

# ROS Cheat Sheet

## Filesystem Command-line Tools

<b>rospack</b> /rosstack	A tool inspecting <a href="#">packages</a> / <a href="#">stacks</a> .
<b>roscd</b>	Changes directories to a package or stack.
<b>rosls</b>	Lists package or stack information.
<b>roscrcat</b>	Creates a new ROS package.
<b>roscrcat</b> -stack	Creates a new ROS stack.
<b>roscd</b>	Installs ROS package system dependencies.
<b>rosmake</b>	Builds a ROS package.
<b>roswtf</b>	Displays a errors and warnings about a running ROS system or launch file.
<b>rxdeps</b>	Displays package structure and dependencies.

Usage:

```
$ rospack find [package]
$ roscd [package[/subdir]]
$ rosls [package[/subdir]]
$ roscrcat [package.name]
$ rosmake [package]
$ roscd install [package]
$ roswtf or roswtf [file]
$ rxdeps [options]
```

## Common Command-line Tools

### roscore

A collection of [nodes](#) and programs that are pre-requisites of a ROS-based system. You must have a roscore running in order for ROS nodes to communicate.

roscore is currently defined as:

```
master
parameter server
rosout
```

Usage:

```
$ roscore
```

### rosmmsg/rossrv

rosmmsg/rossrv displays Message/Service (msg/srv) data structure definitions.

Commands:

<b>rosmmsg show</b>	Display the fields in the msg.
<b>rosmmsg users</b>	Search for code using the msg.
<b>rosmmsg md5</b>	Display the msg md5 sum.
<b>rosmmsg package</b>	List all the messages in a package.
<b>roscd packages</b>	List all the packages with messages.

Examples:

```
Display the Pose msg:
$ rosmmsg show Pose
List the messages in nav_msgs:
$ rosmmsg package nav_msgs
List the files using sensor_msgs/CameraInfo:
$ rosmmsg users sensor_msgs/CameraInfo
```

### roslaunch

roslaunch allows you to run an executable in an arbitrary package without having to cd (or roscd) there first.

Usage:

```
$ roslaunch package executable
```

Example:

```
Run turtlesim:
$ roslaunch turtlesim turtlesim_node
```

### roscd

Displays debugging information about ROS nodes, including publications, subscriptions and connections.

Commands:

<b>roscd ping</b>	Test connectivity to node.
<b>roscd list</b>	List active nodes.
<b>roscd info</b>	Print information about a node.
<b>roscd machine</b>	List nodes running on a particular machine.
<b>roscd kill</b>	Kills a running node.

Examples:

```
Kill all nodes:
$ roscd kill -a
List nodes on a machine:
$ roscd machine aqy.local
Ping all nodes:
$ roscd ping --all
```

### roslaunch

Starts ROS nodes locally and remotely via SSH, as well as setting parameters on the parameter server.

Examples:

```
Launch on a different port:
$ roslaunch -p 1234 package filename.launch
Launch a file in a package:
$ roslaunch package filename.launch
Launch on the local nodes:
$ roslaunch --local package filename.launch
```

### rostopic

A tool for displaying debug information about ROS [topics](#), including publishers, subscribers, publishing rate, and messages.

Commands:

<b>rostopic bw</b>	Display bandwidth used by topic.
<b>rostopic echo</b>	Print messages to screen.
<b>rostopic hz</b>	Display publishing rate of topic.
<b>rostopic list</b>	Print information about active topics.
<b>rostopic pub</b>	Publish data to topic.
<b>rostopic type</b>	Print topic type.
<b>rostopic find</b>	Find topics by type.

Examples:

```
Publish hello at 10 Hz:
$ rostopic pub -r 10 /topic_name std_msgs/String hello
Clear the screen after each message is published:
$ rostopic echo -c /topic_name
Display messages that match a given Python expression:
$ rostopic echo --filter "m.data=='foo'" /topic_name
Pipe the output of rostopic to roscd to view the msg type:
$ rostopic type /topic_name | roscd show
```

### roscd

A tool for getting and setting ROS [parameters](#) on the parameter server using YAML-encoded files.

Commands:

<b>roscd set</b>	Set a parameter.
<b>roscd get</b>	Get a parameter.
<b>roscd load</b>	Load parameters from a file.
<b>roscd dump</b>	Dump parameters to a file.
<b>roscd delete</b>	Delete a parameter.
<b>roscd list</b>	List parameter names.

