLQO5HqIOtRC3O
m+RRQQjDF6Xbk4CUiQ6V09QSAYZn2P6sjtiv4dl5lCXdBMgwwzBivzETw9RhLsqC44wtzJT/rA9C7Q7lj
JpxRCvmcq/vBHQtIIE8EKr6A1+Q3SWH3R+05zlyr5+xd8k085/1r5DNOKYSeBk/Ba2ibiyM+61SFG0aVw
== Hiweed's Key
```

```
$ ssh 192.168.1.10
```

```
$ cat files.list
```

20.4.4　修改密钥口令

```
$ ssh-keygen -p
```

```
Enter file in which the key is (/home/hiweed/.ssh/id_rsa):
Enter old passphrase:
Key has comment '/home/hiweed/.ssh/id_rsa'
Enter new passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved with the new passphrase.
```

20.4.5　将密钥放入内存

```
$ ssh-agent $SHELL
$ ssh-add
```

```
Enter passphrase for /home/hiweed/.ssh/id_rsa:
Identity added: /home/hiweed/.ssh/id_rsa (/home/hiweed/.ssh/id_rsa)
```

```
$ ssh-add -D
```

```
All identities removed.
```

```
$ exit
```

第 21 章

最佳服务器监控方案：Nagios

21.2　安装 Nagios

```
$ sudo apt-get install apache2
```

```
$ sudo apt-get install nagios2 nagios-plugins nagios-images
```

21.3　配置 Nagios

21.3.1　Nagios 初始化设置

1．权限设置

```
$ sed 's/nagiosadmin/ng2admin/g' /etc/nagios2/cgi.cfg > /tmp/cgi.cfg
$ sudo mv /tmp/cgi.cfg /etc/nagios2/cgi.cfg
```

```
$ sudo htpasswd -c /etc/nagios2/htpasswd.users ng2admin
```

2．启用外部命令

```
$ sudo nano /etc/nagios2/nagios.cfg
```

```
[...]
check_external_commands=1
[...]
```

```
$ sudo /etc/init.d/nagios2 stop
$ sudo dpkg-statoverride --update --add nagios www-data 2710 /var/lib/nagios2/rw
$ sudo dpkg-statoverride --update --add nagios nagios 751 /var/lib/nagios2
$ sudo /etc/init.d/nagios2 start
```

21.3.2　Nagios 监控设置

```
$ sudo cp -r conf.d/ conf.d-back
```

1．联系人设置

```
$ sudo nano /etc/nagios2/conf.d/contacts_nagios2.cfg
```

```
define contact{
       contact_name                    hiweed
       alias                           Hiweed Leng
       service_notification_period     24x7
       host_notification_period        24x7
       service_notification_options    w,u,c,r
```

```
        host_notification_options       d,r
        service_notification_commands   notify-by-email
        host_notification_commands      host-notify-by-email
        email                           hiweed@hiweed.com
        }

define contactgroup{
        contactgroup_name       admins
        alias                   Nagios Administrators
        members                 hiweed
        }
```

2．主机设置

```
define host {
        host_name   gateway
        alias       Default Gateway
        address     192.168.1.1
        use         generic-host
        }
```

```
$ sudo nano /etc/nagios2/conf.d/hosts.cfg
```

```
define host{
  host_name  google
  alias      Internet Connection
  address    www.google.com
  use        generic-host
}

define host{
  host_name  mywangateway
  alias      ISP Gateway
  address    218.57.116.185
  parents    google
  use        generic-host
}

define host{
  host_name  mylangateway
  alias      My LAN Internet Gateway
  address    192.168.1.1
  parents    mywangateway
  use        generic-host
}

define host{
  host_name  webserver
  alias      Web Server
  address    192.168.1.12
  parents    mylangateway
  use        generic-host
}

define host{
  host_name  mailserver
  alias      Mail Server
  address    192.168.1.13
```

```
  parents    mylangateway
  use       generic-host
}
```

```
$ sudo nano /etc/nagios2/conf.d/extinfo_nagios2.cfg
```

```
[...]
define hostextinfo{
   host_name   gateway
   icon_image  base/ng-switch40.png
   statusmap_image base/ng-switch40.png
}
```

3．主机组设置

```
define hostgroup {
       hostgroup_name  all
       alias          All Servers
       members        *
       }

define hostgroup {
       hostgroup_name  ubuntu-servers
       alias          Ubuntu GNU/Linux Servers
       members        localhost, webmaster, mailserver
       }

define hostgroup {
       hostgroup_name  http-servers
       alias          HTTP servers
       members        localhost, webserver
       }

define hostgroup {
       hostgroup_name  ssh-servers
       alias          SSH servers
       members        localhost, webserver, mailserver
       }

define hostgroup {
       hostgroup_name  mailservers
       alias          Mail servers
       members        localhost, mailserver
       }

define hostgroup {
       hostgroup_name  ping-servers
       alias          Pingable servers
       members        gateway
       }
```

```
$ sudo nano /etc/nagios2/conf.d/extinfo_nagios2.cfg
```

```
define hostextinfo{
       hostgroup_name   ubuntu-servers
       notes            Ubuntu GNU/Linux servers
       icon_image       base/debian.png
       icon_image_alt   Ubuntu GNU/Linux
       vrml_image       debian.png
```

```
        statusmap_image  base/debian.gd2
        }
[...]
```

```
$ sudo /etc/init.d/nagios2 start
 * Starting nagios2 monitoring daemon nagios2                    [ OK ]
```

4．服务设置

```
$ sudo nano /etc/nagios2/conf.d/services_nagios2.cfg
```

```
define service {
       hostgroup_name                  http-servers
       service_description              HTTP
       check_command                   check_http
       use                             generic-service
       notification_interval            0
}

define service {
       hostgroup_name                  ssh-servers
       service_description              SSH
       check_command                   check_ssh
       use                             generic-service
       notification_interval            0
}

define service {
       hostgroup_name                  ping-servers
       service_description              PING
       check_command                   check_ping!100.0,20%!500.0,60%
       use                             generic-service
       notification_interval            0
}

define service {
  hostgroup_name                  mailservers
  service_description              POP
  check_command                   check_pop
  use                             generic-service
  notification_interval            0
}

define service {
  hostgroup_name                  mailservers
  service_description              IMAP
  check_command                   check_imap
  use                             generic-service
  notification_interval            0
}

define service {
  hostgroup_name                  mailservers
  service_description              Secure POP
  check_command                   check_spop
  use                             generic-service
  notification_interval            0
}

define service {
  hostgroup_name                  mailservers
  service_description              Secure IMAP
  check_command                   check_simap
```

```
  use                             generic-service
  notification_interval           0
}

define service {
  hostgroup_name                  mailservers
  service_description             SMTP
  check_command                   check_smtp
  use                             generic-service
  notification_interval           0
}
```

21.5 Nagios 排错

```
$ sudo /etc/init.d/nagios2 restart
 * Restarting nagios2 monitoring daemon nagios2
 * already running!
                                                                [fail]
```

```
$ sudo /etc/init.d/nagios2 stop
 * Stopping nagios2 monitoring daemon nagios2
$ sudo /etc/init.d/nagios2 start
[...]
Error: Could not find any hostgroup matching 'debian-servers'
Error: Could not expand hostgroups and/or hosts specified in extended host info
(config file '/etc/nagios2/conf.d/extinfo_nagios2.cfg', starting on line 5)
[...]
```

第 22 章

最佳 RAID 方案：RAID10

22.2 RAID10 的实现

22.2.3 分区复制

```
# sfdisk -d /dev/sda | sfdisk /dev/sdb
# sfdisk -d /dev/sda | sfdisk /dev/sdc
# sfdisk -d /dev/sda | sfdisk /dev/sdd
```

22.2.4 创建 RAID 阵列

```
# mdadm --create /dev/md0 --auto=yes --force -R --level=raid1   --raid-devices=4
/ dev/sd[a-d]1
```

```
# mdadm --create /dev/md1 --auto=yes --force -R --level=raid10 --raid-devices=4
/d ev/sd[a-d]2
```

