Package 'AzureCosmosR'

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Title Interface to the 'Azure Cosmos DB' 'NoSQL' Database Service

Version 1.0.0

Description An interface to 'Azure CosmosDB': <https://azure.microsoft.com/en-us/services/cosmos-db/>. On the admin side, 'AzureCosmosR' provides functionality to create and manage 'Cosmos DB' instances in Microsoft's 'Azure' cloud. On the client side, it provides an interface to the 'Cosmos DB' SQL API, letting the user store and query documents and attachments in 'Cosmos DB'. Part of the 'AzureR' family of packages.

URL https://github.com/Azure/AzureCosmosR

https://github.com/Azure/AzureR

BugReports https://github.com/Azure/AzureCosmosR/issues

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R topics documented:

`az_cosmosdb` *Azure Cosmos DB account class*

Description

Class representing an Azure Cosmos DB account. For working with the data inside the account, see cosmos_endpoint and cosmos_database.

Methods

The following methods are available, in addition to those provided by the AzureRMR::az_resource class:

- `list_keys(read_only=FALSE)`: Return the access keys for this account.
- `regen_key(kind)`: Regenerate (change) an access key. `kind` should be one of "primary", "secondary", "primaryReadonly" or "secondaryReadonly".
- `get_endpoint(interface, ...)`: Return a default endpoint object for interacting with the data. See 'Endpoints' below.
- `get_sql_endpoint(key, key_type)`: Return an object representing the core (SQL) endpoint of the account.
- `get_table_endpoint(key)`: Return an object representing the table storage endpoint of the account.
- `get_mongo_endpoint(collection, key, mongo_options)`: Return an object representing the MongoDB enpoint of the account.

Details

Initializing a new object of this class can either retrieve an existing Cosmos DB resource, or create a new resource on the host. Generally, the best way to initialize an object is via the `get_cosmosdb_account` or `create_cosmosdb_account` methods of the AzureRMR::az_resource_group class, which handle the details automatically.

Endpoints

Azure Cosmos DB provides multiple APIs for accessing the data stored within the account. You choose at account creation the API that you want to use: core (SQL), table storage, Mongo DB, Apache Cassandra, or Gremlin. The following methods allow you to create an endpoint object corresponding to these APIs.

- `get_endpoint(interface=NULL, ...)`: Return an endpoint object for interacting with the data. The default `interface=NULL` will choose the interface that you selected at account creation. Otherwise, set `interface` to one of "sql", "table", "mongo", "cassandra" or "gremlin" to create an endpoint object for that API. It's an error to select an interface that the Cosmos DB account doesn't actually provide.
- `get_sql_endpoint(key, key_type=c("master", "resource"))`: Return an endpoint object for the core (SQL) API, of class cosmos_endpoint. A master key provides full access to all the data in the account; a resource key provides access only to a chosen subset of the data.
- `get_table_endpoint(key)`: Return an endpoint object for the table storage API, of class AzureTableStor::table_endpoint.
- `get_mongo_endpoint(key, mongo_options)`: Return an endpoint object for the MongoDB API, of class cosmos_mongo_endpoint. `mongo_options` should be an optional named list of parameters to set in the connection string.

Note that AzureCosmosR provides a client framework only for the SQL API. To use the table storage API, you will also need the AzureTableStor package, and to use the MongoDB API, you will need the mongolite package. Currently, the Cassandra and Gremlin APIs are not supported.

As an alternative to AzureCosmosR, you can also use the ODBC protocol to interface with the SQL API. By installing a suitable ODBC driver, you can then talk to Cosmos DB in a manner similar to other SQL databases. An advantage of the ODBC interface is that it fully supports cross-partition queries, unlike the REST API. A disadvantage is that it does not support nested document fields; functions like `array_contains()` cannot be used, and attempts to reference arrays and objects may return incorrect results.

See Also

get_cosmosdb_account, create_cosmosdb_account, delete_cosmosdb_account

cosmos_endpoint, cosmos_database, cosmos_container, query_documents, cosmos_mongo_endpoint, AzureTableStor::table_endpoint, mongolite::mongo

`bulk_delete` *Delete a set of documents from an Azure Cosmos DB container*

Description

Delete a set of documents from an Azure Cosmos DB container

Usage

```
bulk_delete(container, ...)

## S3 method for class 'cosmos_container'
bulk_delete(
  container,
  query,
  partition_key,
  procname = "_AzureCosmosR_bulkDelete",
  headers = list(),
  ...
)
```

Arguments

`container`	A Cosmos DB container object, as obtained by `get_cosmos_container` or `create_cosmos_container`.
`query`	A query specifying which documents to delete.
`partition_key`	Optionally, limit the deletion only to documents with this key value.
`procname`	The stored procedure name to use for the server-side import code. Change this if, for some reason, the default name is taken.
`headers, ...`	Optional arguments passed to lower-level functions.

