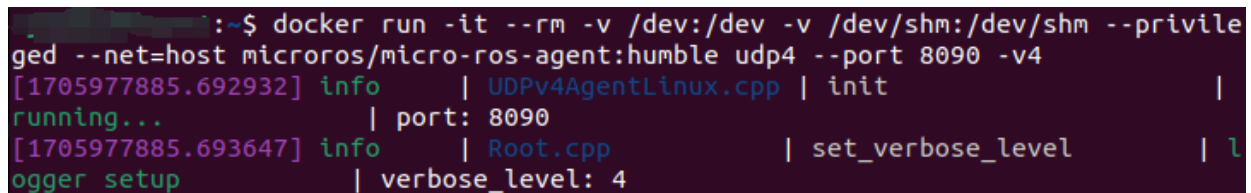# Install and start microros agent

Note: Docker startup mode and source code startup mode can be installed on the same system at the same time, but only one of the startup modes can be selected at startup. Under normal circumstances, it is simple and convenient to use the docker startup method. It is recommended to use the Docker startup method.

1、 1. Docker starts the microros agent

This time, the microros agent is started through docker, so the system docker needs to be set up first. The relevant docker environment has been set up in the factory system and can be run directly.

Docker starts WIFI proxy

```
docker run -it --rm -v /dev:/dev -v /dev/shm:/dev/shm --privileged --net=host
microros/micro-ros-agent:humble udp4 --port 8090 -v4
```


Among them, --port 8090 is the network port number, and -v4 is the LOG printing level. The higher the value, the more printing will be done. Modifications can be made according to actual conditions.

If you need to end the proxy, press Ctrl+C in the terminal to exit the proxy.

Note that you cannot close the terminal directly, otherwise docker will continue to run in the background.

If the microcontroller starts the reconnection agent multiple times, causing ROS2 to search for multiple identical nodes, it does not actually affect the use. Press Ctrl+C to end the agent, then reset the microcontroller and reconnect to the agent.

Docker starts serial port agent

```
docker run -it --rm -v /dev:/dev -v /dev/shm:/dev/shm --privileged --net=host
microros/micro-ros-agent:humble serial --dev /dev/ttyUSB0 -b 921600 -v4
```


Among them, --dev /dev/ttyUSB0 is the serial port device number, and -b 921600 is the baud rate. Modifications can be made according to actual conditions.

If you need to end the proxy, press Ctrl+C in the terminal to exit the proxy.

Note that you cannot close the terminal directly, otherwise docker will continue to run in the background.

If the microcontroller starts the reconnection agent multiple times, causing ROS2 to search for multiple identical nodes, it does not actually affect the use. Press Ctrl+C to end the agent, then reset the microcontroller and reconnect to the agent.

Agent startup failure

The microROS agent can only be opened in one terminal. If a terminal has already opened the microROS agent in the background, an error will be reported when opening the agent again. Please press Ctrl+C on the original agent terminal to exit the agent and then run the agent.

If the agent fails to be started the next time because the terminal is closed directly, you can restart the virtual machine/computer or manually end docker to solve the problem.

How to manually end docker:

Please first query the current docker process number and end the current agent docker process.

```
docker ps -a | grep microros/micro-ros-agent
docker stop xxxxxxxxxx
docker run -it --rm -v /dev:/dev -v /dev/shm:/dev/shm --privileged --net=host
microros/micro-ros-agent:humble udp4 --port 8090 -v4
```

```
                    :~$ docker ps -a | grep microros/micro-ros-agent
6c8aac7b18e5    microros/micro-ros-agent:humble   "/bin/sh /micro-ros_…"   4 seco
nds ago    Up 3 seconds              jovial_feynman
                    :~$ docker stop 6c8aac7b18e5
6c8aac7b18e5
                    :~$ docker ps -a | grep microros/micro-ros-agent
                    :~$ docker run -it --rm -v /dev:/dev -v /dev/shm:/dev/shm --privile
ged --net=host microros/micro-ros-agent:humble udp4 --port 8090 -v4
[1704875781.918662] info     | UDPv4AgentLinux.cpp | init                        |
running...                   | port: 8090
[1704875781.919189] info     | Root.cpp            | set_verbose_level       | l
ogger setup                  | verbose_level: 4
```

2、 Source code to start microros agent

Install tinyxml2 dependencies

Enter the following command in the terminal to install tinyxml2

```
cd ~/
git clone https://github.com/leethomason/tinyxml2.git
cd tinyxml2
mkdir build
cd build
sudo cmake ..
sudo make
sudo make install
```

Install python3-rosdep tool

Enter the following command in the terminal to install the rosdep tool. You can skip it if you have already installed it.

```
sudo apt install python3-rosdep
```

Compile micro_ros_setup environment

Activate the ROS2 environment variable. Here we take the humble version as an example. If it is already activated, you can skip the activation step.

```
source /opt/ros/humble/setup.bash
```

Create and enter the workspace uros_ws in the user directory

```
mkdir ~/uros_ws && cd ~/uros_ws
mkdir src
```

Download the micro_ros_setup file to the src folder

```
git clone -b $ROS_DISTRO https://github.com/micro-ROS/micro_ros_setup.git
src/micro_ros_setup
```

Initialize rosdep

```
sudo rosdep init
```

If there is a network problem, please add the -E parameter

```
sudo -E rosdep init
```


If errors are reported in the above steps and rosdep still cannot be initialized, you can create a new
20-default.list file in the /etc/ros/rosdep/sources.list.d/ directory, add the following content, and then
proceed to the next step.

```
# os-specific listings first
yaml https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/osx-homebrew.yaml
osx

# generic
yaml https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/base.yaml
yaml https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/python.yaml
yaml https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/ruby.yaml
gbpdistro
https://raw.githubusercontent.com/ros/rosdistro/master/releases/fuerte.yaml fuerte

# newer distributions (Groovy, Hydro, ...) must not be listed anymore, they are
being fetched from the rosdistro index.yaml instead
```

Update rosdep and install related driver packages

```
rosdep update && rosdep install --from-paths src --ignore-src -y
```

Compile workspace

```
colcon build
```


Activate micro_ros_setup environment

```
source install/local_setup.bash
```

Compile micro_ros_agent environment

```
ros2 run micro_ros_setup create_agent_ws.sh
ros2 run micro_ros_setup build_agent.sh
```


If an error occurs when compiling build_agent.sh, please compile again.

Source code to start microros agent

Activate micro_ros_agent agent environment

```
source ~/uros_ws/install/local_setup.sh
```

ROS2 source code starts WIFI agent

```
ros2 run micro_ros_agent micro_ros_agent udp4 --port 8090 -v4
```


Among them, --port 8090 is the network port number, and -v4 is the LOG printing level. The higher the value, the more printing will be done. Modifications can be made according to actual conditions.

If you need to end the proxy, press Ctrl+C in the terminal to exit the proxy.

ROS2 source code starts serial port agent

```
ros2 run micro_ros_agent micro_ros_agent serial --dev /dev/ttyUSB0 -b 921600 -v4
```


Among them, --dev /dev/ttyUSB0 is the serial port device number, and -b 921600 is the baud rate. Modifications can be made according to actual conditions.

If you need to end the proxy, press Ctrl+C in the terminal to exit the proxy.