```
# mdadm --create /dev/md2 --auto=yes --force -R --level=raid10 --raid-devices=4
/d ev/sd[a-d]3
```

22.3 RAID10 的日常维护

22.3.2 mdadm 的选项

5．其他选项

```
$ man mdadm
```

22.3.3 创建 RAID 阵列

```
$ sudo mdadm --create /dev/md1 --auto=yes --force -R --level=raid10 --raid-
devices =4 /dev/sd[a-d]2
```

```
$ sudo mdadm --create /dev/md1 --auto=yes --force -R --level=raid10 --raid-
devices =4 /dev/sd[a-d]2 --hot-spares=1 /dev/sde2
```

22.3.4　查询 RAID 阵列

```
$ cat /proc/mdstat
```

```
Personalities : [linear] [multipath] [raid0] [raid1] [raid6] [raid5] [raid4]
[raid10]
md2 : active raid10 sda3[0] sdd3[3] sdc3[2] sdb3[1]
      465664 blocks 64K chunks 2 near-copies [4/4] [UUUU]

md1 : active raid10 sda2[0] sdd2[3] sdc2[2] sdb2[1]
      16209408 blocks 64K chunks 2 near-copies [4/4] [UUUU]

md0 : active raid1 sda1[0] sdd1[3] sdc1[2] sdb1[1]
      48064 blocks [4/4] [UUUU]

unused devices: <none>
```

```
$ sudo mdadm --detail /dev/md0
```

```
$ sudo mdadm --examine /dev/sda2
```

```
$ sudo mdadm --examine /dev/sdb*
```

22.3.5　RAID 的监控

```
$ sudo nano /etc/mdadm/mdadm.conf
```

```
[...]
MAILADDR hiweed@hiweed.com
[...]
```

22.3.6　RAID 的启动/停止

```
$ sudo mdadm -A /dev/md0
```

```
$ sudo mdadm --stop /dev/md0
```

```
mdadm: fail to stop array /dev/md0: Device or resource busy
```

```
$ sudo umount /boot
$ sudo mdadm --stop /dev/md0
mdadm: stopped /dev/md0
```

```
$ sudo mdadm -A /dev/md0
mdadm: /dev/md0 has been started with 4 drives.
```

22.4 故障处理

22.4.1 从 RAID 中移除设备

1. 移除单个 RAID 物理卷

```
$ sudo mdadm /dev/md0 --fail /dev/sda1 --remove /dev/sda1
mdadm: set /dev/sda1 faulty in /dev/md0
mdadm: hot removed /dev/sda1
```

```
$ sudo mdadm --zero-superblock /dev/sda1
```

2. 移除整个硬盘

```
$ sudo mdadm /dev/md0 --fail /dev/sda1 --remove /dev/sda1
mdadm: set /dev/sda1 faulty in /dev/md0
mdadm: hot removed /dev/sda1
$ sudo mdadm /dev/md1 --fail /dev/sda2 --remove /dev/sda2
mdadm: set /dev/sda2 faulty in /dev/md1
mdadm: hot removed /dev/sda2
$ sudo mdadm /dev/md2 --fail /dev/sda3 --remove /dev/sda3
```

```
mdadm: set /dev/sda3 faulty in /dev/md2
mdadm: hot removed /dev/sda3
```

22.4.2　添加已有 RAID 物理卷

```
$ sudo mdadm /dev/md0 --add /dev/sda1
mdadm: re-added /dev/sda1
$ sudo mdadm /dev/md1 --add /dev/sda2
mdadm: re-added /dev/sda1
$ sudo mdadm /dev/md2 --add /dev/sda3
mdadm: re-added /dev/sda1
```

22.4.3　更换全新硬盘

1. 移除坏硬盘

```
$ sudo mdadm /dev/md0 --fail /dev/sda1 --remove /dev/sda1
$ sudo mdadm /dev/md1 --fail /dev/sda2 --remove /dev/sda2
$ sudo mdadm /dev/md2 --fail /dev/sda3 --remove /dev/sda3
```

```
$ cat /proc/mdstat
Personalities : [linear] [multipath] [raid0] [raid1] [raid6] [raid5] [raid4]
[raid10]
md2 : active raid10 sdd3[3] sdc3[2] sdb3[1]
      465664 blocks 64K chunks 2 near-copies [4/3] [_UUU]

md1 : active raid10 sdd2[3] sdc2[2] sdb2[1]
      16209408 blocks 64K chunks 2 near-copies [4/3] [_UUU]

md0 : active raid1 sdd1[3] sdc1[2] sdb1[1]
      48064 blocks [4/3] [_UUU]

unused devices: <none>
```

2．插入硬盘

```
$ sudo halt
```

```
$ sudo fdisk -l
```

3．新硬盘分区

```
$ sudo sfdisk -d /dev/sda | sudo sfdisk /dev/sdd
```

4．将新分区加入 RAID

```
$ sudo mdadm --detail /dev/md1
```

```
[...]
Active Devices : 3
Working Devices : 3
[...]
    Number   Major   Minor   RaidDevice State
       0       0       0        0      removed
       1       8       2        1      active sync   /dev/sda2
       2       8      18        2      active sync   /dev/sdb2
       3       8      34        3      active sync   /dev/sdc2
```

```
$ sudo mdadm /dev/md1 --add /dev/sdd2
```

```
$ sudo mdadm --detail /dev/md1
```

```
[...]
Rebuild Status : 7% complete
[...]
    Number   Major   Minor   RaidDevice State
       4       8      50        0      spare rebuilding   /dev/sdd2
[...]
```

```
$ sudo mdadm --detail /dev/md1
```

```
 Active Devices : 4
Working Devices : 4
[...]
    Number   Major   Minor   RaidDevice State
       0       8      50        0      active sync   /dev/sdd2
       1       8       2        1      active sync   /dev/sda2
       2       8      18        2      active sync   /dev/sdb2
       3       8      34        3      active sync   /dev/sdc2
```

```
$ sudo mdadm /dev/md0 --add /dev/sdd1
```

```
$ sudo mdadm /dev/md2 --add /dev/sdd3
```

5．设置 grub

```
$ sudo grub
grub> root (hd3,0)
grub> setup (hd3)
grub> quit
```

22.5　添加备用硬盘

```
$ sudo mdadm --detail /dev/md1 | grep Spare
  Spare Devices : 0
```

22.5.1　插入新硬盘

```
$ sudo fdisk -l
```

22.5.2　新硬盘分区

```
$ sudo sfdisk -d /dev/sda | sudo sfdisk /dev/sde
```

22.5.3　将新分区加入 RAID

```
$ sudo mdadm /dev/md0 --add /dev/sde1
$ sudo mdadm /dev/md1 --add /dev/sde2
$ sudo mdadm /dev/md2 --add /dev/sde3
```

```
$ sudo mdadm --detail /dev/md0
  Total Devices : 5
[...]
Working Devices : 5
 Failed Devices : 0
  Spare Devices : 1
[...]
    Number   Major   Minor   RaidDevice State
[...]
       4       8       65        -      spare   /dev/sde1
```

22.5.4　设置 grub

```
$ sudo grub
grub> root (hd4,0)
grub> setup (hd4)
grub> quit
```

22.5.5 故障模拟

```
$ sudo mdadm /dev/md0 --fail /dev/sda1
mdadm: set /dev/sda1 faulty in /dev/md0
```

```
$ sudo mdadm --detail /dev/md0
[...]
 Failed Devices : 1
  Spare Devices : 0

          UUID : 858ea4ab:1c224ab8:b41c754c:f8475f43
        Events : 0.80

    Number   Major   Minor   RaidDevice State
       0       8       65        0      active sync   /dev/sde1
       1       8       17        1      active sync   /dev/sdb1
       2       8       33        2      active sync   /dev/sdc1
       3       8       49        3      active sync   /dev/sdd1

