SDK

2.1.4 [async]

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Chapter 1

API for C++

Software Development Kit with Asynchronous API for the CloudBackend Singularity database service managing Data in Motion & Data at Rest.

For more information, see also the `CloudBackend web site`

Document	
Version	2.1.4
Extension	Async API
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Chapter 2

Class diagrams

2.1 Overview

These are the main classes available when writing programs using the CloudBackend SDK.

The CloudBackend class is the core object and entry point into using the SDK.

The classes are represented as UML diagrams below.

2.2 CloudBackend - core object

Creating an instance of CloudBackend will be the first thing to do.

In order to initiate the core CloudBackend object, you need to call the logIn() method on the CloudBackend class. This will return the CloudBackend object instance that holds the currently logged in identity (user) and the databases available for that identity.

Once signed in the CloudBackend object will be able to access the identity's account, containers, objects and other functionality.

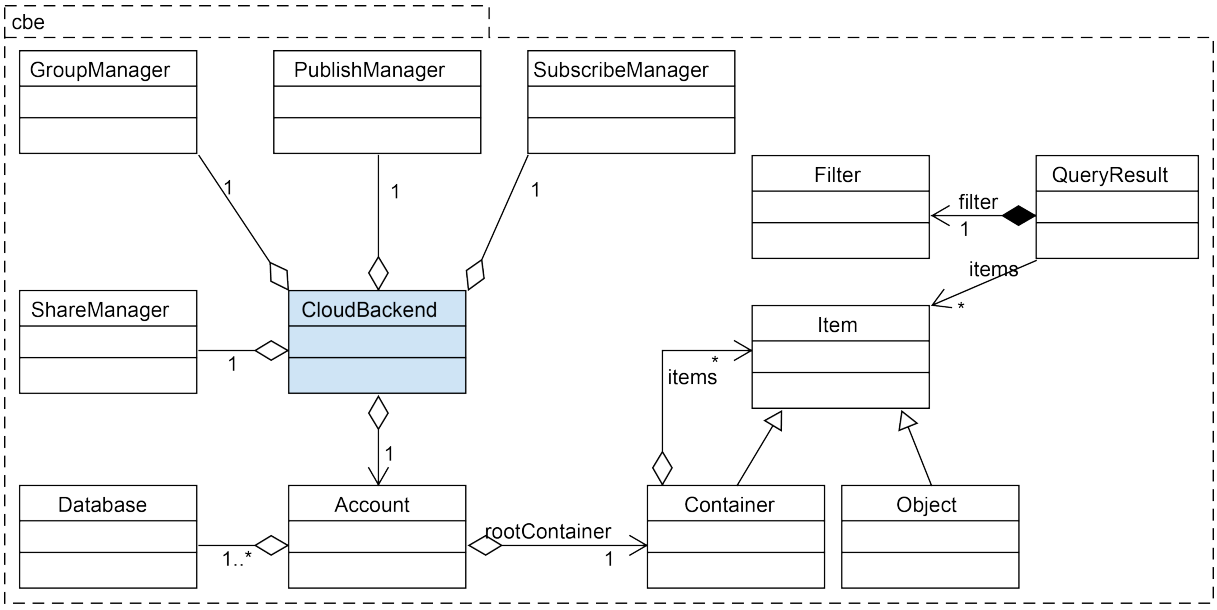


Figure 2.1 UML representation of the major classes in the SDK

2.3 Object

More details around the Object class.

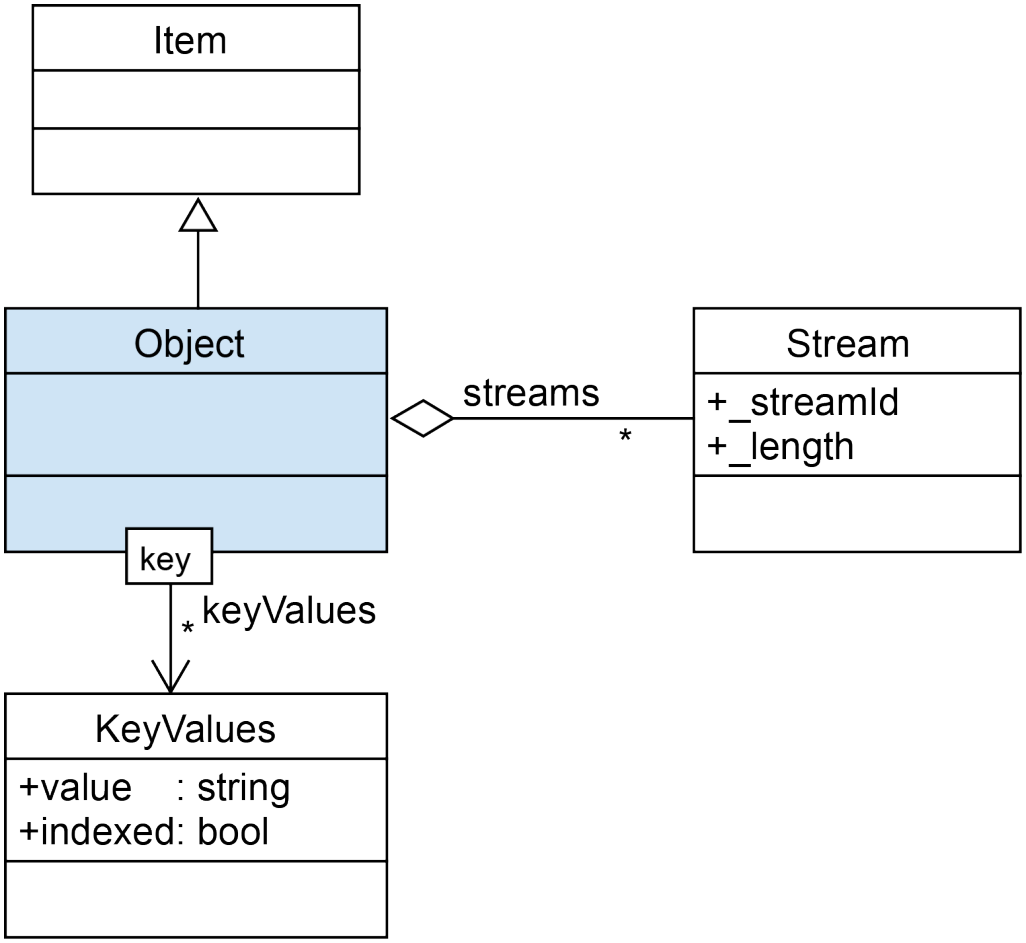


Figure 2.2 Object related classes

2.4 Group

More details around the Group class.

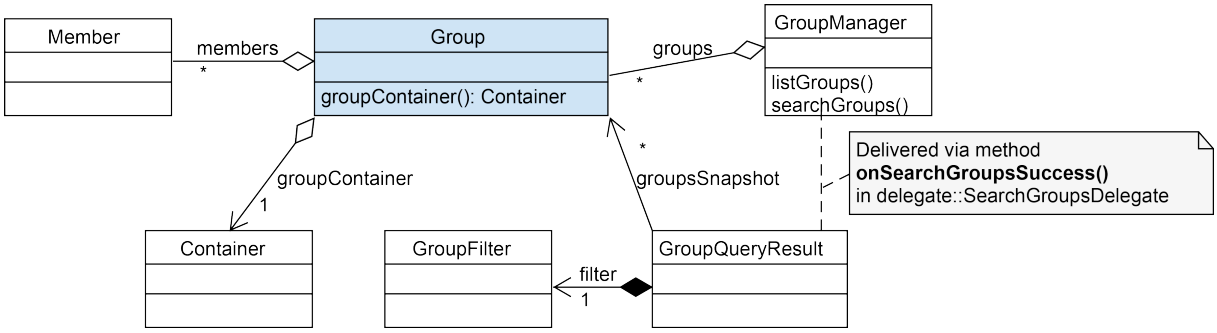


Figure 2.3 Group related classes

Chapter 3

Sync vs. Async

3.1 Choosing a Synchronous or Asynchronous coding style

Many calls to the SDK can return either a synchronous or an asynchronous response. This leads to a decision on how you wish to work based on priorities. All remote communication within the Singularity Database internally takes place asynchronously. Any updates are first made to the local cache of data, then asynchronously applied to the rest of the Singularity Database outside the SDK. When the remote request completes, a callback is made to the delegate you have implemented.

Synchronous

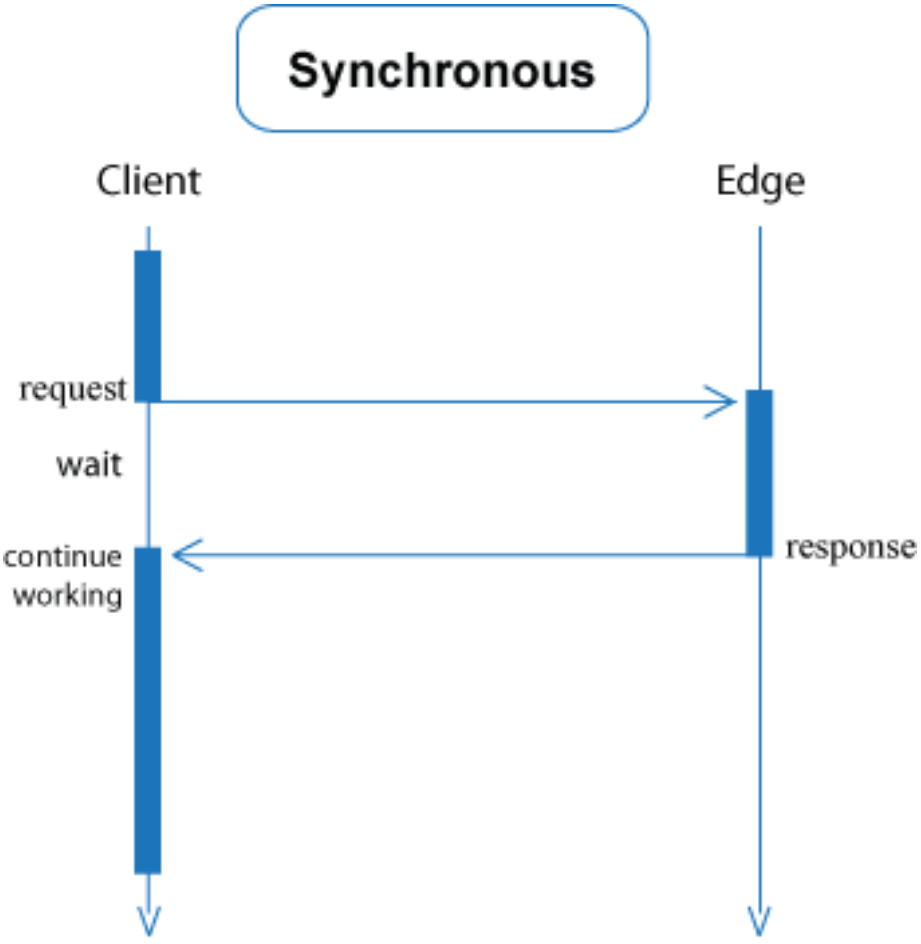


Figure 3.1 Synchronous program sequence

Working synchronously allows one to immediately act on data that has been updated. This, however, means that it is possible someone else is looking at the same data without the updates you just made (inconsistency). The Singularity Database is built on the concept of eventual consistency, meaning that all SDKs viewing or holding the same object will eventually be consistent. Additionally, if a request fails, requests dependent on the success of that request, that appear complete, will be rolled back.

