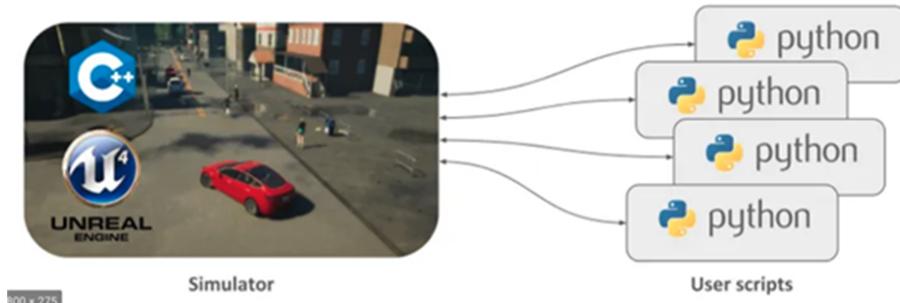


Carla Build (Ubuntu)

2020年10月20日 9:08

0. Overview



- Unreal engine 4: Unreal Engine is the world's most open and advanced real-time 3D creation platform for photoreal visuals and immersive experiences.
- Carla: Open-source simulator for autonomous driving research. (Based on the UE4)
- Python: The script language used by the client.
- Software version:
 - Ubuntu: 18.04 (or 16.04);
 - UE4: 4.24
 - Carla: 0.9.9.4
 - Python: 3.5 (or 3.6, 3.7)
- Hardware requirements:
 - CPU: i9 9900k
 - Disk: 100GB
 - Memory: 8G
 - GPU: 8G 1080Ti/2080Ti
- Carla build (ubuntu) step:
 - Dependencies
 - Unreal Engine
 - Carla build
 - Update the roadRunner plugin
 - Import our own map

https://carla.readthedocs.io/en/latest/build_linux/

1. Dependencies (Carla document)

Based on Ubuntu version (16.04 or 18.04)

Dependencies

CARLA needs many dependencies to run. Some of them are built automatically during this process, such as Boost.Python. Others are binaries that should be installed before starting the build (*cmake*, *clang*, different versions of *Python* and much more). In order to do so, run the commands below in a terminal window.

```
sudo apt-get update &&
sudo apt-get install wget software-properties-common &&
sudo add-apt-repository ppa:ubuntu-toolchain-r/test &&
wget -O - https://apt.llvm.org/llvm-snapshot.gpg.key|sudo apt-key add - &&
sudo apt-add-repository "deb http://apt.llvm.org/xenial/ llvm-toolchain-xenial-8 main" &&
sudo apt-get update
```

⚠ Warning

The following commands depend on your Ubuntu version. Make sure to choose accordingly.

Ubuntu 18.04.

```
sudo apt-get install build-essential clang-8 lld-8 g++-7 cmake ninja-build libvulkan1 python python-pip
pip2 install --user setuptools &&
pip3 install --user -Iv setuptools==47.3.1 &&
pip2 install --user distro &&
pip3 install --user distro
```

Previous Ubuntu versions.

```
sudo apt-get install build-essential clang-8 lld-8 g++-7 cmake ninja-build libvulkan1 python python-pip
pip2 install --user setuptools &&
pip3 install --user -Iv setuptools==47.3.1 &&
pip2 install --user distro &&
pip3 install --user distro
```

All Ubuntu systems.

To avoid compatibility issues between Unreal Engine and the CARLA dependencies, use the same compiler version and C++ runtime library to compile everything. The CARLA team uses clang-8 and LLVM's libc++. Change the default clang version to compile Unreal Engine and the CARLA dependencies.

```
sudo update-alternatives --install /usr/bin/clang++ clang++ /usr/lib/llvm-8/bin/clang++ 180 &&
sudo update-alternatives --install /usr/bin/clang clang /usr/lib/llvm-8/bin/clang 180
```

2. UE4 (carla document)

- Set the env variable
`export UE4_ROOT=~/UnrealEngine_4.24`
- Run UE4
`cd ~/UnrealEngine_4.24/Engine/Binaries/Linux && ./UE4Editor`

GitHub

1. Create a [GitHub](#) account. CARLA is organized in different GitHub repositories, so an account will be needed to clone said repositories.
2. Install [git](#) to manage the repositories via terminal.
3. Create an [Unreal Engine](#) account to access the Unreal Engine repositories, which are set to private.
4. Connect both your GitHub and Unreal Engine accounts. Go to your personal settings in there is a section in Unreal Engine's website. Click on [Connections > Accounts](#), and link both accounts. Here is a brief explanation just in case.

⚠ Warning

New Unreal Engine accounts need activation. After creating the account, a verification mail will be sent. Check it out, or the UE repository will be shown as non-existent in the following steps.

Unreal Engine

The current version of CARLA runs on **Unreal Engine 4.24** only. In this guide, the installation will be done in `~/UnrealEngine_4_24`, but the path can be changed. If your path is different, change the following commands accordingly.

⚠ Note

Alternatively to this section, there is another [guide](#) to build UE on Linux. When consulting it, remember that CARLA will need the **4.24 release**, not the latest.

1. Clone the content for Unreal Engine 4.24 in your local computer.

```
git clone --depth=1 -b 4.24 https://github.com/EpicGames/UnrealEngine.git ~/UnrealEngine_4_24
```

2. Get into the directory where UE4.24 has been cloned.

```
cd ~/UnrealEngine_4_24
```

3. Download a patch for Unreal Engine. This patch fixes some Vulkan visualization issues that may occur when changing the map. Download and install it with the following commands.

```
wget https://carla-releases.s3.eu-west-3.amazonaws.com/Linux/UE_Patch/430667-13636743-patch.txt
```

```
patch -p1 < 430667-13636743-patch.txt
```

⚠ Warning

If UE has already been built, install the patch, and make the build again.

