Julia 社区、包注册及镜像介绍

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Julia 中文社区

由 Julia 开源社区下中文开发者自发形成的组织，致力于为 Julia 编程语言在中文语言圈的发展提供更好的土壤，这包括：主页和文档的本地化、中文社区论坛与 QQ 群的学习交流和分享、协助在国内架设镜像站来帮助用户更好的网络体验、以及定期组织一些会议和见面会。

中文主页：https://cn.julialang.org/
中文文档：https://docs.juliacn.com/latest/
中文论坛：https://discourse.juliacn.com/
QQ 群：316628299

开源镜像站：BFSU、TUNA、OpenTUNA、SJTUG、USTC、SUSTech

开源学生培训计划：OSPP（开源供应链点亮计划）、GSoC（Google Summer of Code）
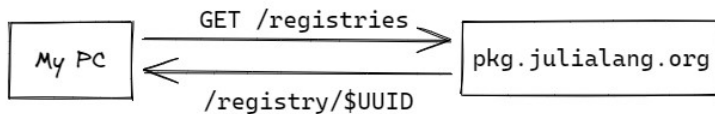
包注册表以及镜像介绍

Pkg.add 背后发生了什么?

```
(@v1.7) pkg> add DataFrames
    Updating registry at `C:\Users\jc\.julia\registries\General.toml`
  Resolving package versions...
  Installed Tables ————————— v1.6.0
  Installed PooledArrays — v1.4.0
  Installed DataFrames ————— v1.3.0
  Installed PrettyTables — v1.2.3
    Updating `C:\Users\jc\.julia\environments\v1.7\Project.toml`
  [a93c6f00] + DataFrames v1.3.0
    Updating `C:\Users\jc\.julia\environments\v1.7\Manifest.toml`
  [a93c6f00] + DataFrames v1.3.0
  [e2d170a0] + DataValueInterfaces v1.0.0
  [59287772] + Formatting v0.4.2
  [41ab1584] + InvertedIndices v1.1.0
  [82899510] + IteratorInterfaceExtensions v1.0.0
  [2dfb63ee] + PooledArrays v1.4.0
  [08abe8d2] + PrettyTables v1.2.3
  [3783bdb8] + TableTraits v1.0.1
  [bd369af6] + Tables v1.6.0
  [9fa8497b] + Future
Precompiling project...
```

1. 下载最新的注册表
2. 去注册表里查找 DataFrames 及其依赖的信息（版本、UUID、下载地址等）
3. 解析满足要求的 DataFrames 及其依赖的版本
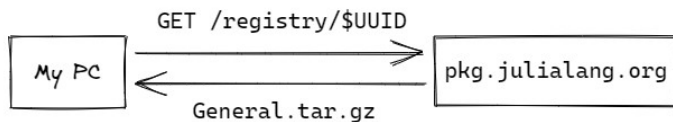4. 下载全部需要的包 （for-loop）

包注册表以及镜像介绍

1. Ask for registry

GET /registries

My PC ← → pkg.julialang.org

/registry/$UUID

```
(base) jc@JC-win11:~$ curl -L https://pkg.julialang.org/registries
/registry/23338594-aafe-5451-b93e-139f81909106/32e1070c18b882bb01dbc798a3a44a623ea39fa9
```

General

2. Download registry

GET /registry/$UUID

My PC ← → pkg.julialang.org

General.tar.gz

```
(base) jc@JC-win11:~/JuliaCN2021$ curl -L https://pkg.julialang.org/registry/23338594-aafe-5451-b93e-139
9106/32e1070c18b882bb01dbc798a3a44a623ea39fa9 -o General.tar.gz
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
  0     0    0     0    0     0      0      0 --:--:--  0:00:02 --:--:--     0
100 3919k  100 3919k    0     0   855k      0  0:00:04  0:00:04 --:--:-- 1807k
(base) jc@JC-win11:~/JuliaCN2021$ du -sh *
3.9M    General.tar.gz
(base) jc@JC-win11:~/JuliaCN2021$ tar -xzf General.tar.gz
(base) jc@JC-win11:~/JuliaCN2021$ head Registry.toml
name = "General"
uuid = "23338594-aafe-5451-b93e-139f81909106"
repo = "https://github.com/JuliaRegistries/General.git"

description = """
Official general Julia package registry where people can
register any package they want without too much debate about
naming and without enforced standards on documentation or
testing. We nevertheless encourage documentation, testing and
some amount of consideration when choosing package names.
(base) jc@JC-win11:~/JuliaCN2021$ ls
A  C             D F  General.tar.gz  I K  LICENSE.md  N P  R        Registry.toml  T V X Z
B  CONTRIBUTING.md  E G H              J L M            O Q  README.md  S              U W Y
```