Details

This is a convenience function to delete multiple documents from a container. It works by creating a stored procedure and then calling it with the supplied query as a parameter. This function is not meant for production use.

Value

The number of rows deleted.

See Also

bulk_import, cosmos_container

Examples

```
## Not run:

endp <- cosmos_endpoint("https://myaccount.documents.azure.com:443/", key="mykey")
db <- get_cosmos_database(endp, "mydatabase")
cont <- create_cosmos_container(db, "mycontainer", partition_key="sex")

 # importing the Star Wars data from dplyr
bulk_import(cont, dplyr::starwars)

# deleting a subset of documents
bulk_delete(cont, "select * from mycontainer c where c.gender = 'masculine'")

# deleting documents for a specific partition key value
bulk_delete(cont, "select * from mycontainer", partition_key="male")

# deleting all documents
bulk_delete(cont, "select * from mycontainer")


## End(Not run)
```

`bulk_import` *Import a set of documents to an Azure Cosmos DB container*

Description

Import a set of documents to an Azure Cosmos DB container

Usage

```
bulk_import(container, ...)

## S3 method for class 'cosmos_container'
bulk_import(
  container,
  data,
  init_chunksize = 1000,
  verbose = TRUE,
  procname = "_AzureCosmosR_bulkImport",
  ...
)
```

Arguments

`container`	A Cosmos DB container object, as obtained by `get_cosmos_container` or `create_cosmos_container`.
`...`	Optional arguments passed to lower-level functions.

`data`	The data to import. Can be a data frame, or a string containing JSON text.
`init_chunksize`	The number of rows to import per chunk. `bulk_import` can adjust this number dynamically based on observed performance.
`verbose`	Whether to print updates to the console as the import progresses.
`procname`	The stored procedure name to use for the server-side import code. Change this if, for some reason, the default name is taken.

Details

This is a convenience function to import a dataset into a container. It works by creating a stored procedure and then calling it in a loop, passing the to-be-imported data in chunks. The dataset must include a column for the container's partition key or an error will result.

Note that this function is not meant for production use. In particular, if the import fails midway through, it will not clean up after itself: you should call `bulk_delete` to remove the remnants of a failed import.

Value

A list containing the number of rows imported, for each value of the partition key.

See Also

bulk_delete, cosmos_container

Examples

```
## Not run:

endp <- cosmos_endpoint("https://myaccount.documents.azure.com:443/", key="mykey")
db <- get_cosmos_database(endp, "mydatabase")
cont <- create_cosmos_container(db, "mycontainer", partition_key="sex")

# importing the Star Wars data from dplyr
# notice that rows with sex=NA are not imported
bulk_import(cont, dplyr::starwars)

# importing from a JSON file
writeLines(jsonlite::toJSON(dplyr::starwars), "starwars.json")
bulk_import(cont, "starwars.json")


## End(Not run)
```

cosmos_endpoint *Client endpoint for Azure Cosmos DB core API*

Description

Client endpoint for Azure Cosmos DB core API

Usage

```
cosmos_endpoint(
  host,
  key,
  key_type = c("master", "resource"),
  api_version = getOption("azure_cosmosdb_api_version")
)

call_cosmos_endpoint(
  endpoint,
  path,
  resource_type,
  resource_link,
  options = list(),
  headers = list(),
  body = NULL,
  encode = "json",
  do_continuations = TRUE,
  http_verb = c("GET", "DELETE", "PUT", "POST", "PATCH", "HEAD"),
  num_retries = 10,
  ...
)

process_cosmos_response(response, ...)

## S3 method for class 'response'
process_cosmos_response(
  response,
  http_status_handler = c("stop", "warn", "message", "pass"),
  return_headers = NULL,
  simplify = FALSE,
  ...
)

## S3 method for class 'list'
process_cosmos_response(
  response,
  http_status_handler = c("stop", "warn", "message", "pass"),
  return_headers = NULL,
```

```
  simplify = FALSE,
  ...
)
```

