- More
  - View source
  - History
- Page

Workstation Setup

This tutorial describes the setup of a development workstation

Contents

- 1 Required Hardware
  - 1.1 Workstation Requirements
- 2 Install Ubuntu
- 3 Open Terminal App
- 4 Install ROS
- 5 Create Development Workspace
- 6 Install Intera SDK Dependencies
- 7 Install Intera Robot SDK
- 8 Configure Robot Communication/ROS Workspace
  - 8.1 intera.sh ROS Environment Setup
  - 8.2 Copy the intera.sh script
  - 8.3 Customize the intera.sh script
  - 8.4 Edit the 'robot_hostname' field
  - 8.5 Edit the 'your_ip' field
  - 8.6 Verify 'ros_version' field
  - 8.7 Save and Close intera.sh script
  - 8.8 Initialize your SDK environment
- 9 Verify Environment
- 10 Setup Rviz

Required Hardware

- Sawyer Robot & Developer Workstation

Workstation Requirements

- A development workstation capable of running **Ubuntu 16.04 LTS** and **ROS Kinetic** (or **Ubuntu 14.04 LTS** and **ROS Indigo**), with the following minimum specifications:
  - Intel i5 or above
  - 4GB Memory or above
  - At least 7 GB of free disk space
  - Ethernet port
  - If any visualization (RViz) or simulation (Gazebo) is required for your application, a **dedicated NVidia graphics card** (http://gazebosim.org/tutorials?tut=guided_b1&cat=#Systemrequirements) with proprietary NVidia drivers is recommended

Install Ubuntu

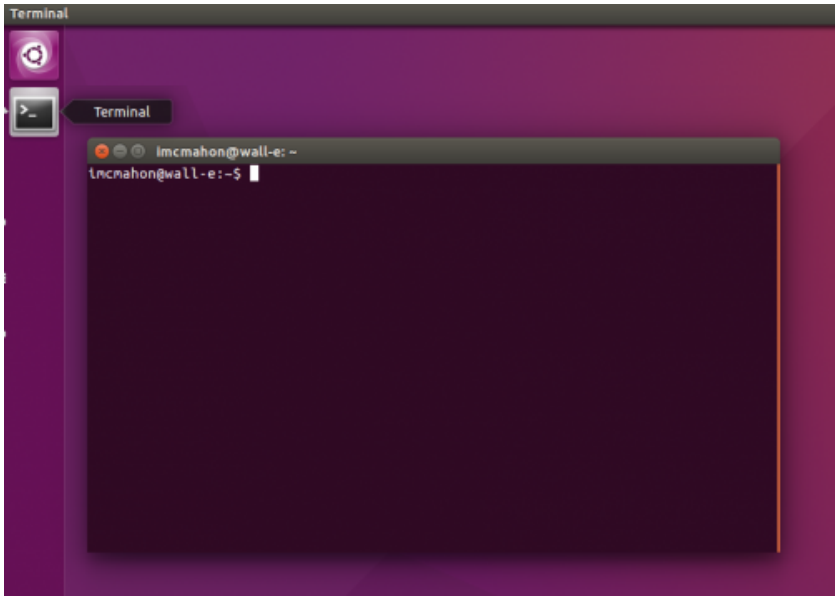
Ubuntu 16.04 (Recommended) | Ubuntu 14.04

Follow the standard Ubuntu Installation Instructions for **16.04** (Desktop):

- Download the Installer Image file, by picking the "Desktop CD (http://releases.ubuntu.com/xenial/)" image appropriate for your machine:
  - 64-bit (AMD64) .iso image (recommended) (http://releases.ubuntu.com/xenial/ubuntu-16.04.3-desktop-amd64.iso) / 32-bit (Intel x86) .iso image (http://releases.ubuntu.com/xenial/ubuntu-16.04.3-desktop-i386.iso)
- Create an Ubuntu LiveUSB installer by burning the installer image onto a USB stick.
  - Windows (http://www.ubuntu.com/download/desktop/create-a-usb-stick-on-windows) / Mac OS X (http://www.ubuntu.com/download/desktop/create-a-usb-stick-on-mac-osx) / Ubuntu (http://www.ubuntu.com/download/desktop/create-a-usb-stick-on-ubuntu)
- Follow the Ubuntu Installation Instructions (https://help.ubuntu.com/community/GraphicalInstall)

Open Terminal App

Search your computer for the Terminal package, and open it:



The rest of the workstation setup tutorial will take place in by typing commands in this terminal prompt.

