

How to Setup Raspberry Pi 3 for 2STON Camera Client

Author: 2STON Core Team

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A. RPi3 Basic Settings and Software Upgrade

1. Setup Network

→ It's easy if you know that of Ubuntu.

2. Menu Preferences → Raspberry Pi Configuration

→ System

→ To CLI selection for more good performance

→ Change Hostname(ex: sun) if you want to change

→ Interfaces

→ Camera Enabled

→ SSH Enabled

3. package upgrade

\$ **sudo apt-get update**

\$ **sudo apt-get upgrade**

→ It takes long time(more than about 10 minutes)

→ Let's reboot after upgrade

4. motion package installation

\$ **sudo apt-get install motion**

→ install motion package

```
pi@sunpi:~ $ sudo apt-get install motion
```

```
Reading package lists... Done
```

```
Building dependency tree
```

```
Reading state information... Done
```

```
The following additional packages will be installed:
```

```
ffmpeg libavdevice57 libmariadbclient18 libpq5 libsdl2-2.0-0 libwayland-cursor0 mysql-common
```

```
Suggested packages:
```

```
ffmpeg-doc default-mysql-client postgresql-client
```

```
The following NEW packages will be installed:
```

```
ffmpeg libavdevice57 libmariadbclient18 libpq5 libsdl2-2.0-0 libwayland-cursor0 motion mysql-common
```

```
0 upgraded, 8 newly installed, 0 to remove and 2 not upgraded.
```

```
Need to get 3,048 kB of archives.
```

```
After this operation, 8,806 kB of additional disk space will be used.
```

Do you want to continue? [Y/n] y
Get:1 http://ftp.kaist.ac.kr/raspbian/raspbian stretch/main armhf libwayland-cursor0 armhf 1.12.0-1 [12.1 kB]
Get:2 http://ftp.kaist.ac.kr/raspbian/raspbian stretch/main armhf libsdl2-2.0-0 armhf 2.0.5+dfsg1-2 [314 kB]
Get:3 http://ftp.kaist.ac.kr/raspbian/raspbian stretch/main armhf libavdevice57 armhf 7:3.2.9-1~deb9u1 [107 kB]
Get:4 http://ftp.kaist.ac.kr/raspbian/raspbian stretch/main armhf ffmpeg armhf 7:3.2.9-1~deb9u1 [1,513 kB]
Get:5 http://ftp.kaist.ac.kr/raspbian/raspbian stretch/main armhf mysql-common all 5.8+1.0.2 [5,608 B]
Get:6 http://ftp.kaist.ac.kr/raspbian/raspbian stretch/main armhf libmariadbclient18 armhf 10.1.23-9+deb9u1 [710 kB]
Get:7 http://ftp.kaist.ac.kr/raspbian/raspbian stretch/main armhf libpq5 armhf 9.6.6-0+deb9u1 [117 kB]
Get:8 http://ftp.kaist.ac.kr/raspbian/raspbian stretch/main armhf motion armhf 4.0-1 [269 kB]
Fetched 3,048 kB in 5s (523 kB/s)
Preconfiguring packages ...
Selecting previously unselected package libwayland-cursor0:armhf.
(Reading database ... 122957 files and directories currently installed.)
Preparing to unpack .../0-libwayland-cursor0_1.12.0-1_armhf.deb ...
Unpacking libwayland-cursor0:armhf (1.12.0-1) ...
Selecting previously unselected package libsdl2-2.0-0:armhf.
Preparing to unpack .../1-libsdl2-2.0-0_2.0.5+dfsg1-2_armhf.deb ...
Unpacking libsdl2-2.0-0:armhf (2.0.5+dfsg1-2) ...
Selecting previously unselected package libavdevice57:armhf.
Preparing to unpack .../2-libavdevice57_7%3a3.2.9-1~deb9u1_armhf.deb ...
Unpacking libavdevice57:armhf (7:3.2.9-1~deb9u1) ...
Selecting previously unselected package ffmpeg.
Preparing to unpack .../3-ffmpeg_7%3a3.2.9-1~deb9u1_armhf.deb ...
Unpacking ffmpeg (7:3.2.9-1~deb9u1) ...
Selecting previously unselected package mysql-common.
Preparing to unpack .../4-mysql-common_5.8+1.0.2_all.deb ...
Unpacking mysql-common (5.8+1.0.2) ...
Selecting previously unselected package libmariadbclient18:armhf.
Preparing to unpack .../5-libmariadbclient18_10.1.23-9+deb9u1_armhf.deb ...
Unpacking libmariadbclient18:armhf (10.1.23-9+deb9u1) ...
Selecting previously unselected package libpq5:armhf.
Preparing to unpack .../6-libpq5_9.6.6-0+deb9u1_armhf.deb ...
Unpacking libpq5:armhf (9.6.6-0+deb9u1) ...
Selecting previously unselected package motion.
Preparing to unpack .../7-motion_4.0-1_armhf.deb ...
Unpacking motion (4.0-1) ...
Setting up mysql-common (5.8+1.0.2) ...
update-alternatives: using /etc/mysql/my.cnf.fallback to provide /etc/mysql/my.cnf (my.cnf) in auto mode
Setting up libmariadbclient18:armhf (10.1.23-9+deb9u1) ...
Setting up libpq5:armhf (9.6.6-0+deb9u1) ...
Processing triggers for libc-bin (2.24-11+deb9u1) ...
Processing triggers for systemd (232-25+deb9u1) ...
Processing triggers for man-db (2.7.6.1-2) ...
Setting up libwayland-cursor0:armhf (1.12.0-1) ...
Setting up motion (4.0-1) ...
Adding group `motion' (GID 116) ...