Asynchronous

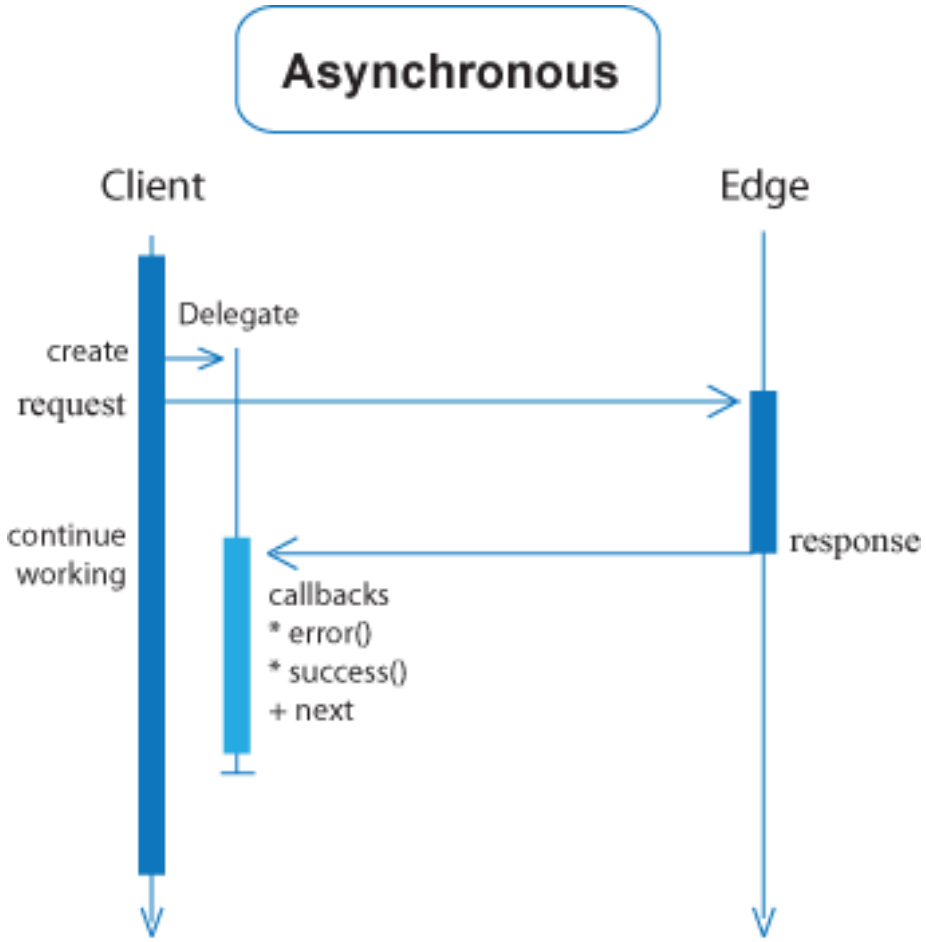


Figure 3.2 Asynchronous program sequence

Working asynchronously means that the main thread may continue to work while there is a separate parallel thread delegate created that will wait for the response, process the response, and optionally make any follow up processing or hand over. This means that the applications you write on top of the SDK will be event-driven instead of being triggered by a main loop. The end user experience will be a user interface that is responsive and does not freese while waiting for a server response. Working this way guarantees everything presented to the end user has been propagated to the Singularity Database and will be what is retrieved if another client communicates with the database.

Pros and cons

With this SDK the developer is provided with sets of API with both Synchronous and Asynchronous variants of the calls that may communicate with the service in the cloud.
The Synchronous calls will be easier to use, but will freeze operations waiting for the cloud to respond. For a sequential program like a report or a sensor feeding data this is probably a good choise.
For a good interactive user experience in a user interface where multiple events happens in an unpredictable order, it is probably more desirable to write asynchronously on top of the SDK.
It is possible to mix Synchronous and Asynchronous calls in the same program.

Error handling

API calls have two possible outcomes: either success or error. The Synchronous API is provided in two variants that either uses exeptions or returns a result that can be of two types: either the error information or the expected result.
In the Asynchronous API the callback delegate needs to cater for both cases: success and error.

Chapter 4

Sequence diagrams - async

4.1 Login asynchronous UML

Sequence diagram for logIn using a delegate for asynchronous callbacks.

User can log in by calling login() submitting parameters with the credentials of:

- username
- password
- tenant

Create a Delegate that will get an input-callback of either:

- success
- error

Call the logIn() with credentials and the pointer to the delegate that is going to handle the callback.

Normally you need to wait for the completion and then, depending on if the result was success or error, take an appropriate action.

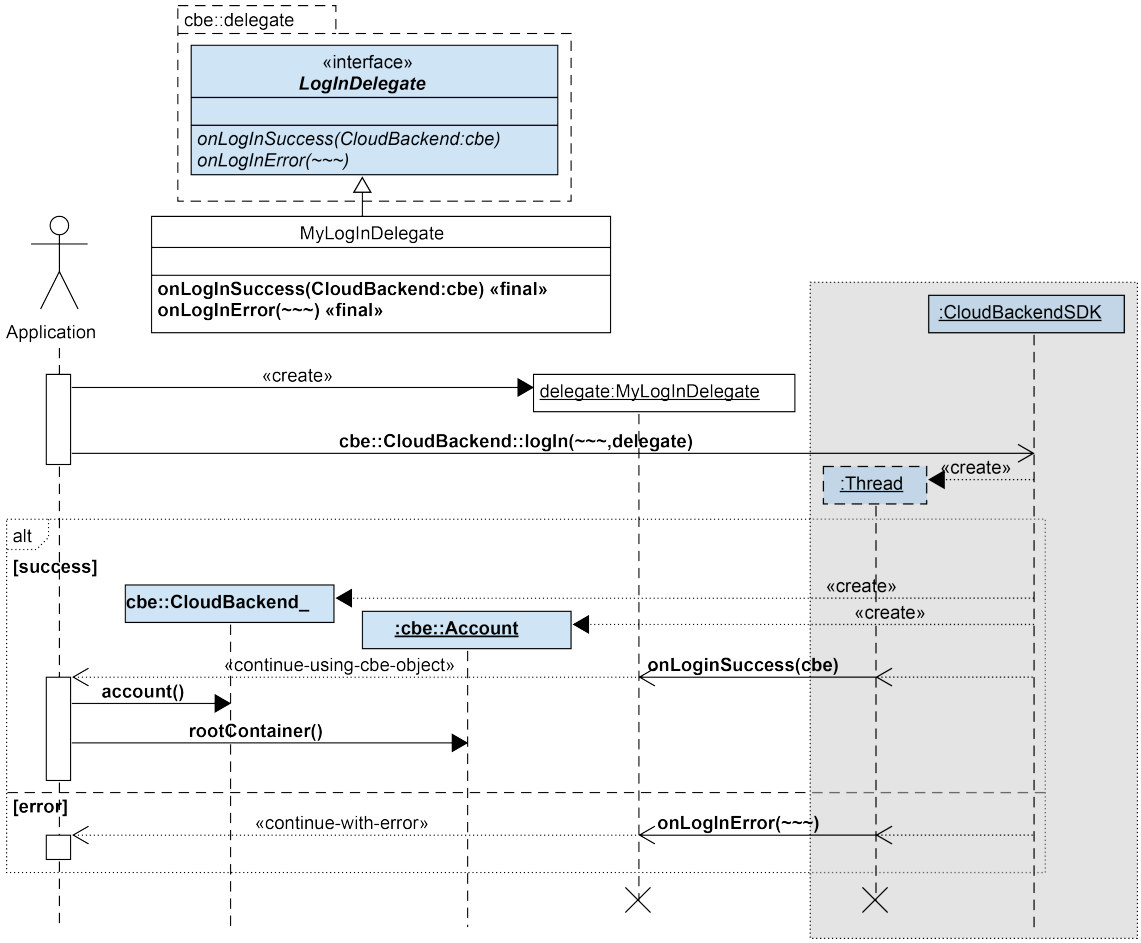


Figure 4.1 Login process sequence diagram

4.2 Query asynchronous UML

Sequence diagram for a query [optional filter] using a delegate for asynchronous callbacks.