Arguments

host	For cosmos_endpoint, the host URL for the endpoint. Typically of the form https://{account-name}.documents.azure.com:443/ (note the port number).
key	For cosmos_endpoint, a string containing the password for the endpoint. This can be either a master key or a resource token.
key_type	For cosmos_endpoint, the type of the key, either "master" or "resource".
api_version	For cosmos_endpoint, the API version to use.
endpoint	For call_cosmos_endpoint, a Cosmos DB endpoint object, as returned by cosmos_endpoint.
path	For call_cosmos_endpoint, the path in the URL for the endpoint call.
resource_type	For call_cosmos_endpoint, the type of resource: for example, "dbs" for a database, "colls" for a collection (container), "docs" for a document, etc.
resource_link	For call_cosmos_endpoint, a string to pass to the API for authorization purposes. See the Cosmos DB API documentation for more information.
options	For call_cosmos_endpoint, query options to include in the request URL.
headers	For call_cosmos_endpoint, any HTTP headers to include in the request. You don't need to include authorization headers as call_cosmos_endpoint will take care of the details.
body	For call_cosmos_endpoint, the body of the request if any.
encode	For call_cosmos_endpoint, the encoding (really content-type) of the request body. The Cosmos DB REST API uses JSON, so there should rarely be a need to change this argument.
do_continuations	For call_cosmos_endpoint, whether to automatically handle paged responses. If FALSE, only the initial response is returned.
http_verb	For call_cosmos_endpoint, the HTTP verb for the request. One of "GET", "POST", "PUT", "PATCH", "HEAD" or "DELETE".
num_retries	For call_cosmos_endpoint, how many times to retry a failed request. Useful for dealing with rate limiting issues.
...	Arguments passed to lower-level functions.
response	For process_cosmos_response, the returned object from a call_cosmos_endpoint call. This will be either a single httr request object, or a list of such objects.
http_status_handler	For process_cosmos_response, the R handler for the HTTP status code of the response. "stop", "warn" or "message" will call the corresponding handlers in httr, while "pass" ignores the status code. The latter is primarily useful for debugging purposes.

`return_headers` For `process_cosmos_response`, whether to return the headers from the response object(s), as opposed to the body. Defaults to TRUE if the original endpoint call was a HEAD request, and FALSE otherwise.

`simplify` For `process_cosmos_response`, whether to convert arrays of objects into data frames via the `simplifyDataFrame` argument to jsonlite::fromJSON.

Details

These functions are the basis of the SQL API client framework provided by AzureCosmosR. The `cosmos_endpoint` function returns a client object, which can then be passed to other functions for querying databases and containers. The `call_cosmos_endpoint` function sends calls to the REST endpoint, the results of which are then processed by `process_cosmos_response`.

In most cases, you should not have to use `call_cosmos_endpoint` directly. Instead, use `do_cosmos_op` which provides a slightly higher-level interface to the API, by providing sensible defaults for the `resource_type` and`resource_link` arguments and partially filling in the request path.

As an alternative to AzureCosmosR, you can also use the ODBC protocol to interface with the SQL API. By installing a suitable ODBC driver, you can then talk to Cosmos DB in a manner similar to other SQL databases. An advantage of the ODBC interface is that it fully supports cross-partition queries, unlike the REST API. A disadvantage is that it does not support nested document fields; functions like `array_contains()` cannot be used, and attempts to reference arrays and objects may return incorrect results.

Note that AzureCosmosR is a framework for communicating directly with the *core* Cosmos DB client API, also known as the "SQL" API. Cosmos DB provides other APIs as options when creating an account, such as Cassandra, MongoDB, table storage and Gremlin. These APIs are not supported by AzureCosmosR, but you can use other R packages for working with them. For example, you can use AzureTableStor to work with the table storage API, or mongolite to work with the MongoDB API.

Value

For `cosmos_endpoint`, an object of S3 class `cosmos_endpoint`.

For `call_cosmos_endpoint`, either a httr response object, or a list of such responses (if a paged query, and `do_continuations` is TRUE).

For `process_cosmos_response` and a single response object, the content of the response. This can be either the parsed response body (if `return_headers` is FALSE) or the headers (if `return_headers` is TRUE).

For `process_cosmos_response` and a list of response objects, a list containing the individual contents of each response.

See Also

do_cosmos_op, cosmos_database, cosmos_container, az_cosmosdb

httr::VERB, which is what carries out the low-level work of sending the HTTP request.

Examples

```
## Not run:

endp <- cosmos_endpoint("https://myaccount.documents.azure.com:443/", key="mykey")

# properties for the Cosmos DB account
call_cosmos_endpoint(endp, "", "", "") %>%
    process_cosmos_response()


## End(Not run)
```

`cosmos_mongo_endpoint` *MongoDB endpoint for Azure Cosmos DB*

Description

MongoDB endpoint for Azure Cosmos DB

Usage

```
cosmos_mongo_endpoint(
  host,
  key,
  mongo_options = list(),
  connection_string = NULL
)

cosmos_mongo_connection(endpoint, ...)

## S3 method for class 'cosmos_mongo_endpoint'
cosmos_mongo_connection(endpoint, collection, database, ...)
```

Arguments

`host`	For `cosmos_mongo_endpoint`, the URL of the Cosmos DB MongoDB endpoint. Usually of the form "https://account-name.mongo.cosmos.azure.com:443/".
`key`	For `cosmos_mongo_endpoint`, a string containing the access key (password) for the endpoint. Can be either a read-write or read-only key.
`mongo_options`	For `cosmos_mongo_endpoint`, a named list containing any additional parameters for the MongoDB connection string.
`connection_string`	Alternatively, the full connection string for the MongoDB endpoint. If this is supplied, all other arguments to `cosmos_mongo_endpoint` are ignored. Note that if you already have the full connection string, you most likely do not need AzureCosmosR and can call `mongolite::mongo` directly.

endpoint — For cosmos_mongo_connection, a MongoDB endpoint object as obtained from cosmos_mongo_endpoint.

