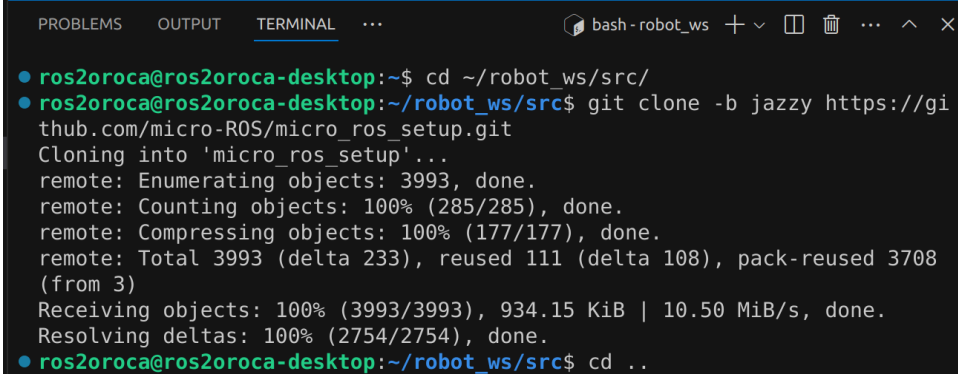


0. 라즈베리파이5에서 ROS2 jazzy 기반에서 진행

1. micro_ros_setup Install

1) git clone으로 micro_ros_setup 가져오기

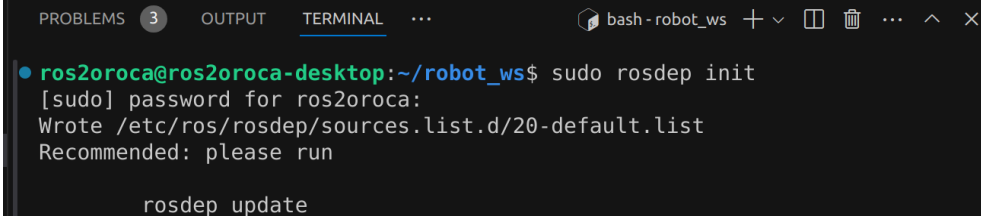
```
cd ~/robot_ws/src
git clone -b jazzy https://github.com/micro-ROS/micro_ros_setup.git
cd ..
```



```
PROBLEMS OUTPUT TERMINAL ... bash - robot_ws + v [icon] [icon] ... ^ x
• ros2oroca@ros2oroca-desktop:~$ cd ~/robot_ws/src/
• ros2oroca@ros2oroca-desktop:~/robot_ws/src$ git clone -b jazzy https://github.com/micro-ROS/micro_ros_setup.git
Cloning into 'micro_ros_setup'...
remote: Enumerating objects: 3993, done.
remote: Counting objects: 100% (285/285), done.
remote: Compressing objects: 100% (177/177), done.
remote: Total 3993 (delta 233), reused 111 (delta 108), pack-reused 3708 (from 3)
Receiving objects: 100% (3993/3993), 934.15 KiB | 10.50 MiB/s, done.
Resolving deltas: 100% (2754/2754), done.
• ros2oroca@ros2oroca-desktop:~/robot_ws/src$ cd ..
```

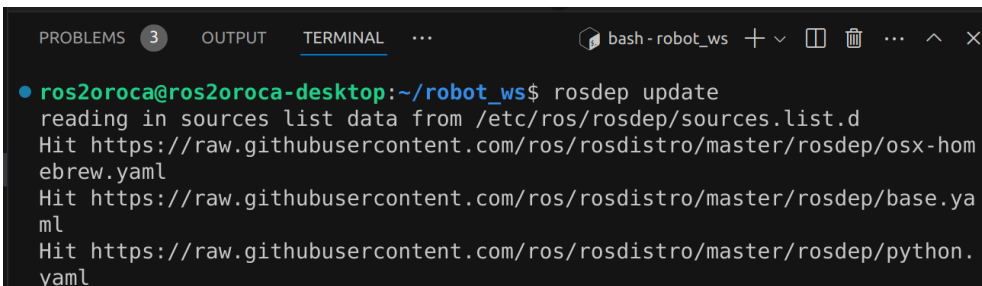
2) rosdep로 의존패키지 업데이트

```
sudo rosdep init
rosdep update
rosdep install --from-paths src --ignore-src -y
```

