

ROS Cheat Sheet

This will be converted to an image later.

roscheatsheet_catkin.pdf

ROS Indigo Cheatsheet

Filesystem Management Tools

rospack A tool for inspecting packages.
rospack profile Fixes path and pluginlib problems.
roscd Change directory to a package.
rospd/rosd Pushd equivalent for ROS.
rosls Lists package or stack information.
rosed Open requested ROS file in a text editor.
roscp Copy a file from one place to another.
roscp Installs package system dependencies.
rosdep Displays a errors and warnings about a running ROS system or launch file.
roswtf Creates a new ROS stack.
catkin_create_pkg Manage many repos in workspace.
wstool Builds a ROS catkin workspace.
catkin_make Builds package structure and dependencies.
rqt_dep

Usage:

```
$ rospack find [package]
$ roscd [package[/subdir]]
$ rospd [package[/subdir] | +N | -N]
$ rosd
$ rosls [package[/subdir]]
$ rosed [package] [file]
$ roscp [package] [file] [destination]
$ rosdep install [package]
$ roswtf or rosutf [file]
$ catkin_create_pkg [package_name] [depend1]..[dependN]
$ wstool [init | set | update]
$ catkin_make
$ rqt_dep [options]
```

Start-up and Process Launch Tools

roscore
The basis nodes and programs for ROS-based systems. A roscore must be running for ROS nodes to communicate.

Usage:

```
$ roscore
```

rosvrun
Runs a ROS package's executable with minimal typing.

Usage:

```
$ rosvrun package_name executable_name
```

Example (runs turtlesim):

```
$ rosvrun turtlesim turtlesim_node
```

roslaunch

Starts a roscore (if needed), local nodes, remote nodes via SSH, and sets parameter server parameters.

Examples:
Launch a file in a package:

```
$ roslaunch package_name file_name.launch
```

Launch on a different port:

```
$ roslaunch -p 1234 package_name file_name.launch
```

Launch on the local nodes:

```
$ roslaunch --local package_name file_name.launch
```

Logging Tools

rosvbag

A set of tools for recording and playing back of ROS topics.
Commands:
rosvbag record Record a bag file with specified topics.
rosvbag play Play content of one or more bag files.
rosvbag compress Compress one or more bag files.
rosvbag decompress Decompress one or more bag files.
rosvbag filter Filter the contents of the bag.

Examples:
Record select topics:

```
$ rosvbag record topic1 topic2
```

Replay all messages without waiting:

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

Replay several bag files at once:

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

Introspection and Command Tools

rosvmsg/rosvsrv

Displays Message/Service (msg/srv) data structure definitions.
Commands:
rosvmsg show Display the fields in the msg/srv.
rosvmsg list Display names of all msg/srv.
rosvmsg md5 Display the msg/srv md5 sum.
rosvmsg package List all the msg/srv in a package.
rosvmsg packages List all packages containing the msg/srv.

Examples:
Display the Pose msg:

```
$ rosvmsg show Pose
```

List the messages in the nav_msgs package:

```
$ rosvmsg package nav_msgs
```

List the packages using sensor_msgs/CameraInfo:

```
$ rosvmsg packages sensor_msgs/CameraInfo
```

rosvnode

Displays debugging information about ROS nodes, including publications, subscriptions and connections.
Commands:
rosvnode ping Test connectivity to node.
rosvnode list List active nodes.
rosvnode info Print information about a node.
rosvnode machine List nodes running on a machine.
rosvnode kill Kill a running node.

Examples:
Kill all nodes:

```
$ rosvnode kill -a
```

List nodes on a machine:

```
$ rosvnode machine aqy.local
```

Ping all nodes:

```
$ rosvnode ping --all
```

rosvtopic

A tool for displaying information about ROS topics, including publishers, subscribers, publishing rate, and messages.

Commands:
rosvtopic bw Display bandwidth used by topic.
rosvtopic echo Print messages to screen.
rosvtopic find Find topics by type.
rosvtopic hz Display publishing rate of topic.
rosvtopic info Print information about an active topic.
rosvtopic list List all published topics.
rosvtopic pub Publish data to topic.
rosvtopic type Print topic type.

Examples:
Publish hello at 10 Hz:

```
$ rosvtopic pub -r 10 /topic_name std_msgs/String hello
```

Clear the screen after each message is published:

```
$ rosvtopic echo -c /topic_name
```

Display messages that match a given Python expression:

```
$ rosvtopic echo --filter "n.data=='foo'" /topic_name
```

Pipe the output of rosvtopic to rosvmsg to view the msg type:

```
$ rosvtopic type /topic_name | rosvmsg show
```

rosvparam

A tool for getting and setting ROS parameters on the parameter server using YAML-encoded files.

Commands:
rosvparam set Set a parameter.
rosvparam get Get a parameter.
rosvparam load Load parameters from a file.
rosvparam dump Dump parameters to a file.
rosvparam delete Delete a parameter.
rosvparam list List parameter names.

Examples:
List all the parameters in a namespace:

```
$ rosvparam list /namespace
```

Setting a list with one as a string, integer, and float:

```
$ rosvparam set /foo "[1', 1, 1.0]"
```

Dump only the parameters in a specific namespace to file:

```
$ rosvparam dump dump.yaml /namespace
```

rosvservice

A tool for listing and querying ROS services.

Commands:
rosvservice list Print information about active services.
rosvservice node Print name of node providing a service.
rosvservice call Call the service with the given args.
rosvservice args List the arguments of a service.
rosvservice type Print the service type.
rosvservice uri Print the service ROSRPC uri.
rosvservice find Find services by service type.