Install ROS

ROS Kinetic for Ubuntu 16.04 (Recommended) | ROS Indigo for Ubuntu 14.04

Configure Ubuntu repositories

Configure your Ubuntu repositories to allow "restricted," "universe," and "multiverse." You can follow the Ubuntu guide (https://help.ubuntu.com/community/Repositories/Ubuntu) for instructions on doing this.

Likely, they are already configured properly, and you only need to confirm the configuration.

Setup your sources.list

```
$ sudo sh -c 'echo "deb http://packages.ros.org/ros/ubuntu xenial main" > /etc/apt/sources.list.d/ros-latest.list'
```

Setup your keys

```
$ sudo apt-key adv --keyserver hkp://ha.pool.sks-keyservers.net:80 --recv-key 421C365BD9FF1F717815A3895523BAEEB01FA116
```

Update to Latest Software Lists

```
$ sudo apt-get update
```

Install ROS Kinetic Desktop Full

```
$ sudo apt-get install ros-kinetic-desktop-full
```

Initialize rosdep

rosdep enables you to easily install system dependencies for source you want to compile and is required to run some core components in ROS.

```
$ sudo rosdep init
$ rosdep update
```

Install rosinstall

```
$ sudo apt-get install python-rosinstall
```

Create Development Workspace

ROS Kinetic for Ubuntu 16.04 (Recommended) | ROS Indigo for Ubuntu 14.04

Create ROS Workspace

```
$ mkdir -p ~/ros_ws/src
# ros_ws (short for ROS Workspace)
```

Source ROS and Build

ROS Kinetic

Source ROS Setup

```
$ source /opt/ros/kinetic/setup.bash
```

Build

```
$ cd ~/ros_ws
$ catkin_make
```

Install Intera SDK Dependencies

ROS Kinetic for Ubuntu 16.04 (Recommended) | ROS Indigo for Ubuntu 14.04

Install SDK Dependencies

```
$ sudo apt-get update
$ sudo apt-get install git-core python-argparse python-wstool python-vcstools python-rosdep ros-kinetic-control-msgs ros-kinetic-joystick-drivers
ros-kinetic-xacro ros-kinetic-tf2-ros ros-kinetic-rviz ros-kinetic-cv-bridge ros-kinetic-actionlib ros-kinetic-actionlib-msgs ros-kinetic-dynamic-
reconfigure ros-kinetic-trajectory-msgs ros-kinetic-rospy-message-converter
```

Install Intera Robot SDK

Intera 5.3 ROS Kinetic for Ubuntu 16.04 (Recommended) | Intera 5.3 ROS Indigo for Ubuntu 14.04

Download the SDK on your Workstation

Checkout all required Github Repositories into your ROS workspace source directory: Use git clone or download the packages directly from Github:

```
$ cd ~/ros_ws/src
$ wstool init .
$ git clone https://github.com/RethinkRobotics/sawyer_robot.git
$ wstool merge sawyer_robot/sawyer_robot.rosinstall
$ wstool update
```

Source ROS Setup

To use ROS Kinetic to use RSDK, use command below:

```
# ROS Kinetic
$ source /opt/ros/kinetic/setup.bash
```

