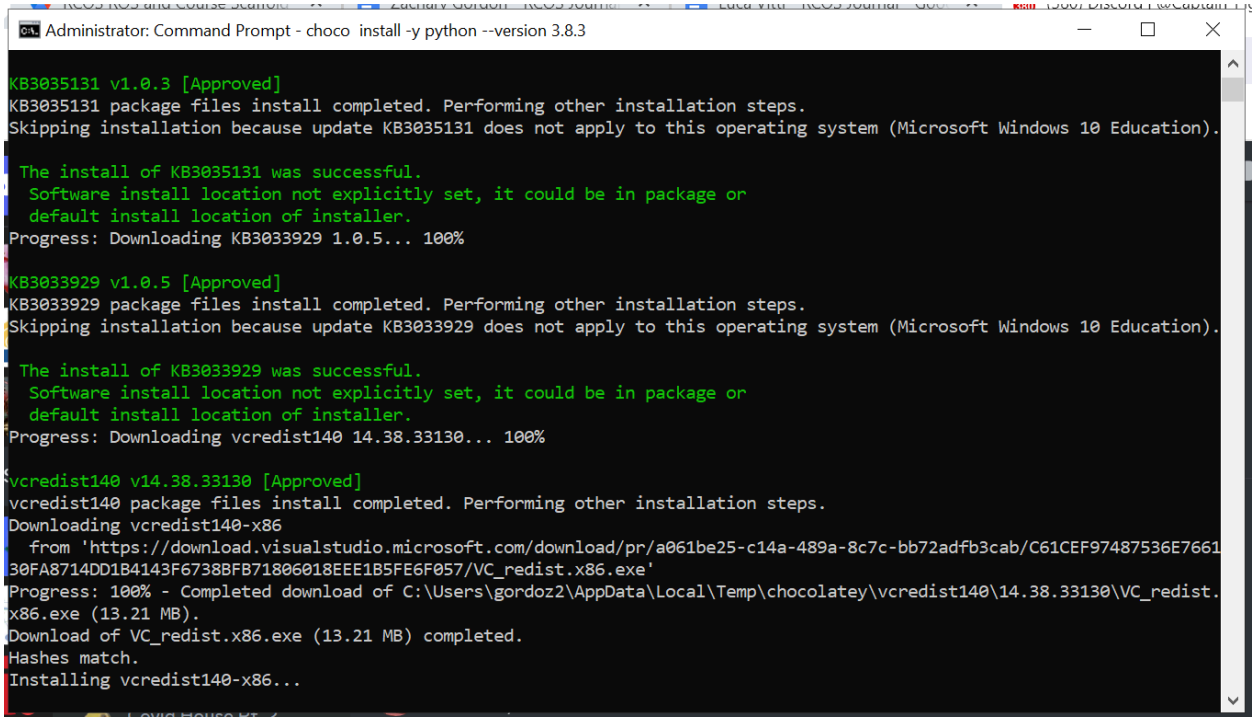
# Zachary Gordon - RCOS S24 Journal

## Date: 1/30/24

Today I followed Luca's YT guide for the ROS install. I was told nothing about the process, and I have never had ROS on my computer before, so I am a good test subject for the guide.

At the Python 3.8.3 installation step, my computer got hung up on the line "Installing vcredist140-x86". I let it sit for about 10 minutes, but it was unmoving. At that point I hit Ctrl+C, figuring I'd restart the step. Instead, it actually forced the process to move forward, and Python 3.8.3 installed successfully from there.




One difference between my computer and the guide is that my terminal told me I should reboot after the Chocolatey/Python 3.8.3 install. This may have had to do with the vcredist140 which got stuck. I did not reboot, and moved forward to attempt to follow the guide as closely as possible. The next step was a manual install of the C++ redistributables. Since vcredist140 had been installed automatically in the Python step, it did not get installed again, and a message appeared saying it was already installed.

During my installation, my computer sometimes did not allow copying of commands out of the Jupiter Notebook and into my Command Prompt window. I'm unsure if this was an issue specific to me.

Another question came up at the Visual Studio Installation Step. I already had an installation of VS 2022 on my laptop from years ago, and I'm sure it included some of the installed tools we didn't want. I attempted the download according to the instructions, and I found a difference. My download was only 5.15 GB, despite the fact I had everything checked as in the video. We probably should include some direct guidance for those who might already have a VS installation on their PC. Maybe make clear also that the version is VS Community 2019.

