ROS
An iceberg used to make robots do things.

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In a nutshell

• Structure
  ■ Stacks are composed of packages
  ■ Packages have dependencies, code, etc.
  ■ Nodes are runnable things contained in packages
  ■ Workspaces = user-controlled groupings of stacks and packages
• Build system + dependency management
• Languages: (predominantly) C(++) & Python
• Tools
  ■ rviz, rqt, etc.
OS Compatibility

If you might want help with anything... ever... then use **Ubuntu 12.04** or **Ubuntu 14.04**.

VMs are fine, assuming you can work-around potential issues involving network configuration and **USB device drivers**.

**Ubuntu 12.04**: ROS Hydro

**Ubuntu 14.04**: ROS Indigo
OS Compatibility-ish

There are "experimental" ways to install ROS on...
- OS X (via homebrew)
- Arch Linux.

Beyond entire ROS distributions, there are ROS clients (can produce a ROS-compatible node that communicates with ROS nodes and tools, but doesn't include all of those nodes and tools)
Available ROS Clients

ROSJava
ROSLisp
ROS.NET
ROSLUA
rosR
rosruby
Master of what?

rosmaster is ROS's phonebook.

It knows how to contact all running ROS nodes, knows what services they provide/require, and topics they publish or want to subscribe.

rosmaster is started when you run "roscore"

_The solution to 90% of the issues you will encounter:_

```bash
export ROS_MASTER_URI=http://[ IP / hostname ]:11311
ex: export ROS_MASTER_URI=http://localhost:11311
```
Topics? Services? Messages? WAT?

Topic:
- a unidirectional, named "tube" that passes messages from a publisher to a subscriber.

Service:
- like a topic with a return value and success bool - synchronous

Action:
- a construct of messages and topics that afford longer asynchronous behaviors with results and progress messages.
Whiteboard Talker + Listener

Spec:
- Talker publishes messages of type std_msgs/String on a topic named "/chatter"
- Listener subscribes to /chatter and prints the contents of the std_msgs/Strings it receives
Resources *(beyond Google-fu)*

http://ros.org
Getting started

read about ROS:
http://wiki.ros.org/ROS/Introduction

install ROS:
http://wiki.ros.org/ROS/Installation

Hello[ROS]:
http://wiki.ros.org/ROS/Tutorials
This slideshow:  http://goo.gl/ZC3Hne

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