Linux Operations

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# Tasks

## Build a virtual machine

* 1. Images are at <http://cdimage.ubuntu.com/>
  2. Daily Ubuntu server images are at <http://cdimage.ubuntu.com/ubuntu-server/daily/current/>  
     Download link: <http://cdimage.ubuntu.com/ubuntu-server/daily/current/zesty-server-amd64.iso>
  3. See My Virtual Machines.docx for how to create a virtual machine

## Build Package from Source

* + Get package tools  
    apt-get install build-essential checkinstall devscripts debian-keyring
  + Create a build folder  
    mkdir /opt/build-foxyboy/161217-mutter  
    cd /opt/build-foxyboy/161217-mutter
  + Find what package to check out
    - apt-cache showsrc --only-source mutter | egrep "^(Ve|Package:)"  
      Package: mutter  
      Version: 3.20.3-2
    - Debian source packages:  
      has name: mutter\_3.20.3\*.debian.tar.xz
    - Debian binary packages  
      has name:  
      has home page: <https://packages.debian.org/sid/mutter>
    - Ubuntu binary packages:  
      has name: mutter\_3.22.2-1ubuntu1~ubuntu16.10.1\_amd64.deb
    - Ubuntu source packages:  
      installs archives like: mutter\_3.20.3-2.debian.tar.xz mutter\_3.20.3.orig.tar.xz  
      has home page: <https://launchpad.net/ubuntu/+source/mutter>
  + Fetch source package
    - apt-get source mutter  
      fetches:  
      drwxr-xr-x 10 foxyboy foxyboy 4096 Dec 17 08:57 mutter-3.20.3  
      -rw-r--r-- 1 foxyboy foxyboy 20008 Aug 1 08:59 mutter\_3.20.3-2.debian.tar.xz  
      -rw-r--r-- 1 foxyboy foxyboy 3234 Aug 1 08:59 mutter\_3.20.3-2.dsc  
      -rw-r--r-- 1 foxyboy foxyboy 1488396 Aug 1 08:59 mutter\_3.20.3.orig.tar.xz
  1. <https://bugs.launchpad.net/ubuntu/+source/dnsmasq/+bug/1639776/comments/6>
  2. mkdir redshift-patch

cd redshift-patch

sudo nano /etc/apt/sources.list

- uncomment all deb-src

sudo apt-get update

apt-get source gnome-settings-daemon

sudo apt-get build-dep gnome-settings-daemon

- package build dependencies

sudo apt-get install build-essential checkinstall devscripts

- patch

wget https://bug742149.bugzilla-attachments.gnome.org/attachment.cgi?id=293518

cd gnome-settings-daemon-3.22.1

patch --strip=1 <../attachment.cgi\?id\=293518

- fix problem with plugins/color/gsd-color-state.c

- build package:

dch --increment # add changelog comment

debuild -us -uc --build=binary # --unsigned-source --unsigned-changes won’t work

sha256sum ../gnome-settings-daemon\_3.22.1-0ubuntu1\_amd64.deb

aee0bbb71b17b355682ecf84fea7ea5d94fcb818368da91df8186d1482e70ca1 ../gnome-settings-daemon\_3.22.1-0ubuntu1\_amd64.deb

- the comment that has the patch  
[https://bugzilla.gnome.org/show\_bug.cgi?id=741224#c29](https://bugzilla.gnome.org/show_bug.cgi?id=741224" \l "c29)

- the patch file:  
<https://bug742149.bugzilla-attachments.gnome.org/attachment.cgi?id=293518>

## Examine Boot

1. grep "rsyslogd:" /var/log/syslog | grep start  
   Sep 22 00:24:57 xpc21 rsyslogd: [origin software="rsyslogd" swVersion="7.4.4" x-pid="13843" x-info="http://www.rsyslog.com"] start
2. First syslog message:  
   Nov 9 09:45:00 xpc21 rsyslogd: [origin software="rsyslogd" swVersion="7.4.4" x-pid="1004" x-info="http://www.rsyslog.com"] start

## Examine Shutdown

1. grep "rsyslogd:" /var/log/syslog | grep 15.  
   Sep 22 18:57:26 xpc21 rsyslogd: [origin software="rsyslogd" swVersion="7.4.4" x-pid="13843" x-info="http://www.rsyslog.com"] exiting on signal 15.
2. Last syslog message:  
   Nov 9 09:42:21 xpc21 rsyslogd: [origin software="rsyslogd" swVersion="7.4.4" x-pid="1438" x-info="http://www.rsyslog.com"] exiting on signal 15.