Done.
Warning: The home dir /var/lib/motion you specified already exists.
Adding system user `motion' (UID 111) ...
Adding new user `motion' (UID 111) with group `motion' ...
The home directory `/var/lib/motion' already exists. Not copying from `/etc/skel'.
adduser: Warning: The home directory `/var/lib/motion' does not belong to the user you are currently creating.
Adding user `motion' to group `video' ...
Adding user motion to group video
Done.
Setting up libstdc++2.0-0:armhf (2.0.5+dfsg1-2) ...
Setting up libavdevice57:armhf (7:3.2.9-1~deb9u1) ...
Setting up ffmpeg (7:3.2.9-1~deb9u1) ...
Processing triggers for libc-bin (2.24-11+deb9u1) ...
Processing triggers for systemd (232-25+deb9u1) ...
pi@michaelpi:~ \$

\$ sudo vi /etc/motion/motion.conf

→ You can edit this file

\$ sudo vi /etc/default/motion

→ You can edit this file

→ start_motion_daemon=yes

\$ sudo service motion start

(*) Actually detailed settings for motion as above is not needed because 2ston_cam rpi3 package(See Section B) will setup it automatically at installation time.

5. Edit /etc/rc.local

\$ sudo vi /etc/rc.local

← load bcm2835-v4l2.ko while booting

...

modprobe bcm2835-v4l2

exit 0

\$ sudo reboot

\$ lsmod

← Let's check bcm2835-v4l2 module

Module	Size	Used by
fuse	99603	3
rfcomm	37723	6
cmac	3239	1
bnep	12051	2

```

hci_uart                20020  1
btbcm                   7916   1 hci_uart
bluetooth               365780 29 hci_uart,bnep,btbcm,rftcomm
bcm2835_v4l2            44695  1
videobuf2_vmalloc       5920   1 bcm2835_v4l2
videobuf2_memops        2009   1 videobuf2_vmalloc
videobuf2_v4l2          17077  1 bcm2835_v4l2
videobuf2_core          34083  2 bcm2835_v4l2,videobuf2_v4l2
v4l2_common             6284   1 bcm2835_v4l2
videodev                184712  5
v4l2_common,videobuf2_core,bcm2835_v4l2,videobuf2_v4l2
media                   28362  1 videodev
joydev                  9988   0
brcmfmac                292632  0
brcmutil                9863   1 brcmfmac
cfg80211                544545  1 brcmfmac
rfkill                  20851  6 bluetooth,cfg80211
snd_bcm2835             24427  1
snd_pcm                 98501  1 snd_bcm2835
snd_timer               23968  1 snd_pcm
snd                     70032  5 snd_timer,snd_bcm2835,snd_pcm
bcm2835_gpiomem         3940   0
evdev                   12423  6
fixed                   3285   0
uio_pdrv_genirq         3923   0
uio                     10204  1 uio_pdrv_genirq
i2c_dev                 6913   0
ip_tables               13161  0
x_tables                20578  1 ip_tables
ipv6                    408900 26

```

(*) Actually detailed settings(/etc/rc.local) as above is not needed because 2ston_cam rpi3 package(See Section B) will setup it automatically at installation time.

6. How to check motion & camera's status

```

pi@michaelpi:~ $ ps aux | grep motion
motion    544 10.1  2.2 119876 20188 ?        Sl   01:38   0:21 /usr/bin/motion
pi         1556  0.0  0.0  4372   572 pts/0    S+   01:41   0:00 grep --
color=auto motion

```

<web browser>

http://YOUR_RPI3_IP_ADDRESS:8081/

B. How to install 2ston cam package

1. Install and uninstall 2ston cam package file to RPi3 board

<Copy Step>

```
$ scp ./2ston_cam_rpipkg_20180131_130210.tar.gz  
pi@YOUR_PI_ADDRESS:~/workspace
```

<Installation Step>

```
$ tar xvzf ./2ston_cam_rpipkg_20180131_130210.tar.gz  
$ cd rpi/2ston_cam_pkg  
$ sudo ./Install.sh
```

=> You should run this script with root permission.

```
$ sudo reboot
```

=> After rebooting the RPi3, 2ston_cam daemon will be loaded.

