ROS1 (Noetic) and ROS2 (Humble) Bridge Setup using Docker

This document summarizes the steps, commands, and troubleshooting notes for setting up a ROS1 (Noetic) and ROS2 (Humble) bridge using Docker on Ubuntu 22.04. It includes setup of individual containers for ROS1 and ROS2, a Docker network, and running the ros1_bridge.

Problem Summary

ROS Noetic is designed for Ubuntu 20.04 (focal), while ROS2 Humble is for Ubuntu 22.04 (jammy). Installing Noetic on a jammy base leads to dependency errors due to incompatible library versions.

Solution Summary

Use Ubuntu 20.04 base image for ROS Noetic containers, and Ubuntu 22.04 for ROS2 Humble containers. Run the ROS1-ROS2 bridge in a compatible container (typically Ubuntu 20.04) and connect them via a Docker network.

Commands & Logs

```
# ROS2 container setup

docker run -it --rm --name ros2 --network ros_net ros:humble

source /opt/ros/humble/setup.bash

ros2 run ros1_bridge dynamic_bridge  # (Package not found error expected if not installed)

ros2 topic echo /chatter

# Docker network setup

docker network create ros_net

# ROS1 container setup

docker run -it --rm --name ros1 --network ros_net ros:noetic

source /opt/ros/noetic/setup.bash

rostopic pub /chatter std_msgs/String "data: 'Hello from ROS1'" -r 1
```

```
# Bridge container setup (custom image ros1_bridge_manual expected)

docker run -it --rm --name bridge --network ros_net ros1_bridge_manual

source /opt/ros/noetic/setup.bash

source /opt/ros/humble/setup.bash  # Will fail if Humble not present in this container

ros2 run ros1_bridge dynamic_bridge

# Common errors and their meaning included in logs
```

Final Notes

Ensure proper ROS versions and base images are used. ROS1 Noetic must be installed on Ubuntu 20.04. Avoid trying to install ROS Noetic on Ubuntu 22.04 as the required libraries are not compatible.