... — Optional arguments passed to lower-level functions.

collection, database — For cosmos_mongo_connection, the collection and database to connect to.

Details

These functions act as a bridge between the Azure resource and the functionality provided by the mongolite package.

Value

For cosmos_mongo_endpoint, an object of S3 class cosmos_mongo_endpoint.

For cosmos_mongo_connection, an object of class mongolite::mongo which can then be used to interact with the given collection.

See Also

az_cosmosdb, mongolite::mongo

For the SQL API client framework: cosmos_endpoint, cosmos_database, cosmos_container, query_documents

Examples

```
## Not run:

mendp <- cosmos_mongo_endpoint("https://mymongoacct.mongo.cosmos.azure.com:443",
    key="mykey")

cosmos_mongo_connection(mendp, "mycollection", "mydatabase")


## End(Not run)
```

---

create_cosmosdb_account

Create Azure Cosmos DB account

Description

Method for the AzureRMR::az_resource_group class.

Usage

```
create_cosmosdb_account(
    name,
    location = self$location,
    interface = c("sql", "cassandra", "mongo", "table", "graph"),
    serverless = FALSE,
    free_tier = FALSE,
    properties = list(),
    ...
)
```

Arguments

- `name`: The name of the Cosmos DB account.
- `location`: The location/region in which to create the account. Defaults to the resource group's location.
- `interface`: The default API by which to access data in the account.
- `serverless`: Whether this account should use provisioned throughput or a serverless mode. In the latter, you are charged solely on the basis of the traffic generated by your database operations. Serverless mode is best suited for small-to-medium workloads with light and intermittent traffic that is hard to forecast; it is currently (January 2021) in preview.
- `free_tier`: Whether this account should be in the free tier, in which a certain amount of database operations are provided free of charge. You can have one free tier account per subscription.
- `properties`: Additional properties to set for the account.
- `wait`: Whether to wait until the Cosmos DB account provisioning is complete.
- `...`: Optional arguments to pass to `az_cosmosdb$new()`.

Details

This method creates a new Azure Cosmos DB account in the given resource group. Azure Cosmos DB is a globally distributed multi-model database that supports the document, graph, and key-value data models.

The ARM resource object provides methods for working in the management plane. For working in the data plane, AzureCosmosR provides a client framework that interfaces with the core (SQL) API. Other packages provide functionality for other APIs, such as AzureTableStor for table storage and mongolite for MongoDB.

Value

An object of class `az_cosmosdb` representing the Cosmos DB account.

See Also

get_cosmosdb_account, delete_cosmosdb_account

For the SQL API client framework: cosmos_endpoint, cosmos_database, cosmos_container, query_documents

For the table storage API: AzureTableStor::table_endpoint

For the MongoDB API: cosmos_mongo_endpoint, mongolite::mongo

`delete_cosmosdb_account` *Delete Azure Cosmos DB account*

Description

Method for the AzureRMR::az_resource_group class.

Usage

```
delete_cosmosdb_account(name, confirm = TRUE, wait = FALSE)
```

Arguments

- `name`: The name of the Cosmos DB account.
- `confirm`: Whether to ask for confirmation before deleting.
- `wait`: Whether to wait until the deletion has completed before returning.

Details

This method deletes an existing Azure Cosmos DB account.

See Also

create_cosmosdb_account, get_cosmosdb_account

For the SQL API client framework: cosmos_endpoint, cosmos_database, cosmos_container, query_documents

For the table storage API: AzureTableStor::table_endpoint

For the MongoDB API: cosmos_mongo_endpoint, mongolite::mongo

`do_cosmos_op` *Carry out a Cosmos DB operation*

Description

Carry out a Cosmos DB operation

Usage

```
do_cosmos_op(object, ...)

## S3 method for class 'cosmos_endpoint'
do_cosmos_op(object, ...)

## S3 method for class 'cosmos_database'
do_cosmos_op(object, path = "", resource_type = "dbs", resource_link = "", ...)

## S3 method for class 'cosmos_container'
do_cosmos_op(
  object,
  path = "",
  resource_type = "colls",
  resource_link = "",
  ...
)

## S3 method for class 'cosmos_document'
do_cosmos_op(
  object,
  path = "",
  resource_type = "docs",
  resource_link = "",
  headers = list(),
  ...
)
```

Arguments

object	A Cosmos DB endpoint, database, container or document object.
...	Arguments passed to lower-level functions.
path	The (partial) URL path for the operation.
resource_type	The type of resource. For most purposes, the default value should suffice.
resource_link	The resource link for authorization. For most purposes, the default value should suffice.
headers	Any optional HTTP headers to include in the API call.

