tf

→ Package that lets the user keep track of multiple coordinate frames over time.

→ tf maintains the relationship between coordinate frames in a tree structure buffered in time.
  ↳ lets the user transform points, vectors, etc between any two coordinate frames at any desired point in time.

⇒ tf2 is an integration on tf providing generally the same features set more efficiently.
  ↳ As well as adding a few new features.

① Writing a tf listner

```
#include <tf/transform_listner.h>

tf::TransformListner listner;
```

→ Once the listner is created, it starts receiving tf transformations over the wire, and buffers them for up to 10 second.

```
listener.lookupTransform ("/frame2", "/frame1",
                          ros::Time(0), transform);
```

→ We want the transform from "/frame1" to frame "/frame2".

→ The time at which we want to transform
· ros::Time(0) will just get us the latest
available transform.

→ The object in which we store the resulting
transform.

① Writing a tf broadcaster

```
#include <tf/transform_broadcaster.h>
static tf::TransformBroadcaster br;
tf::Transform transform;
transform.setOrigin(tf::Vector3(x,y,z));
tf::Quaternion q;
q.setRPY(roll, pitch, yaw)
transform.setRotation(q);
br.sendTransform(tf::StampedTransform(
,ros::Time::now()),"Parent_frame","child_frame");
```

② Command-line Tools

ⓐ view_frames

```
rosrun tf view_frames
evince frames.pdf
```

⇒ view_frame is a graphical debugging tool that creates a pdf graph of your current transform tree.

ⓑ tf_echo

```
rosrun tf tf_echo <source_frame> <target_frame>
```

⇒ Print information about a particular transform between a source_frame and a target_frame.