Examples:
Call a service from the command-line:

```
$ rosvservice call /add_two_ints 1 2
```

Pipe the output of rosvservice to rosvrv to view the srv type:

```
$ rosvservice type add_two_ints | rosvrv show
```

Display all services of a particular type:

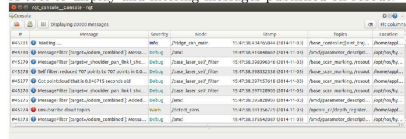
```
$ rosvservice find rosvpy_tutorials/AddTwoInts
```

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Logging Tools

rqt_console

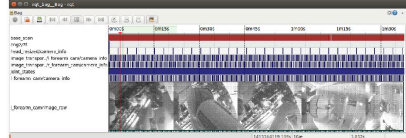
A tool to display and filtering messages published on rosout.



Usage:
\$ rqt_console

rqt_bag

A tool for visualizing, inspecting, and replaying bag files.



Usage, viewing:
\$ rqt_bag bag_file.bag
Usage, bagging:
\$ rqt_bag *press the big red record button.*

rqt_logger_level

Change the logger level of ROS nodes. This will increase or decrease the information they log to the screen and rqt_console.

Usage:
viewing \$ rqt_logger_level

Introspection & Command Tools

rqt_top

A tool for viewing published topics in real time.

Usage:
\$ rqt
Plugin Menu->Topic->Topic Monitor

rqt_msg, rqt_srv, and rqt_action

A tool for viewing available msgs, srvs, and actions.

Usage:
\$ rqt
Plugin Menu->Topic->Message Type Browser
Plugin Menu->Service->Service Type Browser
Plugin Menu->Action->Action Type Browser

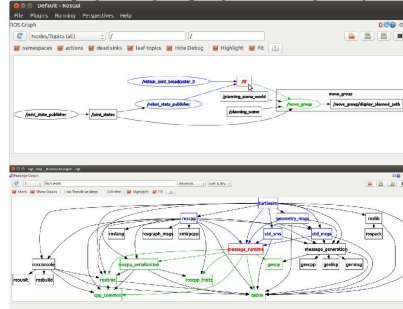
rqt_publisher, and rqt_service_caller

Tools for publishing messages and calling services.

Usage:
\$ rqt
Plugin Menu->Topic->Message Publisher
Plugin Menu->Service->Service Caller

rqt_graph, and rqt_dep

Tools for displaying graphs of running ROS nodes with connecting topics and package dependencies respectively.



Usage:
\$ rqt_graph
\$ rqt_dep

rqt_top

A tool for ROS specific process monitoring.

Usage:
\$ rqt
Plugin Menu->Introspection->Process Monitor

rqt_reconfigure

A tool for dynamically reconfiguring ROS parameters.

Usage:
\$ rqt
Plugin Menu->Configuration->Dynamic Reconfigure

Development Environments

rqt_shell, and rqt_py_console

Two tools for accessing an xterm shell and python console respectively.

Usage:
\$ rqt
Plugin Menu->Miscellaneous Tools->Shell
Plugin Menu->Miscellaneous Tools->Python Console

Data Visualization Tools

tf_echo

A tool that prints the information about a particular transformation between a source_frame and a target_frame.

Usage:
\$ rosrn tf tf_echo <source_frame> <target_frame>

Examples:
To echo the transform between /map and /odom:
\$ rosrn tf tf_echo /map /odom

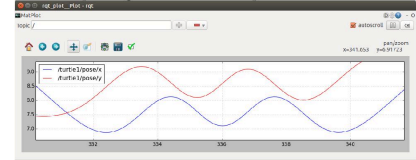
view_frames

A tool for visualizing the full tree of coordinate transforms.

Usage:
\$ rosrn tf2.tools.view_frames.py
\$ evince frames.pdf

rqt_plot

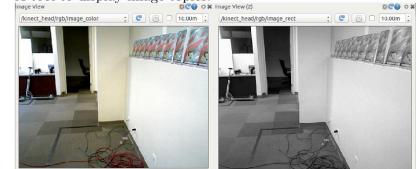
A tool for plotting data from ROS topic fields.



Examples:
To graph the data in different plots:
\$ rqt_plot /topic1/field1 /topic2/field2
To graph the data all on the same plot:
\$ rqt_plot /topic1/field1, /topic2/field2
To graph multiple fields of a message:
\$ rqt_plot /topic1/field1:field2:field3

rqt_image_view

A tool to display image topics.



Usage:
\$ rqt_image_view

ROS Indigo Catkin Workspaces

Create a catkin workspace

Setup and use a new catkin workspace from scratch.

```
Example:
$ source /opt/ros/hydro/setup.bash
$ mkdir -p ~/catkin_ws/src
$ cd ~/catkin_ws/src
$ catkin_init_workspace
```

Checkout an existing ROS package

Get a local copy of the code for an existing package and keep it up to date using `wstool`.

```
Examples:
$ cd ~/catkin_ws/src
$ wstool init
$ wstool set tutorials --git git://github.com/ros/ros_tutorials.git
$ wstool update
```

Create a new catkin ROS package

Create a new ROS catkin package in an existing workspace with `catkin create package`. After using this you will need to edit the `CMakeLists.txt` to detail how you want your package built and add information to your `package.xml`.

```
Usage:
$ catkin_create_pkg <package.name> [depend1] [depend2]
```

```
Example:
$ cd ~/catkin_ws/src
$ catkin_create_pkg tutorials std_msgs rospy roscpp
```

Build all packages in a workspace

Use `catkin make` to build all the packages in the workspace and then source the `setup.bash` to add the workspace to the `ROS_PACKAGE_PATH`.

```
Examples:
$ cd ~/catkin_ws
$ ~/catkin_make
$ source devel/setup.bash
```

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