       4       8        1        -      faulty spare   /dev/sda1
```

```
$ sudo mdadm /dev/md0 --remove /dev/sda1
$ sudo mdadm /dev/md0 --add /dev/sda1
```

第 23 章

最佳数据安全方案：RAID10+LVM

23.1 创建 RAID 物理卷

23.1.2 剩余硬盘的分区处理

```
# sfdisk -d /dev/sda | sfdisk /dev/sdb
# sfdisk -d /dev/sda | sfdisk /dev/sdc
# sfdisk -d /dev/sda | sfdisk /dev/sdd
```

23.2 创建 RAID 阵列

23.2.1 创建 RAID1 阵列

```
# mdadm --create /dev/md0 --auto=yes --force -R --level=raid1   --raid-devices=4
/ dev/sd[a-d]1
```

23.2.2 创建 RAID10 阵列

```
# mdadm --create /dev/md1 --auto=yes --force -R --level=raid10 --raid-devices=4
/d ev/sd[a-d]2
```

23.5　LVM 的相关命令

23.5.1　LVM 物理卷相关命令

1．显示 LVM 物理卷信息

```
$ sudo pvdisplay
  --- Physical volume ---
  PV Name               /dev/md1
  VG Name               ubox_lvm
  PV Size               15.90 GB / not usable 512.00 KB
  Allocatable           yes (but full)
  PE Size (KByte)       4096
  Total PE              4071
  Free PE               0
  Allocated PE          4071
  PV UUID               E3MQdl-NwhH-zJUo-hSX1-J5uY-44b1-bYgV9P
```

2．创建新的 LVM 物理卷

```
$ sudo pvcreate /dev/sde1 /dev/sdf
  Physical volume "/dev/sde1" successfully created
  Physical volume "/dev/sdf" successfully created
```

3．LVM 物理卷的扫描

```
$ sudo pvscan
  PV /dev/md1   VG ubox_lvm   lvm2 [15.90 GB / 0    free]
  Total: 1 [15.90 GB] / in use: 1 [15.90 GB] / in no VG: 0 [0   ]
```

```
$ sudo pvs
  PV         VG          Fmt  Attr PSize     PFree
  /dev/md1   ubox_lvm  lvm2 a-    15.90G    0
```

4．LVM 物理卷容量的修改

```
$ sudo pvresize /dev/sda1
```

```
$ sudo pvresize --setphysicalvolumesize 30G /dev/sda1
```

5．LVM 物理卷的移动

```
$ sudo  pvmove -v /dev/sda4
```

6．LVM 物理卷的删除

```
$ sudo pvremove /dev/sda4
```

23.5.2 LVM 卷组相关命令

1．创建 LVM 卷组

```
$ sudo vgcreate ubuntu_vg /dev/sdk1 /dev/sdl1
```

2．查询 LVM 卷组

```
$ sudo vgdisplay
```

```
  --- Volume group ---
  VG Name               ubox_lvm
  System ID
  Format                lvm2
  [...]
  VG Size               15.90 GB
  PE Size               4.00 MB
  Total PE              4071
  Alloc PE / Size       4071 / 15.90 GB
  Free  PE / Size       0 / 0
  VG UUID               IZTYxO-L008-D39n-s33P-UAgJ-RYww-PKISqE
```

3．LVM 卷组扫描

```
$ sudo vgs
```

```
  VG             #PV #LV #SN Attr   VSize     VFree
  ubox_lvm   1    5    0   wz--n- 15.90G    0
```

```
$ sudo vgscan
```

```
  Reading all physical volumes.  This may take a while...
  Found volume group "ubox_lvm" using metadata type lvm2
```

4．LVM 卷组改名

```
$ sudo vgrename /dev/ubox_lvm /dev/my_volume_group
```

```
$ sudo vgrename ubox_lvm my_volume_group
```

5．LVM 卷组的拆分、合并

```
$ sudo vgsplit -v databases_vg new_vg /dev/sdk1 /dev/sdn1
```

```
$ sudo vgmerge -v databases_vg my_vg
```

6．LVM 卷组的导出、导入

```
$ sudo vgchange -an vg02
```

```
$ sudo vgexport vg02
```

```
$ sudo vgimport vg02 /dev/sd[b-h]5
```

7．LVM 卷组的扩容、收缩

```
$ sudo vgextend vg00 /dev/sda4 /dev/sdn1
```

```
$ sudo vgreduce vg00 /dev/sda4 /dev/sdn1
```

8．LVM 卷组属性修改

```
$ sudo vgchange -an vg02
```

```
$ sudo vgchange -a y
```

```
$ sudo vgchange -l 128 /dev/vg00
```

9．LVM 卷组 meta 数据的备份、恢复

```
$ sudo vgcfgbackup ubox_lvm
```

```
$ sudo vgcfgbackup
```

```
$ sudo vgcfgrestore --file /etc/lvm/backup/vg02 vg02
```

23.5.3　LVM 逻辑卷相关命令

1．创建 LVM 逻辑卷

```
$ sudo lvcreate --name share_lv --size 40G vg00
```

2．查询 LVM 逻辑卷

```
$ sudo lvdisplay
```

```
  --- Logical volume ---
  LV Name                /dev/ubox_lvm/ubox_home
```

```
  VG Name               ubox_lvm
  LV UUID               oIDBUy-42e3-fxtC-VCei-yrQi-KKus-tKNpTh
  LV Write Access       read/write
  LV Status             available
  # open                1
  LV Size               2.00 GB
  Current LE            512
  Segments              1
  Allocation            inherit
  Read ahead sectors    0
  Block device          254:0
[...]
```

3．LVM逻辑卷扫描

```
$ sudo lvs
  LV       VG      Attr   LSize   Origin Snap%  Move Log Copy%
  ubox_home ubox_lvm -wi-ao   2.00G
  ubox_root ubox_lvm -wi-ao   4.00G
  ubox_swap ubox_lvm -wi-ao 256.00M
  ubox_tmp  ubox_lvm -wi-ao   1.00G
  ubox_var  ubox_lvm -wi-ao   8.65G
$ sudo lvscan
  ACTIVE            '/dev/ubox_lvm/ubox_home' [2.00 GB] inherit
  ACTIVE            '/dev/ubox_lvm/ubox_root' [4.00 GB] inherit
  ACTIVE            '/dev/ubox_lvm/ubox_tmp' [1.00 GB] inherit
  ACTIVE            '/dev/ubox_lvm/ubox_swap' [256.00 MB] inherit
  ACTIVE            '/dev/ubox_lvm/ubox_var' [8.65 GB] inherit
```

4．LVM逻辑卷改名

```
$ sudo lvrename /dev/ubox_lvm/ubox_home /dev/ubox_lvm/ubox_opt
```

```
$ sudo lvrename ubox_lvm ubox_home ubox_opt
```

5．LVM逻辑卷的扩容

```
$ sudo umount /home
```

```
$ sudo lvextend -L10G /dev/ubox_lvm/ubox_home
```

```
$ sudo e2fsck -f /dev/ubox_lvm/ubox_home
```

```
$ sudo resize2fs /dev/ubox_lvm/ubox_home
```

6．LVM 逻辑卷的收缩

```
$ sudo resize2fs /dev/ubox_lvm/ubox_home 5G
```

```
$ sudo lvreduce -L5G /dev/ubox_lvm/ubox_home
```

7．LVM 逻辑卷属性修改

```
$ sudo lvchange -an /dev/ubox_lvm/ubox_home
```

```
$ sudo lvchange -ay
```

```
 $ sudo lvchange -pr /dev/ubox_lvm/ubox_home
```

23.6　添加新硬盘

23.6.1　插入新硬盘

```
$ sudo fdisk -l
```

23.6.2　配置 RAID

1．创建 RAID 物理卷

```
$ sudo cfdisk /dev/sde
```

```
                  cfdisk (util-linux-ng 2.13.1)

                       Disk Drive: /dev/sde
                  Size: 8589934592 bytes, 8589 MB
          Heads: 255   Sectors per Track: 63   Cylinders: 1044

  Name       Flags     Part Type  FS Type         [Label]       Size (MB)
------------------------------------------------------------------------
                      Pri/Log   Free Space                     8587.20