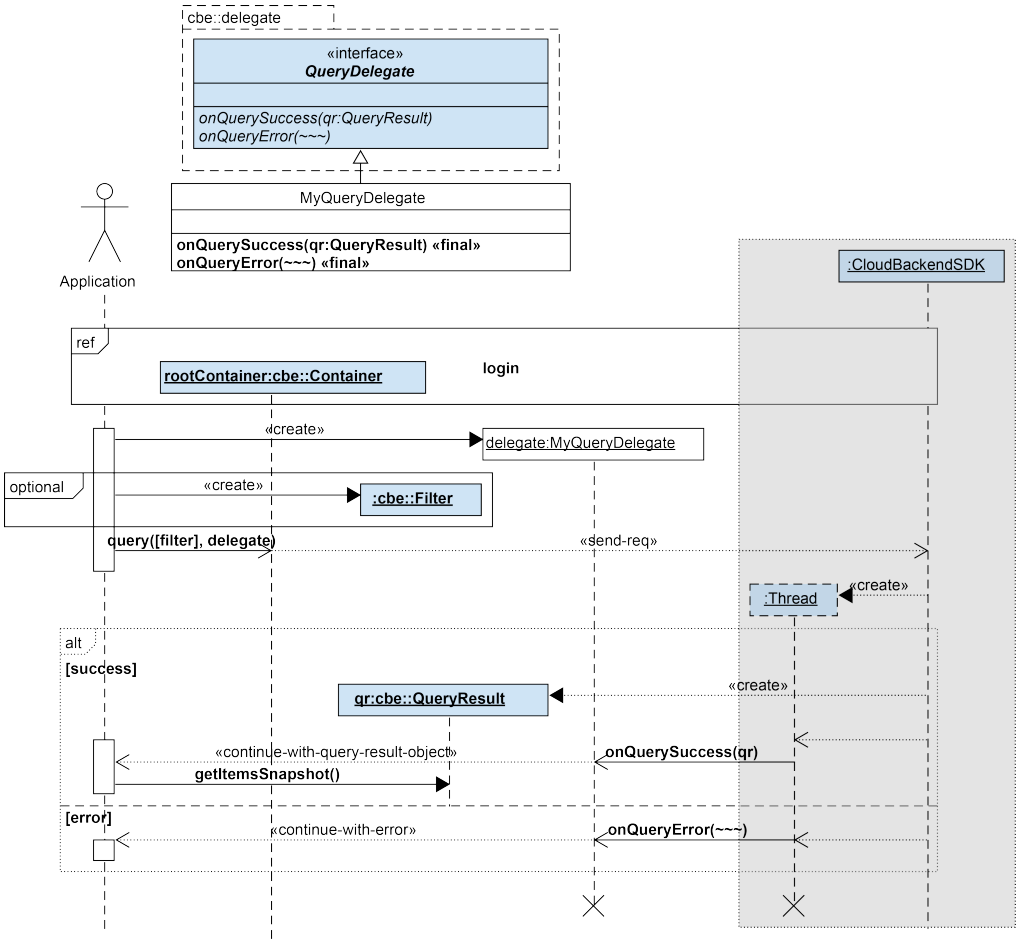


Figure 4.2 Query process sequence diagram

Chapter 5

Example code - combined lists grouped by call

Index of links — to sections that contains examples — for inspiration A line in a code example with **"∼∼∼"** indicates that additional code should be added there to handle next action.

5.1 login

1. login - async example

5.2 upload

1. upload - async example

5.3 getStreams

1. getStreams - async example

5.4 uploadStream

1. uploadStream - async example

5.5 downloadStream

1. downloadStream - async example

5.6 query - select

1. query - async example
2. QueryDelegate implementation class - async only

5.7 databases - tenant

1. databases - tenant container example

5.8 Complete program

1. all code - async example

Chapter 6

Full example - async

Example program - asynchronous

```
#include <algorithm>
#include <fstream>
#include <iostream>
#include "cbe/Account.h"
#include "cbe/CloudBackend.h"
#include "cbe/Container.h"
#include "cbe/Stream.h"
#include "cbe/Object.h"
#include "cbe/QueryChain.h"
#include "cbe/util/ErrorInfo.h"
#include "MyDelegates.cpp"
#include "../user_credentials.cpp"
int main(int argc, const char** argv) {
  static constexpr const char testContainer[] = "z-MediumExample";
  cbe::Container rootContainer{cbe::DefaultCtor{}};
  cbe::Container myContainer{cbe::DefaultCtor{}};
  cbe::Filter objectFilter;
  objectFilter.setDataType(cbe::ItemType::Object);
  // - - - - - - - - - - - - - - - - login_async - - - - - - - - - - - - - - - - -
  std::shared_ptr<MyLogInDelegate> myLogInDelegate =
                                          std::make_shared<MyLogInDelegate>();
  cbe::CloudBackend cloudBackend = cbe::CloudBackend::logIn(username,
                                                            password,
                                                            tenant,
                                                            client,
                                                            myLogInDelegate);
  myLogInDelegate->waitForRsp();
  if (myLogInDelegate->error) {
    std::cout « "Failed to login: error={" « myLogInDelegate->errorInfo « '}'
              « std::endl;
    cloudBackend.terminate();
    return 1;
  }
  cloudBackend = myLogInDelegate->cloudBackend;
  myLogInDelegate.reset();
  rootContainer = cloudBackend.account().rootContainer();
  std::cout « "login: " « cloudBackend.account().username() « std::endl;
  // - - - - - - - - - - - - - check for existing container - - - - - - - - - - -
  std::shared_ptr<MyQueryDelegate> myQueryDelegate =
                                          std::make_shared<MyQueryDelegate>();
  rootContainer.query(myQueryDelegate).getQueryResult();
  myQueryDelegate->waitForRsp();
  cbe::QueryResult resultSet = myQueryDelegate->queryResult;
  for (auto entry : resultSet.getItemsSnapshot()){
    if (entry.type() == cbe::ItemType::Container &&
        entry.name() == testContainer){
      std::cout « "Using existing container:" « std::endl;
      myContainer = cbe::CloudBackend::castContainer(entry);
    }
  }
  if (!myContainer){
    std::cout « "Creating a new container:" « std::endl;
    std::shared_ptr<MyCreateContainerDelegate> myCreateContainerDelegate =
                                  std::make_shared<MyCreateContainerDelegate>();
    rootContainer.createContainer(testContainer, myCreateContainerDelegate);
    myCreateContainerDelegate->waitForRsp();
    myContainer = myCreateContainerDelegate->container;
  }
  std::cout « "home://"
            « myContainer.name()
            « "/"
            « std::endl;
  // - - - - - - - - - - - - - -upload_async - - - - - - - - - - - - - - - - - -
  constexpr const char* const uploadPath = "/tmp/";
```

```
constexpr const char* const myObjectFileName = "Medium_A_a_message";
const std::string           qualFile1Name = std::string{uploadPath} +
                                                    myObjectFileName;
cbe::Object anObject{cbe::DefaultCtor{}};
cbe::Object myObject{cbe::DefaultCtor{}};
cbe::Object::Streams streams;
std::cout « "Create local file " « qualFile1Name « std::endl;
std::ofstream ofs{qualFile1Name};
ofs « "Line a\n"
    « "Line b\n"
    « "Line c\n"
    « std::flush;
ofs.close();
std::cout « "Uploading object from "
          « qualFile1Name
          « std::endl;
std::shared_ptr<MyUploadDelegate> myUploadDelegate =
                                          std::make_shared<MyUploadDelegate>();
myContainer.upload(qualFile1Name, myUploadDelegate);
myObject = myUploadDelegate->waitForRsp();
if (!myObject) {
  std::cout « "Error! " « myUploadDelegate->errorInfo « std::endl;
}
std::shared_ptr<MyGetStreamsDelegate> getStreamsDelegate =
                                      std::make_shared<MyGetStreamsDelegate>();
myObject.getStreams(getStreamsDelegate);
getStreamsDelegate->waitForRsp();
if (getStreamsDelegate->errorInfo) {
  std::cout « "Error! " « myLogInDelegate->errorInfo « std::endl;
}
streams = *getStreamsDelegate->streams;
// - - - - - - - - - - - - - - - uploadStream_async - - - - - - - - - - - - -
constexpr const char* const myFile2Name = "Medium_A_an_attachment";
const std::string qualFile2Name = std::string{uploadPath} + myFile2Name;
std::ofstream ofs2{qualFile2Name};
ofs2  « "line 21\n"
      « "line 22\n"
      « "line 23\n"
      « "line 24\n"
      « std::flush;
ofs2.close();
std::cout « "Uploading additional stream from: "
          « qualFile2Name
          « std::endl;
const auto nextStreamId =
            std::max_element(std::begin(streams), std::end(streams),
                             [](const cbe::Stream& stream1,
                                const cbe::Stream& stream2) {
                               return stream1.streamId < stream2.streamId;
                             })->streamId + 1;
std::shared_ptr<MyUploadStreamDelegate> myUploadStreamDelegate =
                               std::make_shared<MyUploadStreamDelegate>();
myObject.uploadStream(qualFile2Name, nextStreamId, myUploadStreamDelegate);
myUploadStreamDelegate->waitForRsp();
if (myUploadStreamDelegate->errorInfo) {
  std::cout « "Error! " « myLogInDelegate->errorInfo « std::endl;
}
std::cout « "home://"
          « myContainer.name()
          « "/"
          « myObject.name()
          « " now has two streams."
          « std::endl;
myObject.getStreams(getStreamsDelegate);
getStreamsDelegate->waitForRsp();
if (getStreamsDelegate->errorInfo) {
  std::cout « "Error! " « myLogInDelegate->errorInfo « std::endl;
}
streams = *getStreamsDelegate->streams;
// - - - - - - - - - - - - - - - downloadStream_async - - - - - - - - - - - -
std::cout « "Downloading stream:" « std::endl;
std::shared_ptr<MyDownloadDelegate> myDownloadDelegate =
                                        std::make_shared<MyDownloadDelegate>();
constexpr const char* const downloadPath = "/tmp/Medium_A_download_stream_";
for (const auto& stream : streams) {
  const auto path = std::string{downloadPath} +
                    std::to_string(stream.streamId) + "_of_";
  std::cout « stream.streamId
            « " to: "
            « path
            « myObject.name()
            « std::endl;
  myObject.downloadStream(path, stream, myDownloadDelegate);
  myDownloadDelegate->waitForRsp();
  if (!myDownloadDelegate) {
    std::cout « "Error! " « myDownloadDelegate->errorInfo « std::endl;
  }
```

```
  }
  // - - - - - - - - - - - - - - - cloudbackend_query_async - - - - - - - - - - -
  std::cout « "Content of "
            « myContainer.name()
            « std::endl;
  myContainer.query(objectFilter, myQueryDelegate);
  myQueryDelegate->waitForRsp();
  if (myQueryDelegate->errorInfo) {
    std::cout « "Error! " « myQueryDelegate->errorInfo « std::endl;
  } else {
    cbe::QueryResult::ItemsSnapshot itemsSnapshot =
                              myQueryDelegate->queryResult.getItemsSnapshot();
    std::cout « "--------- table content -----------" « std::endl;
    for (auto& item : itemsSnapshot) {
      anObject = cloudBackend.castObject(item);
      std::cout « " sum "
                « anObject.length()
                « " Bytes\t"
                « anObject.name()
                « std::endl;
    }
    std::cout « "-----------------------------------" « std::endl;
  }
  std::cout « "Example Medium done" « std::endl;
  cloudBackend.terminate();
} // int main()
```

Chapter 7

Document list

C++ latest version

- HTML version of the Synchronous and Asynchronous reference document
- PDF version of this reference document
- HTML version of the Asynchronous only reference document
- PDF version of the Asynchronous only reference document

Java latest version

- Java and Android API reference document

Swift latest version

- iOS Swift API reference document

Other

- CloudBackend web site document index

Chapter 8

Namespace Index

8.1 Namespace List

Here is a list of all documented namespaces with brief descriptions:

Chapter 9

Hierarchical Index

9.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Chapter 10

Class Index

10.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

Chapter 11

Namespace Documentation

11.1 cbe Namespace Reference

Root namespace for the CloudBackend SDK API.