I ran into one other issue right at the end. In the video, a non-admin command prompt is opened for the listener while the admin (system32) command prompt is used for the caller. Doing this will mean that the listener cannot respond to the talker. It's a poor showcase and probably should be updated in the video. I tested using admin (system32) prompts for both the talker and listener and non-admin prompts for both the talker and listener. In each of these cases, ros2 responded as it should have.

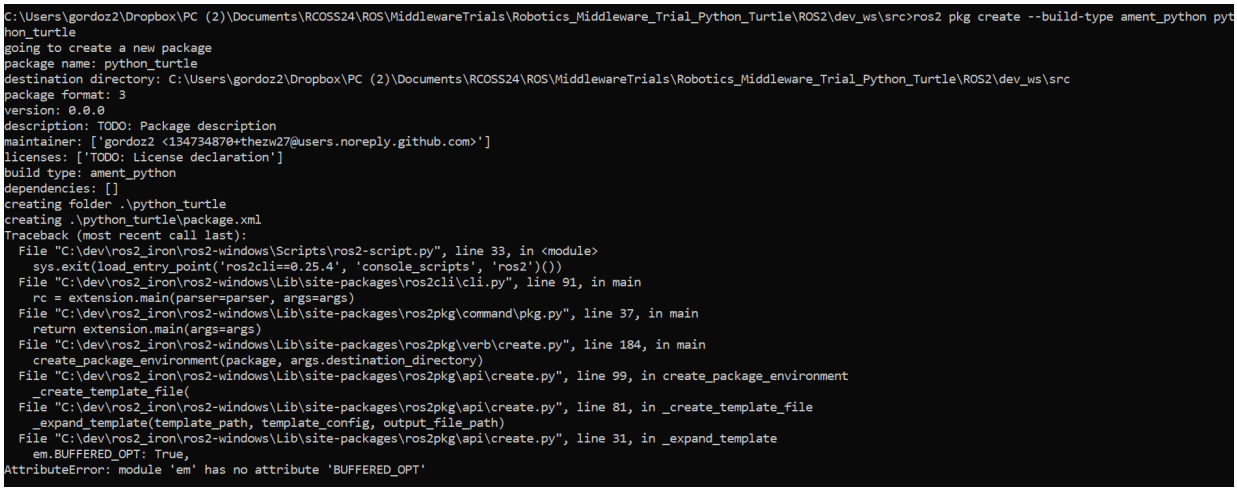
OVERALL REVIEW:
Using the video, I was able to install ros2 on Windows successfully. It was mostly very helpful, with good narration and showing every single step. Besides the few issues outlined in the notes above, my other comments have to do with small annoyances. The repeated editing of the Environment variables might be able to be streamlined into a single step. Constantly going in and out got old and took up a lot of time. The other thing to watch out for are some small inaccuracies in the video. Examples include the wrong pip command at 18:58, the wrong (non-universal) file size at 11:47, and the mentioned Command Prompt mismatch at 31:24. That last one especially needs to be updated, as the video ends with an instruction that will never work. We also might want to add a time estimate about the install - mine took nearly two hours.

## Date: 02/02/24

Following Instructions from
https://github.com/robotraconteur-contrib/Robotics_Middleware_Trial_Python_Turtle/blob/master/ROS2/Trial_instruction.md

1. Clone/pull the repository, you will need it to follow these steps.
    a. Use the repo URL https://github.com/robotraconteur-contrib/Robotics_Middleware_Trial_Python_Turtle.git
    b. Use either GitHub desktop or the command line to clone the repo to a local directory
2. Find and copy the absolute path to your local repository
3. Open x64 VS Command prompt as administrator

    a. Type “x64” in the Windows search Bar. “x64 Native Tools Command Prompt for VS 2019” should come up. Right click it, and select Run as Administrator.
4. Enter “cd PATH_TO_REPO\Robotics_Middleware_Trial_Python_Turtle>cd ROS2\dev_ws\src”
5. Assuming you installed ROS2 according to Luca’s directions, enter “call C:\dev\ros2_iron\ros2-windows\local_setup.bat”. Otherwise, enter “call C:\YOUR_PATH\ros2-windows\local_setup.bat” You may see the warning: "[rti_connext_dds_cmake_module][warning] RTI Connext DDS environment script not found (\resource\scripts\rtisetenv_x64Win64VS2017.bat). RTI Connext DDS will not be available at runtime, unless you already configured PATH manually." IGNORE IT
6. Run the command “pip install empy==3.3.4”
7. Type “ros2 pkg create --build-type ament_python python_turtle”. This creates a new directory in your src folder called python_turtle. You should see the following information:




8. Enter “ros2 pkg create --build-type ament_cmake turtle_interfaces”. This creates a new directory in your src folder called turtle_interfaces. You should see output

like the following:

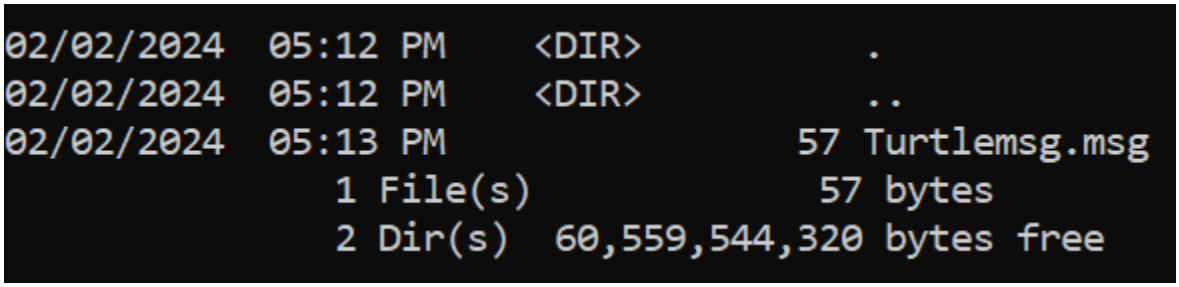
```
C:\Users\gordoz2\Dropbox\PC (2)\Documents\RCOSS24\ROS\MiddlewareTrials\Robotics_Middleware_Trial_Python_Turtle\ROS2\dev_ws\src>ros2 pkg create --build-type ament_cmake turt
le_interfaces
going to create a new package
package name: turtle_interfaces
destination directory: C:\Users\gordoz2\Dropbox\PC (2)\Documents\RCOSS24\ROS\MiddlewareTrials\Robotics_Middleware_Trial_Python_Turtle\ROS2\dev_ws\src
package format: 3
version: 0.0.0
description: TODO: Package description
maintainer: ['gordoz2 <134734870+thezw27@users.noreply.github.com>']
licenses: ['TODO: License declaration']
build type: ament_cmake
dependencies: []
creating folder .\turtle_interfaces
creating .\turtle_interfaces\package.xml
Traceback (most recent call last):
  File "C:\dev\ros2_iron\ros2-windows\Scripts\ros2-script.py", line 33, in <module>
    sys.exit(load_entry_point('ros2cli==0.25.4', 'console_scripts', 'ros2')())
  File "C:\dev\ros2_iron\ros2-windows\Lib\site-packages\ros2cli\cli.py", line 91, in main
    rc = extension.main(parser=parser, args=args)
  File "C:\dev\ros2_iron\ros2-windows\Lib\site-packages\ros2pkg\command\pkg.py", line 37, in main
    return extension.main(args=args)
  File "C:\dev\ros2_iron\ros2-windows\Lib\site-packages\ros2pkg\verb\create.py", line 184, in main
    create_package_environment(package, args.destination_directory)
  File "C:\dev\ros2_iron\ros2-windows\Lib\site-packages\ros2pkg\api\create.py", line 99, in create_package_environment
    _create_template_file(
  File "C:\dev\ros2_iron\ros2-windows\Lib\site-packages\ros2pkg\api\create.py", line 81, in _create_template_file
    _expand_template(template_path, template_config, output_file_path)
  File "C:\dev\ros2_iron\ros2-windows\Lib\site-packages\ros2pkg\api\create.py", line 31, in _expand_template
    em.BUFFERED_OPT: True,
AttributeError: module 'em' has no attribute 'BUFFERED_OPT'
```