   [ Help ]  [ New  ]  [ Print ]  [ Quit ]  [ Units ]
   [ Write ]
```

```
                        Print help screen
```

```
$ sudo sfdisk -d /dev/sde | sudo sfdisk /dev/sdf
```

2．创建 RAID1 阵列

```
$ sudo mdadm --create /dev/md2 --auto=yes --force -R --level=raid1 --raid-
devices= 2 /dev/sd[e-f]1
mdadm: array /dev/md2 started.
```

```
$ sudo mdadm --detail /dev/md2
/dev/md2:
[...]
    Raid Level : raid1
[...]
 Active Devices : 2
Working Devices : 2
[...]
   Number   Major   Minor   RaidDevice State
      0       8       65        0      active sync   /dev/sde1
      1       8       81        1      active sync   /dev/sdf1
```

23.6.3 在 RAID 上配置 LVM

1．创建 LVM 物理卷

```
$ sudo pvcreate /dev/md2
  Physical volume "/dev/md2" successfully created
```

```
$ sudo pvdisplay /dev/md2
  --- NEW Physical volume ---
  PV Name               /dev/md2
  VG Name
[...]
```

2．扩容现有 LVM 卷组

```
$ sudo vgextend ubox_lvm /dev/md2
  Volume group "ubox_lvm" successfully extended
```

```
$ sudo pvdisplay
  --- Physical volume ---
  PV Name               /dev/md2
  VG Name               ubox_lvm
```

3．扩容现有 LVM 逻辑卷

```
$ sudo lvdisplay /dev/ubox_lvm/ubox_var | grep Size
  LV Size                8.65 GB
```

```
$ sudo lvextend -L+7.9G /dev/ubox_lvm/ubox_var
  Rounding up size to full physical extent 7.90 GB
  Extending logical volume ubox_var to 16.55 GB
  Logical volume ubox_var successfully resized
```

```
$ sudo lvdisplay /dev/ubox_lvm/ubox_var | grep Size
  LV Size                16.55 GB
```

23.6.4　扩容文件系统

```
$ df -h | grep var
[...]
/dev/mapper/ubox_lvm-ubox_var
                  8.7G  129M  8.6G   2% /var
```

```
$ sudo xfs_growfs /var
[...]
data blocks changed from 2268160 to 4339712
```

```
$ df -h | grep var
[...]
/dev/mapper/ubox_lvm-ubox_var
                   17G  130M   17G   1% /var
```

23.8　LVM 分区备份

23.8.1　创建快照

```
$ sudo lvcreate -s -L90M -n var_snapshot /dev/ubox_lvm/ubox_var
  Rounding up size to full physical extent 92.00 MB
  Logical volume "var_snapshot" created
```

```
$ sudo lvm lvscan
  ACTIVE            '/dev/ubox_lvm/ubox_home' [2.00 GB] inherit
  ACTIVE            '/dev/ubox_lvm/ubox_root' [4.00 GB] inherit
```

```
  ACTIVE            '/dev/ubox_lvm/ubox_tmp' [1.00 GB] inherit
  ACTIVE            '/dev/ubox_lvm/ubox_swap' [256.00 MB] inherit
  ACTIVE   Original '/dev/ubox_lvm/ubox_var' [16.55 GB] inherit
  ACTIVE   Snapshot '/dev/ubox_lvm/var_snapshot' [92.00 MB] inherit
```

23.8.2 备份快照内容

```
$ sudo mount /dev/ubox_lvm/var_snapshot /mnt -o nouuid
```

```
$ ls /mnt
backups  cache  lib  local  lock  log  mail  opt  run  spool  tmp
```

```
$ sudo tar cfz /tmp/var.tar.gz /mnt
```

```
$ sudo umount /mnt
```

23.8.3 删除快照

```
$ sudo lvremove /dev/ubox_lvm/var_snapshot
Do you really want to remove active logical volume "var_snapshot"? [y/n]: y
  Logical volume "var_snapshot" successfully removed
```

第 24 章 Ubuntu Server 系统安全

24.1 系统安全更新

24.1.1 订阅安全列表

```
$ sudo apt-get update && apt-get upgrade
```

24.1.2 自动更新

```
$ sudo nano /etc/apt/apt.conf.d/10periodic
```

```
APT::Periodic::Update-Package-Lists "1";
APT::Periodic::Download-Upgradeable-Packages "1";
APT::Periodic::AutocleanInterval "0";
APT::Periodic::Unattended-Upgrade "1";
```

```
$ sudo nano /etc/apt/apt.conf.d/50unattended-upgrades
```

```
Unattended-Upgrade::Allowed-Origins {
       "ubuntu hardy-security";
};
```

24.2 控制台安全

```
$ sudo nano /etc/event.d/control-alt-delete
```

```
[...]
#exec /sbin/shutdown -r now "Control-Alt-Delete pressed"
```

24.3 用户、密码管理

24.3.1 关于 root 用户

```
$ sudo passwd
```

```
[sudo] password for hiweed:  <-- 你当前用户的密码
Enter new UNIX password:     <-- root 的密码
Retype new UNIX password:        <-- 再输入一遍 root 的密码
passwd: password updated successfully
```

```
$ sudo passwd -l root
Password changed.
```

24.3.3 关于/etc/sudoers

```
用户名  主机名 = [(目的用户)] [NOPASSWD:] 命令列表
```

```
$ man sudoers
```

1．指定运行命令的身份

```
hiweed    ubox = (operator) /bin/ls, /bin/kill, /usr/bin/lprm
```

```
$ sudo -u operator /bin/ls
```

```
hiweed    ubox = (operator) /bin/ls, (root) /bin/kill, /usr/bin/lprm
```

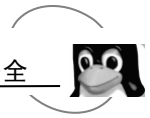
```
hiweed    ubox = (:dailer) /usr/bin/tip, /usr/bin/cu
```

2．有密码/无密码

```
hiweed    ubox = NOPASSWD: /bin/ls, /bin/kill, /usr/bin/lprm
```

```
hiweed    ubox = NOPASSWD: /bin/ls, PASSWD: /bin/kill, /usr/bin/lprm
```

```
hiweed ubox = NOPASSWD: ALL
```



24.3.4　密码策略

1．密码长度设置

```
$ sudo nano /etc/pam.d/common-password
```

```
password   requisite   pam_unix.so nullok obscure md5
```

```
password   requisite   pam_unix.so nullok obscure md5 min=8
```

2．密码有效期

```
$ sudo chage -l hiweed
Last password change                                    : Mar 14, 2009
Password expires                                        : never
Password inactive                                       : never
Account expires                                         : never
Minimum number of days between password change          : 0
Maximum number of days between password change          : 99999
Number of days of warning before password expires       : 7
```

```
$ sudo chage hiweed
Changing the aging information for hiweed
Enter the new value, or press ENTER for the default

       Minimum Password Age [0]:                              <-- 最短有效期
       Maximum Password Age [99999]:                          <-- 最长有效期
       Last Password Change (YYYY-MM-DD) [2009-03-14]:        <-- 密码最后修改日期
       Password Expiration Warning [7]:                       <-- 密码过期提前警告期
       Password Inactive [-1]:                                <-- 过期后密码是否锁定
       Account Expiration Date (YYYY-MM-DD) [1969-12-31]:<-- 账号过期日
```

```
$ sudo chage -M 90 -W 14 -I 5 hiweed
```

```
$ sudo chage -E 2010-12-31 hiweed
```

24.4 ufw 防火墙

24.4.1 启用、禁用 ufw

```
$ sudo ufw status
Firewall not loaded
```

```
$ sudo enable ufw
Firewall started and enabled on system startup
```

```
$ sudo ufw status
Firewall loaded
```

```
$ sudo ufw disable
Firewall stopped and disabled on system startup
```

要启用 ufw 日志，运行命令：