Namespaces

- delegate

  Root namespace for the delegate interfaces.
- util

  General support program utilities.

Classes

- class Account

  Login account information.
- class CloudBackend

  The session that holds the connection with the cloud.
- class Container

  A collection of Item, can also represent a table or folder.
- class Database

  A database.
- class Filter

  Use to select Item that meets specific criterias when doing a query.
- class Group

  A group of members.
- class GroupFilter

  To filter when searching a list of Group.
- class GroupManager

  For managing the groups.
- class GroupQueryResult

  Resultset of data retrieved in a search for Group.
- class Item

  A set made up of Container and Object.
- struct Request
- class Member

  A of member of a Group.
- class Object

  Holder of a set of data, can represent a table row.
- class Publish

Managing a `published` Item.

- class PublishManager

  Managing the list of web shares.
- class QueryChain

  To do a search for Object combining more than one Container table.
- class QueryChainExt

  Extension of class QueryChain.
- class QueryResult

  resultset of data retrieved.
- class Role

  User role information.
- class ShareManager

  Managing Shares.
- class Stream

  A data file attached to Object.
- class Subscribe

  Managing a subscribed Item.
- class SubscribeManager

  For managing subscriptions.
- struct ShareData
- class MatchesID

  Search lists with ID.

Typedefs

- using Streams = std::vector< cbe::Stream >

  Collection of Stream objects.
- using AclGroupId = std::uint64_t

  Identifies ACL-group.
- using ContainerId = std::uint64_t

  Unique Id of a cbe::Container.
- using DatabaseId = std::uint64_t

  The id of a Database.
- using Date = std::uint64_t

  A time-stamp in the unix epoch format.
- using GroupId = std::uint64_t

  Uniquely identifies the Group.
- using ItemId = std::uint64_t

  Id of a cbe::Container or cbe::Object.
- using MemberId = std::uint64_t

  Represents the cbe::Group membership id.
- using ListenerHandle = std::uint64_t

  Unique Id for added Listener.
- using ObjectId = std::uint64_t

  Unique Id of a cbe::Object.
- using PublishId = std::uint64_t

  Id of a subscribed cbe::Container or cbe::Object.
- using RoleId = std::uint64_t

  Uniquely identifies the Role.
- using ShareId = std::uint64_t

  Uniquely identifies a sharing of a cbe::Container or cbe::Object.

- using StreamId = std::uint64_t

  Uniquely identifies a cbe::Stream.
- using SubscribeId = std::uint64_t

  Id of a subscription of a cbe::Container or cbe::Object.
- using UserId = std::uint64_t

  Uniquely identifies the CBE user number.
- using **account_status_t** = std::uint32_t
- using **failed_status_t** = std::uint32_t
- using **http_t** = std::uint32_t
- using **publish_access_t** = std::uint32_t
- using **publish_visibility_t** = std::uint32_t
- using **sync_direction_t** = std::uint32_t
- using **sync_status_t** = std::uint32_t
- using **transfer_t** = std::uint32_t
- using ErrorCode = std::uint32_t

  Mimics the general error code encoding in the www.
- using **application_t** = int
- using **item_t** = int
- using **object_t** = int
- using **permission_status_t** = int
- using **stream_t** = int
- using **visibility** = int
- using AclMap = std::map< cbe::AclGroupId, std::pair< cbe::Permissions, AclScope > >

  *ACL map (**Access Control List**) relating to users and groups.*
- using DataBases = std::map< std::string, cbe::Database >

  Databases available for the account.
- using Items = std::vector< cbe::Item >

  Collection of items.
- using KeyValues = std::map< std::string, std::pair< std::string, bool > >

  Map with key/value pairs, a.k.a. metadata.
- using MemberBanInfo = std::map< std::pair< cbe::MemberId, cbe::MemberId >, std::pair< cbe::Date, std::string > >

  Map of a pair of members, associated with ban information.
- using ShareIds = std::map< cbe::ShareId, std::vector< cbe::ShareData > >

  Map of cbe::ShareData for a specific cbe::ShareId.

Enumerations

- enum class AccountStatus : cbe::account_status_t { **NotLoggedIn** = 1 , **LoggedIn** = 2 , **Failed** = 3 }
- enum class AclScope : uint64_t { **User** = 1 , **Group** = 2 , **Role** = 3 }
- enum DefaultCtor

  Default constructor marker.
- enum class FilterOrder : uint32_t {
  Title = 1 , **Relevance** = 2 , **Published** = 3 , **Updated** = 4 ,
  Length = 5 , **S1** = 6 , **S2** = 7 , **S3** = 8 ,
  S4 = 9 }
- enum class ItemType : cbe::item_t {
  Unapplicable = 1 , **Unknown** = 2 , **Object** = 4 , **Container** = 8 ,
  Tag = 16 , **Group** = 32 }
- enum class ObjectType : object_t { **Other** = 1 , **GroupInvites** = 2 , **ShareInvite** = 3 }

- enum class Permissions : permission_status_t {
  Read = 1 , **Write** = 2 , **ReadWrite** = 3 , **Delete** = 4 ,
  ReadDelete = 5 , **WriteDelete** = 6 , **ReadWriteDelete** = 7 , **ChangeACL** = 8 ,
  ReadChangeACL = 9 , **WriteChangeACL** = 10 , **ReadWriteChangeACL** = 11 , **DeleteChangeACL** = 12 ,
  ReadDeleteChangeACL = 13 , **WriteDeleteChangeACL** = 14 , **AllPermissions** = 15 , **NoPermissions** = 0
  }

  Represents the access permission that can be set for any cbe::Object or cbe::Container.
- enum class PublishAccess : cbe::publish_access_t { **Read** = 1 , **Update** = 2 , **Create** = 3 }
- enum class PublishVisibility : cbe::publish_visibility_t { **Public** = 1 , **Friends** = 2 , **Private** = 3 , **Invited** = 4 }
- enum class Visibility : visibility { **Public** = 1 , **Private** = 2 }

Functions

- cbe::ItemType **operator|** (cbe::ItemType lh, cbe::ItemType rh)
- std::ostream & **operator<<** (std::ostream &os, ItemType itemType)

11.1.1 Detailed Description

Root namespace for the CloudBackend SDK API.
Located in Types.h that should be included in programs.

11.1.2 Typedef Documentation

11.1.2.1 AclGroupId

```
using cbe::AclGroupId = typedef std::uint64_t
```

Identifies ACL-group.
Representation that can be a UserId or GroupId.
I.e., the union set:
AclGroupId = UserId ∪ GroupId.

11.1.2.2 AclMap

```
using cbe::AclMap = typedef std::map<cbe::AclGroupId, std::pair<cbe::Permissions, AclScope> >
```

ACL map (**Access Control List**) relating to users and groups.
Map of a specific user or group, in terms of cbe::UserId or cbe::GroupId and its cbe::Permission on a Container or Object, to represent access permissions for specific users or groups.

11.1.2.3 Date

```
using cbe::Date = typedef std::uint64_t
```

A time-stamp in the unix epoch format.
A.k.a. POSIX time or time-stamp.
The equivalent in Linux shell can be found using e.g.,

```
date +%s --utc --date='now'
date +%s --utc --date='today 17:30:00'
```

To convert a time-stamp to human readable format use e.g.,

```
date --utc --date=@1678902345
```

11.1.2.4 ErrorCode

```
using cbe::ErrorCode = typedef std::uint32_t
```

Mimics the general error code encoding in the www.
see Wikipedia: List of HTTP status codes

11.1.2.5 KeyValues

`using cbe::KeyValues = typedef std::map<std::string, std::pair<std::string, bool> >`
Map with key/value pairs, a.k.a. metadata.
Can be applied on cbe::Object but not on cbe::Container.

- **key** uniquely identifies the value; name must start with a letter or _
- **value** and **index flag**
  - a string value
  - a boolean flag indicating whether this key/value entry is index (`true`) or not indexed (`false`).

11.1.2.6 MemberBanInfo

`using cbe::MemberBanInfo = typedef std::map<std::pair<cbe::MemberId, cbe::MemberId>, std::pair<cbe::Date, std::string> >`
Map of a pair of members, associated with ban information.
Structure:

- **Key** is formed by a **`std::pair`** of members, where:
  - `first` represents the banned member.
  - `second` represents the banning member with administration privileges.
- **Value** is formed by another pair:
  - date of the ban
  - a free text reason message.

11.1.3 Enumeration Type Documentation

11.1.3.1 AccountStatus

`enum cbe::AccountStatus : cbe::account_status_t [strong]`
Callback for login returns one of these three in callback.

1. NotLoggedIn
2. LoggedIn
3. Failed

11.1.3.2 AclScope

`enum cbe::AclScope : uint64_t [strong]`
Enum that determines different ACL categories

11.1.3.3 DefaultCtor

enum cbe::DefaultCtor
Default constructor marker.
To default construct objects from most of the CloudBackend classes, this marker type is required.

Example use

```
~~~
// Conceptually, a default construction of an instance of cbe::Container
cbe::Container myContainer{ cbe::DefaultCtor{} };
// Ditto
cbe::Object    myObject{ cbe::DefaultCtor{} };
~~~
```

11.1.3.4 FilterOrder

enum cbe::FilterOrder : uint32_t [strong]
Set the filter order in which the search or query will be sorted after.

