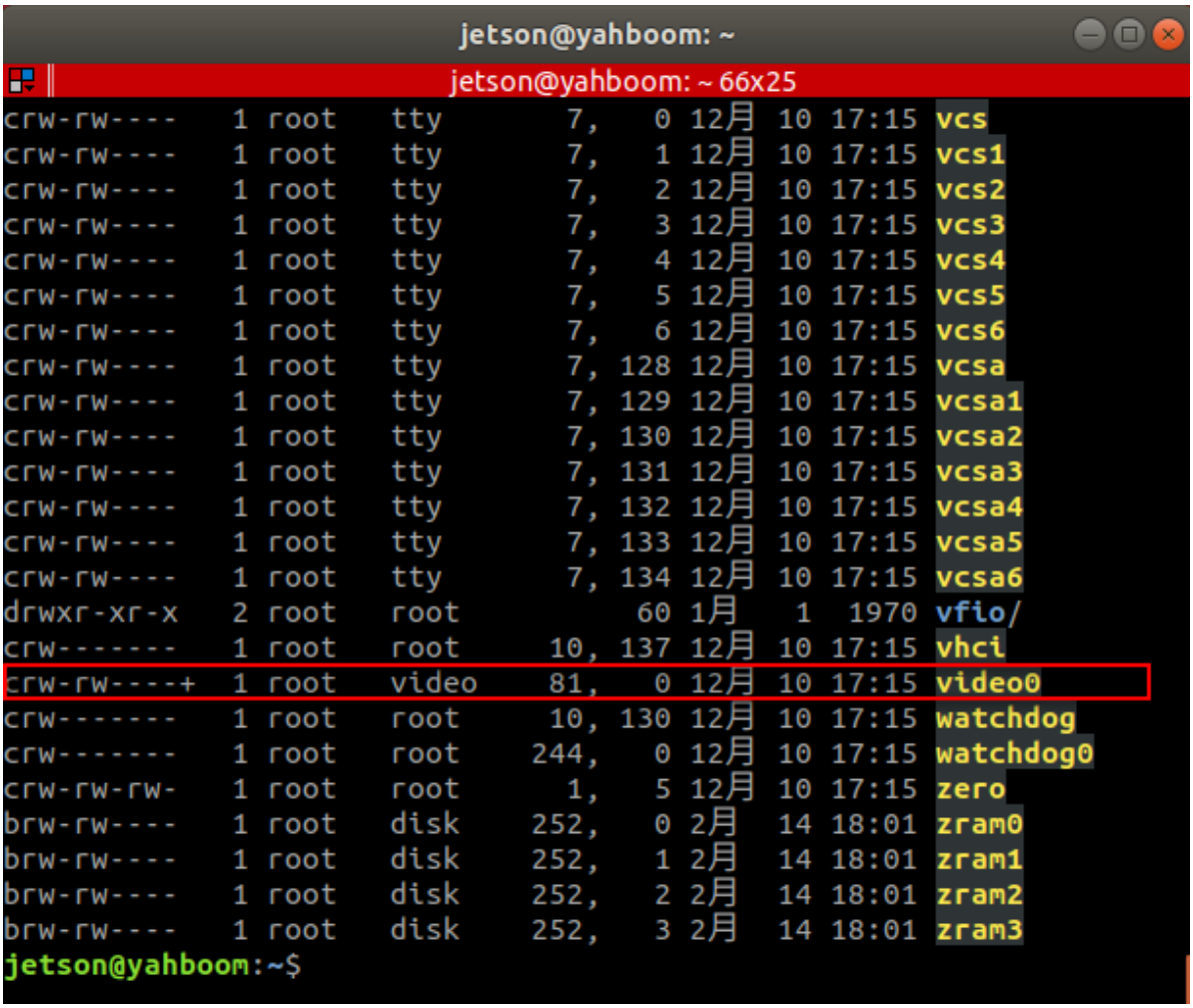
7. Web page real-time monitoring

7.1. Environment Construction

```
sudo apt-get install ros-noetic-async-web-server-cpp ros-noetic-web-video-server
ros-noetic-usb-cam
```

First, make sure the USB camera is connected correctly. Enter the following command to check that the USB device number exists and is video0.

```
ll /dev
```



If the execution permission is not enough, you need to add execution permission

```
sudo chmod 777 /dev/video*
```

7.2. modify the launch file

```
sudo vim /opt/ros/noetic/share/usb_cam/launch/usb_cam-test.launch
```

Keep clicking [d] on the keyboard to delete everything. Click [i] on the keyboard to enter editing mode and write the following content into it.

```
<launch>
    <arg name="open_view" default="false"/>
    <node name="usb_cam" pkg="usb_cam" type="usb_cam_node" output="screen">
        <param name="video_device" value="/dev/video0"/>
        <param name="image_width" value="640"/>
        <param name="image_height" value="480"/>
        <param name="pixel_format" value="yuyv"/>
        <param name="camera_frame_id" value="usb_cam"/>
        <param name="io_method" value="mmap"/>
    </node>
    <!-- web_video_server -->
    <node pkg="web_video_server" type="web_video_server" name="web_video_server"
output="screen"/>
    <!-- image_view -->
    <group if="$(arg open_view)">
        <node name="image_view" pkg="image_view" type="image_view"
respawn="false" output="screen">
            <remap from="image" to="/usb_cam/image_raw"/>
            <param name="autosize" value="true"/>
        </node>
    </group>
</launch>
```

Click the [ESC] key twice (or multiple times), click the keyboard [shift + ;], enter [wq], and click the [Enter] key.

7.3. effect demonstration

Open the terminal and start

```
roslaunch usb_cam usb_cam-test.launch
```

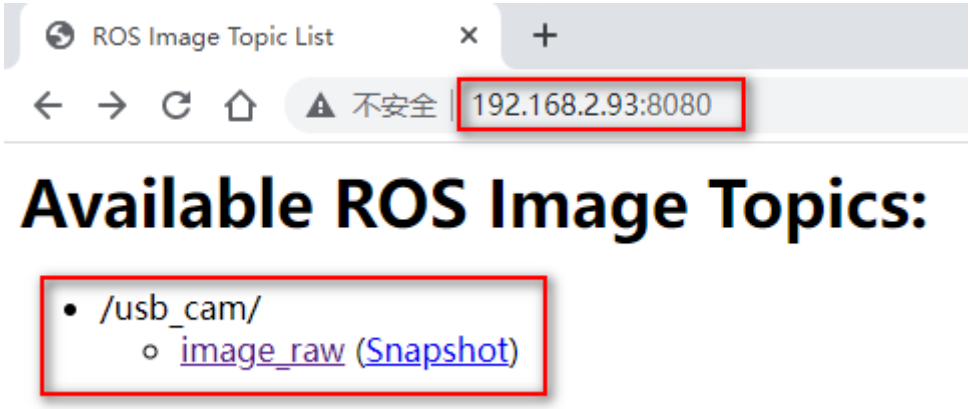
- View in local web browser

```
http://localhost:8080/
```

- View on other devices (must be in the same LAN, 192.168.2.93 is the IP address of the master)

```
http://192.168.2.93:8080/
```

Note: It is recommended to use Google Chrome or mobile QQ browser, other browsers may not be able to open the image



Click [image_raw] to view the camera image in real time, click [Snapshot] to display only one frame of image.