

# Package: pjrt.cuda (via r-universe)

October 10, 2026

**Title** CUDA Toolkit Libraries for 'pjrt'

**Version** 0.2.0

**Description** Provides the CUDA 13.3 native libraries required by the CUDA PJRT plugin used by the 'pjrt' package (CUDA runtime, cuBLAS, cuDNN, CUPTI, NVRTC, cuFFT, cuSOLVER, cuSPARSE, NvJitLink, NCCL, and NVCC). The package itself is lightweight; the CUDA components are downloaded as NVIDIA's official redistributable binaries from PyPI into a user cache directory the first time the package is loaded.

**SystemRequirements** Linux on x86\_64 or aarch64; an NVIDIA GPU driver at runtime.

**License** MIT + file LICENSE

**URL** <https://github.com/r-xla/pjrt.cuda>

**BugReports** <https://github.com/r-xla/pjrt.cuda/issues>

**Depends** R (>= 4.4.0)

**Imports** tools, utils

**Encoding** UTF-8

**OS\_type** unix

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**Repository** <https://r-xla.r-universe.dev>

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|                                |                                                     |
|--------------------------------|-----------------------------------------------------|
| <code>pjrt.cuda-package</code> | <i>pjrt.cuda: CUDA Toolkit Libraries for 'pjrt'</i> |
|--------------------------------|-----------------------------------------------------|

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Description

Provides the CUDA 13.3 native libraries required by the CUDA PJRT plugin used by the 'pjrt' package (CUDA runtime, cuBLAS, cuDNN, CUPTI, NVRTC, cuFFT, cuSOLVER, cuSPARSE, NvJitLink, NCCL, and NVCC). The package itself is lightweight; the CUDA components are downloaded as NVIDIA's official redistributable binaries from PyPI into a user cache directory the first time the package is loaded.

Installation of the CUDA components

The package itself is lightweight. The CUDA components (several GB) are downloaded from PyPI into `cuda_home()` the first time the package is loaded, or when `install_cuda()` is called. Whether loading the package may download them is controlled by the environment variable `PJRT_INSTALL`, which is shared with the `pjrt` package:

- `PJRT_INSTALL=1`: download without asking (e.g. CI, scripts, Docker builds).
- `PJRT_INSTALL=0`: never download.
- unset: ask for confirmation in an interactive session, do nothing in a non-interactive one.

Environment Variables

- `PJRT_INSTALL`: Whether loading the package may download the CUDA components, see above.
- `PJRT_CUDA_HOME`: Directory in which the CUDA components are installed. Defaults to `tools::R_user_dir("pjrt.cuda", "cache")`.
- `PJRT_CUDA_COMPONENTS`: Comma-separated list of components to install (default: all components), e.g. `"runtime,cublas,cudnn"`. A component's pinned version can be overridden with `@`, e.g. `"cudnn@9.10.0.56"`. Note that the `pjrt` CUDA backend requires all components to be present.

### Third-Party Licenses

The `pjrt.cuda` package itself is MIT-licensed. It does not bundle NVIDIA software; instead it downloads NVIDIA's official redistributable binaries from PyPI. Their use is governed by the [NVIDIA CUDA Toolkit EULA](#), with the exception of cuDNN, which is covered by the [NVIDIA cuDNN SLA](#), and NCCL, which is covered by its [own license](#). By downloading them you accept those terms.

### Author(s)

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### See Also

Useful links:

- <https://github.com/r-xla/pjrt.cuda>
- Report bugs at <https://github.com/r-xla/pjrt.cuda/issues>

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|          |                                            |
|----------|--------------------------------------------|
| bin_path | <i>Path to a CUDA Component's Binaries</i> |
|----------|--------------------------------------------|

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### Description

Returns the bin directory of a single CUDA component (e.g. `ptxas` for `"nvcc"`).

### Usage

```
bin_path(component)
```

### Arguments

|           |                                                                                                                                                                         |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| component | (character(1))<br>Component name (e.g., <code>"runtime"</code> , <code>"cublas"</code> , <code>"nvcc"</code> ). See <code>inst/components.tsv</code> for the full list. |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Value

(character(1))  
Path to the component's bin directory.

---

|           |                                                      |
|-----------|------------------------------------------------------|
| cuda_home | <i>Installation Directory of the CUDA Components</i> |
|-----------|------------------------------------------------------|

---

**Description**

Returns the directory into which the CUDA components are downloaded. This is `tools::R_user_dir("pjrt.cuda", "cache")` unless the environment variable `PJRT_CUDA_HOME` is set.

**Usage**

```
cuda_home()
```

**Value**

(character(1))  
Path to the installation directory (which may not exist yet).

---

|                |                                           |
|----------------|-------------------------------------------|
| cuda_installed | <i>Are the CUDA Components Installed?</i> |
|----------------|-------------------------------------------|

---

**Description**

Checks whether the CUDA components selected by `PJRT_CUDA_COMPONENTS` (default: all) are installed in [cuda\\_home\(\)](#) with the versions pinned by this version of the package.

**Usage**

```
cuda_installed()
```

**Value**

(logical(1))

---

|           |                                              |
|-----------|----------------------------------------------|
| cuda_path | <i>Path to a CUDA Component Installation</i> |
|-----------|----------------------------------------------|

---

**Description**

Returns the installation root of a single CUDA component.

**Usage**

cuda\_path(component)

**Arguments**

|           |                                                                                                                  |
|-----------|------------------------------------------------------------------------------------------------------------------|
| component | (character(1))<br>Component name (e.g., "runtime", "cublas", "nvcc"). See inst/components.tsv for the full list. |
|-----------|------------------------------------------------------------------------------------------------------------------|

**Value**

(character(1))  
Path to the installed component files.

---

|              |                                           |
|--------------|-------------------------------------------|
| include_path | <i>Path to a CUDA Component's Headers</i> |
|--------------|-------------------------------------------|

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**Description**

Returns the include directory of a single CUDA component.

**Usage**

include\_path(component)

**Arguments**

|           |                                                                                                                  |
|-----------|------------------------------------------------------------------------------------------------------------------|
| component | (character(1))<br>Component name (e.g., "runtime", "cublas", "nvcc"). See inst/components.tsv for the full list. |
|-----------|------------------------------------------------------------------------------------------------------------------|

**Value**

(character(1))  
Path to the component's include directory.

---

|              |                                    |
|--------------|------------------------------------|
| install_cuda | <i>Install the CUDA Components</i> |
|--------------|------------------------------------|

---

### Description

Downloads the CUDA components from PyPI and unpacks them into `cuda_home()`. This runs automatically when the package is loaded (see [pjrt.cuda-package](#) for how to control that), so calling it manually is only needed to force a reinstallation or to install in a session where automatic downloads are disabled.

Which components are installed is controlled by the environment variable PJRT\_CUDA\_COMPONENTS, see [pjrt.cuda-package](#).

### Usage

```
install_cuda(reinstall = FALSE)
```

### Arguments

|           |              |
|-----------|--------------|
| reinstall | (logical(1)) |
|-----------|--------------|

Whether to reinstall even if the components are already installed.

### Value

|                |
|----------------|
| (character(1)) |
|----------------|

The installation directory, invisibly.

---

|          |                                             |
|----------|---------------------------------------------|
| lib_path | <i>Path to the Shared Library Directory</i> |
|----------|---------------------------------------------|

---

### Description

All CUDA component shared libraries are installed into a single directory, which this function returns.

### Usage

```
lib_path()
```

### Value

|                |
|----------------|
| (character(1)) |
|----------------|

Path to the lib directory.

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