Package 'gbifdb'

October 19, 2023

Version 1.0.0

Title High Performance Interface to 'GBIF'

Description A high performance interface to the Global Biodiversity
Information Facility, 'GBIF'. In contrast to 'rgbif', which can
access small subsets of 'GBIF' data through web-based queries to
a central server, 'gbifdb' provides enhanced performance for R users
performing large-scale analyses on servers and cloud computing
providers, providing full support for arbitrary 'SQL' or 'dplyr'
operations on the complete 'GBIF' data tables (now over 1 billion
records, and over a terabyte in size). 'gbifdb' accesses a copy
of the 'GBIF' data in 'parquet' format, which is already readily
available in commercial computing clouds such as the Amazon Open
Data portal and the Microsoft Planetary Computer, or can be
accessed directly without downloading, or downloaded
to any server with suitable bandwidth and storage space.
The high-performance techniques for local and remote access
are described in <https://duckdb.org/why_duckdb>
and <https://arrow.apache.org/docs/r/articles/fs.html> respectively.

License Apache License (>= 2)

Encoding UTF-8

ByteCompile true

Depends R (>= 4.0)

Imports arrow (>= 8.0.0), dplyr, duckdbfs

Suggests spelling, dbplyr, testthat (>= 3.0.0), covr, knitr,
rmarkdown, minioclient

URL https://docs.ropensci.org/gbifdb/,
https://github.com/ropensci/gbifdb

BugReports https://github.com/ropensci/gbifdb

Language en-US

RoxygenNote 7.2.3

Config/testthat/edition 3

VignetteBuilder knitr

NeedsCompilation no

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Repository CRAN

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R topics documented:

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gbif_dir   *Default storage location*

Description

Default location can be set with the env var GBIF_HOME, otherwise will use the default provided by tools::R_user_dir()

Usage

```
gbif_dir()
```

Value

path to the gbif home directory directory

Examples

```
gbif_dir()
```

| gbif_download | *Download GBIF data using minioclient* |

Description

Sync a local directory with selected release of the AWS copy of GBIF

Usage

```
gbif_download(
  version = gbif_version(),
  dir = gbif_dir(),
  bucket = gbif_default_bucket(),
  region = ""
)
```

Arguments

version	Release date (YYYY-MM-DD) which should be synced. Will detect latest version by default.
dir	path to local directory where parquet files should be stored. Fine to leave at default, see gbif_dir().
bucket	Name of the regional S3 bucket desired. Default is "gbif-open-data-us-east-1". Select a bucket closer to your compute location for improved performance, e.g. European researchers may prefer "gbif-open-data-eu-central-1" etc.
region	bucket region (usually ignored? Just set the bucket appropriately)

Details

Sync parquet files from GBIF public data catalog, https://registry.opendata.aws/gbif/.

Note that data can also be found on the Microsoft Cloud, https://planetarycomputer.microsoft.com/dataset/gbif

Also, some users may prefer to download this data using an alternative interface or work on a cloud-host machine where data is already available. Note, these data include all CC0 and CC-BY licensed data in GBIF that have coordinates which passed automated quality checks, see https://github.com/gbif/occurrence/blob/master/aws-public-data.md.

Value

logical indicating success or failure.

Examples

```
gbif_download()
```

---

gbif_example_data   *Return a path to the directory containing GBIF example parquet data*

Description

Return a path to the directory containing GBIF example parquet data

Usage

```
gbif_example_data()
```

Details

example data is taken from the first 1000 rows of the 2011-11-01 release of the parquet data.

Value

path to the example occurrence data installed with the package.

Examples

```
gbif_example_data()
```

---

gbif_local   *Local connection to a downloaded GBIF Parquet database*

Description

Local connection to a downloaded GBIF Parquet database

Usage

```
gbif_local(
  dir = gbif_parquet_dir(version = gbif_version(local = TRUE)),
  tblname = "gbif",
  backend = c("arrow", "duckdb"),
  safe = TRUE
)
```

Arguments

dir	location of downloaded GBIF parquet files
tblname	name for the database table
backend	choose duckdb or arrow.
safe	logical. Should we exclude columns mediatype and issue? (default TRUE). varchar datatype on these columns substantially slows downs queries.

Details

A summary of this GBIF data, along with column meanings can be found at `https://github.com/gbif/occurrence/blob/master/aws-public-data.md`

Value

a remote tibble `tbl_sql` class object

Examples

```
gbif <- gbif_local(gbif_example_data())
```

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gbif_remote   *gbif remote*

Description

Connect to GBIF remote directly. Can be much faster than downloading for one-off use or when using the package from a server in the same region as the data. See Details.

Usage

```
gbif_remote(
  version = gbif_version(),
  bucket = gbif_default_bucket(),
  safe = TRUE,
  unset_aws = getOption("gbif_unset_aws", TRUE),
  endpoint_override = Sys.getenv("AWS_S3_ENDPOINT", "s3.amazonaws.com"),
  backend = c("arrow", "duckdb"),
  ...
)
```

Arguments

version	GBIF snapshot date
bucket	GBIF bucket name (including region). A default can also be set using the option `gbif_default_bucket`, see options.
safe	logical, default TRUE. Should we exclude columns `mediatype` and `issue`? varchar datatype on these columns substantially slows downs queries.
unset_aws	Unset AWS credentials? GBIF is provided in a public bucket, so credentials are not needed, but having a AWS_ACCESS_KEY_ID or other AWS environmental variables set can cause the connection to fail. By default, this will unset any set environmental variables for the duration of the R session. This behavior can also be turned off globally by setting the option `gbif_unset_aws` to FALSE (e.g. to use an alternative network endpoint)

endpoint_override

                optional parameter to `arrow::s3_bucket()`

backend   duckdb or arrow

...   additional parameters passed to the `arrow::s3_bucket()`

Details

Query performance is dramatically improved in queries that return only a subset of columns. Consider using explicit `select()` commands to return only the columns you need.

A summary of this GBIF data, along with column meanings can be found at `https://github.com/gbif/occurrence/blob/master/aws-public-data.md`

Value

a remote tibble `tbl_sql` class object.

Examples

```
gbif <- gbif_remote()
gbif()
```

---

gbif_version   *Get the latest gbif version string*

Description

Can also return latest locally downloaded version, or list all versions

Usage

```
gbif_version(
  local = FALSE,
  dir = gbif_dir(),
  bucket = gbif_default_bucket(),
  all = FALSE,
  ...
)
```

Arguments

local   Search only local versions? logical, default FALSE.

dir   local directory (`gbif_dir()`)

bucket   Which remote bucket (region) should be checked

all   show all versions? (logical, default FALSE)

...   additional arguments to arrow::s3_bucket

Details

A default version can be set using option `gbif_default_version`

Value

latest available gbif version, string

Examples

```
## Latest local version available:
gbif_version(local=TRUE)
## default version
options(gbif_default_version="2021-01-01")
gbif_version()

## Latest online version available:
gbif_version()
## All online versions:
gbif_version(all=TRUE)
```

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