

## Running ROS across multiple machine

→ It explains the use of ROS\_MASTER\_URI to configure multiple machine to use a single master.

### \* Overview

⇒ ROS is designed with distributed computing in mind.

⇒ A well-written node makes no assumptions about where in the network it runs, allowing computation to be relocated at runtime to match the available resources.

→ Exception is driver node that communicates with a piece of hardware.

⇒ Deploying a ROS system across multiple machines:

- You only need one master. Select one machine to run it on.
- All nodes must be configured to use the same master, via ROS\_MASTER\_URI.

- There must be complex, bi-directional connectivity between all pairs of machine, on all ports.
- Each machine must advertise itself by a name that all other machines can resolve.

In raspberrypi

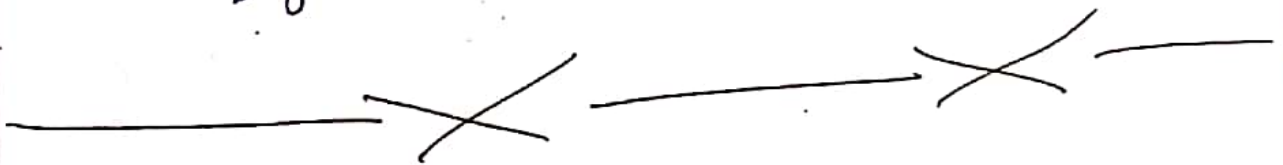
```
ssh adityashivastava35@Coffee_bot
export ROS_MASTER_URI=http://
      coffeebot:11311
```

=== run any node ===

In Laptop

```
ssh aditya@laptop
export ROS_MASTER_URI=http://coffeebot:11311
```

=== run any node or subscribe ===  
to any topic that is hosted  
by coffeebot.





## ROS/Network Setup

⇒ ROS has certain requirements of the network configuration:

→ There must be complete bi-directional connectivity between all pairs of machine, on all ports.

→ Each machine must advertise itself by a name that all other machine can resolve.

⇒ In the following sections, we'll assume that you want to run a ROS system on two machines, with the following hostnames and IP address.

- marvin.example.com : 192.168.1.1
- hal.example.com : 192.168.1.2

### \* Name resolution

⇒ When a ROS node advertises a topic, it provides a hostname:port combination (a URI) that other nodes will contact when they want to subscribe to that topic.

URI ⇒ A Uniform Resource Identifier is a string of characters that unambiguously identifies a particular resource.

⇒ Most common form of URI is the Uniform Resource Locator (URL)

## ⊕ Setting a name explicitly

⇒ If a machine reports a hostname that is not addressable by other machines, then you need to set either the ROS\_IP or ROS\_HOSTNAME environment variables.

In `/etc/hosts`



192.168.43.18      coffeebot

192.168.43.21      laptop

