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RS-D455

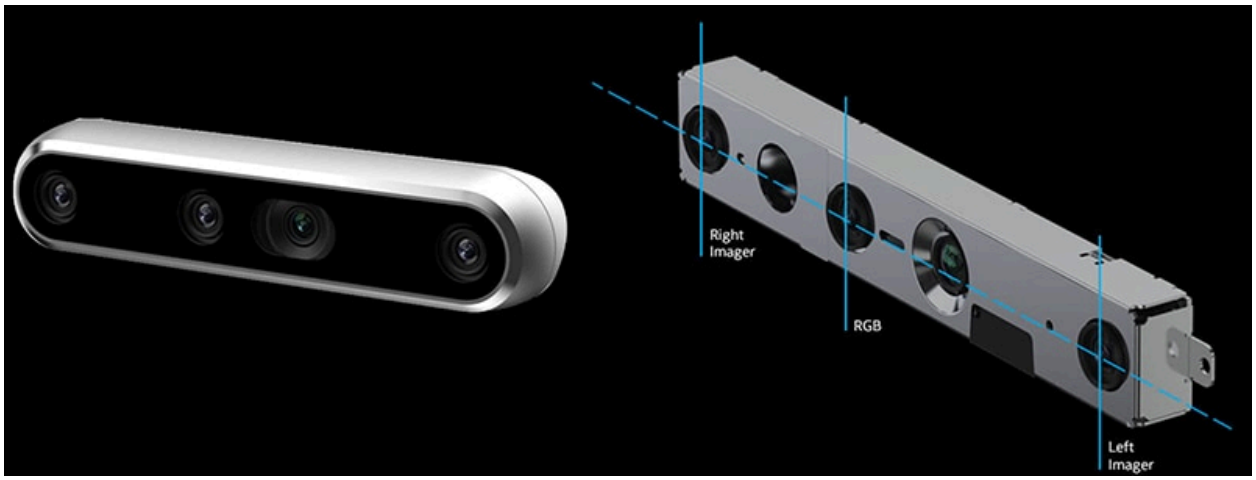
OBJECTIVE

1. Install RealSense SDK
2. Install ROS Package for RealSense

OVERVIEW

Intel RealSense D455 Camera

Intel Realsense Depth Camera D455 is designed to equip devices with the ability to see, understand, and learn from their environment. Using stereo cameras, the D455 can calculate depth. A left imager, a right imager, and an optional infrared projector are used to implement the stereo vision. To enhance depth accuracy in scenes with low texture, the infrared projector emits a non-visible static IR pattern. The left and right imagers capture the scene and send raw image data to the Vision Processor, which calculates depth values for each pixel by correlating points on the left image to the right image. The depth frame is then generated by processing the depth pixel values. Following depth, frames create a depth video stream



Intel RealSense D455 Tech Specification

Features	Use Environment	Indoor/outdoor
	Ideal Range	0.6 to 6 m
	Image Sensor Technology	Global Shutter

	IMU	Bosch BMI055
Depth	Depth Technology	Stereoscope
	Depth FOV	87 Degree * 58 Degree
	Depth Accuracy	<2% at 4m
	Depth Frame rate	Up to 90fps
RGB	RGB frame resolution	Up to 1280 * 800
	RSB sensor FOV (H * V)	90 * 65 Degree
	RGB frame rate	30 fps
	RGB sensor resolution	1Mp
	RGB sensor technology	Global Shutter
Major Component	Camera module	Intel RealSense Module D450
	Vision Processor Board	Intel RealSesnse Vision Processor D4

RealSense SDK Installation

Note Power the jetson nano with the DC barrel jack while using the Camera.

PROCEDURE

Installation

1. Register the server's public key

```
sudo apt-key adv --keyserver keyserver.ubuntu.com --recv-key F6E65AC044F831AC80A06380C8B3A55A6F3EFCDE || sudo apt-key adv --keyserver hkp://keyserver.ubuntu.com:80 --recv-key F6E65AC044F831AC80A06380C8B3A55A6F3EFCDE
```

2. Add the server to the list of repositories

```
sudo add-apt-repository "deb https://librealsense.intel.com/Debian/apt-repo $(lsb_release -cs) main" -u
```