https://github.com/JuliaLang/General.git

包注册表以及镜像介绍

3. query the registry

```
(base) jc@JC-win11:~/JuliaCN2021$ tree -L 3 | head -n 12
├── A
│   ├── AAindex
│   │   ├── Compat.toml
│   │   ├── Deps.toml
│   │   ├── Package.toml
│   │   └── Versions.toml
│   ├── ABC_jll
│   │   ├── Compat.toml
│   │   ├── Deps.toml
│   │   ├── Package.toml
│   │   └── Versions.toml
```

DataFrames v1.3.0

    UUID: a93c6f00-e57d-5684-b7b6-d8193f3e46c0
    HASH: 2e993336a3f68216be91eb8ee4625ebbaba19147

```
(base) jc@JC-win11:~/JuliaCN2021$ ls D/DataFrames/
Compat.toml  Deps.toml  Package.toml  Versions.toml
(base) jc@JC-win11:~/JuliaCN2021$ tail D/DataFrames/Versions.toml
git-tree-sha1 = "1dadfca11c0e08e03ab15b63aaeda55266754bad"

["1.2.1"]
git-tree-sha1 = "a19645616f37a2c2c3077a44bc0d3e73e13441d7"

["1.2.2"]
git-tree-sha1 = "d785f42445b63fc86caa08bb9a9351008be9b765"

["1.3.0"]
git-tree-sha1 = "2e993336a3f68216be91eb8ee4625ebbaba19147"
(base) jc@JC-win11:~/JuliaCN2021$ head D/DataFrames/Package.toml
name = "DataFrames"
uuid = "a93c6f00-e57d-5684-b7b6-d8193f3e46c0"
repo = "https://github.com/JuliaData/DataFrames.jl.git"
```
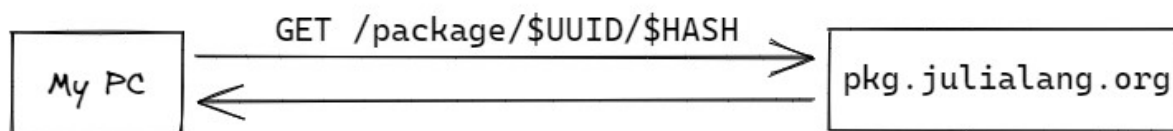
包注册表以及镜像介绍

4. download the package

My PC → GET /package/$UUID/$HASH → pkg.julialang.org

```
(base) jc@JC-win11:~/JuliaCN2021$ curl -L https://pkg.julialang.org/package/a93c6f00-e57d-5684-b7b6-d8193f3e4
6c0/2e993336a3f68216be91eb8ee4625ebbaba19147 -o DataFrames@1.3.0.tar.gz
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
    0     0    0     0    0     0      0      0 --:--:--  0:00:01 --:--:--     0
100  412k  100  412k    0     0    166k      0  0:00:02  0:00:02 --:--:--   335k
(base) jc@JC-win11:~/JuliaCN2021$ du -sh *
416K    DataFrames@1.3.0.tar.gz
(base) jc@JC-win11:~/JuliaCN2021$ tar -xzf DataFrames@1.3.0.tar.gz
(base) jc@JC-win11:~/JuliaCN2021$ ls
CONTRIBUTING.md            LICENSE.md   Project.toml   benchmarks   src
DataFrames@1.3.0.tar.gz  NEWS.md       README.md       docs         test
(base) jc@JC-win11:~/JuliaCN2021$ head Project.toml
name = "DataFrames"
uuid = "a93c6f00-e57d-5684-b7b6-d8193f3e46c0"
version = "1.3.0"

[deps]
Compat = "34da2185-b29b-5c13-b0c7-acf172513d20"
DataAPI = "9a962f9c-6df0-11e9-0e5d-c546b8b5ee8a"
Future = "9fa8497b-333b-5362-9e8d-4d0656e87820"
InvertedIndices = "41ab1584-1d38-5bbf-9106-f11c6c58b48f"
IteratorInterfaceExtensions = "82899510-4779-5014-852e-03e436cf321d"
```

包注册表以及镜像介绍

Package protocol

服务器端 API

注册表: /registry/$uuid/$hash

包: /package/$uuid/$hash

二进制依赖: /artifact/$hash

CUDA_jll

本地: 存放在 ~/.julia/ 目录下

注册表: /registries/$name.tar.gz

包: /packages/$name/$short_hash

二进制依赖: /artifacts/$hash

*所有内容都是 tar.gz 格式

包注册表以及镜像介绍

Package protocol

服务器端 API

注册表: /registry/$uuid

包: /package/$uuid/$hash

二进制依赖: /artifact/$hash

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注册表: /registries/$name.tar.gz

包: /packages/$name/$short_hash

二进制依赖: /artifacts/$hash

所以什么是镜像?

