Софтуерен Университет

Курс – Линукс системна администрация 2016

Лекция №7

Файлови услуги

- Видове файлови услуги

- Block device vs FileSystem

- Direct Attached Storage (DAS)
  - IDE, SAS(SCSI), SATA

- Storage Area Network (SAN)
  - FiberChannel, iSCSI, FCoE

- Network File Storage (NAS)
  - NFS, CIFS

- Паралеризъм

Agenda

- Компилация – общи концепции

- Компилация от сорс

- Компилация на пакет

- Компилация на Linux kernel

- Често използвани инструменти

- Основи на автоматизацията на процеси в Linux – shell scripts

Компилация общи концепции

- Какво е компилация на софтуер за Linux
- Инструменти – gcc, g++, make, libc, autoconf, ldconfig
- Класически начин за компилация
  - Изтегляне на сорса
  - $./configure
  - $make
  - #make install
  - #make uninstall
  - $make clean

Специфична компилация в Debian

- Предимства на този метод

- Подготовка – devscripts,

- Папката debian

- Стъпки

  - apt-get source the-package

    - apt-get build-dep the-package

    - правим промени по сорса

    - fakeroot debian/rules binary

    - dpkg-buildpackage -us -uc | debuild -us -uc (-b опция)

    - dpkg -i ../the-package-blabla.deb

Компилация на kernel

- Linux Kernel - версии

- Kernel модули

- Vanilla kernel vs Debian kernel

- Vanilla kernel versions

    - Prepatch

    - Mainline

    - Stable

    - Longterm

Какво е initrd

- Initial ramdisk

- Сценарии
  - boot splash screen
  - Network boot
  - Software RAID
  - LVM
  - Криптирани дялове (partitions)

Bootable Linux Image

rootfs

Kernel	Initrd

Boot Loader
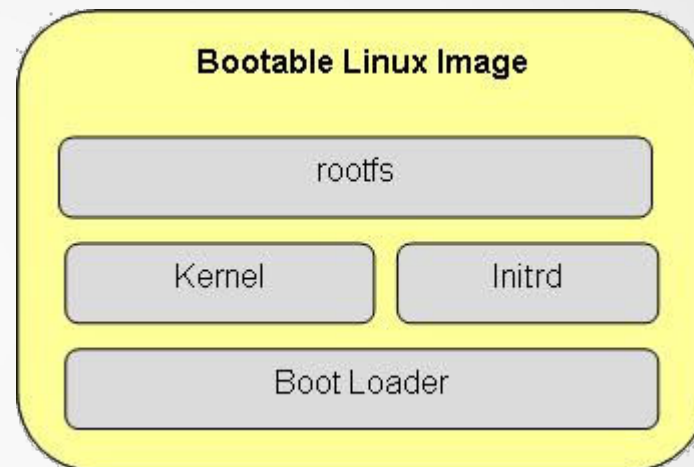
Vanilla Kernel компилация

- Kernel и модул
- Подход №1 – Vanilla Kernel
  - Изтегляне на сорса от http://kernel.org
  - make [config | menuconfig | nconfig | xconfig]
  - make deb-pkg
  - Класически метод (make dep bzImage modules module_install)
    - cp /usr/src/linux/arch/i386/boot/bzImage /boot/vmlinuz.new
    - cp /usr/src/linux/System.map /boot/System.map.new
    - cd /
    - ln -s /boot/vmlinuz.new vmlinuz
    - ln -s /boot/System.map.new System.map
    - grub settings
  - dpkg -i ../linux-image-3.2.19_3.2.19-1_i386.deb
  - reboot

Компилация на Debian kernel package

- Стъпки:

  - # apt-get install build-essential fakeroot libncurses5-dev

  - # apt-get build-dep linux

  - $ apt-get source kernel-package linux

  - $ cd linux-version

  - cp /boot/config-<version> .config

  - $ make [config | menuconfig | nconfig | xconfig]

  - $ make-kpkg --initrd --append-to-version=-mykernel kernel_image kernel_headers

  - # dpkg -i ../linux-<version>-mykernel.deb

Компилация на Астериск – от сорс

- cd /usr/src/
- apt-get install build-essential
- apt-get build-dep asterisk
- wget downloads.asterisk.org/pub/telephony/asterisk/asterisk-14-current.tar.gz
- tar zxvf asterisk-14-current.tar.gz
- cd asterisk<tab>
- ./configure
- make
- make install
- make samples
- make uninstall