3. Install SDK

```
sudo apt-get install librealsense2-utils
```

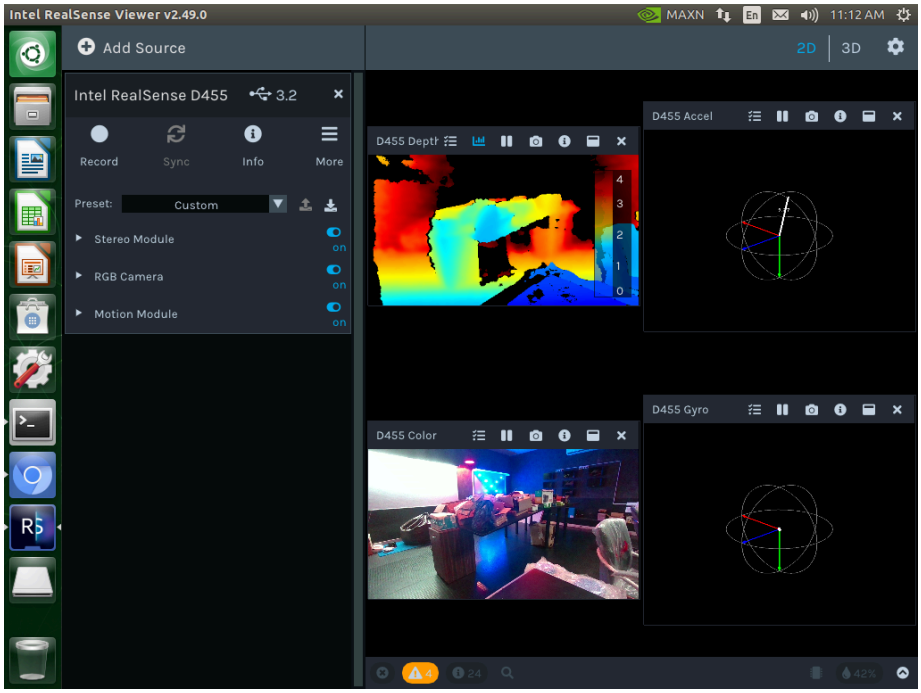
```
sudo apt-get install librealsense2-dev
```

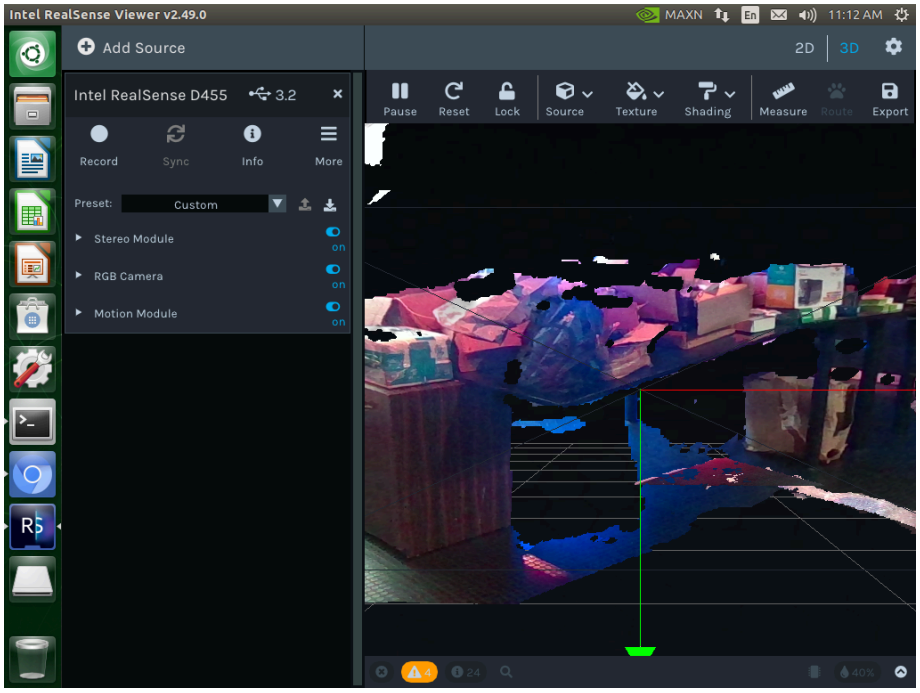
Testing

To verify the installation of SDK, connect the RealSense device and run the command in Terminal

```
realsense-viewer
```