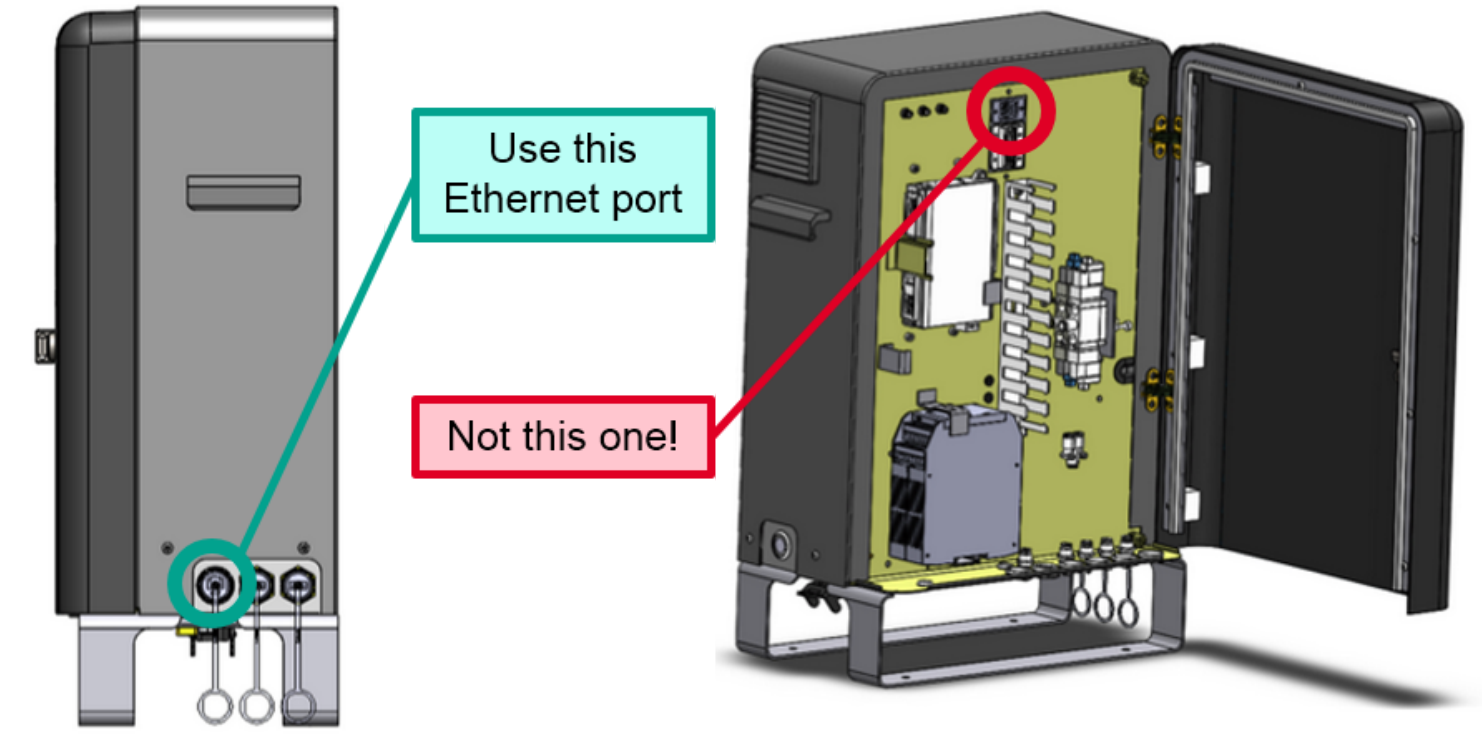
Build

```
$ cd ~/ros_ws
$ catkin_make
```

Configure Robot Communication/ROS Workspace

This step describes the configuration and setup of your ROS environment (http://wiki.ros.org/ROS/EnvironmentVariables). This section assumes you have linked your workstation to the robot via Ethernet.

Important Note: Connect to the robot via the ethernet port on the outside of the Controller. Connecting to the ethernet port inside the Controller door will not work (this is a diagnostic port that is only accessible by Rethink Employees).