Details

`do_cosmos_op` provides a higher-level interface to the Cosmos DB REST API than `call_cosmos_endpoint`. In particular, it sets the `resource_type` and `resource_link` arguments to sensible defaults, and fills in the beginning of the URL path for the REST call.

Value

The result of `call_cosmos_endpoint`: either a httr response object, or a list of such objects. Call `process_cosmos_response` to extract the result of the call.

Examples

```
## Not run:

endp <- cosmos_endpoint("https://myaccount.documents.azure.com:443/", key="mykey")

db <- get_cosmos_database(endp, "mydatabase")
do_cosmos_op(db) %>%
    process_cosmos_response()

cont <- get_cosmos_container(db, "mycontainer")
do_cosmos_op(cont) %>%
    process_cosmos_response()


## End(Not run)
```

`get_cosmosdb_account` *Get Azure Cosmos DB account*

Description

Method for the AzureRMR::az_resource_group class.

Usage

```
get_cosmosdb_account(name)
list_cosmosdb_accounts()
```

Arguments

- `name`: The name of the Cosmos DB account.

Details

`get_cosmosdb_account` retrieves the details for an existing Azure Cosmos DB account. `list_cosmosdb_accounts` retrieves all the Cosmos DB accounts within the resource group.

Value

For `get_cosmosdb_account`, an object of class `az_cosmosdb` representing the Cosmos DB account. For `list_cosmosdb_accounts`, a list of such objects.

See Also

create_cosmosdb_account, delete_cosmosdb_account

For the SQL API client framework: cosmos_endpoint, cosmos_database, cosmos_container, query_documents

For the table storage API: AzureTableStor::table_endpoint

For the MongoDB API: cosmos_mongo_endpoint, mongolite::mongo

get_cosmos_container *Methods for working with Azure Cosmos DB containers*

Description

Methods for working with Azure Cosmos DB containers

Usage

```
get_cosmos_container(object, ...)

## S3 method for class 'cosmos_database'
get_cosmos_container(object, container, ...)

## S3 method for class 'cosmos_endpoint'
get_cosmos_container(object, database, container, ...)

create_cosmos_container(object, ...)

## S3 method for class 'cosmos_database'
create_cosmos_container(
  object,
  container,
  partition_key,
  partition_version = 2,
  autoscale_maxRUs = NULL,
  manual_RUs = NULL,
  headers = list(),
  ...
)

delete_cosmos_container(object, ...)

## S3 method for class 'cosmos_database'
delete_cosmos_container(object, container, confirm = TRUE, ...)

## S3 method for class 'cosmos_container'
delete_cosmos_container(object, ...)

list_cosmos_containers(object, ...)

## S3 method for class 'cosmos_database'
list_cosmos_containers(object, ...)
```

Arguments

object	A Cosmos DB database object, as obtained from get_cosmos_database or create_cosmos_database, or for delete_cosmos_container.cosmos_container,

	the container object.
container	The name of the container.
database	For get_cosmos_container.cosmos_endpoint, the name of the database that includes the container.
partition_key	For create_cosmos_container, the name of the partition key.
partition_version	For create_cosmos_container, the partition version. Can be either 1 or 2. Version 2 supports large partition key values (longer than 100 bytes) but requires API version 2018-12-31 or later. Use version 1 if the container needs to be accessible to older Cosmos DB SDKs.
autoscale_maxRUs, manual_RUs	For create_cosmos_container, optional parameters for the maximum request units (RUs) allowed. See the Cosmos DB documentation for more details.
headers, ...	Optional arguments passed to lower-level functions.
confirm	For delete_cosmos_container, whether to ask for confirmation before deleting.

Details

These are methods for working with Cosmos DB containers using the core (SQL) API. A container is analogous to a table in SQL, or a collection in MongoDB.

get_cosmos_container, create_cosmos_container, delete_cosmos_container and list_cosmos_containers provide basic container management functionality.

get_partition_key returns the name of the partition key column in the container, and list_partition_key_values returns all the distinct values for this column. These are useful when working with queries that have to be mapped across partitions.

Value

For get_cosmos_container and create_cosmos_container, an object of class cosmos_container. For list_cosmos_con a list of such objects.