*所有内容都是 tar.gz 格式

包注册表以及镜像介绍

北京外国语大学开源软件镜像站

Index of /julia/

File Name ↓	File Size ↓
Parent directory/	-
artifact/	-
package/	-
registry/	-
static/	-
failed_resources.txt	223.2 KiB
registries	88 B

所以什么是镜像？

*所

包注册表以及镜像介绍

使用镜像：设置环境变量 JULIA_PKG_SERVER

BASH

包注册表以及镜像介绍

使用镜像：设置环境变量 JULIA_PKG_SERVER

```
julia> ENV["JULIA_PKG_SERVER"] = "https://mirrors.sjtug.sjtu.edu.cn/julia"
"https://mirrors.sjtug.sjtu.edu.cn/julia"

julia> versioninfo()
Julia Version 1.7.0
Commit 3bf9d17731 (2021-11-30 12:12 UTC)
Platform Info:
  OS: Linux (x86_64-pc-linux-gnu)
  CPU: 12th Gen Intel(R) Core(TM) i9-12900K
  WORD_SIZE: 64
  LIBM: libopenlibm
  LLVM: libLLVM-12.0.1 (ORCJIT, goldmont)
Environment:
  JULIA_PKG_SERVER = https://mirrors.sjtug.sjtu.edu.cn/julia
  JULIA_NUM_THREADS = 16
```

Julia 内部

包注册表以及镜像介绍

使用镜像：借助 PkgServerClient – 每次打开 Julia 时将"最近"的镜像站作为下载上游

```
julia> versioninfo()
Julia Version 1.7.0
Commit 3bf9d17731 (2021-11-30 12:12 UTC)
Platform Info:
  OS: Linux (x86_64-pc-linux-gnu)
  CPU: 12th Gen Intel(R) Core(TM) i9-12900K
  WORD_SIZE: 64
  LIBM: libopenlibm
  LLVM: libLLVM-12.0.1 (ORCJIT, goldmont)
Environment:
  JULIA_NUM_THREADS = 16
```

```
julia> using PkgServerClient

julia> versioninfo()
Julia Version 1.7.0
Commit 3bf9d17731 (2021-11-30 12:12 UTC)
Platform Info:
  OS: Linux (x86_64-pc-linux-gnu)
  CPU: 12th Gen Intel(R) Core(TM) i9-12900K
  WORD_SIZE: 64
  LIBM: libopenlibm
  LLVM: libLLVM-12.0.1 (ORCJIT, goldmont)
Environment:
  JULIA_NUM_THREADS = 16
  JULIA_PKG_SERVER = https://mirrors.bfsu.edu.cn/julia
```

Tip: 可以将 using PkgServerClient 添加到 ~/.julia/config/startup.jl 里

包注册表以及镜像介绍

使用镜像: 借助 PkgServerClient – 将"最近"的镜像站作为下载上游

```
julia> versioninfo          julia> PkgServerClient.registry_response_time()
Julia Version 1.7.          Dict{String, Float64} with 9 entries:     nt
Commit 3bf9d17731             "BFSU"        => 0.254528
Platform Info:                "OpenTUNA"    => 0.170882
  OS: Linux (x86_6            "ISCAS"       => 0.293369              -30 12:12 UTC)
  CPU: 12th Gen In            "SJTUG"       => 0.183159
  WORD_SIZE: 64               "SUSTech"     => 0.13177               ux-gnu)
  LIBM: libopenlib            "TUNA"        => Inf                   ore(TM) i9-12900K
  LLVM: libLLVM-12            "USTC"        => 0.211151
Environment:                  "JuliaLang"   => Inf                   CJIT, goldmont)
  JULIA_NUM_THREAD            "NJU"         => 0.156597
                                                                    ://mirrors.bfsu.edu.cn/julia
```

Tip: 可以将 using PkgServerClient 添加到 ~/.julia/config/startup.jl 里