See Network Setup for recommended network configurations.

intera.sh ROS Environment Setup

The intera.sh script is a convenience script which allows for intuitive modification of the core ROS environment components. This user edited script will allow for the quickest and easiest ROS setup.

Further information and a detailed description is available on the SDK_Shell page.

Copy the intera.sh script

The intera.sh file already exists in intera_sdk repo, copy the file into your ros workspace.

```
$ cp ~/ros_ws/src/intera_sdk/intera.sh ~/ros_ws
```

Customize the intera.sh script

Please edit the intera.sh shell script making the necessary modifications to describe your development PC.

Using your favorite editor (gedit (https://wiki.gnome.org/Apps/Gedit) used for example)

```
$ cd ~/ros_ws
$ gedit intera.sh
```

Edit the 'robot_hostname' field

Your robot's hostname is defaulted as the **Controller's Serial Number** and NOT the Robot's Serial Number. The serial number can be located on the back of the robot's controller box. Unless you intend to modify the default Networking configuration, leave the ".local" suffix on the end of the Controller's Serial Number in the **robot_hostname.local** field.

Edit the 'your_ip' field

Modify where 'your_ip' is either your computer's hostname or the IP address of your PC. We advise against using WiFi connections between your robot and workstation.

```
your_ip="192.168.XXX.XXX"
```

Useful command for identifying your IP address:

```
$ ifconfig
# Result will be contained in the 'inet addr' field (Ubuntu).
```

Alternatively, you may choose to use the hostname of your development PC rather than the PC's IP address. For instructions, press Expand on the right. [Expand]

Verify 'ros_version' field

Verify that the the 'ros_version' field matches the ROS version you are running:

This field will default to "indigo". To use another ROS version, update:

ROS Kinetic for Ubuntu 16.04 (Recommended) | ROS Indigo for Ubuntu 14.04

```
ros_version="kinetic"
```

Save and Close intera.sh script

Please save and close the intera.sh script.

Initialize your SDK environment

From this point forward, your ROS environment setup should be as simple as sourcing the intera.sh script from the root of your Catkin workspace:

```
$ cd ~/ros_ws
$ ./intera.sh
```

Verify Environment

A useful command for viewing and validating your ROS environment setup is:

```
$ env | grep ROS
```

The important fields at this point:

ROS_MASTER_URI - This should now contain your robot's hostname.

ROS_IP - This should contain your workstation's IP address.

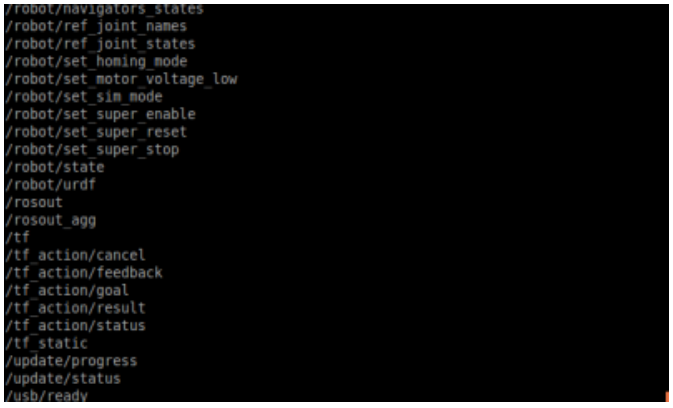
or

ROS_HOSTNAME - If not using the workstation's IP address, the ROS_HOSTNAME field should contain your PC's hostname. Otherwise, this field should not be available.