<Uninstallation Step>

```
$ sudo ./Uninstall.sh
```

=> You should run this script with root permission.

2. Let's check the running 2ston_cam daemon

```
root      505 25.1  2.2 119268 20004 ?        Ssl  04:39   5:43 motion  
root      516  0.0  0.1  1812   1100 ?        S    04:39   0:00 watch  
root      523  0.0  0.1  4196   1396 tty1    Ss+  04:39   0:00 /sbin/agetty --noclear tty1 lin  
root      527  0.0  0.0      0      0 ?        S<   04:39   0:00 [kworker/3:1H]  
root      528  0.0  0.0      0      0 ?        S<   04:39   0:00 [kworker/0:1H]  
root      539  0.0  0.8  31908  7420 ?        Sl   04:39   0:00 lightdm --session-child 18 21  
lightdm   543  0.0  0.6   9660  5800 ?        Ss   04:39   0:00 /lib/systemd/systemd --user  
lightdm   546  0.0  0.1  11324  1376 ?        S    04:39   0:00 (sd-pam)  
lightdm   551  0.5  4.6 113740 41352 ?        Ssl  04:39   0:06 /usr/sbin/pi-greeter  
root      558  0.0  0.0      0      0 ?        S<   04:39   0:00 [kworker/u9:0]  
root      560  0.0  0.0      0      0 ?        S<   04:39   0:00 [hci0]  
root      561  0.0  0.0      0      0 ?        S<   04:39   0:00 [hci0]  
root      562  0.0  0.0   2096   136 ?        S    04:39   0:00 /usr/bin/hciattach /dev/serial1  
root      566  0.0  0.4   7268  3704 ?        Ss   04:39   0:00 /usr/lib/bluetooth/bluetoothd  
root      567  0.0  0.0      0      0 ?        S<   04:39   0:00 [kworker/u9:2]  
root      568  0.0  0.3  35036  3544 ?        Ssl  04:39   0:00 /usr/bin/bluealsa  
root      584  0.0  0.0      0      0 ?        S<   04:39   0:00 [krfcommd]  
lightdm   588  0.0  0.3   6380  3076 ?        Ss   04:39   0:00 /usr/bin/dbus-daemon --session  
lightdm   589  0.0  0.6  39648  5828 ?        Ssl  04:39   0:00 /usr/lib/gvfs/gvfsd  
lightdm   594  0.0  0.7  55460  6700 ?        Sl   04:39   0:00 /usr/lib/gvfs/gvfsd-fuse /run/uf  
root      609  0.0  0.5  10940  4540 ?        S    04:39   0:00 lightdm --session-child 14 21  
root      663  0.0  0.2  44960  1884 ?        Sl   04:39   0:00 ./2ston_cam -c  
root      674  0.0  0.6  11520  5676 ?        Ss   04:40   0:00 sshd: pi [priv]  
pi        680  0.0  0.6   9660  5764 ?        Ss   04:40   0:00 /lib/systemd/systemd --user  
pi        683  0.0  0.1  11324  1376 ?        S    04:40   0:00 (sd-pam)  
pi        692  0.0  0.3  11520  3404 ?        Ss   04:40   0:00 sshd: pi@pts/0  
pi        695  0.0  0.4   6072  4104 pts/0    Ss   04:40   0:00 -bash  
root      717  0.0  0.0      0      0 ?        S<   04:40   0:00 [kworker/2:1H]  
root      830  0.0  0.0      0      0 ?        S    04:44   0:00 [kworker/3:1]  
root      912  0.0  0.0      0      0 ?        S    04:48   0:00 [kworker/u8:0]  
root     1073  0.0  0.0      0      0 ?        S    04:54   0:00 [kworker/0:1]  
root     1090  0.0  0.0      0      0 ?        S    04:55   0:00 [kworker/2:0]  
root     1111  0.0  0.0      0      0 ?        S    04:56   0:00 [kworker/3:0]  
root     1212  0.0  0.0      0      0 ?        S    05:00   0:00 [kworker/2:2]  
root     1261  1.0  0.0      0      0 ?        S    05:02   0:00 [kworker/u8:1]  
pi       1263  0.0  0.3   7736  2872 pts/0    R+   05:02   0:00 ps aux  
pi@michaelpi:~ $
```