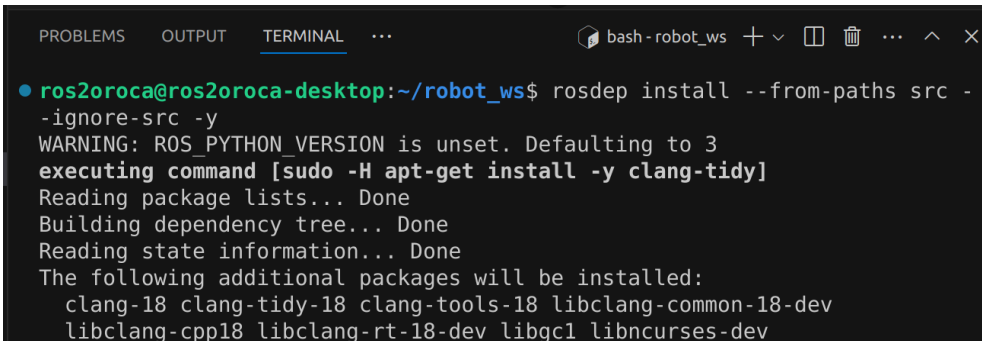


```
PROBLEMS 3 OUTPUT TERMINAL ... bash - robot_ws + v [icon] [icon] ... ^ x
• ros2oroca@ros2oroca-desktop:~/robot_ws$ sudo rosdep init
[sudo] password for ros2oroca:
Wrote /etc/ros/rosdep/sources.list.d/20-default.list
Recommended: please run

rosdep update
```



```
PROBLEMS 3 OUTPUT TERMINAL ... bash - robot_ws + v [icon] [icon] ... ^ x
• ros2oroca@ros2oroca-desktop:~/robot_ws$ rosdep update
reading in sources list data from /etc/ros/rosdep/sources.list.d
Hit https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/osx-homebrew.yaml
Hit https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/base.yaml
Hit https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/python.yaml
```



```
PROBLEMS OUTPUT TERMINAL ... bash - robot_ws + v [icon] [icon] ... ^ x
• ros2oroca@ros2oroca-desktop:~/robot_ws$ rosdep install --from-paths src --ignore-src -y
WARNING: ROS_PYTHON_VERSION is unset. Defaulting to 3
executing command [sudo -H apt-get install -y clang-tidy]
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  clang-18 clang-tidy-18 clang-tools-18 libclang-common-18-dev
  libclang-cpp18 libclang-rt-18-dev libgc1 libncurses-dev
```

3) micro_ros_setup 빌드

```
source /opt/ros/jazzy/setup.bash
colcon build --symlink-install --packages-select micro_ros_setup
source install/local_setup.bash
```

주의) `source /opt/ros/jazzy/setup.bash` 를 안하면 다음과 같이 에러가 난다.

```
ros2oroca@ros2oroca-desktop:~/robot_ws$ colcon build --symlink-install --packages-select micro_r
os_setup
Starting >>> micro_ros_setup
--- stderr: micro_ros_setup
CMake Error at CMakeLists.txt:19 (find_package):
  By not providing "ament_cmake.cmake" in CMAKE_MODULE_PATH this project
  has asked CMake to find a package configuration file provided by
  "ament_cmake", but CMake did not find one.

Could not find a package configuration file provided by "ament_cmake" with
any of the following names:

  ament_cmakeConfig.cmake
  ament_cmake-config.cmake

Add the installation prefix of "ament_cmake" to CMAKE_PREFIX_PATH or set
"ament_cmake_DIR" to a directory containing one of the above files.  If
"ament_cmake" provides a separate development package or SDK, be sure it
has been installed.

---
Failed <<< micro_ros_setup [1.52s, exited with code 1]

Summary: 0 packages finished [1.73s]
1 package failed: micro_ros_setup
1 package had stderr output: micro_ros_setup
ros2oroca@ros2oroca-desktop:~/robot_ws$
```