1. Title
2. Relevance
3. Published
4. Updated
5. Length
6. S1
7. S2
8. S3
9. S4

11.1.3.5 ItemType

enum cbe::ItemType : cbe::item_t [strong]
ItemType can be used to sort out cbe objects if the user would like to create a container to put all different kinds of cbe objects in. E.g.,

- Object
- Container
- Group

11.1.3.6 ObjectType

enum cbe::ObjectType : object_t [strong]
Type of invite.

11.1.3.7 Permissions

`enum cbe::Permissions : permission_status_t [strong]`
Represents the access permission that can be set for any cbe::Object or cbe::Container.
Forms the the possible different combinations of:

- 1: Read
- 2: Write
- 4: Delete
- 8: ChangeACL

combinations give access for users to use different API calls.

0. NoPermissions
1. Read
2. Write
3. ReadWrite
4. Delete
5. ReadDelete
6. WriteDelete
7. ReadWriteDelete
8. ChangeACL
9. ReadChangeACL
10. WriteChangeACL
11. ReadWriteChangeACL
12. DeleteChangeACL
13. ReadDeleteChangeACL
14. WriteDeleteChangeACL
15. AllPermissions

E.g.: cbe::Permissions::ReadDelete gives the ability to call move() on a Container or an Object.

11.1.3.8 PublishAccess

`enum cbe::PublishAccess : cbe::publish_access_t [strong]`
Access permission for publish

1. Read
2. Update
3. Create

11.1.3.9 PublishVisibility

`enum cbe::PublishVisibility : cbe::publish_visibility_t [strong]`
Visibility for publish

1. Public
2. Friends
3. Private
4. Invited

11.1.3.10 Visibility

`enum cbe::Visibility : visibility [strong]`
Visibility is used for both groups and members, in this version the member visibility will be Public for all members who join a group.
Members will in the future also have the option of visibility friends.

1. Public
2. Private

11.2 cbe::delegate Namespace Reference

Root namespace for the delegate interfaces.

Namespaces

- container

  Namespace for cbe::Container specific delegate interfaces.
- group

  Namespace for cbe::Group specific delegate interfaces.
- object

  Namespace for cbe::Object specific delegate interfaces.

Classes

- class AclDelegate
- class AddRoleMemberDelegate
- class BanDelegate
- class BanSuccess

  Convenience type that bundles all parameters passed to method cbe::delegate::BanDelegate::onBanSuccess.
- class ChunkTransferred

  Bundles the progress event information in connection with download and upload.
- class CloudBackendListenerDelegate
- class CreateAccountDelegate
- class CreateContainerDelegate
- class CreateGroupDelegate
- class CreateObjectDelegate
- class CreateRoleDelegate
- class DownloadBinaryDelegate
- class DownloadBinarySuccess

  Convenience type that bundles all parameters passed to method cbe::delegate::DownloadBinaryDelegate::onDownloadBinarySuccess.
- class DownloadDelegate

- class DownloadSuccess

  Convenience type that bundles all parameters passed to method cbe::delegate::DownloadDelegate::onDownloadSuccess.
- class Error
- class GetStreamsDelegate
- class GetSubscriptionsDelegate
- class ICloudBackendListener
- class LoadError
- class JoinError
- class ItemError
- class JoinDelegate
- class KickDelegate
- class KickSuccess

  Convenience type that bundles all parameters passed to method cbe::delegate::KickDelegate::onKickSuccess.
- class LeaveDelegate
- class LeaveSuccess
- class ListGroupsDelegate
- class ListMembersDelegate
- class ListRolesDelegate
- class ListSharesDelegate
- class LogInDelegate
- class PublishDelegate
- class PublishSuccess

  Convenience type that bundles the parameter passed to method cbe::delegate::ShareDelegate::onShareSuccess.
- class QueryDelegate
- class QueryError
- class QueryJoinDelegate
- struct QueryLoaded
- class RemoveRoleDelegate
- class RemoveRoleMemberDelegate
- class SearchGroupsDelegate
- class ShareDelegate
- class ShareSuccess

  Convenience type that bundles the parameter passed to method cbe::delegate::ShareDelegate::onShareSuccess.
- class SubscribeDelegate
- class TransferError
- class UnBanDelegate
- class UnBanSuccess

  Convenience type that bundles all parameters passed to method cbe::delegate::UnBanDelegate::onUnBanSuccess.
- class UnPublishDelegate
- class UnPublishSuccess

  Convenience type that bundles all parameters passed to method cbe::delegate::UnPublishDelegate::onUnPublishError.
- class UnShareDelegate
- class UnShareSuccess

  Convenience type that bundles the parameter passed to method cbe::delegate::ShareDelegate::onShareSuccess.
- class UnSubscribeDelegate
- class UnSubscribeSuccess

  Convenience type that bundles all parameters passed to method cbe::delegate::UnSubscribeDelegate::onUnSubscribeSuccess.
- class UpdateKeyValuesDelegate
- class UploadDelegate

Typedefs

- using AclDelegatePtr = std::shared_ptr< AclDelegate >
- using AddRoleMemberDelegatePtr = std::shared_ptr< AddRoleMemberDelegate >
- using BanDelegatePtr = std::shared_ptr< BanDelegate >
- using CloudBackendListenerDelegatePtr = std::shared_ptr< CloudBackendListenerDelegate >
- using CreateAccountDelegatePtr = std::shared_ptr< CreateAccountDelegate >
- using CreateContainerDelegatePtr = std::shared_ptr< CreateContainerDelegate >
- using CreateGroupDelegatePtr = std::shared_ptr< CreateGroupDelegate >
- using CreateObjectDelegatePtr = std::shared_ptr< CreateObjectDelegate >
- using CreateRoleDelegatePtr = std::shared_ptr< CreateRoleDelegate >
- using DownloadBinaryDelegatePtr = std::shared_ptr< DownloadBinaryDelegate >
- using DownloadDelegatePtr = std::shared_ptr< DownloadDelegate >
- using GetStreamsDelegatePtr = std::shared_ptr< GetStreamsDelegate >
- using GetSubscriptionsDelegatePtr = std::shared_ptr< GetSubscriptionsDelegate >
- using ICloudBackendListenerPtr = std::shared_ptr< ICloudBackendListener >
- using JoinDelegatePtr = std::shared_ptr< JoinDelegate >
- using KickDelegatePtr = std::shared_ptr< KickDelegate >
- using LeaveDelegatePtr = std::shared_ptr< LeaveDelegate >
- using ListGroupsDelegatePtr = std::shared_ptr< ListGroupsDelegate >
- using ListMembersDelegatePtr = std::shared_ptr< ListMembersDelegate >
- using ListRolesDelegatePtr = std::shared_ptr< ListRolesDelegate >
- using ListSharesDelegatePtr = std::shared_ptr< ListSharesDelegate >
- using LogInDelegatePtr = std::shared_ptr< LogInDelegate >
- using ProgressEventFn = std::function< void(const ChunkTransferred &)>

  Callback interface function that the CloudBackend SDK uses to indicate the progress of an upload/download.
- using PublishDelegatePtr = std::shared_ptr< PublishDelegate >
- using QueryDelegatePtr = std::shared_ptr< QueryDelegate >
- using **Error** = delegate::Error
- using QueryJoinDelegatePtr = std::shared_ptr< QueryJoinDelegate >
- using RemoveRoleDelegatePtr = std::shared_ptr< RemoveRoleDelegate >
- using RemoveRoleMemberDelegatePtr = std::shared_ptr< RemoveRoleMemberDelegate >
- using SearchGroupsDelegatePtr = std::shared_ptr< SearchGroupsDelegate >
- using ShareDelegatePtr = std::shared_ptr< ShareDelegate >
- using SubscribeDelegatePtr = std::shared_ptr< SubscribeDelegate >
- using UnBanDelegatePtr = std::shared_ptr< UnBanDelegate >
- using UnPublishDelegatePtr = std::shared_ptr< UnPublishDelegate >
- using UnShareDelegatePtr = std::shared_ptr< UnShareDelegate >
- using UnSubscribeDelegatePtr = std::shared_ptr< UnSubscribeDelegate >
- using UpdateKeyValuesDelegatePtr = std::shared_ptr< UpdateKeyValuesDelegate >
- using UploadDelegatePtr = std::shared_ptr< UploadDelegate >

Functions

- CBI::ItemDelegatePtr **createCbiQueryDelegate** (QueryDelegatePtr, cbe::util::Context &&)
- CBI::ItemDelegatePtr **createCbiQueryDelegate** (QueryJoinDelegatePtr, cbe::util::Context &&)
- CBI::ItemDelegatePtr **createCbiJoinDelegate** (JoinDelegatePtr, cbe::util::Context &&)

11.2.1 Detailed Description

Root namespace for the delegate interfaces.

11.2.2 Typedef Documentation

11.2.2.1 AclDelegatePtr

```
using cbe::delegate::AclDelegatePtr = typedef std::shared_ptr<AclDelegate>
```

Pointer to AclDelegate that is passed into:

- cbe::Container::getAcl()
- cbe::Container::setAcl()
- cbe::Object::getAcl()
- cbe::Object::setAcl()

11.2.2.2 AddRoleMemberDelegatePtr

```
using cbe::delegate::AddRoleMemberDelegatePtr = typedef std::shared_ptr<AddRoleMemberDelegate>
```

Pointer to AddRoleMemberDelegate that is passed into:

- cbe::Group::AddMember(AddRoleMemberDelegatePtr).

11.2.2.3 BanDelegatePtr

```
using cbe::delegate::BanDelegatePtr = typedef std::shared_ptr<BanDelegate>
```

Pointer to BanDelegate that is passed into:

- cbe::Member::ban(std::string,BanDelegatePtr)

11.2.2.4 CloudBackendListenerDelegatePtr

```
using cbe::delegate::CloudBackendListenerDelegatePtr = typedef std::shared_ptr<CloudBackendListenerDelegate>
```

Pointer to CloudBackendListenerDelegate that is passed into:
CloudBackend::addListener(CloudBackendListenerDelegatePtr).

