Read-only Raspberry PI with Jessie

From : http://petr.io/2015/11/09/read-only-raspberry-pi-with-jessie/

1. Get Jessie and copy it it to your SD card
see SD_prepare.pdf

2. Boot up, find out IP address from your router and SSH in, then run:

sudo su
apt-get update
apt-get upgrade
reboot

add a folder in / called /data
mkdir /data
chmod 777 /data

run raspi-config to make sure the root partition fills the whole SD card
sudo raspi-config
reboot

clean up unwanted packages
sudo su
apt-get remove --purge wolfram-engine triggerhappy cron logrotate dphys-swapfile xserver-common lightdm fake-hwclock
apt-get autoremove --purge

replace log management with busybox, you can read the logs with logread
apt-get install busybox-syslogd; dpkg --purge rsyslog

just for convenience
apt-get install vim

3. Disable swap and start read-only FS

$ *vim /boot/cmdline.txt*
dwc_otg.lpm_enable=0 console=ttyAMA0,115200 console=tty1 root=/dev/mmcblk0p2 rootfstype=ext4 elevator=deadline fsck.repair=yes rootwait **fastboot noswap ro**

move spool
rm -rf /var/spool
ln -s /tmp /var/spool

move log for apache2
ln -s /tmp /var/log/apache2

move webapp point
rm /var/www/html
ln -s /data/webapp/ /var/www/html

and put all webapp files in /data/webapp

if need, enable apache2 service
 # systemctl enable apache2.service

and to start it:
 # isystemctl start apache2.service

4. Make sure SSH works – I had to disable UsePrivilegeSeparation, for me it says:

 # vim /etc/ssh/sshd_config
...
UsePrivilegeSeparation no
...

5. Make edits to the fstab

 # vim /etc/fstab

```
proc            /proc           proc    defaults                        0       0
/dev/mmcblk0p1  /boot           vfat    defaults,ro                     0       2
/dev/mmcblk0p2  /               ext4    defaults,noatime,ro     0       1
# a swapfile is not a swap partition, no line here
#   use  dphys-swapfile swap[on|off]  for that
tmpfs   /var/log        tmpfs   nodev,nosuid            0       0
tmpfs   /var/tmp        tmpfs   nodev,nosuid            0       0
tmpfs   /tmp            tmpfs   nodev,nosuid            0       0
```

Last 3 lines and RO flag for /dev/mmcblk0p* are new additions

6. Optional step – enable easy way to switch back and forth:

Place the below at the end of your /etc/bash.bashrc

 # vim /etc/bash.bashrc

```
# set variable identifying the filesystem you work in (used in the prompt below)
fs_mode=$(mount | sed -n -e "s/^\/dev\/root on \/ .*(\(r[w|o]\).*/\1/p")

alias ro='mount -o remount,ro / ; fs_mode=$(mount | sed -n -e "s/^\/dev\/root on \/ .*(\(r[w|
o]\).*/\1/p")'
alias rw='mount -o remount,rw / ; fs_mode=$(mount | sed -n -e "s/^\/dev\/root on \/ .*(\(r[w|
o]\).*/\1/p")'

# setup fancy prompt
export PS1='\[\033[01;32m\]\u@\h${fs_mode:+($fs_mode)}\[\033[00m\]:\[\033[01;34m\]\w\
[\033[00m\]\$ '
```

7. Optional step – enable watchdog

```
# enter RW mode
```

rw

enable watchdog
modprobe bcm2708_wdog; apt-get install watchdog

# add bcm2708_wdog in to /etc/modules to load it at boot time
$ cat /etc/modules
# /etc/modules: kernel modules to load at boot time.
#
This file contains the names of kernel modules that should be loaded
at boot time, one per line. Lines beginning with "#" are ignored.
bcm2708_wdog

edit watchdog config /etc/watchdog.conf and enable (uncomment) following lines:

watchdog-device = /dev/watchdog
max-load-1

start watchdog at system start and start right away
insserv watchdog; /etc/init.d/watchdog start

http://raspberrypi.stackexchange.com/questions/33850/pi-b-raspbian-jessie-watchdog-doesnt-start-at-boot
additional settings needed on Jessie, edit /lib/systemd/system/watchdog.service and add:
[Install]
WantedBy=multi-user.target

now it should be enabled properly
systemctl enable watchdog

# setup automatic reboot after kernel panic in /etc/sysctl.conf (add to the end)
kernel.panic = 10

finish and reboot
ro
reboot

Known issues:

- The “setup fancy prompt” step from the bash.bashrc does not seem to work