9. Create a new directory named msg within your turtle_interfaces directory called “msg”. This can be accomplished from File Explorer or with the following commands (assuming you begin in your PATH_TO_REPO\Robotics_Middleware_Trial_Python_Turtle>cd ROS2\dev_ws\src directory)
    a. “cd turtle_interfaces”
    b. “mkdir msg”
10. Check whether the folder has been created by entering the command “dir”. You should see this output:

```
02/02/2024  05:01 PM    <DIR>          .
02/02/2024  05:01 PM    <DIR>          ..
02/02/2024  05:12 PM    <DIR>          msg
               0 File(s)              0 bytes
               3 Dir(s)  60,557,242,368 bytes free
```

11. Now, create a new file named “Turtlemsg.msg” inside of the new “msg” directory. To do this:
    a. Enter “cd msg”
    b. Enter “nul > Turtlemsg.msg”

12. Check whether the file has been created by entering the command “dir”. You should see this output (though your file should show 0 bytes):




13. Open Turtlemsg.msg in Visual Studio or some other editor. (To do this, you may have to right-click the file in File Explorer and change its default opening application). Enter this data into the file, then save and close:

```
string name
geometry_msgs/Pose turtle_pose
string color
```

## Date: 02/06/24

Continued translating/following Instructions from https://github.com/robotraconteur-contrib/Robotics_Middleware_Trial_Python_Turtle/blob/master/ROS2/Trial_instruction.md

NOTE: STEPS CONTINUED FROM ABOVE

14. Open the file “CMakeLists.txt” in the turtle_interfaces directory. Paste the following code into the file before the line “ament_package()” Do not delete any existing code. Be sure to save after editing the file.

```
find_package(geometry_msgs REQUIRED)
find_package(rosidl_default_generators REQUIRED)

rosidl_generate_interfaces(${PROJECT_NAME}
  "msg/Turtlemsg.msg"
  DEPENDENCIES geometry_msgs
)
```

15. Open the file “package.xml” under the turtle_interfaces directory. Paste the following code into the file between the line “</export>” and the line “</package>” Do not delete any existing code. Be sure to save after editing the file.

```
<build_depend>rosidl_default_generators</build_depend>
<depend>geometry_msgs</depend>

<exec_depend>rosidl_default_runtime</exec_depend>

<member_of_group>rosidl_interface_packages</member_of_group>
```

16. At this point, the Turtlemsg type should be built when building the package. These can be included like other ROS messages.

```
from python_turtle import Turtlemsg
from geometry_msgs import Pose
```

Turtlemsg objects are created like this:

```
turtle_msg=Turtlemsg()
turtle_msg.name="myturtle"
turtle_msg.turtle_pose=Pose()
turtle_msg.color="red"
```

17. Create a new folder in the turtle_interfaces directory called “srv”. This can be accomplished in the terminal with the following commands (assuming you begin in your PATH_TO_REPO\Robotics_Middleware_Trial_Python_Turtle>cd ROS2\dev_ws\src directory):
    a. “cd turtle_interfaces”
    b. “mkdir srv”
18. Now, navigate into the “srv” directory and create two new files, “Setpose.srv” and “Setcolor.srv”
    a. cd turtle_interfaces\srv
    b. nul > Setpose.srv
    c. nul > Setcolor.srv
19. In the file “Setpose.srv”, paste the following code:

```
geometry_msgs/PoseStamped turtle_pose
---
int8 ret
```

20. In the file “Setcolor.srv”, paste the following code:
    string color
    ---
    int8 ret

21. Open CMakeLists.txt in the turtle_interfaces directory. Add the following two lines between ”msg/Turtlemsg.msg” and “DEPENDENCIES geometry_msgs”. Be sure to save after editing the file.
    "srv/Setpose.srv"
    "srv/Setcolor.srv"

22. Assuming the same x64 terminal is still open and the ROS2 environment is set up (“call C:\YOUR_PATH\ros2-windows\local_setup.bat” in the ROS2 dev_ws directory if not), we are now ready to build the workspace and packages. Enter the following code:

    colcon build --merge-install

## Date: 02/09/24

Debugged colon issues

1. Need to do pip install -U colcon-common-extensions before step 22
2. Need to do pip install setuptools==58.2.0 before step 22