11.2.2.5 CreateAccountDelegatePtr

```
using cbe::delegate::CreateAccountDelegatePtr = typedef std::shared_ptr<CreateAccountDelegate>
```

Pointer to CreateAccountDelegate that is passed into:
CloudBackend::createAccount(const std::string&,const std::string&,const std::string&,const std↩
::string&,const std::string&,CreateAccountDelegatePtr).

11.2.2.6 CreateContainerDelegatePtr

```
using cbe::delegate::CreateContainerDelegatePtr = typedef std::shared_ptr<CreateContainerDelegate>
```

Pointer to CreateContainerDelegate that is passed into:

- cbe::Container::createContainer()

11.2.2.7 CreateGroupDelegatePtr

```
using cbe::delegate::CreateGroupDelegatePtr = typedef std::shared_ptr<CreateGroupDelegate>
```

Pointer to CreateGroupDelegate that is passed into:
Group::createGroup(std::string,std::string,CreateGroupDelegatePtr,cbe::Visibility).

11.2.2.8 CreateObjectDelegatePtr

```
using cbe::delegate::CreateObjectDelegatePtr = typedef std::shared_ptr<CreateObjectDelegate>
```

Pointer to CreateObjectDelegate that is passed into:
Container::createObject(std::string,CreateObjectDelegatePtr,cbe::KeyValues).

11.2.2.9 CreateRoleDelegatePtr

```
using cbe::delegate::CreateRoleDelegatePtr = typedef std::shared_ptr<CreateRoleDelegate>
```

Pointer to CreateRoleDelegate that is passed into:
Group::createRole(std::string, CreateRoleDelegatePtr).

11.2.2.10 DownloadBinaryDelegatePtr

```
using cbe::delegate::DownloadBinaryDelegatePtr = typedef std::shared_ptr<DownloadBinaryDelegate>
```

Pointer to DownloadBinaryDelegate that is passed into:

- cbe::Object::download(DownloadBinaryDelegatePtr)

11.2.2.11 DownloadDelegatePtr

```
using cbe::delegate::DownloadDelegatePtr = typedef std::shared_ptr<DownloadDelegate>
```

Pointer to DownloadDelegate that is passed into:

- cbe::Object::download(const std::string&,DownloadDelegatePtr)
- cbe::Object::downloadStream(const std::string&,cbe::Stream,DownloadDelegatePtr)

11.2.2.12 GetStreamsDelegatePtr

```
using cbe::delegate::GetStreamsDelegatePtr = typedef std::shared_ptr<GetStreamsDelegate>
```

Pointer to GetStreamsDelegate that is passed into:
Object::getStreams(GetStreamsDelegatePtr).

11.2.2.13 GetSubscriptionsDelegatePtr

```
using cbe::delegate::GetSubscriptionsDelegatePtr = typedef std::shared_ptr<GetSubscriptionsDelegate>
```

Pointer to GetSubscriptionsDelegate that is passed into: SubscribeManager::getSubscriptions(GetSubscriptionsDelegatePtr).

11.2.2.14 ICloudBackendListenerPtr

```
using cbe::delegate::ICloudBackendListenerPtr = typedef std::shared_ptr<ICloudBackendListener>
```

Pointer to ICloudBackendListener.

11.2.2.15 JoinDelegatePtr

```
typedef std::shared_ptr< JoinDelegate > cbe::delegate::JoinDelegatePtr
```

Pointer to JoinDelegate that is passed into cbe::QueryChain::join().

Note

This is different from the group join.

11.2.2.16 KickDelegatePtr

```
using cbe::delegate::KickDelegatePtr = typedef std::shared_ptr<KickDelegate>
```

Pointer to KickDelegate that is passed into:

- cbe::Member::kick(std::string,KickDelegatePtr)

11.2.2.17 LeaveDelegatePtr

```
using cbe::delegate::LeaveDelegatePtr = typedef std::shared_ptr<LeaveDelegate>
```

Pointer to LeaveDelegate that is passed into:
Group::leave(LeaveDelegatePtr).

11.2.2.18 ListGroupsDelegatePtr

```
using cbe::delegate::ListGroupsDelegatePtr = typedef std::shared_ptr<ListGroupsDelegate>
```

Pointer to ListGroupsDelegate that is passed into:
GroupManager::listGroups(ListGroupsDelegatePtr).

11.2.2.19 ListMembersDelegatePtr

```
using cbe::delegate::ListMembersDelegatePtr = typedef std::shared_ptr<ListMembersDelegate>
```

Pointer to ListMembersDelegate that is passed into:

- cbe::Group::listMembers(ListMembersDelegatePtr).

11.2.2.20 ListRolesDelegatePtr

```
using cbe::delegate::ListRolesDelegatePtr = typedef std::shared_ptr<ListRolesDelegate>
```

Pointer to ListRolesDelegate that is passed into:

- cbe::Group::ListRoles(ListRolesDelegatePtr).

11.2.2.21 ListSharesDelegatePtr

```
using cbe::delegate::ListSharesDelegatePtr = typedef std::shared_ptr<ListSharesDelegate>
```

Pointer to ListSharesDelegate that is passed into:

- ShareManager::listAvailableShares(ListSharesDelegatePtr)
- ShareManager::listMyShares(ListSharesDelegatePtr)

11.2.2.22 LogInDelegatePtr

```
using cbe::delegate::LogInDelegatePtr = typedef std::shared_ptr<LogInDelegate>
```

Pointer to LogInDelegate that is passed into:

- cbe::CloudBackend::logIn(const std::string&,const std::string&,const std::string&,LogInDelegatePtr)

11.2.2.23 ProgressEventFn

```
using cbe::delegate::ProgressEventFn = typedef std::function<void(const ChunkTransferred&)>
```

Callback interface function that the CloudBackend SDK uses to indicate the progress of an upload/download.

11.2.2.24 PublishDelegatePtr

```
using cbe::delegate::PublishDelegatePtr = typedef std::shared_ptr<PublishDelegate>
```

Pointer to PublishDelegate that is passed into:

- cbe::Container::publish()
- cbe::Object::publish()

11.2.2.25 QueryDelegatePtr

```
typedef std::shared_ptr< QueryDelegate > cbe::delegate::QueryDelegatePtr
```

Pointer to QueryDelegate that is passed into:

- CloudBackend::query(ContainerId,delegate::QueryDelegatePtr) and overloads.
- Container::query(delegate::QueryDelegatePtr) and overloads.

11.2.2.26 QueryJoinDelegatePtr

```
typedef std::shared_ptr< QueryJoinDelegate > cbe::delegate::QueryJoinDelegatePtr
```

Pointer to QueryJoinDelegate that is passed into:

- CloudBackend::query(ContainerId,delegate::QueryJoinDelegatePtr) and overloads.
- Container::query(delegate::QueryJoinDelegatePtr) and overloads.

11.2.2.27 RemoveRoleDelegatePtr

```
using cbe::delegate::RemoveRoleDelegatePtr = typedef std::shared_ptr<RemoveRoleDelegate>
```

Pointer to RemoveRoleDelegate that is passed into:
Group::removeRole(std::string, RemoveRoleDelegatePtr).

11.2.2.28 RemoveRoleMemberDelegatePtr

```
using cbe::delegate::RemoveRoleMemberDelegatePtr = typedef std::shared_ptr<RemoveRoleMemberDelegate>
```

Pointer to RemoveRoleMemberDelegate that is passed into:

- cbe::Group::RemoveMember(RemoveRoleMemberDelegatePtr).

11.2.2.29 SearchGroupsDelegatePtr

```
using cbe::delegate::SearchGroupsDelegatePtr = typedef std::shared_ptr<SearchGroupsDelegate>
```

Pointer to SearchGroupsDelegate that is passed into:

- cbe::GroupManager::searchGroups()

11.2.2.30 ShareDelegatePtr

```
using cbe::delegate::ShareDelegatePtr = typedef std::shared_ptr<ShareDelegate>
```

Pointer to ShareDelegate that is passed into:

- cbe::Container::share(cbe::UserId,std::string,ShareDelegatePtr)
- cbe::Object::share(cbe::UserId,std::string,ShareDelegatePtr)

11.2.2.31 SubscribeDelegatePtr

```
using cbe::delegate::SubscribeDelegatePtr = typedef std::shared_ptr<SubscribeDelegate>
```

Pointer to SubscribeDelegate that is passed into:

- cbe::SubscribeManager::subscribe(cbe::UserId,std::string,cbe::PublishId,std::string,std::string,std::string,SubscribeDelegatePt

11.2.2.32 UnBanDelegatePtr

```
using cbe::delegate::UnBanDelegatePtr = typedef std::shared_ptr<UnBanDelegate>
```
Pointer to UnBanDelegate that is passed into:

- cbe::Member::unBan(UnBanDelegatePtr)

11.2.2.33 UnPublishDelegatePtr

```
using cbe::delegate::UnPublishDelegatePtr = typedef std::shared_ptr<UnPublishDelegate>
```
Pointer to UnPublishDelegate that is passed into:

- Container::unPublish(UnPublishDelegatePtr)
- Object::unPublish(UnPublishDelegatePtr)

11.2.2.34 UnShareDelegatePtr

```
using cbe::delegate::UnShareDelegatePtr = typedef std::shared_ptr<UnShareDelegate>
```
Pointer to UnShareDelegate that is passed into:

- cbe::Container::unShare()
- cbe::Object::unShare()

11.2.2.35 UnSubscribeDelegatePtr

```
using cbe::delegate::UnSubscribeDelegatePtr = typedef std::shared_ptr<UnSubscribeDelegate>
```
Pointer to UnSubscribeDelegate that is passed into:

- Container::unSubscribe(UnSubscribeDelegatePtr)
- Object::unSubscribe(UnSubscribeDelegatePtr)

11.2.2.36 UpdateKeyValuesDelegatePtr

```
using cbe::delegate::UpdateKeyValuesDelegatePtr = typedef std::shared_ptr<UpdateKeyValuesDelegate>
```
Pointer to UpdateKeyValuesDelegate that is passed into:

- cbe::Object::updateKeyValues()

11.2.2.37 UploadDelegatePtr

```
using cbe::delegate::UploadDelegatePtr = typedef std::shared_ptr<UploadDelegate>
```
Pointer to UploadDelegate that is passed into:

- cbe::Container::upload(const std::string&,UploadDelegatePtr)
- cbe::Container::upload(const std::string&,const std::string&,UploadDelegatePtr)
- cbe::Object::uploadStream(const std::string&,cbe::StreamId,UploadDelegatePtr)

11.3 cbe::delegate::container Namespace Reference

Namespace for cbe::Container specific delegate interfaces.