See Also

cosmos_container, query_documents, bulk_import, bulk_delete

Examples

```
## Not run:

endp <- cosmos_endpoint("https://myaccount.documents.azure.com:443/", key="mykey")
db <- get_cosmos_database(endp, "mydatabase")

create_cosmos_container(db, "mycontainer", partition_key="sex")

list_cosmos_containers(db)

cont <- get_cosmos_container(db, "mycontainer")
```

```
delete_cosmos_container(cont)


## End(Not run)
```

`get_cosmos_database` *Methods for working with Azure Cosmos DB databases*

Description

Methods for working with Azure Cosmos DB databases

Usage

```
get_cosmos_database(object, ...)

## S3 method for class 'cosmos_endpoint'
get_cosmos_database(object, database, ...)

create_cosmos_database(object, ...)

## S3 method for class 'cosmos_endpoint'
create_cosmos_database(
  object,
  database,
  autoscale_maxRUs = NULL,
  manual_RUs = NULL,
  headers = list(),
  ...
)

delete_cosmos_database(object, ...)

## S3 method for class 'cosmos_endpoint'
delete_cosmos_database(object, database, confirm = TRUE, ...)

## S3 method for class 'cosmos_database'
delete_cosmos_database(object, ...)

list_cosmos_databases(object, ...)

## S3 method for class 'cosmos_endpoint'
list_cosmos_databases(object, ...)
```

Arguments

object	A Cosmos DB endpoint object as obtained from cosmos_endpoint, or for delete_cosmos_database.co the database object.
database	The name of the Cosmos DB database.
autoscale_maxRUs, manual_RUs	For create_cosmos_database, optional parameters for the maximum request units (RUs) allowed. See the Cosmos DB documentation for more details.
headers, ...	Optional arguments passed to lower-level functions.
confirm	For delete_cosmos_database, whether to ask for confirmation before deleting.

Details

These are methods for managing Cosmos DB databases using the core (SQL) API.

Value

get_cosmos_database and create_cosmos_database return an object of class cosmos_database. list_cosmos_databases returns a list of such objects.

Examples

```
## Not run:

endp <- cosmos_endpoint("https://myaccount.documents.azure.com:443/", key="mykey")

create_cosmos_database(endp, "mydatabase")

list_cosmos_databases(endp)

db <- get_cosmos_database(endp, "mydatabase")

delete_cosmos_database(db)


## End(Not run)
```

---

get_document *Methods for working with Azure Cosmos DB documents*

Description

Methods for working with Azure Cosmos DB documents

Usage

```
get_document(object, ...)

create_document(object, ...)

## S3 method for class 'cosmos_container'
create_document(object, data, headers = list(), ...)

list_documents(object, ...)

## S3 method for class 'cosmos_container'
list_documents(
  object,
  partition_key = NULL,
  as_data_frame = FALSE,
  metadata = TRUE,
  headers = list(),
  ...
)

delete_document(object, ...)

## S3 method for class 'cosmos_container'
delete_document(
  object,
  id,
  partition_key,
  headers = list(),
  confirm = TRUE,
  ...
)

## S3 method for class 'cosmos_document'
delete_document(object, ...)
```

Arguments

object	A Cosmos DB container object, as obtained by get_cosmos_container or create_cosmos_container.
data	For create_document, the document data. This can be either a string containing JSON text, or a (possibly nested) list containing the parsed JSON.
headers, ...	Optional arguments passed to lower-level functions.
partition_key	For get_document and delete_document, the value of the partition key for the desired document. For list_documents, restrict the returned list only to documents with this key value.
as_data_frame	For list_documents, whether to return a data frame or a list of Cosmos DB document objects. Note that the default value is FALSE, unlike query_documents.

metadata	For get_document and list_documents, whether to include Cosmos DB document metadata in the result.
id	The document ID.
confirm	For delete_cosmos_container, whether to ask for confirmation before deleting.

Details

These are low-level functions for working with individual documents in a Cosmos DB container. In most cases you will want to use query_documents to issue queries against the container, or bulk_import and bulk_delete to create and delete documents.

Value

get_document and create_document return an object of S3 class cosmos_document. The actual document contents can be found in the data component of this object.

list_documents returns a list of cosmos_document objects if as_data_frame is FALSE, and a data frame otherwise.

See Also

query_documents, bulk_import, bulk_delete, cosmos_container

Examples

```
## Not run:

endp <- cosmos_endpoint("https://myaccount.documents.azure.com:443/", key="mykey")
db <- get_cosmos_database(endp, "mydatabase")

cont <- get_cosmos_container(db, "mycontainer")

# a list of document objects
list_documents(cont)

# a data frame
list_documents(cont, as_data_frame=TRUE)

# a single document
doc <- get_document(cont, "mydocumentid")
doc$data

delete_document(doc)


## End(Not run)
```

get_partition_key *Container partition key information*

Description

Container partition key information

Usage

```
get_partition_key(container)

list_partition_key_values(container)

list_partition_key_ranges(container)
```

Arguments

container	An object of class cosmos_container.