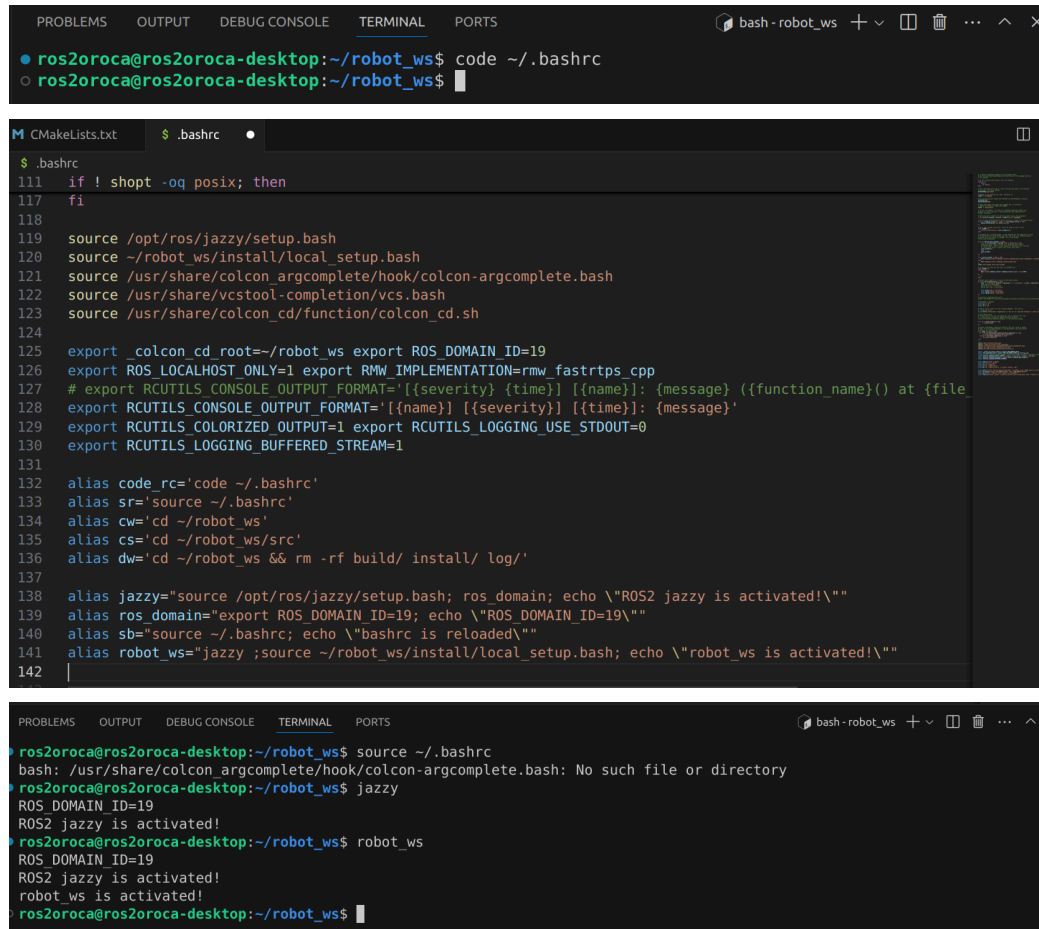
`source /opt/ros/jazzy/setup.bash` 를 입력하여 정상일 때

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS bash - robot_ws + v □ □ ... ^ ×
ros2oroca@ros2oroca-desktop:~/robot_ws$ source /opt/ros/jazzy/setup.bash
ros2oroca@ros2oroca-desktop:~/robot_ws$ colcon build --symlink-install --packages-select micro_r
os_setup
Starting >>> micro_ros_setup
Finished <<< micro_ros_setup [2.97s]