Classes

- class MoveDelegate
- class RemoveDelegate
- class RemoveSuccess

  Convenience type that bundles all parameters passed to method cbe::delegate::container::RemoveDelegate::onRemoveSuccess.
- class RenameDelegate

Typedefs

- using MoveDelegatePtr = std::shared_ptr< MoveDelegate >
- using RemoveDelegatePtr = std::shared_ptr< RemoveDelegate >
- using RenameDelegatePtr = std::shared_ptr< RenameDelegate >

11.3.1 Detailed Description

Namespace for cbe::Container specific delegate interfaces.

11.3.2 Typedef Documentation

11.3.2.1 MoveDelegatePtr

```
using cbe::delegate::container::MoveDelegatePtr = typedef std::shared_ptr<MoveDelegate>
```

Pointer to MoveDelegate that is passed into: Container::move(void move(cbe::ContainerId,MoveDelegatePtr).

11.3.2.2 RemoveDelegatePtr

```
using cbe::delegate::container::RemoveDelegatePtr = typedef std::shared_ptr<RemoveDelegate>
```

Pointer to RemoveDelegate that is passed into:

- cbe::Container::remove(RemoveDelegatePtr)

11.3.2.3 RenameDelegatePtr

```
using cbe::delegate::container::RenameDelegatePtr = typedef std::shared_ptr<RenameDelegate>
```

Pointer to RenameDelegate that is passed into: Container::rename(const std::string&,RenameDelegatePtr).

11.4 cbe::delegate::group Namespace Reference

Namespace for cbe::Group specific delegate interfaces.

Classes

- class JoinDelegate
- class RemoveDelegate
- class RemoveSuccess

  Convenience type that bundles all parameters passed to method cbe::delegate::group::RemoveDelegate::onRemoveSuccess.
- class RenameDelegate
- class RenameSuccess

  Convenience type that bundles all parameters passed to method cbe::delegate::group::RenameDelegate::onRenameSuccess.

Typedefs

- using JoinDelegatePtr = std::shared_ptr< JoinDelegate >
- using RemoveDelegatePtr = std::shared_ptr< RemoveDelegate >
- using RenameDelegatePtr = std::shared_ptr< RenameDelegate >

11.4.1 Detailed Description

Namespace for cbe::Group specific delegate interfaces.

11.4.2 Typedef Documentation

11.4.2.1 JoinDelegatePtr

```
using cbe::delegate::group::JoinDelegatePtr = typedef std::shared_ptr<JoinDelegate>
```

Pointer to JoinDelegate that is passed into: cbe::Group::join()

Note

This is different from the query chain join.

11.4.2.2 RemoveDelegatePtr

```
using cbe::delegate::group::RemoveDelegatePtr = typedef std::shared_ptr<RemoveDelegate>
```

Pointer to RemoveDelegate that is passed into:

- cbe::Group::remove(RemoveDelegatePtr)

11.4.2.3 RenameDelegatePtr

```
using cbe::delegate::group::RenameDelegatePtr = typedef std::shared_ptr<RenameDelegate>
```

Pointer to RenameDelegate that is passed into: cbe::Group::rename()

11.5 cbe::delegate::object Namespace Reference

Namespace for cbe::Object specific delegate interfaces.

Classes

- class MoveDelegate
- class RemoveDelegate
- class RemoveSuccess

  Convenience type that bundles all parameters passed to method cbe::delegate::object::onRemoveSuccess.
- class RenameDelegate

Typedefs

- using MoveDelegatePtr = std::shared_ptr< MoveDelegate >
- using RemoveDelegatePtr = std::shared_ptr< RemoveDelegate >
- using RenameDelegatePtr = std::shared_ptr< RenameDelegate >

11.5.1 Detailed Description

Namespace for cbe::Object specific delegate interfaces.

11.5.2 Typedef Documentation

11.5.2.1 MoveDelegatePtr

```
using cbe::delegate::object::MoveDelegatePtr = typedef std::shared_ptr<MoveDelegate>
```
Pointer to MoveDelegate that is passed into: cbe::Object::move()

11.5.2.2 RemoveDelegatePtr

```
using cbe::delegate::object::RemoveDelegatePtr = typedef std::shared_ptr<RemoveDelegate>
```
Pointer to RemoveDelegate that is passed into:

- cbe::Object::remove(RemoveDelegatePtr)

11.5.2.3 RenameDelegatePtr

```
using cbe::delegate::object::RenameDelegatePtr = typedef std::shared_ptr<RenameDelegate>
```
Pointer to RenameDelegate that is passed into: cbe::Object::rename()

11.6 cbe::util Namespace Reference

General support program utilities.

Classes

- struct Context
- struct ErrorInfo
- struct ErrorInfoImpl
- struct Exception
- struct ExceptionImpl
- class Optional

  Class template Optional manages an optional contained value - i.e., a value that is either present or absent.

Functions

- template<typename T , typename... Ts>
  std::ostream & **buildMsg** (std::ostream &os, T &&arg, Ts &&... restArgs)
- template<typename T , typename... Ts>
  std::enable_if<!std::is_base_of< std::ostream, typename std::remove_reference< T >::type >::value, std↩
  ::string >::type **buildMsg** (T &&arg, Ts &&... restArgs)
- std::ostream & **operator**<< (std::ostream &os, const ErrorInfo &ei)

11.6.1 Detailed Description

General support program utilities.

Chapter 12

Class Documentation

12.1 cbe::Account Class Reference

Login account information.
`#include <Account.h>`

Public Member Functions

- cbe::UserId userId () const
  Returns the account id of the user.
- std::string username () const
  Returns the username of the account.
- std::string password () const
  Returns the password of the account.
- std::string source () const
  Returns the tenant name of the account.
- std::string client () const
  Returns the client of the account.
- std::string firstName () const
  Returns the given name of the user.
- std::string lastName () const
  Returns the surname of the user.
- cbe::Container rootContainer () const
  Returns the rootContainer for the account.
- cbe::ContainerId tenantContainerId () const
  Returns the tenant ContainerId.
- cbe::ContainerId libContainerId () const
  Returns the library ContainerId.
- cbe::DatabaseId rootDatabase () const
  Returns the DatabaseId for home:///.
- cbe::DataBases databases () const
  Returns the Databases available.
- Account (cbe::DefaultCtor)
  Default constructor.
- operator bool () const
  Checks if the current instance is real.

Friends

- class **CloudBackend**

12.1.1 Detailed Description

Login account information.

12.1.2 Constructor & Destructor Documentation

12.1.2.1 Account()

```
cbe::Account::Account (
            cbe::DefaultCtor  )
```

Default constructor.
Construct a new object with the `DefaultCtor` to enable the operator bool() test

12.1.3 Member Function Documentation

12.1.3.1 client()

```
std::string cbe::Account::client ( ) const
```

Returns the client of the account.
If it was set when the account was created.

12.1.3.2 databases()

```
cbe::DataBases cbe::Account::databases ( ) const
```

Returns the Databases available.
Returns a std::map of databases available for the account.

12.1.3.3 firstName()

```
std::string cbe::Account::firstName ( ) const
```

Returns the given name of the user.
Stored in lowercase.

12.1.3.4 libContainerId()

```
cbe::ContainerId cbe::Account::libContainerId ( ) const
```

Returns the library ContainerId.
The ContainerId of the library database for the account, which is where application specific settings and application state can be permanently stored in order to be available next time the app starts.

12.1.3.5 operator bool()

```
cbe::Account::operator bool ( ) const  [explicit]
```

Checks if the current instance is real.
An "unreal" instance implies typically a failed event.
Relies on the `Default constructor` Account(cbe::DefaultCtor)

Returns

`true` : is real

`false` : unreal; got nullptr; if current instance is unbound/undefined. I.e., if it is only default constructed.

12.1.3.6 password()

`std::string cbe::Account::password ( ) const`
Returns the password of the account.
What was used to login.

12.1.3.7 rootContainer()

`cbe::Container cbe::Account::rootContainer ( ) const`
Returns the rootContainer for the account.
The top container is also known as home://

12.1.3.8 rootDatabase()

`cbe::DatabaseId cbe::Account::rootDatabase ( ) const`
Returns the DatabaseId for home://.
Returns the databaseId for root a.k.a. home:// of the account.

12.1.3.9 source()

`std::string cbe::Account::source ( ) const`
Returns the tenant name of the account.

Note

Stored in lowercase.

12.1.3.10 tenantContainerId()

`cbe::ContainerId cbe::Account::tenantContainerId ( ) const`
Returns the tenant ContainerId.
Returns the ContainerId of the tenant database for the account. The top container is also known as tenant://
To get the Container, see Databases

12.1.3.11 username()

`std::string cbe::Account::username ( ) const`
Returns the username of the account.
Stored in lowercase.
The documentation for this class was generated from the following file:

- include/cbe/Account.h

12.2 cbe::delegate::AclDelegate Class Reference

`#include <AclDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Success** = AclMap
- using **Error** = delegate::Error

Public Member Functions

- virtual void onAclSuccess (AclMap &&aclMap)=0
- virtual void onAclError (Error &&error, cbe::util::Context &&context)=0

12.2.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Container::getAcl()
- cbe::Container::setAcl()
- cbe::Object::getAcl()
- cbe::Object::setAcl()

12.2.2 Member Function Documentation

12.2.2.1 onAclError()

```
virtual void cbe::delegate::AclDelegate::onAclError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.2.2.2 onAclSuccess()

```
virtual void cbe::delegate::AclDelegate::onAclSuccess (
            AclMap && aclMap )  [pure virtual]
```

Called upon successful GetACL.

Parameters

aclMap	The permissions for requested cbe::Container or cbe::Object.

The documentation for this class was generated from the following file:

- include/cbe/delegate/AclDelegate.h

12.3 cbe::delegate::AddRoleMemberDelegate Class Reference