Details

These are functions to facilitate working with a Cosmos DB container, which often requires knowledge of its partition key.

Value

For get_partition_key, the name of the partition key column as a string.

For list_partition_key_values, a character vector of all the values of the partition key.

For list_partition_key_ranges, a character vector of the IDs of the partition key ranges.

get_stored_procedure *Methods for working with Azure Cosmos DB stored procedures*

Description

Methods for working with Azure Cosmos DB stored procedures

Usage

```
get_stored_procedure(object, ...)

## S3 method for class 'cosmos_container'
get_stored_procedure(object, procname, ...)

list_stored_procedures(object, ...)

create_stored_procedure(object, ...)

## S3 method for class 'cosmos_container'
create_stored_procedure(object, procname, body, ...)

exec_stored_procedure(object, ...)

## S3 method for class 'cosmos_container'
exec_stored_procedure(object, procname, parameters = list(), ...)

## S3 method for class 'cosmos_stored_procedure'
exec_stored_procedure(object, ...)

replace_stored_procedure(object, ...)

## S3 method for class 'cosmos_container'
replace_stored_procedure(object, procname, body, ...)

## S3 method for class 'cosmos_stored_procedure'
replace_stored_procedure(object, body, ...)

delete_stored_procedure(object, ...)

## S3 method for class 'cosmos_container'
delete_stored_procedure(object, procname, confirm = TRUE, ...)

## S3 method for class 'cosmos_stored_procedure'
delete_stored_procedure(object, ...)
```

Arguments

object	A Cosmos DB container object, as obtained by `get_cosmos_container` or `create_cosmos_container`, or for `delete_stored_procedure.cosmos_stored_procedure`, the stored procedure object.
...	Optional arguments passed to lower-level functions.
procname	The name of the stored procedure.
body	For `create_stored_procedure` and `replace_stored_procedure`, the body of the stored procedure. This can be either a character string containing the source code, or the name of a source file.

parameters	For exec_stored_procedure, a list of parameters to pass to the procedure.
confirm	For delete_stored_procedure, whether to ask for confirmation before deleting.

Details

These are methods for working with stored procedures in Azure Cosmos DB using the core (SQL) API. In the Cosmos DB model, stored procedures are written in JavaScript and associated with a container.

Value

For get_stored_procedure and create_stored_procedure, an object of class cosmos_stored_procedure. For list_stored_procedures, a list of such objects.

See Also

cosmos_container, get_udf

Examples

```
## Not run:

endp <- cosmos_endpoint("https://myaccount.documents.azure.com:443/", key="mykey")
db <- get_cosmos_database(endp, "mydatabase")
cont <- create_cosmos_container(db, "mycontainer", partition_key="sex")

# a simple stored procedure
src <- 'function helloworld() {
   var context = getContext();
    var response = context.getResponse();
    response.setBody("Hello, World");
}'
create_stored_procedure(cont, "helloworld", src)
sproc <- get_stored_procedure(cont, "helloworld")
exec_stored_procedure(sproc)

# more complex example: uploading data
sproc2 <- create_stored_procedure(cont, "myBulkUpload",
    body=system.file("srcjs/bulkUpload.js", package="AzureCosmosR"))

list_stored_procedures(cont)

sw_male <- dplyr::filter(dplyr::starwars, sex == "male")
exec_stored_procedure(sproc2, parameters=list(sw_male))

delete_stored_procedure(sproc)
delete_stored_procedure(sproc2)


## End(Not run)
```

get_udf *Methods for working with Azure Cosmos DB user-defined functions*

Description

Methods for working with Azure Cosmos DB user-defined functions

Usage

```
get_udf(object, ...)

## S3 method for class 'cosmos_container'
get_udf(object, funcname, ...)

list_udfs(object, ...)

create_udf(object, ...)

## S3 method for class 'cosmos_container'
create_udf(object, funcname, body, ...)

replace_udf(object, ...)

## S3 method for class 'cosmos_container'
replace_udf(object, funcname, body, ...)

## S3 method for class 'cosmos_udf'
replace_udf(object, body, ...)

delete_udf(object, ...)

## S3 method for class 'cosmos_container'
delete_udf(object, funcname, confirm = TRUE, ...)

## S3 method for class 'cosmos_udf'
delete_udf(object, ...)
```

Arguments

object	A Cosmos DB container object, as obtained by get_cosmos_container or create_cosmos_container, or for delete_udf.cosmos_udf, the function object.
...	Optional arguments passed to lower-level functions.
funcname	The name of the user-defined function.
body	For create_udf and replace_udf, the body of the function. This can be either a character string containing the source code, or the name of a source file.
confirm	For delete_udf, whether to ask for confirmation before deleting.

Details

These are methods for working with user-defined functions (UDFs) in Azure Cosmos DB using the core (SQL) API. In the Cosmos DB model, UDFs are written in JavaScript and associated with a container.