```
$ sudo ufw logging on
Logging enabled
```

```
$ sudo ufw logging off
Logging disabled
```

24.4.2 基本规则设置

1．开放端口

```
$ sudo ufw allow 53
```

```
$ sudo ufw allow 53/tcp
```

```
$ sudo ufw allow 53/udp
```

2．关闭端口

```
$ sudo ufw deny 53
```

```
$ sudo ufw deny 53/tcp
```

```
$ sudo ufw deny 53/udp
```

3．以服务名代替端口号

```
$ sudo ufw deny ssh
$ sudo ufw allow ssh
```

```
$ less /etc/services
```

4．删除规则

```
$ sudo ufw deny 53/udp
```

```
$ sudo ufw delete deny 53/udp
```

24.4.3　常用规则设置

1．允许某个 IP 访问

```
$ sudo ufw allow from 10.10.100.100
```

2．禁止某个 IP 访问

```
$ sudo ufw deny from 10.10.100.100
```

3．允许某个网段访问

```
$ sudo ufw allow from 10.10.100.0/24
```

4．禁止某个网段访问

```
$ sudo ufw deny from 10.10.100.0/24
```

5．允许某 IP 访问某个端口

```
$ sudo ufw allow from 192.168.1.4 to any port 22
```

6．禁止某 IP 访问某个端口

```
$ sudo ufw deny from 192.168.1.4 to any port 22
```

7．禁止 ping

```
$ sudo nano /etc/ufw/before.rules
```

```
-A ufw-before-input -p icmp --icmp-type echo-request -j ACCEPT
```

```
-A ufw-before-input -p icmp --icmp-type echo-request -j DROP
```

```
$ sudo /etc/init.d/ufw force-reload
 * Stopping firewall: ufw...                                        [ OK ]
 * Starting firewall: ufw...                                        [ OK ]
```

24.4.4 高级规则设置

1．挡掉某个 IP 地址

```
$ sudo ufw allow 80
```

```
$ sudo ufw deny 111.222.33.44
```

```
$ sudo nano /etc/ufw/before.rules
[...]
# drop INVALID packets
# uncomment to log INVALID packets
#-A ufw-before-input -m conntrack --ctstate INVALID -j LOG --log-prefix "[UFW
BLOCK INVALID]: "
-A ufw-before-input -m conntrack --ctstate INVALID -j DROP

# Block IPs
-A ufw-before-input -s 111.222.33.44 -j DROP
[...]
```

2．控制子网中的个别主机（1）

```
$ sudo ufw deny from 192.168.1.1 to any port 22
Rule added
$ sudo ufw deny from 192.168.1.20 to any port 22
Rule added
```

```
$ sudo ufw allow from 192.168.1.0/24 to any port 22
```

```
Rule added
```

```
$ sudo ufw status
Firewall loaded

To                         Action  From
--                         ------  ----
22:tcp                      DENY    192.168.1.1
22:udp                      DENY    192.168.1.1
22:tcp                      DENY    192.168.1.20
22:udp                      DENY    192.168.1.20
22:tcp                      ALLOW   192.168.1.0/24
22:udp                      ALLOW   192.168.1.0/24
```

3．控制子网中的个别主机（2）

```
$ sudo ufw delete allow from 192.168.1.0/24 to any port 22
Rule deleted
```

```
$ sudo ufw status
Firewall loaded

To                         Action  From
--                         ------  ----
53:tcp                      ALLOW   Anywhere
53:udp                      ALLOW   Anywhere
22:tcp                      DENY    192.168.1.1
22:udp                      DENY    192.168.1.1
22:tcp                      DENY    192.168.1.20
22:udp                      DENY    192.168.1.20
```

```
$ sudo ufw deny from 192.168.1.9 to any port 22
Rule added
```

```
$ sudo ufw allow from 192.168.1.0/24 to any port 22
Rule added
```

```
$ sudo ufw status
Firewall loaded

To                         Action  From
--                         ------  ----
53:tcp                      ALLOW   Anywhere
53:udp                      ALLOW   Anywhere
22:tcp                      DENY    192.168.1.1
```

```
22:udp                     DENY    192.168.1.1
22:tcp                     DENY    192.168.1.20
22:udp                     DENY    192.168.1.20
22:tcp                     DENY    192.168.1.9
22:udp                     DENY    192.168.1.9
22:tcp                     ALLOW   192.168.1.0/24
22:udp                     ALLOW   192.168.1.0/24
```

24.4.5 IP 伪装

1. 启用包转发

```
$ sudo nano /etc/default/ufw
```

```
DEFAULT_FORWARD_POLICY="DROP"
```

```
DEFAULT_FORWARD_POLICY="ACCEPT"
```

```
$ sudo nano /etc/ufw/sysctl.conf
```

```
net/ipv4/ip_forward=1
```

```
net/ipv6/conf/default/forwarding=1
```

2. 添加规则

```
$ sudo nano /etc/ufw/before.rules
```

```
# nat 规则
*nat
:POSTROUTING ACCEPT [0:0]

# 将来自 eth1 的数据包转发给 eth0
-A POSTROUTING -s 192.168.0.0/24 -o eth0 -j MASQUERADE

# 不要删掉该 COMMIT 行，否则 nat 规则不会生效
COMMIT
```

```
$ sudo /etc/init.d/ufw restart
 * Stopping firewall: ufw...                                          [ OK ]
 * Starting firewall: ufw...                                          [ OK ]
```

24.5　入侵检测

24.5.1　安装 LAMP

```
$ sudo apt-get install  mysql-server libapache2-mod-php5 php5-mysql libphp-adodb
```

24.5.2　安装、配置 Snort

1．安装 Snort

```
$ sudo apt-get install  snort-mysql
```

```
Setting up snort-mysql (2.7.0-14) ...
 * Stopping Network Intrusion Detection System  snort
 * No running snort instance found
 * Starting Network Intrusion Detection System  snort
 * /etc/snort/db-pending-config file found
 * Snort will not start as its database is not yet configured.
 * Please configure the database as described in
 * /usr/share/doc/snort-{pgsql,mysql}/README-database.Debian
 * and remove /etc/snort/db-pending-config
invoke-rc.d: initscript snort, action "start" failed.
dpkg: error processing snort-mysql (--configure):
 subprocess post-installation script returned error exit status 6
Processing triggers for libc6 ...
ldconfig deferred processing now taking place
Errors were encountered while processing:
 snort-mysql
E: Sub-process /usr/bin/dpkg returned an error code (1)
```

```
$ less /usr/share/doc/snort-mysql/README-database.Debian
$ zless /usr/share/doc/snort-mysql/README.database.gz
```

2．为 Snort 创建数据库

```
$ mysql -uroot -p
```

```
mysql> CREATE DATABASE snortdb;
Query OK, 1 row affected (0.00 sec)

mysql> grant CREATE, INSERT, SELECT, UPDATE on snortdb.* to snort@localhost;
Query OK, 0 rows affected (0.01 sec)

mysql> SET PASSWORD FOR snort@localhost=PASSWORD('snortPassword');
```

```
Query OK, 0 rows affected (0.01 sec)

mysql> exit
Bye

$ cd /usr/share/doc/snort-mysql
$ zcat create_mysql.gz | mysql snortdb  -u snort -psnortPassword

$ sudo rm /etc/snort/db-pending-config
```

3．配置 Snort

```
$ sudo nano /etc/snort/snort.conf

#var HOME_NET any
var HOME_NET 192.168.1.0/24

#var EXTERNAL_NET any
var EXTERNAL_NET !$HOME_NET

#output database: log, mysql,
output database: log, mysql, user=snort password=snortPassword dbname=snortdb
host=localhost

$ sudo chown snort /var/log/snort/alert

$ sudo snort -c /etc/snort/snort.conf
[...]
       --== Initialization Complete ==--

   ,,_     -*> Snort! <*-
  o"  )~   Version 2.7.0 (Build 35)
   ''''    By Martin Roesch & The Snort Team: http://www.snort.org/team.html
           (C) Copyright 1998-2007 Sourcefire Inc., et al.