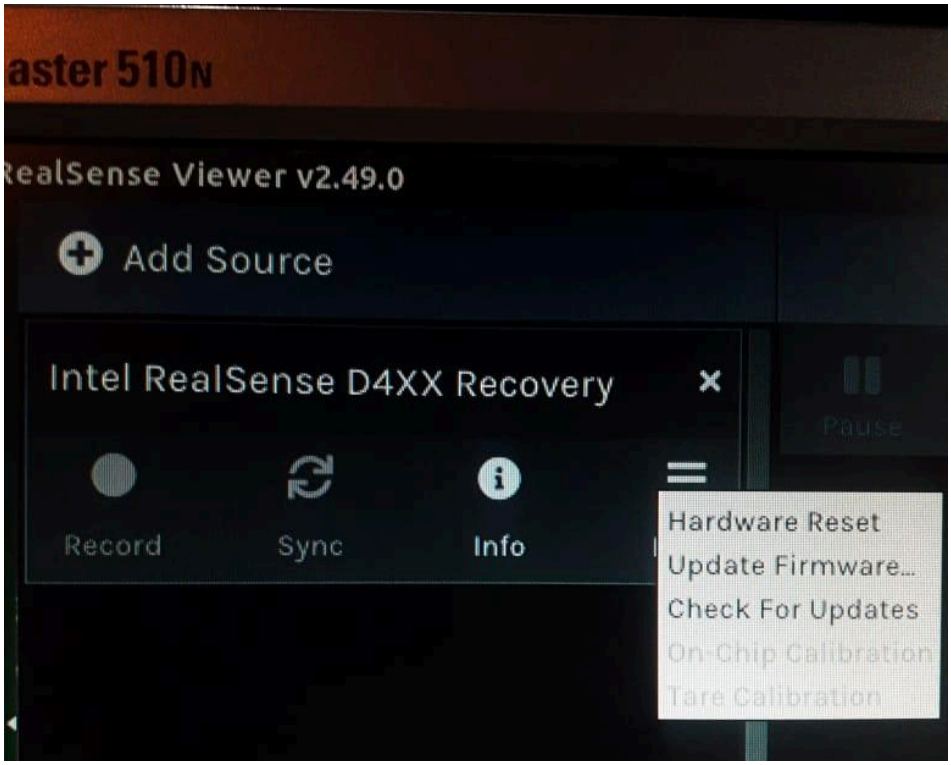
View of the RealSense





Problem

Intel RealSense D4XX Recovery, mean the sdk not detecting the camera model.



This will happen the first time, for that we need to update the Firmware of the camera with the tool provided by Intel RealSense.

Check tool is installed or not by the following command, keep the camera connected

```
rs-fw-update -l
```

Download the latest version of firmware (.bin) file from the below site
[Firmware releases D400]

Open the terminal in the downloaded folder and run

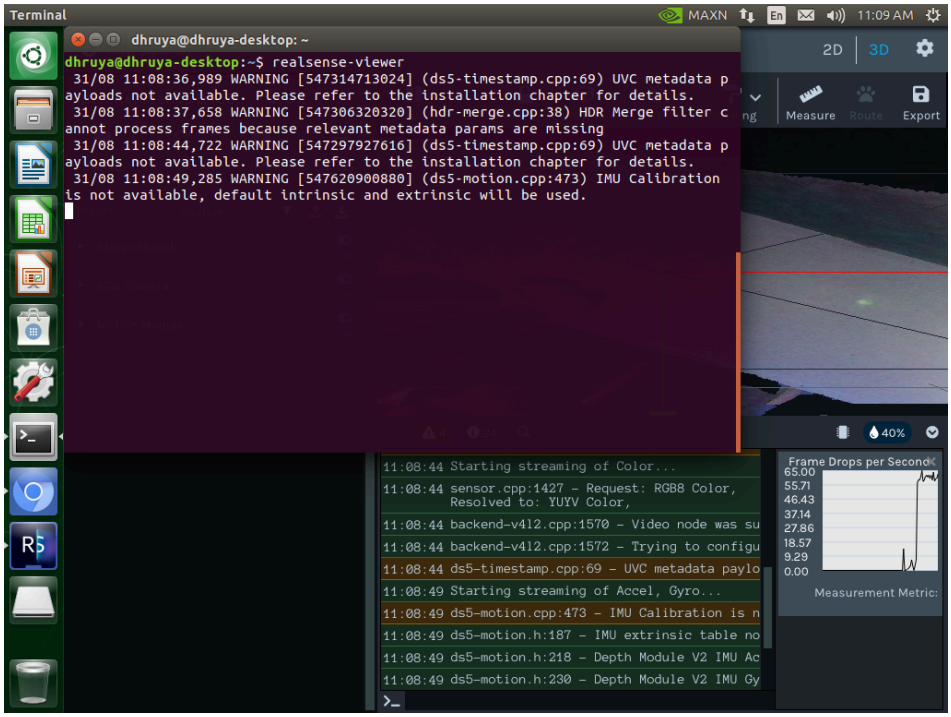
```
rs-fw-update -r -f Signed_Image_UVC_5_11_6_250.bin
```