4. Make the build. This may take an hour or two depending on your system.

```
./Setup.sh && ./GenerateProjectFiles.sh && make
```

5. Open the Editor to check that UE has been properly installed.

```
cd ~/UnrealEngine_4_24/Engine/Binaries/Linux && ./UE4Editor
```

Any issues this far are related with Unreal Engine. There is not much CARLA can do about it. However, the [build documentation](#) provided by Unreal Engine may be helpful.

3. Carla Build (Carla document)

• Carla version 0.9.9.4

git clone -b 0.9.9.4 <https://github.com/carla-simulator/carla>

• Run carla: make launch

Clone repository

[CARLA repository](#)

The official repository of the project. Either download and extract it, or clone the repository with the following command line.

```
git clone https://github.com/carla-simulator/carla
```

Now the latest state of the simulator, known as `master` branch in the repository, has been copied in local. Here is brief introduction to the most relevant branches of the repository. Remember that you can change and check your branches with the command `git branch`.

- `master` branch — Latest fixes and features that have been tested. These will be featured in the next CARLA release.
- `dev` branch — Latest fixes and features still in development and testing. This branch will be merged with `master` when the time for a new release comes.
- `stable` branch — Latest version of CARLA tagged as stable. Previous CARLA versions also have their own branch.

Get assets

Download the assets, as they are necessary to run CARLA. These are stored in a separated package to reduce the size of the build. A script downloads and extracts the latest stable assets automatically. The package is >3GB, so the download may take some time.

1. Get into your root carla directory. The path should correspond with the repository just cloned.

```
cd ~/carla
```

2. Run the script to get the assets.

```
./update.sh
```

4. Update the roadRunner plugin (Carla document)

https://carla.readthedocs.io/en/0.9.7/how_to_make_a_new_map/

- Put the RoadRunner folder into `~/Your path to carla/Unreal/CarlaUE4/Plugins`
- And make launch again

3 Importing into Unreal

This section is divided into two. The first part shows how to import a map from RoadRunner and the second part shows how to import a map from other software that generates .fbx and .obj files.



We have also created a new way to import assets into Unreal, check this [guide](#)!

3.1 Importing from RoadRunner

3.1.1 Plugin Installation

RoadRunner provides a series of plugins that make the importing simpler.

1. Locate the plugins under RoadRunner's installation folder:
/usr/src/RoadRunner/tools/RoadRunnerPlugins
2. Copy those folders to the CarlaUE4 plugins directory: /carla/unreal/CarlaUE4/Plugins/
3. Rebuild the plugin.

Rebuild on Windows

1. Generate project files.
 - Right-click the .slnproj file and generate Visual Studio project files.
2. Open the project and build the plugins.

Rebuild on Linux

```
> UDEV_KNOWN_GENERATEPROJECTFILESH -project=carla/unreal/CarlaUE4/CarlaUE4.slnproj -game=engine
```

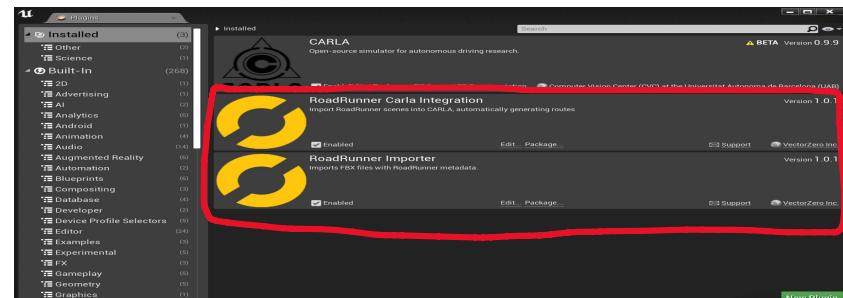
Finally, restart Unreal Engine and make sure the checkbox is on for both plugins: Edit > Plugins ...



Plugins

< > Home Car carla Unreal CarlaUE4 Plugins

Recent
Home
Desktop
Documents
Downloads
Music
Pictures
Videos
Trash



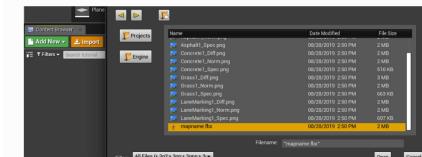
5. Import the new map

https://carla.readthedocs.io/en/0.9.7/how_to_make_a_new_map/

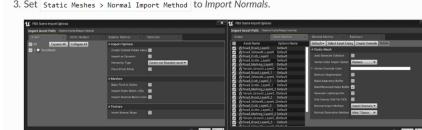
- Save as the new map and play

3.1.2 Importing

1. Import the mapname.fbx file to a new folder under /Content/Carla/Maps with the Import button.

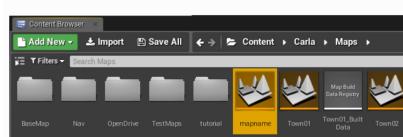


2. Set Scene > Hierarchy Type to Create One Blueprint Asset (selected by default).
3. Set Static Meshes > Normal Import Method to Import Normals.



4. Click Import.
5. Save the current level File > Save Current As... > mapname.

The new map should now appear next to the others in the Unreal Engine Content Browser.



And that's it! The map is ready!