Summary: 1 package finished [3.19s]
ros2oroca@ros2oroca-desktop:~/robot_ws$
```

2. micro_ros_agent build

0) alias 정의를 위해 .bashrc 파일 수정



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
bash - robot_ws + - - - ^ X

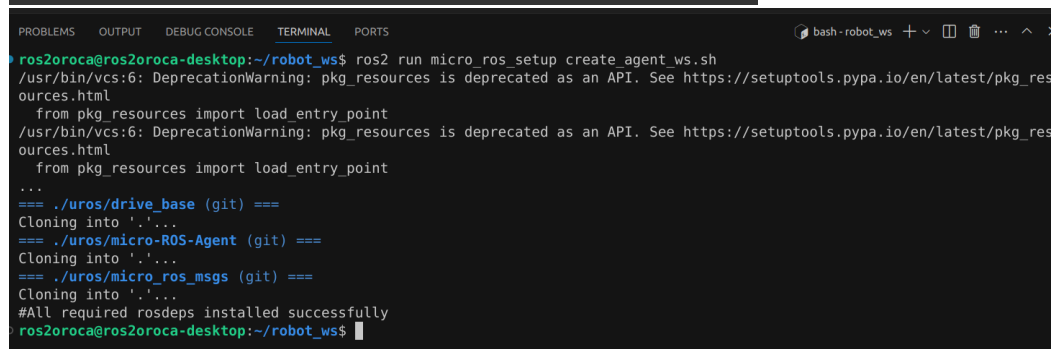
ros2oroca@ros2oroca-desktop:~/robot_ws$ code ~/.bashrc
ros2oroca@ros2oroca-desktop:~/robot_ws$

CMakeLists.txt $ .bashrc
$ .bashrc
111 if ! shopt -oq posix; then
112 fi
113
114 source /opt/ros/jazzy/setup.bash
115 source ~/robot_ws/install/local_setup.bash
116 source /usr/share/colcon_argcomplete/hook/colcon_argcomplete.bash
117 source /usr/share/vcstool-completion/vcs.bash
118 source /usr/share/colcon_cd/function/colcon_cd.sh
119
120 export colcon_cd_root=~/.robot_ws export ROS_DOMAIN_ID=19
121 export ROS_LOCALHOST_ONLY=1 export RMW_IMPLEMENTATION=rmw_fastrtps_cpp
122 # export RCUTILS_CONSOLE_OUTPUT_FORMAT='[{severity}] [{time}] [{name}]: {message} ({function_name}) at {file_
123 export RCUTILS_CONSOLE_OUTPUT_FORMAT='[{severity}] [{time}] [{name}]: {message}'
124 export RCUTILS_COLORIZED_OUTPUT=1 export RCUTILS_LOGGING_USE_STDOUT=0
125 export RCUTILS_LOGGING_BUFFERED_STREAM=1
126
127 alias code_rc='code ~/.bashrc'
128 alias sr='source ~/.bashrc'
129 alias cw='cd ~/robot_ws'
130 alias cs='cd ~/robot_ws/src'
131 alias dw='cd ~/robot_ws && rm -rf build/ install/ log/'
132
133 alias jazzy='source /opt/ros/jazzy/setup.bash; ros domain; echo \"ROS2 jazzy is activated!\"'
134 alias ros_domain='export ROS_DOMAIN_ID=19; echo \"ROS_DOMAIN_ID=19\"'
135 alias sb='source ~/.bashrc; echo \"bashrc is reloaded\"'
136 alias robot_ws='jazzy ;source ~/robot_ws/install/local_setup.bash; echo \"robot_ws is activated!\"'
137
138 |

ros2oroca@ros2oroca-desktop:~/robot_ws$ source ~/.bashrc
bash: /usr/share/colcon_argcomplete/hook/colcon_argcomplete.bash: No such file or directory
ros2oroca@ros2oroca-desktop:~/robot_ws$ jazzy
ROS_DOMAIN_ID=19
ROS2 jazzy is activated!
ros2oroca@ros2oroca-desktop:~/robot_ws$ robot_ws
ROS_DOMAIN_ID=19
ROS2 jazzy is activated!
robot_ws is activated!
ros2oroca@ros2oroca-desktop:~/robot_ws$
```

1) Download micro-ROS-Agent packages

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

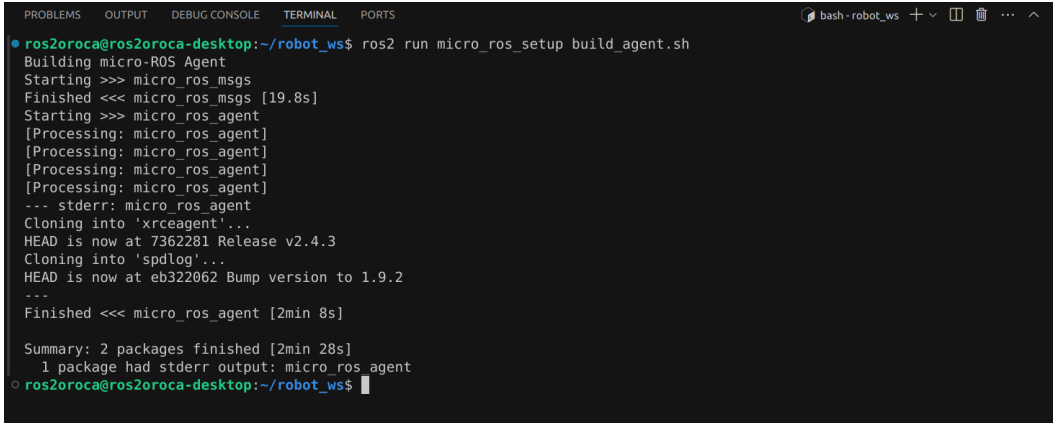


```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
bash - robot_ws + - - - ^ X

ros2oroca@ros2oroca-desktop:~/robot_ws$ ros2 run micro_ros_setup create_agent_ws.sh
/usr/bin/vcs:6: DeprecationWarning: pkg_resources is deprecated as an API. See https://setuptools.pypa.io/en/latest/pkg_res
ources.html
  from pkg_resources import load_entry_point
/usr/bin/vcs:6: DeprecationWarning: pkg_resources is deprecated as an API. See https://setuptools.pypa.io/en/latest/pkg_res
ources.html
  from pkg_resources import load_entry_point
...
=== ./uros/drive_base (git) ===
Cloning into './...'
=== ./uros/micro-R0S-Agent (git) ===
Cloning into './...'
=== ./uros/micro_ros_msgs (git) ===
Cloning into './...'
#All required rosdeps installed successfully
ros2oroca@ros2oroca-desktop:~/robot_ws$
```