           Rules Engine: SF_SNORT_DETECTION_ENGINE  Version 1.6  <Build 11>
           Preprocessor Object: SF_FTPTELNET  Version 1.0  <Build 10>
           Preprocessor Object: SF_DNS  Version 1.0  <Build 2>
           Preprocessor Object: SF_DCERPC  Version 1.0  <Build 4>
           Preprocessor Object: SF_SMTP  Version 1.0  <Build 7>
           Preprocessor Object: SF_SSH  Version 1.0  <Build 1>
Not Using PCAP_FRAMES
```

```
$ sudo /etc/init.d/snort start
 * Starting Network Intrusion Detection System  snort                    [ OK ]
```

```
$ ps aux|grep snort
snort     7166  122 24.7  88572 63324 ?       Rs   04:04   0:02 /usr/sbin/snort -m
02 7 -D -d -l /var/log/snort -u snort -g snort -c /etc/snort/snort.conf -S
HOME_NET=[1 92.168.1.0/24] -i eth0
```

```
$ cat /var/log/syslog | grep snort | grep ERROR
Apr  4 03:52:49 ubuntu snort[7032]: FATAL ERROR: OpenAlertFile() => fopen() alert
f ile /var/log/snort/alert: Permission denied
Apr  4 04:01:12 ubuntu snort[7141]: FATAL ERROR: database: mysql_error: Access
deni ed for user 'snort'@'localhost' (using password: YES)
```

24.5.3　安装、配置 BASE

1. 安装 acidbase 软件包

```
$ sudo apt-get install acidbase
```

2．配置 Apache

```
$ sudo nano /etc/apache2/sites-available/default
```

```
Alias /acidbase "/usr/share/acidbase"

<Directory /usr/share/acidbase/>
  Options +FollowSymLinks
  AllowOverride None
  Order allow,deny
  allow from all
</Directory>
```

```
$ sudo /etc/init.d/apache2 reload
 * Reloading web server config apache2                                [ ok ]
```

3．配置 BASE

```
$ sudo mv /etc/acidbase/base_conf.php /etc/acidbase/base_conf.php-orig
```

```
$ sudo nano /etc/acidbase/base_conf.php
```

```
//$BASE_path = dirname(__FILE__);
$BASE_path = "/usr/share/acidbase";
```

```
$ sudo chmod o= /etc/acidbase/base_conf.php
$ sudo chgrp www-data /etc/acidbase/base_conf.php
```

24.6 肉鸡检测

24.6.1 chkrootkit 的使用

```
$ sudo apt-get install chkrootkit
```

```
$ sudo chkrootkit ps ls cron
ROOTDIR is `/'
Checking `ps'... not infected
Checking `ls'... not infected
```

```
Checking `cron'... not infected
```

```
$ sudo chkrootkit
```

```
$ sudo chkrootkit -q
```

```
$ sudo chkrootkit -x su | less
ROOTDIR is `/'
###
### Output of: /usr/bin/strings -a /bin/su
###
/lib/ld-linux.so.2
libcrypt.so.1
__gmon_start__
_Jv_RegisterClasses
libpam.so.0
pam_start
[...]
```

```
$ sudo chkrootkit -p /cdrom/bin:/cdrom/sbin:/cdron/usr/bin
```

```
$ sudo chkrootkit -r /mnt/yourharddisk/
```

24.6.2　rkhunter 的使用

1. 安装 rkhunter

```
$ sudo apt-get install rkhunter postfix mailx
```

```
$ sudo rkhunter --update
[ Rootkit Hunter version 1.3.0 ]

Checking rkhunter data files...
  Checking file mirrors.dat                                  [ No update ]
  Checking file programs_bad.dat                             [ No update ]
  Checking file backdoorports.dat                            [ No update ]
  Checking file suspscan.dat                                 [ No update ]
  Checking file i18n/cn                                      [ Updated ]
  Checking file i18n/en                                        [ Updated ]
  Checking file i18n/zh                                        [ Updated ]
```

```
  Checking file i18n/zhutf                                  [ Updated ]
```

```
$ sudo rkhunter --list
```

```
$ sudo rkhunter -c
[ Rootkit Hunter version 1.3.0 ]

Checking system commands...

  Performing 'strings' command checks
    Checking 'strings' command                              [ OK ]

  Performing 'shared libraries' checks
    Checking for preloading variables                       [ None found ]
    Checking for preload file                               [ Not found ]
    Checking LD_LIBRARY_PATH variable                       [ Not found ]

  Performing file properties checks
    Checking for prerequisites                              [ OK ]
    /bin/bash                                               [ OK ]
[...]
```

2．配置 rkhunter

```
BINDIR="/cdrom/bin /cdrom/usr/bin /cdrom/sbin /cdrom/usr/sbin"
```

```
$ sudo nano /etc/default/rkhunter
```

```
REPORT_EMAIL="hiweed@hiweed.com"
```

```
$ less /etc/cron.daily/rkhunter
```

24.6.3 unhide 的使用

```
$ sudo apt-get install unhide
```

2．检测隐藏进程

```
$ sudo unhide proc
Unhide 02-11-2007
yjesus@security-projects.com


[*]Searching for Hidden processes through /proc scanning
```

```
$ sudo unhide sys
Unhide 02-11-2007
yjesus@security-projects.com


[*]Searching for Hidden processes through getpriority() scanning

[*]Searching for Hidden processes through getpgid() scanning

[*]Searching for Hidden processes through getsid() scanning

[*]Searching for Hidden processes through sched_getaffinity() scanning

[*]Searching for Hidden processes through sched_getparam() scanning

[*]Searching for Hidden processes through sched_getscheduler() scanning

[*]Searching for Hidden processes through sched_rr_get_interval() scanning

[*]Searching for Hidden processes through sysinfo() scanning

HIDDEN Processes Found:2
```

```
$ sudo unhide brute
Unhide 02-11-2007
yjesus@security-projects.com


[*]Starting scanning using brute force against PIDS

Found HIDDEN PID: 31194
Found HIDDEN PID: 31200
Found HIDDEN PID: 31201
Found HIDDEN PID: 31202
Found HIDDEN PID: 31204
Found HIDDEN PID: 31211
Found HIDDEN PID: 31212
Found HIDDEN PID: 31215
Found HIDDEN PID: 31216
```

3．检测隐藏的网络端口

```
$ sudo unhide-tcp
Unhide-TCP 28-12-2005
yjesus@security-projects.com


Starting TCP checking

Starting UDP checking
```

24.7 数据完整性检测

24.7.1 安装 Tripwire

```
$ sudo apt-get install tripwire
```

24.7.2 配置 Tripwire

1. 配置 twcfg.txt

```
ROOT         =/usr/sbin
POLFILE      =/etc/tripwire/tw.pol
DBFILE       =/var/lib/tripwire/$(HOSTNAME).twd
REPORTFILE   =/var/lib/tripwire/report/$(HOSTNAME)-$(DATE).twr
SITEKEYFILE  =/etc/tripwire/site.key
LOCALKEYFILE =/etc/tripwire/$(HOSTNAME)-local.key
EDITOR       =/usr/bin/vi
LATEPROMPTING =false
LOOSEDIRECTORYCHECKING =false
MAILNOVIOLATIONS =true
EMAILREPORTLEVEL =3
REPORTLEVEL  =3
SYSLOGREPORTING =true
MAILMETHOD   =SMTP
SMTPHOST     =localhost
SMTPPORT     =25
```

```
$ cd /etc/tripwire
$ sudo twadmin -m F -S site.key twcfg.txt
```

```
Please enter your site passphrase:
Wrote configuration file: /etc/tripwire/tw.cfg
```

```
$ sudo chmod 600 /etc/tripwire/twcfg.txt
```

```
$ sudo rm -f /etc/tripwire/twcfg.txt
```

```
$ sudo twadmin --print-cfgfile | sudo tee /etc/tripwire/twcfg.txt
```

2. 配置 twpol.txt