Examples:

```
List all the parameters in a namespace:
$ roscd list /namespace
Setting a list with one as a string, integer, and float:
$ roscd set /foo "[1', 1, 1.0]"
Dump only the parameters in a specific namespace to file:
$ roscd dump dump.yaml /namespace
```

### rosservice

A tool for listing and querying ROS services.

Commands:

<b>rosservice list</b>	Print information about active services.
<b>rosservice node</b>	Print the name of the node providing a service.
<b>rosservice call</b>	Call the service with the given args.
<b>rosservice args</b>	List the arguments of a service.
<b>rosservice type</b>	Print the service type.
<b>rosservice uri</b>	Print the service ROSRPC uri.
<b>rosservice find</b>	Find services by service type.

Examples:

```
Call a service from the command-line:
$ rosservice call /add_two_ints 1 2
Pipe the output of rosservice to rossrv to view the srv type:
$ rosservice type add_two_ints | rossrv show
Display all services of a particular type:
$ rosservice find rospy_tutorials/AddTwoInts
```

## Logging Command-line Tools

### rosvbag

This is a set of tools for recording from and playing back to ROS topics. It is intended to be high performance and avoids deserialization and reserialization of the messages.

**rosvbag record** will generate a “.bag” file (so named for historical reasons) with the contents of all topics that you pass to it.

Examples:

Record all topics:

```
$ rosvbag record -a
```

Record select topics:

```
$ rosvbag record topic1 topic2
```

**rosvbag play** will take the contents of one or more bag file, and play them back in a time-synchronized fashion.

Examples:

Replay all messages without waiting:

```
$ rosvbag play -a demo_log.bag
```

Replay several bag files at once:

```
$ rosvbag play demo1.bag demo2.bag
```

## Graphical Tools

### rxgraph

Displays a graph of the ROS nodes that are currently running, as well as the ROS topics that connect them.

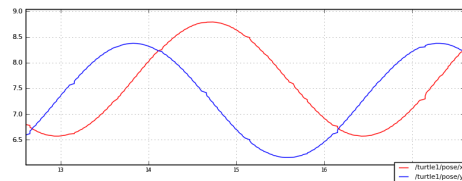


Usage:

```
$ rxgraph
```

### rxplot

A tool for plotting data from one or more ROS topic fields using matplotlib.



Examples:

To graph the data in different plots:

```
$ rxplot /topic1/field1 /topic2/field2
```

To graph the data all on the same plot:

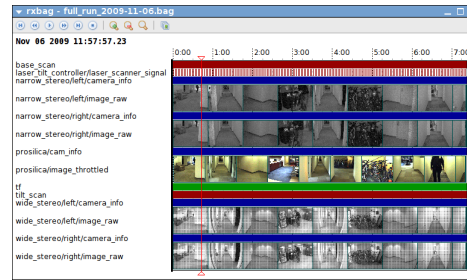
```
$ rxplot /topic1/field1,/topic2/field2
```

To graph multiple fields of a message:

```
$ rxplot /topic1/field1:field2:field3
```

### rxrbag

A tool for visualizing, inspecting, and replaying histories (bag files) of ROS messages.

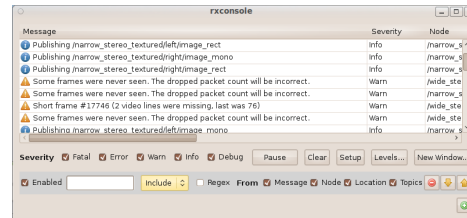


Usage:

```
$ rxrbag bag_file.bag
```

### rxconsole

A tool for displaying and filtering messages published on rosvout.



Usage:

```
$ rxconsole
```

## tf Command-line Tools

### tf\_echo

A tool that prints the information about a particular transformation between a source\_frame and a target\_frame.

Usage:

```
$ rosvrun tf tf_echo <source_frame> <target_frame>
```

Examples:

To echo the transform between /map and /odom:

```
$ rosvrun tf tf_echo /map /odom
```

### view\_frames

A tool for visualizing the full tree of coordinate transforms.

Usage:

```
$ rosvrun tf view_frames
```

```
$ evince frames.pdf
```