Компилация на Asterisk

- Какво е Asterisk – PBX

- PBX – Private Branch Exchange

- Какво е VoIP и как работи Asterisk PBX

- Какво е SIP, RTP
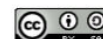
Asterisk конфигурационни файлове

- Конфигурационна директория - /etc/asterisk

- Спиране и пускане

- sip.conf

- extensions.conf

- users.conf

- asterisk.conf

- Астериск конзола

- Примерен сценарии

Други важни осбености на шел

- ~/.bashrc

- Shell aliases

- Стандартен вход

- Стандартен изход

- Стандартна грешка

- Оператори за пренасочване < > >> << |

Често използвани команди

File Commands

ls – directory listing
ls -al – formatted listing with hidden files
cd *dir* - change directory to *dir*
cd – change to home
pwd – show current directory
mkdir *dir* – create a directory *dir*
rm *file* – delete *file*
rm -r *dir* – delete directory *dir*
rm -f *file* – force remove *file*
rm -rf *dir* – force remove directory *dir* *
cp *file1 file2* – copy *file1* to *file2*
cp -r *dir1 dir2* – copy *dir1* to *dir2*; create *dir2* if it doesn't exist
mv *file1 file2* – rename or move *file1* to *file2* if *file2* is an existing directory, moves *file1* into directory *file2*
ln -s *file link* – create symbolic link *link* to *file*
touch *file* – create or update *file*
cat > *file* – places standard input into *file*
more *file* – output the contents of *file*
head *file* – output the first 10 lines of *file*
tail *file* – output the last 10 lines of *file*
tail -f *file* – output the contents of *file* as it grows, starting with the last 10 lines

Process Management

ps – display your currently active processes
top – display all running processes
kill *pid* – kill process id *pid*
killall *proc* – kill all processes named *proc* *
bg – lists stopped or background jobs; resume a stopped job in the background
fg – brings the most recent job to foreground
fg *n* – brings job *n* to the foreground

File Permissions

chmod *octal file* – change the permissions of *file* to *octal*, which can be found separately for user, group, and world by adding:
- 4 – read (r)
- 2 – write (w)
- 1 – execute (x)

Examples:
chmod 777 – read, write, execute for all
chmod 755 – rwx for owner, rx for group and world
For more options, see **man chmod**.

SSH

ssh *user@host* – connect to *host* as *user*
ssh -p *port user@host* – connect to *host* on port *port* as *user*
ssh-copy-id *user@host* – add your key to *host* for *user* to enable a keyed or passwordless login

Searching

grep *pattern files* – search for *pattern* in *files*
grep -r *pattern dir* – search recursively for *pattern* in *dir*
command | grep *pattern* – search for *pattern* in the output of *command*
locate *file* – find all instances of *file*

System Info

date – show the current date and time
cal – show this month's calendar
uptime – show current uptime
w – display who is online
whoami – who you are logged in as
finger *user* – display information about *user*
uname -a – show kernel information
cat /proc/cpuinfo – cpu information
cat /proc/meminfo – memory information
man *command* – show the manual for *command*
df – show disk usage
du – show directory space usage
free – show memory and swap usage
whereis *app* – show possible locations of *app*
which *app* – show which *app* will be run by default

Compression

tar cf *file.tar files* – create a tar named *file.tar* containing *files*
tar xf *file.tar* – extract the files from *file.tar*
tar czf *file.tar.gz files* – create a tar with Gzip compression
tar xzf *file.tar.gz* – extract a tar using Gzip
tar cjf *file.tar.bz2* – create a tar with Bzip2 compression
tar xjf *file.tar.bz2* – extract a tar using Bzip2
gzip *file* – compresses *file* and renames it to *file.gz*
gzip -d *file.gz* – decompresses *file.gz* back to *file*

Network

ping *host* – ping *host* and output results
whois *domain* – get whois information for *domain*
dig *domain* – get DNS information for *domain*
dig -x *host* – reverse lookup *host*
wget *file* – download *file*
wget -c *file* – continue a stopped download

Installation

Install from source:
./configure
make
make install
dpkg -i *pkg.deb* – install a package (Debian)
rpm -Uvh *pkg.rpm* – install a package (RPM)

Shortcuts

Ctrl+C – halts the current command
Ctrl+Z – stops the current command, resume with **fg** in the foreground or **bg** in the background
Ctrl+D – log out of current session, similar to **exit**
Ctrl+W – erases one word in the current line
Ctrl+U – erases the whole line
Ctrl+R – type to bring up a recent command
!! - repeats the last command
exit – log out of current session

* use with extreme caution.