Try to get rostopic list from robot by typing following command:

```
$ rostopic list
```

You can see the rostopic list from the command line output similar as following:



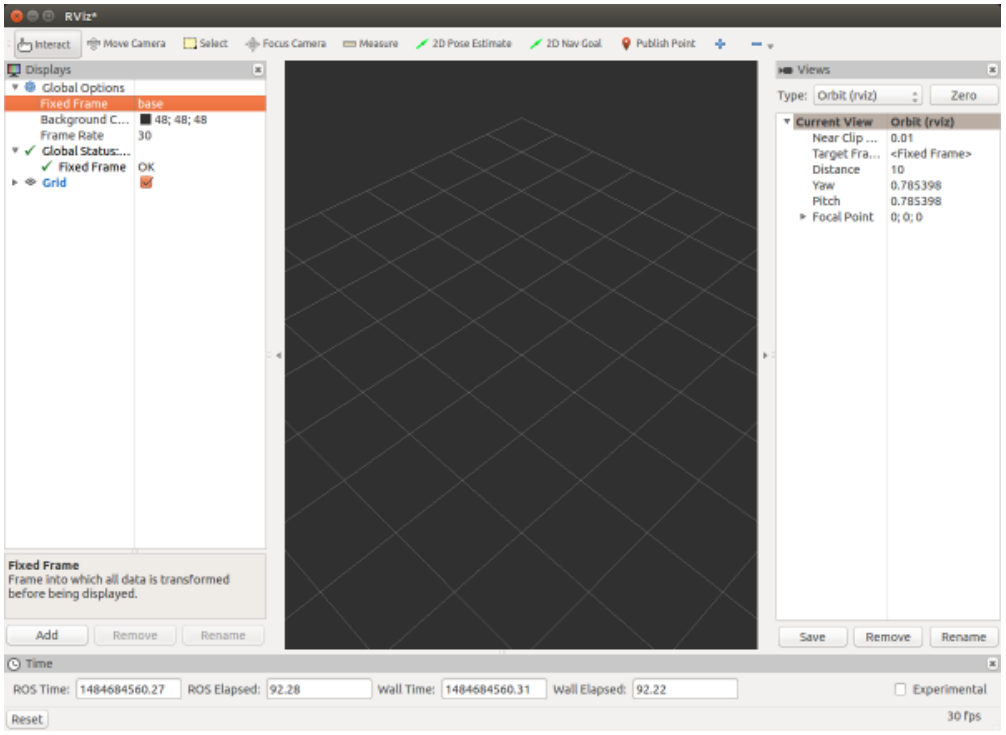
Setup Rviz

We can also setup Rviz to view robot model, start Rviz from a properly initialized environment using:

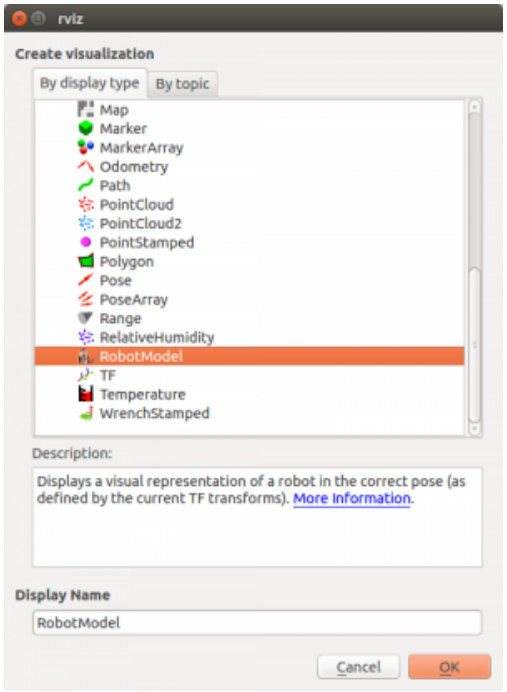
```
$ rosrun rviz rviz
```

Set the Fixed Frame as `/base`

Info: The ‘Fixed Frame’ provides a static, base reference for your visualization. Any sensor data that comes in to rviz will be transformed into that reference frame so it can be properly displayed in the virtual world.



Add robot model into Rviz by clicking add button, then select robot model in the list, press OK to add.



Now you can visualize your robot on Rivz! Next : Hello Robot

Retrieved from "http://sdk.rethinkrobotics.com/intera/a/index.php?title=Workstation_Setup&oldid=1578"