## Finding Plymouth Messages

1. Some startup messages only go to /var/log/boot.log  
   more if the kernel parameter quiet is not used.
2. foxyboy@xpc21:~$ sudo grep -rHn "OpenSSH server" /var/log/\* | grep "[ OK ]"  
   /var/log/boot.log:135: \* Starting OpenSSH server [ OK ]
3. Shutdown Plymouth is not available anywhere  
   foxyboy@xpc21:~$ sudo grep -rHn "Stopping Postfix" /var/log/\* | grep "[ OK ]"

## Output Text to Log

* 1. Logger
  2. default: --priority is user.notice, ends up in /var/log/user.log only  
     use local3.info
  3. logger abc  
     Oct 19 19:03:42 c505 foxyboy: abc
  4. logger --id abc  
     Oct 19 19:05:05 c505 foxyboy[6139]: abc  
     - logs the logger process id, not the executing process id.
  5. logger --id --tag ABC abc  
     Oct 19 19:06:11 c505 ABC[6260]: abc  
     - if tag is not provided the user id is used.

# Reference

## .bashrc Prompt

* 1. Must support  
     xterm: terminal window from within a window manager  
     linux: terminal from console login  
     dumb: terminal without control sequences
  2. - prompt has time  
     - non-zero status code is displayed and in red  
     - no user name  
     - red color reset on status code 0

## TERM

* 1. In Window Manager terminal window
  2. TERM=xterm
  3. In console login
  4. TERM=linux

the color prompt is dirtracting: hostname and folder are in green and blue.

The default PS1 is:  
PS1='${debian\_chroot:+($debian\_chroot)}\u@\h:\w\$ '

${debian\_chroot:+($debian\_chroot)}:

if debian\_chroot mpt defined (almost always the case): empty string  
otherwise the value within parenthesis.

my PS1 was:

xterm lists with colors

anything but dump should have colors

## Rotate

unclear. AT list 23 MiB size, 43 days

## Timestamps

Dates are given as 3-letter month and space-padded date  
Times are local (-07)

# Installation and Configuration

## Logger

Package: bsdutils

## Logging: rsyslogd

### Modify 50-default.conf

* 1. Sudo nano /etc/rsyslog.d/50-default.conf
  2. Add ,mail,user  
     \*.\*;auth,authpriv,mail,user.none -/var/log/syslog
  3. uncomment user  
     #user.\* -/var/log/user.log

### Configuration

* 1. Dash in front of filename: no syncing after each write
  2. Selector  
     facility.priority, case matters  
     \* all facilities or priorities  
     ; using multiple selectors  
     , using multiple facilities for a single priority  
     none: no priority
  3. /etc/rsyslog.d/50-default.conf
  4. /etc/rsyslog.d  
     /etc/rsyslog.conf  
     /etc/default/rsyslog  
     nothing
  5. man rsyslog.conf
  6. man rsyslogd  
     default configuration file: /etc/rsyslog.conf
  7. Syslog Function
  8. Linux syslog is standardized computer message logging featuring rotating and storage.
  9. The reason to use syslog is its rotate feature and its offer of standardized eternal storage.
  10. Linux log output is routed by facility name and categorized in levels.
  11. Facilities: auth, authpriv, cron, daemon, ftp, kern, lpr, mail, news, security, syslog, user, uucp, and local0 to local7.
  12. Levels: alert, crit, debug, emerg, err, error, info, notice, panic, warning, warn.
  13. Syslog is implemented by the rsyslog package.
  14. Log Files
  15. Routing of facility.level to specific log files is configured in /etc/rsyslog.d/50-default.conf.
  16. By default, all logging except auth goes to syslog.
  17. Log Rotate
  18. By default, /etc/logrotate.d/rsyslog rotates files syslog mail daemon kern auth user lpr cron debug messages
  19. Dedicated use: syslog mail kern auth lpr cron
  20. Candidates: daemon user debug messages
  21. daemon: System daemon catch-all
  22. user: regular user messages
  23. debug: for debug level logging
  24. messages: info level logging
  25. Use /var/log/user.log, ie. use the user facility
  26. bash syslog interface
  27. Output by bash to rotated log files is provided by logger command from bsdutils package
  28. default --priority is user.notice