Value

For `get_udf` and `create_udf`, an object of class `cosmos_udf`. For `list_udfs`, a list of such objects.

See Also

cosmos_container, get_stored_procedure

Examples

```
## Not run:

endp <- cosmos_endpoint("https://myaccount.documents.azure.com:443/", key="mykey")
db <- get_cosmos_database(endp, "mydatabase")

# importing the Star Wars data from dplyr
cont <- endp %>%
    get_cosmos_database(endp, "mydatabase") %>%
    create_cosmos_container(db, "mycontainer", partition_key="sex")

create_udf(cont, "times2", "function(x) { return 2*x; }")

list_udfs(cont)

# UDFs in queries are prefixed with the 'udf.' identifier
query_documents(cont, "select udf.times2(c.height) t2 from cont c")

delete_udf(cont, "times2")


## End(Not run)
```

`query_documents` *Query an Azure Cosmos DB container*

Description

Query an Azure Cosmos DB container

Usage

```
query_documents(container, ...)

## S3 method for class 'cosmos_container'
query_documents(
  container,
  query,
  parameters = list(),
  cross_partition = TRUE,
  partition_key = NULL,
  by_pkrange = FALSE,
  as_data_frame = TRUE,
  metadata = TRUE,
  headers = list(),
  ...
)
```

Arguments

container	A Cosmos DB container object, as obtained by get_cosmos_container or create_cosmos_container.
query	A string containing the query text.
parameters	A named list of parameters to pass to a parameterised query, if required.
cross_partition, partition_key, by_pkrange	Arguments that control how to handle cross-partition queries. See 'Details' below.
as_data_frame	Whether to return the query result as a data frame, or a list of Cosmos DB document objects.
metadata	Whether to include Cosmos DB document metadata in the query result.
headers, ...	Optional arguments passed to lower-level functions.

Details

This is the primary function for querying the contents of a Cosmos DB container (table). The query argument should contain the text of a SQL query, optionally parameterised. if the query contains parameters, pass them in the parameters argument as a named list.

Cosmos DB is a partitioned key-value store under the hood, with documents stored in separate physical databases according to their value of the partition key. The Cosmos DB REST API has limited support for cross-partition queries: basic SELECTs should work, but aggregates and more complex queries may require some hand-hacking.

The default cross_partition=TRUE runs the query for all partition key values and then attempts to stitch the results together. To run the query for only one key value, set cross_partition=FALSE and partition_key to the desired value. You can obtain all the values of the key with the list_partition_key_values function.

The by_pkrange argument allows running the query separately across all *partition key ranges*. Each partition key range corresponds to a separate physical partition, and contains the documents for one

or more key values. You can set this to TRUE to run a query that fails when run across partitions; the returned object will be a list containing the individual query results from each pkrange.

As an alternative to AzureCosmosR, you can also use the ODBC protocol to interface with the SQL API. By installing a suitable ODBC driver, you can then talk to Cosmos DB in a manner similar to other SQL databases. An advantage of the ODBC interface is that it fully supports cross-partition queries, unlike the REST API. A disadvantage is that it does not support nested document fields; functions like `array_contains()` cannot be used, and attempts to reference arrays and objects may return incorrect results.

Value

`query_documents` returns the results of the query. Most of the time this will be a data frame, or list of data frames if `by_pkrange=TRUE`.

See Also

cosmos_container, cosmos_document, list_partition_key_values, list_partition_key_ranges

Examples

```
## Not run:

endp <- cosmos_endpoint("https://myaccount.documents.azure.com:443/", key="mykey")

# importing the Star Wars data from dplyr
cont <- endp %>%
    get_cosmos_database(endp, "mydatabase") %>%
    create_cosmos_container(db, "mycontainer", partition_key="sex")

bulk_import(cont, dplyr::starwars)

query_documents(cont, "select * from mycontainer")

# removing the Cosmos DB metadata cruft
query_documents(cont, "select * from mycontainer", metadata=FALSE)

# a simple filter
query_documents(cont, "select * from mycontainer c where c.gender = 'masculine'")

# run query for one partition key -- zero rows returned
query_documents(cont, "select * from mycontainer c where c.gender = 'masculine'",
    partition_key="female")

# aggregates will fail -- API does not fully support cross-partition queries
try(query_documents(cont, "select avg(c.height) avgheight from mycontainer c"))
# Error in process_cosmos_response.response(response, simplify = as_data_frame) :
#  Bad Request (HTTP 400). Failed to complete Cosmos DB operation. Message:
# ...

# run query separately by pkrange and combine the results manually
query_documents(
```

```
    cont,
    "select avg(c.height) avgheight, count(1) n from mycontainer c",
    by_pkrange=TRUE
)


## End(Not run)
```

Index