Команда grep

- egrep 'asd' file1
- egrep -R test *
- egrep -n 'asd' file1
- egrep -c 'asd' file1
- egrep '^#' *

Командата find

- Допълнителни команди: sed, find, cut, tr, awk

- Командата find – търси файлови обекти по определени критерии

-
```
# find . -name tecmint.txt
./tecmint.txt
```

```
# find /home -iname tecmint.txt
./tecmint.txt
./Tecmint.txt
```

```
# find / -type d -name Tecmint
/Tecmint
```

```
# find . -type f -name "*.php"
./tecmint.php
./login.php
./index.php
```

```
# find / -perm 2644
```

```
# find / -perm /u=r
```

```
# find / -type f -perm 0777 -print -exec chmod 644 {} \;
```

Командата find продължение

```
# find . -type f -name "*.txt" -exec rm -f {} \;
OR
# find . -type f -name "*.mp3" -exec rm -f {} \;
```

```
# find /tmp -type d -empty
```

```
# find /tmp -type f -name ".*"
```

```
# find / -user root -name tecmint.txt
```

```
# find / -size +100M -exec rm -rf {} \;
```

```
# find / -mtime 50
```

```
# find / -atime 50
```

```
# find / -cmin -60
```

Команда sed

- sed (stream editor) - Търсене и заместване

Sed Commands		
: label	**# comment**	**{....} Block**
= - print line number	**a ** - Append	**b label** - Branch
c \ - change	**d** and **D** - Delete	**g** and **G** - Get
h and **H** - Hold	**i ** - Insert	**l** - Look
n and **N** - Next	**p** and **P** - Print	**q** - Quit
r filename - Read File	**s/..../..../** - Substitute	**t label** - Test
w filename - Write Filename	**x** - eXchange	**y/..../..../** - Transform

Sed Pattern Flags
/g - Global
/I - Ignore Case
/p - Print
/w filename - Write Filename

- Примери
  - sed s/day/night/ <old >new
  - echo day | sed s/day/night/

Команда sed - продължение

- Делимитери

    - sed 's/\/usr\/local\/bin/\/common\/bin/' <old >new

    - sed 's_/usr/local/bin_/common/bin_' <old >new

    - sed 's:/usr/local/bin:/common/bin:' <old >new

    - sed 's|/usr/local/bin|/common/bin|' <old >new

sed - продължение

- & - заменя намерения стринг
  - echo asd | sed 's/[a-z]*/(&)/'
  - echo "123 abc" | sed 's/[0-9]*/& &/'
- Разширени regular expressions
  - echo "123 abc" | sed 's/[0-9][0-9]*/& &/'

    аналогично на
  - echo "123 abc" | sed -r 's/[0-9]+/& &/'
- Пореден номер на на срещане
  - echo \#asd | sed 's/^#\(.*\)/\1/'
  - echo one two | sed -r 's/([a-z]+) ([a-z]+)/\2 \1/'

sed - продължение

- Inplace редакция за файлове

  - find . -perm /o+t -type f -exec sed -i 's/^#\(.*\)/\1/' {} \;

- Търсене в цялата дължина на стринга

  - find . -perm /o+t -type f -exec sed -i 's/^#\(.*\)/\1/' {} \;

  - find . -perm /o+t -type f -exec sed -i '/^$/ d' {} \;

- Премахване на всички празни редове и коментари

  - find . -perm /o+t -type f -exec sed -i -e '/^$/ d' -e 's/^#\(.*\)/\1/' {} \;

cut, tr, awk, rev, sort, uniq

- ps ax | cut -d ' ' -f 1
- ps ax | awk '{print $1}'
- cat /etc/passwd | rev | cut -d ":" -f1 | rev
- cat /etc/passwd | awk -F ":" '{print $1}'
- cat /etc/passwd | awk -F ":" '{print $3, "\t", $1}'
- egrep -n '^asd' * | cut -d ":" -f 1 | sort -u

Въпроси