Open the realsense-viewer

```
realsense-viewer
```

If a window pops up for the update, do update. After that, we can get the connection with D455

Errors and Warnings



WARNING: UVC metadata payloads not available. please refer to the installation chapter for details

This warning comes because of the kernel version for that we need to download the DKMS for the respective kernel, to install that the following command is used

```
sudo apt-get install librealsense2-dkms
```

WARNING: HDR Merge filter cannot process frames because relevant metadata params are missing.

WARNING: IMU Calibration is not available, default intrinsic and extrinsic will be used.

RealSense ROS Package Installation

PROCEDURE

Installation

1. realsense2_camera ROS package

```
sudo apt-get install ros-$ROS_DISTRO-realsense2-camera
```

2. Realsence2_description ROS package

```
sudo apt-get install ros-$ROS_DISTRO-realsense2-description
```

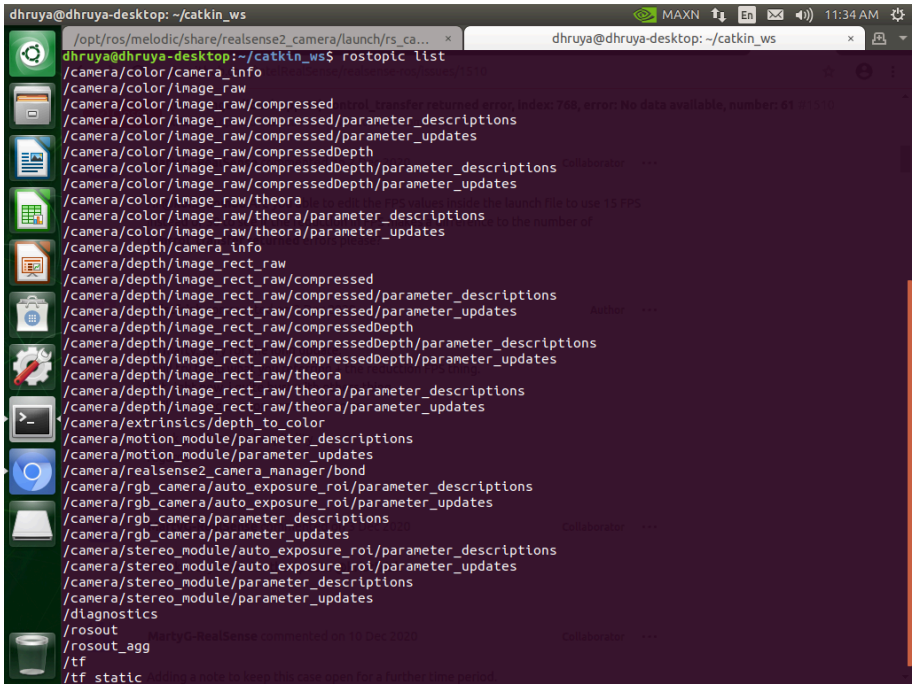
Testing

Connect the D455 camera and start the camera node

```
roslaunch realsense2_camera rs_camera.launch
```

List the topic this node running

```
rostopic list
```



Errors and Warnings

After starting the launch file, getting the Warning on the terminal

```
WARNING [281472619504000] (messenger-libusb.cpp:42) control_transfer
returned error, index: 768, error: No data available, number: 61
```

This error can be ignored if it occurs around a minute or with a less frequency

```
ERROR: Resource temporarily unavailable, number: 11
```

This can be resolved by connecting the camera to the USB3 port, but after that errors are coming. And this is a serious issue because it disconnects the camera.

CONCLUSION

The errors and warnings coming in the experiments are not solved. But we can work on this and can run the rviz and visualize camera data.