2) Build micro-ROS-Agent

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



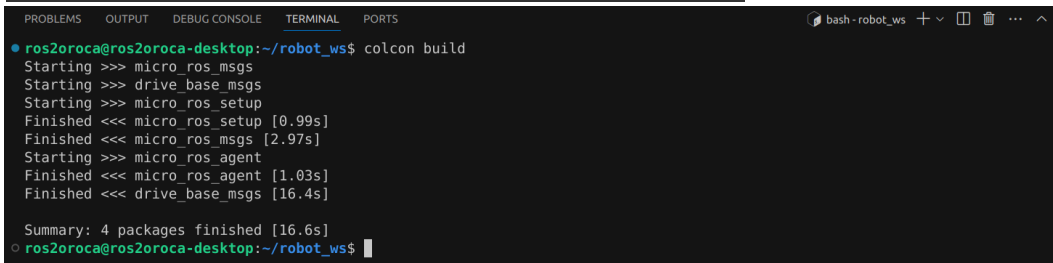
A terminal window titled 'bash - robot_ws' showing the output of the command 'ros2 run micro_ros_setup build_agent.sh'. The output indicates the building of the micro-ROS Agent, starting and finishing 'micro_ros_msgs' and 'micro_ros_agent' packages. It also shows cloning into 'xrceagent' and 'spdlog', and bumping the version to 1.9.2. The process takes 2 minutes and 28 seconds. A summary shows 2 packages finished, with 1 package having stderr output: 'micro_ros agent'.

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
ros2oroca@ros2oroca-desktop:~/robot_ws$ ros2 run micro_ros_setup build_agent.sh
Building micro-ROS Agent
Starting >>> micro_ros_msgs
Finished <<< micro_ros_msgs [19.8s]
Starting >>> micro_ros_agent
[Processing: micro_ros_agent]
[Processing: micro_ros_agent]
[Processing: micro_ros_agent]
[Processing: micro_ros_agent]
--- stderr: micro_ros_agent
Cloning into 'xrceagent'...
HEAD is now at 7362281 Release v2.4.3
Cloning into 'spdlog'...
HEAD is now at eb322062 Bump version to 1.9.2
---
Finished <<< micro_ros_agent [2min 8s]

Summary: 2 packages finished [2min 28s]
1 package had stderr output: micro_ros agent
ros2oroca@ros2oroca-desktop:~/robot_ws$
```

3) micro-ROS Build

```
source ~/robot_ws/install/local_setup.bash
colcon build
```



A terminal window titled 'bash - robot_ws' showing the output of the command 'colcon build'. The output indicates the building of four packages: 'micro_ros_msgs', 'drive_base_msgs', 'micro_ros_setup', and 'micro_ros_agent'. The process takes 16.6 seconds. A summary shows 4 packages finished.

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
ros2oroca@ros2oroca-desktop:~/robot_ws$ colcon build
Starting >>> micro_ros_msgs
Starting >>> drive_base_msgs
Starting >>> micro_ros_setup
Finished <<< micro_ros_setup [0.99s]
Finished <<< micro_ros_msgs [2.97s]
Starting >>> micro_ros_agent
Finished <<< micro_ros_agent [1.03s]
Finished <<< drive_base_msgs [16.4s]

Summary: 4 packages finished [16.6s]
ros2oroca@ros2oroca-desktop:~/robot_ws$
```