```
$ sudo nano /etc/tripwire/twpol.txt
```

```
#
```

```
# Critical devices
#
(
  rulename = "Devices & Kernel information",
  severity = $(SIG_HI),
  emailto = hiweed@hiweed.com
)
{
    /dev           -> $(Device) ;
    /proc/devices                  -> $(Device) ;
    /proc/net                     -> $(Device) ;
    /proc/sys                     -> $(Device) ;
    /proc/cpuinfo                  -> $(Device) ;
    /proc/modules                  -> $(Device) ;
    /proc/mounts                   -> $(Device) ;
    /proc/dma                     -> $(Device) ;
    /proc/filesystems               -> $(Device) ;
    /proc/pci                     -> $(Device) ;
    /proc/interrupts                -> $(Device) ;
    /proc/driver/rtc                -> $(Device) ;
    /proc/ioports                  -> $(Device) ;
    /proc/scsi                    -> $(Device) ;
    /proc/kcore                    -> $(Device) ;
    /proc/self                    -> $(Device) ;
    /proc/kmsg                    -> $(Device) ;
    /proc/stat                    -> $(Device) ;
    /proc/ksyms                   -> $(Device) ;
    /proc/loadavg                  -> $(Device) ;
    /proc/uptime                   -> $(Device) ;
    /proc/locks                   -> $(Device) ;
    /proc/version                  -> $(Device) ;
    /proc/mdstat                   -> $(Device) ;
    /proc/meminfo                  -> $(Device) ;
    /proc/cmdline                  -> $(Device) ;
    /proc/misc                    -> $(Device) ;
}
```

```
$ cd /etc/tripwire
$ sudo twadmin -m P -S site.key twpol.txt
```

```
Please enter your site passphrase:
Wrote policy file: /etc/tripwire/tw.pol
```

```
$ sudo chmod 600 /etc/tripwire/twpol.txt
```

```
$ sudo rm -f /etc/tripwire/twpol.txt
```

```
$ sudo twadmin --print-polfile | sudo tee /etc/tripwire/twpol.txt
```

```
$ sudo tripwire --test --email hiweed@hiweed.com
Sending a test message to: hiweed@hiweed.com
```

24.7.3 初始化 Tripwire 数据库

```
$ sudo tripwire -m i
Please enter your local passphrase:                <-- 输入 local 密钥的密码
Parsing policy file: /etc/tripwire/tw.pol
Generating the database...
*** Processing Unix File System ***
### Warning: File system error.
### Filename: /etc/rc.boot
### No such file or directory
### Continuing...
### Warning: File system error.
### Filename: /root/mail
### No such file or directory
[...]
```

24.7.4 执行完整性检测

```
$ sudo tripwire --check --email-report
```

24.7.5 检测报告分析

```
$ sudo twprint -m r --twrfile /var/lib/tripwire/report/<your-file>.twr |less
```

检测报告的第一部分是摘要，列出了报告生成的时间等信息：

```
Note: Report is not encrypted.
Tripwire(R) 2.3.0 Integrity Check Report

Report generated by:        root
Report created on:          Sat Apr  4 17:46:06 2009
Database last updated on:    Never

===============================================================================
Report Summary:
===============================================================================

Host name:                 ubuntu
Host IP address:            127.0.1.1
Host ID:                   None
Policy file used:           /etc/tripwire/tw.pol
Configuration file used:     /etc/tripwire/tw.cfg
Database file used:         /var/lib/tripwire/ubuntu.twd
Command line used:          tripwire --check --quiet --email-report


===============================================================================
Rule Summary:
===============================================================================
```

```
--------------------------------------------------------------------------
  Section: Unix File System
--------------------------------------------------------------------------

  Rule Name                   Severity Level    Added    Removed  Modified
  ---------                   --------------    -----    -------  --------
  Invariant Directories         66              0        0        0
  Tripwire Data Files           100             0        0        0
  Other binaries               66              0        0        0
  Tripwire Binaries             100             0        0        0
  Other libraries              66              0        0        0
* Root file-system executables    100             0        0        1
  System boot changes           100             0        0        0
  Root file-system libraries     100             0        0        0
  (/lib)
  Critical system boot files     100             0        0        0
* Other configuration files      66              1        0        1
  (/etc)
  Boot Scripts                 100             0        0        0
  Security Control              66              0        0        0
  Root config files             100             0        0        0
* Devices & Kernel information    100             212      84       0

Total objects scanned:  19623
Total violations found:  299
```

```
==========================================================================
Object Detail:
==========================================================================

--------------------------------------------------------------------------
  Section: Unix File System
--------------------------------------------------------------------------

--------------------------------------------------------------------------
Rule Name: Root file-system executables (/sbin)
Severity Level: 100
--------------------------------------------------------------------------
  ----------------------------------------
  Modified Objects: 1
  ----------------------------------------

Modified object name:  /sbin

  Property:          Expected                Observed
  -------------       -----------             -----------
* Modify Time         Sat Apr  4 12:53:19 2009    Sat Apr  4 17:37:57 2009
```

24.7.6　查看 Tripwire 数据库内容

```
$ sudo twprint -m d --print-dbfile | less
```

```
Tripwire(R) 2.3.0 Database

Database generated by:       root
Database generated on:       Sat Apr  4 18:10:13 2009
Database last updated on:    Never
```

```
===============================================================================
Database Summary:
===============================================================================

Host name:                 ubuntu
Host IP address:            127.0.1.1
Host ID:                   None
Policy file used:           /etc/tripwire/tw.pol
Configuration file used:     /etc/tripwire/tw.cfg
Database file used:         /var/lib/tripwire/ubuntu.twd
Command line used:          tripwire -m i

===============================================================================
Object Summary:
===============================================================================

-------------------------------------------------------------------------------
# Section: Unix File System
-------------------------------------------------------------------------------

    Mode       UID               Size       Modify Time
    ------     ----------         ---------- ----------
 /
    drwxr-xr-x  root (0)           XXX       XXXXXXXXXXXXXXXXX
 /bin
    drwxr-xr-x  root (0)           4096      Sat Apr  4 12:53:19 2009
 /bin/bash
    -rwxr-xr-x  root (0)           702160    Mon May 12 14:33:24 2008
 /bin/bunzip2
    -rwxr-xr-x  root (0)           26300     Fri Mar 21 06:32:33 2008
 /bin/bzcat
    -rwxr-xr-x  root (0)           26300     Fri Mar 21 06:32:33 2008
 /bin/bzcmp
    lrwxrwxrwx  root (0)           6         Wed Feb 25 22:20:19 2009
```

```
$ sudo twprint -m d --print-dbfile /bin/ls
Object name:  /bin/ls

Property:             Value:
-------------          -----------
Object Type           Regular File
Device Number          2049
Inode Number           32848
Mode                  -rwxr-xr-x
Num Links              1
UID                   root (0)
GID                   root (0)
Size                  92376
Modify Time            Fri Apr  4 02:42:37 2008
Blocks                192
CRC32                 CtpvTt
MD5                   D1iGDyfdJnMREIN3DJRFCZ
```

24.8　被入侵后的系统恢复

24.8.3　找到黑客入侵的方法

1．找出非正常文件

```
$ sudo find / -xdev -ctime -10
```

```
$ sudo find / -name ".. " -type d -print -xdev
$ sudo find / -name ".*" -print -xdev
$ sudo find / -name ".,*" -print -xdev
```

```
$ sudo grep "*:0" /etc/passwd
$ sudo grep "x:0" /etc/passwd
```

```
$ sudo find / -user root -perm -4000 -print
```

4．看看谁在服务器上

```
$ w
 19:16:18 up 16:25,  2 users,  load average: 1.00, 1.00, 1.00
USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
hiweed   tty1     -                02:50   16:19   0.34s  0.29s -bash
hiweed   pts/0    hixp             10:11    0.00s  1.28s  0.38s sshd: hiweed [priv]
$ sudo netstat -nalp |grep ":22 "
(No info could be read for "-p": geteuid()=1000 but you should be root.)
tcp6       0      0 :::22                   :::*                    LISTEN      -
tcp6       0     52 192.168.1.10:22         192.168.1.119:1370      ESTABLISHED -
```