The most convenient way to log would be a unix socket

The syslog system calls are inconvenient from Node.js

### Installation

* 1. /usr/sbin/rsyslogd
  2. $ dpkg -l rsyslog  
     ii rsyslog 5.8.11-2ubuntu amd64 reliable system and kernel logging daemon

## Logrotate

### Operation

* 1. Testrun  
     sudo logrotate -v /etc/logrotate.conf 2>&1 | less  
     - prints to stderr  
     - if no configuration file is provided, logrotate does nothing  
     .conf can not have g+w, owner must be root  
     -d debug: dry run, adds -v  
     -v verbose
  2. /var/lib/logrotate/status

1. Started by /etc/cron.daily/logrotate
2. foxyboy@xpc21:/etc$ sudo grep -r logrotate cron\*
3. [sudo] password for foxyboy:
4. cron.daily/logrotate:cd /var/lib/logrotate
5. cron.daily/logrotate:test -x /usr/sbin/logrotate || exit 0
6. cron.daily/logrotate:/usr/sbin/logrotate /etc/logrotate.conf
7. crontabs/foxyboy:# 1 before the hour to not collide with logrotate
8. crontabs/root:# run meticulous 2 minutes after midnight so that it does not collide with logrotate
9. /etc/logrotate.conf  
   /etc/logrotate.d:  
   apport apt aptitude dpkg ppp rsyslog ufw unattended-upgrades upstart
10. will be run by root cron: whoami:root, pwd:/root, PATH:/usr/bin:/bin, SHELL:/bin/sh, ~:/root  
    sudo /bin/sh -c "cd /root; PATH=/usr/bin:/bin; /home/foxyboy/bin/copylog"

### /etc/logrotate.d/00-varoldlogs

* + - Because filename starts with 0, this script will be run first in the folder
    - Because all logs should be captured, we use lastaction/endscript
    - Best compression: use xz
    - Maintain change date
    - Copy to a folder and adjust to be owned by a normal user in the /home tree
    - Rotate needs to be something greater than 0

# raspberrypi:/etc/logrotate.d/0-logrotate-raspberrypi

# chown root.root /etc/logrotate.d/0-logrotate-raspberrypi

# chmod 644 /etc/logrotate.d/0-logrotate-raspberrypi

# sudo logrotate -v /etc/logrotate.conf 2>&1 | less

rotate 2

compress

compresscmd /usr/bin/xz

compressext .xz

uncompresscmd /usr/bin/unxz

notifempty

missingok

lastaction

for FILES in "\*.gz" "\*.bz2" "\*.xz"; do

find /var/log -name "$FILES" -exec /usr/local/bin/copylog {} /home/pi/varlog pi pi \;

done

endscript

for FILES in "\*.gz" "\*.bz2" "\*.xz"; do find /var/log -name "$FILES" -exec /usr/local/bin/copylog {} /home/foxyboy/varlog foxyboy foxyboy \; ; done

# log that forces rotate

# sudo nano /var/log/fake

# enter at least one character

#/var/log/fake {

# missingok

# size 1

# rotate 5

#}

### Configuration

default config file:  
/etc/logrotate.conf  
- includes:  
/etc/logrotate.d/  
- owner must be root  
- group can be anything  
- can not have file mode g+w,o+w  
- typical mode is 644 o=rw,g=r,o=r

Comment out in /etc/logrotate.conf  
##rotate 4

wtmp:  
##rotate 1

btmp:  
## rotate 1

add /etc/logrotate.d/00-varoldlogs

comment out all rotate  
grep -r rotate /etc/logrotate.d | grep -v '#'

man logrotate  
rotate delete files after certain rotation. We want to keep them forever.

sudo /usr/sbin/logrotate -d /etc/logrotate.conf

Ignoring 00-varoldlogs because the file owner is wrong (should be root).

Ignoring apache2 because of bad file mode.

Man logrotate

### Installation

$ file $(which logrotate)  
/usr/sbin/logrotate: ELF 64-bit LSB executable

$ dpkg -l logrotate  
ii logrotate 3.8.3-3ubuntu2 amd64 Log rotation utility