```
$ last -a
hiweed   pts/0        Sat Apr  4 10:11   still logged in   hixp
hiweed   pts/0        Sat Apr  4 02:58 - 10:07  (07:08)    hixp
hiweed   tty1         Sat Apr  4 02:50   still logged in
hiweed   tty1         Sat Apr  4 02:50 - 02:50  (00:00)
reboot   system boot  Sat Apr  4 02:49 - 19:21  (16:32)    2.6.24-23-server
hiweed   tty1         Wed Feb 25 23:04 - down   (00:00)
hiweed   tty1         Wed Feb 25 23:04 - 23:04  (00:00)
reboot   system boot  Wed Feb 25 23:03 - 23:04  (00:00)    2.6.24-23-server

wtmp begins Wed Feb 25 23:03:33 2009
```

```
$ cat /var/log/auth.log | grep Accept
Apr    4  02:58:50  ubuntu  sshd[4356]:  Accepted  password  for  hiweed  from
192.168.1.119 port 3322 ssh2
Apr    4  10:11:38  ubuntu  sshd[31004]:  Accepted  password  for  hiweed  from
192.168.1.119 port 1370 ssh2
```

5．查看当前网络状态

```
$ sudo netstat -nalp | less
Active Internet connections (servers and established)
Proto  Recv-Q  Send-Q  Local  Address              Foreign  Address           State
PID/Program name
tcp       0      0 127.0.0.1:3306          0.0.0.0:*               LISTEN      -
tcp       0      0 0.0.0.0:80              0.0.0.0:*               LISTEN      -
tcp       0      0 0.0.0.0:25              0.0.0.0:*               LISTEN      -
tcp6      0      0 :::22                   :::*                    LISTEN      -
tcp6      0      0 192.168.1.10:22         192.168.1.119:1370      ESTABLISHED -
udp       0      0 0.0.0.0:68              0.0.0.0:*                           -
Active UNIX domain sockets (servers and established)
Proto RefCnt Flags       Type       State         I-Node   PID/Program name    Path
unix  2      [ ]         DGRAM                    5743     -                   @/com/ ubuntu/
upstart
unix  11     [ ]         DGRAM                    10577    -                   /dev/ log
unix  2      [ ACC ]     STREAM     LISTENING     24411    -                   /var/
run/m ysqld/mysqld.sock
```

```
$ sudo netstat -plant | awk '$4 ~ /:80\>/ {print}' | awk '{print $5}' | cut -f1
-d: | sort | uniq -c | sort -n
      1 0.0.0.0
      1 202.160.179.31
      1 208.36.144.9
      1 61.135.190.245
      1 72.30.79.49
      2 124.115.0.111
      2 124.115.0.171
      2 67.195.37.155
      3 124.115.0.109
      3 124.115.0.162
      5 61.135.249.219
     13 59.60.23.147
     20 125.78.103.53
```

```
$ sudo netstat -plant | awk '{print $6}' | sort | uniq -c | sort -n
      1 ESTABLISHED
      1 Foreign
      1 established)
     17 LISTEN
     38 TIME_WAIT
```

```
$ sudo lsof -i -n | less
COMMAND    PID    USER   FD   TYPE   DEVICE SIZE NODE NAME
```

```
proftpd    1942   nobody    1u  IPv4 44593574      TCP *:ftp (LISTEN)
inetd      2215     root    4u  IPv4     4874      TCP *:auth (LISTEN)
sendmail-  2267     root    4u  IPv4 45167849      TCP 127.0.0.1:smtp (LISTEN)
fcserver   2330   nobody    4u  IPv4     5144      TCP *:1935 (LISTEN)
fcadmin    2338     root    1u  IPv4     5148      TCP *:1111 (LISTEN)
java       2366     root   33u  IPv4     5505      TCP 220.50.11.147:51127 (LISTEN)
asterisk   2414     root   14u  IPv4     5437      TCP *:cisco-sccp (LISTEN)
nc         2433     root    3u  IPv4     5352      TCP *:20710 (LISTEN)
mysqld     9504    mysql   13u  IPv4 45256749      TCP *:mysql (LISTEN)
apache2   18375 www-data    4u  IPv4 21204540      TCP *:www (LISTEN)
apache2    18375  www-data    23u   IPv4  45434974         TCP  220.50.11.147:www->
124.115.0.162:32814 (ESTABLISHED)
sshd        19171    hiweed     3u   IPv4  45432810         TCP  220.50.11.147:ssh->
119.165.92.251:3570 (ESTABLISHED)
rsync     26762     root    4u  IPv4 45320044      TCP *:rsync (LISTEN)
named     27742     bind  513u  IPv4 21257436      UDP 220.50.11.147:domain
sshd      32070     root    3u  IPv4 21266250      TCP *:ssh (LISTEN)
```

```
$ sudo lsof -nPi
COMMAND    PID    USER   FD   TYPE   DEVICE SIZE  NODE NAME
proftpd    1942   nobody    1u  IPv4 44593574      TCP *:21 (LISTEN)
inetd      2215     root    4u  IPv4     4874      TCP *:113 (LISTEN)
sendmail-  2267     root    4u  IPv4 45167849      TCP 127.0.0.1:25 (LISTEN)
fcserver   2330   nobody    4u  IPv4     5144      TCP *:1935 (LISTEN)
fcadmin    2338     root    1u  IPv4     5148      TCP *:1111 (LISTEN)
java       2366     root   33u  IPv4     5505      TCP 220.50.11.147:51127 (LISTEN)
asterisk   2414     root   14u  IPv4     5437      TCP *:2000 (LISTEN)
nc         2433     root    3u  IPv4     5352      TCP *:20710 (LISTEN)
mysqld     9504    mysql   13u  IPv4 45256749      TCP *:3306 (LISTEN)
apache2   13769     root    4u  IPv4 21204540      TCP *:80 (LISTEN)
sshd        19171    hiweed     3u   IPv4  45432810         TCP  220.50.11.147:22->
119.165.92. 251:3570 (ESTABLISHED)
apache2   19500 www-data    4u  IPv4 21204540      TCP *:80 (LISTEN)
rsync     26762     root    4u  IPv4 45320044      TCP *:873 (LISTEN)
named     27742     bind   22u  IPv4 21257438      TCP 127.0.0.1:953 (LISTEN)
sshd      32070     root    3u  IPv4 21266250      TCP *:22 (LISTEN)
```

6．查看进程

```
$ ps -elf | less
4 S root      2414     1  0  80   0 -  7586 -      Jan17 ?       03:08:32 /usr/sbin/
as terisk -f
0 S root      2417     1  0  80   0 -   412 -      Jan17 tty2     00:00:00 /sbin/
getty 38400 tty2
0 S root      9465     1  0  80   0 -   619 -      06:29 ?        00:00:00 /bin/sh
/usr/ bin/mysqld_safe
4 S mysql     9504  9465  1  80   0 - 33428 -      06:29 ?        00:06:45 /usr/
sbin/my   sqld   --basedir=/usr   --datadir=/home/mysqldb   --user=mysql   --pid-
file=/var/   run/mysq   ld/mysqld.pid   --skip-external-locking   --port=3306   --
socket=/var/run/ mysqld/mysqld. sock
0 S root      9505  9465  0  80   0 -   408 -      06:29 ?        00:00:00 logger -p
da emon.err -t mysqld_safe -i -t mysqld
5 S snort    13766     1  0  80   0 - 47709 -      06:30 ?        00:06:08 /usr/
sbin/sn   ort   -m   027   -D   -d   -l   /var/log/snort   -u   snort   -g   snort   -c
/etc/snort/snort.conf -S HO ME_NET=[210.51.1.136/32] -i eth0
5 S root     13769     1  0  80   0 - 10162 -      Feb20 ?        00:05:59 /usr/sbin/
ap ache2 -k start
```

```
5 S www-data 16622 13769  1  80   0 - 12283 -      15:49 ?        00:01:27 /usr/
sbin/a pache2 -k start
```

24.8.6 修复问题

```
$ sudo apt-get update && sudo apt-get dist-upgrade
```