```
#include <AddRoleMemberDelegate.h>
```

Classes

- struct ErrorInfo

Public Types

- using **Success** = MemberId
- using **Error** = delegate::Error

Public Member Functions

- virtual void onAddRoleMemberSuccess (MemberId memberId)=0
- virtual void onAddRoleMemberError (Error &&error, cbe::util::Context &&context)=0

12.3.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Group::AddMember

12.3.2 Member Function Documentation

12.3.2.1 onAddRoleMemberError()

```
virtual void cbe::delegate::AddRoleMemberDelegate::onAddRoleMemberError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.3.2.2 onAddRoleMemberSuccess()

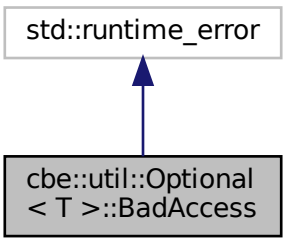
```
virtual void cbe::delegate::AddRoleMemberDelegate::onAddRoleMemberSuccess (
            MemberId memberId )  [pure virtual]
```

Called upon successful AddMember.
The documentation for this class was generated from the following file:

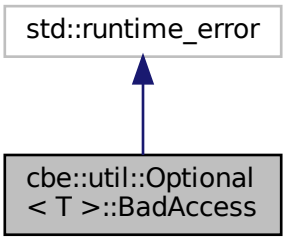
- include/cbe/delegate/AddRoleMemberDelegate.h

12.4 cbe::util::Optional< T >::BadAccess Class Reference

Thrown by value() method when accessing an object that does not contain a value.
`#include <Optional.h>`
Inheritance diagram for cbe::util::Optional< T >::BadAccess:



Collaboration diagram for cbe::util::Optional< T >::BadAccess:



12.4.1 Detailed Description

template<typename T>
class cbe::util::Optional< T >::BadAccess

Thrown by value() method when accessing an object that does not contain a value.
The documentation for this class was generated from the following file:

- include/cbe/util/Optional.h

12.5 cbe::delegate::BanDelegate Class Reference

`#include <BanDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Success** = BanSuccess
- using **Error** = delegate::Error

Public Member Functions

- virtual void onBanSuccess (std::string &&memberName, cbe::MemberId memberId)=0
- virtual void onBanError (Error &&error, cbe::util::Context &&context)=0

12.5.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Member::ban

12.5.2 Member Function Documentation

12.5.2.1 onBanError()

```
virtual void cbe::delegate::BanDelegate::onBanError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.5.2.2 onBanSuccess()

```
virtual void cbe::delegate::BanDelegate::onBanSuccess (
            std::string && memberName,
            cbe::MemberId memberId )  [pure virtual]
```

Called upon successful ban.

Parameters

memberName	Name of the member being banned.
memberId	Id of the member being banned.

The documentation for this class was generated from the following file:

- include/cbe/delegate/BanDelegate.h

12.6 cbe::delegate::BanSuccess Class Reference

Convenience type that bundles all parameters passed to method cbe::delegate::BanDelegate::onBanSuccess.

`#include <BanDelegate.h>`

Public Member Functions

- **BanSuccess** (cbe::DefaultCtor)
- **BanSuccess** (std::string &&memberName, cbe::MemberId memberId)

Public Attributes

- std::string **memberName** {}
- cbe::MemberId **memberId** {}

12.6.1 Detailed Description

Convenience type that bundles all parameters passed to method cbe::delegate::BanDelegate::onBanSuccess.
The documentation for this class was generated from the following file:

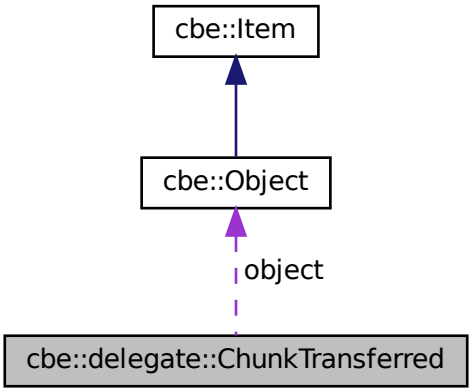
- include/cbe/delegate/BanDelegate.h

12.7 cbe::delegate::ChunkTransferred Class Reference

Bundles the progress event information in connection with download and upload.

`#include <ChunkTransferred.h>`

Collaboration diagram for cbe::delegate::ChunkTransferred:



Public Member Functions

- **ChunkTransferred** (cbe::DefaultCtor)
- **ChunkTransferred** (cbe::Object &&object, std::uint64_t transferred, std::uint64_t total)

Public Attributes

- cbe::Object **object** {cbe::DefaultCtor{}}
- std::uint64_t **transferred** {}
- std::uint64_t **total** {}

12.7.1 Detailed Description

Bundles the progress event information in connection with download and upload.
Convenience type that bundles all parameters passed to methods:

- cbe::delegate::DownloadDelegate::onChunkReceived()
- cbe::delegate::DownloadBinaryDelegate::onChunkReceived()
- cbe::delegate::UploadDelegate::onChunkSent()
- cbe::delegate::UploadBinaryDelegate::onChunkSent()

The documentation for this class was generated from the following file:

- include/cbe/delegate/ChunkTransferred.h

12.8 cbe::CloudBackend Class Reference

The session that holds the connection with the cloud.
`#include <CloudBackend.h>`

Public Types

- using LogInDelegatePtr = delegate::LogInDelegatePtr
- using CreateAccountDelegatePtr = delegate::CreateAccountDelegatePtr
- using CloudBackendListenerDelegatePtr = std::shared_ptr< delegate::CloudBackendListenerDelegate >
- using ListenerHandle = std::uint64_t

  Handle identifying a registered Listener.
- using QueryDelegatePtr = delegate::QueryDelegatePtr
- using QueryJoinDelegatePtr = delegate::QueryJoinDelegatePtr

Public Member Functions

- ListenerHandle addListener (CloudBackendListenerDelegatePtr listener)

  Listen for changes to specific items.
- void removeListener (ListenerHandle handle)

  Delete a specific listener.
- cbe::QueryChain query (ContainerId containerId, QueryDelegatePtr queryDelegate)

  Select Item's of a container (table).
- cbe::QueryChain query (ContainerId containerId, Filter filter, QueryDelegatePtr queryDelegate)

  Select Item's of a container (table) with a filter (where).
- cbe::QueryChainExt query (ContainerId containerId, QueryJoinDelegatePtr queryJoinDelegate)

  Join multiple tables.
- cbe::QueryChainExt query (ContainerId containerId, Filter filter, QueryJoinDelegatePtr queryJoinDelegate)

  Join multiple tables using filter (where).
- cbe::QueryChain queryWithPath (std::string relativePath, cbe::ContainerId queryRoot, QueryDelegatePtr delegate)

  Queries items of a container with a given path.
- cbe::QueryChain queryWithPath (std::string relativePath, QueryDelegatePtr delegate)

  Queries items of a container with a given path relative the home root container.
- cbe::QueryResult search (std::string tags, cbe::ContainerId containerId, QueryDelegatePtr delegate)

  Select Object's with specified key/values.
- cbe::QueryResult search (cbe::Filter filter, cbe::ContainerId containerId, QueryDelegatePtr delegate)

  Select Object's with specified key/values using filter.
- bool clearCache ()

  Clear the local cache.
- cbe::Account account ()

  Returns an account object with information on the user.
- std::string version () const

  Returns the version number of the SDK.
- cbe::GroupManager groupManager ()

  Gets the group manager.
- cbe::ShareManager shareManager ()

  Gets the share manager.
- cbe::PublishManager publishManager ()

  Gets the publish manager.
- void terminate ()

  Terminates the CloudBackend service.
- cbe::SubscribeManager subscribeManager ()

  Gets the subscribe manager.
- CloudBackend (cbe::DefaultCtor)

  Default constructor.
- operator bool () const

  Checks if the current instance is real.

Static Public Member Functions

- static cbe::CloudBackend logIn (const std::string &username, const std::string &password, const std::string &tenant, const std::string &client, LogInDelegatePtr delegate)

  Logs in to the CloudBackend service.
- static cbe::UserId createAccount (const std::string &username, const std::string &password, const std::string &email, const std::string &firstName, const std::string &lastName, const std::string &tenant, const std::string &client, CreateAccountDelegatePtr delegate)

  Creates a user account.
- static cbe::Container castContainer (cbe::Item item)

  Casts an item to a container.
- static cbe::Object castObject (cbe::Item item)

  Casts an item to an object.

12.8.1 Detailed Description

The session that holds the connection with the cloud.
It ensures the connection is authenticated.

12.8.2 Member Typedef Documentation

12.8.2.1 CloudBackendListenerDelegatePtr

```
using cbe::CloudBackend::CloudBackendListenerDelegatePtr = std::shared_ptr<delegate::CloudBackendListenerDele
```

Pointer to delegate::CloudBackendListenerDelegate that is passed into asynchronous version of method addListener(CloudBackendListenerDelegatePtr)

12.8.2.2 CreateAccountDelegatePtr

```
using cbe::CloudBackend::CreateAccountDelegatePtr = delegate::CreateAccountDelegatePtr
```

Pointer to delegate::CreateAccountDelegate that is passed into asynchronous version of method createAccount()

12.8.2.3 LogInDelegatePtr

```
using cbe::CloudBackend::LogInDelegatePtr = delegate::LogInDelegatePtr
```

Pointer to cbe::delegate::LogInDelegate() that is passed into asynchronous version of method logIn()

12.8.2.4 QueryDelegatePtr

```
using cbe::CloudBackend::QueryDelegatePtr = delegate::QueryDelegatePtr
```

Pointer to delegate::QueryDelegate that is passed into asynchronous version of methods:

- query(ContainerId,QueryDelegatePtr),
- query(ContainerId,Filter,QueryDelegatePtr),
- queryWithPath(std::string, QueryDelegatePtr)
- queryWithPath(std::string, cbe::ContainerId, QueryDelegatePtr),
- search(std::string,cbe::ContainerId,QueryDelegatePtr),
- search(Filter,cbe::ContainerId,QueryDelegatePtr)

12.8.2.5 QueryJoinDelegatePtr

```
using cbe::CloudBackend::QueryJoinDelegatePtr = delegate::QueryJoinDelegatePtr
```

Pointer to delegate::QueryJoinDelegate that is passed into asynchronous version of methods

- query(ContainerId,QueryJoinDelegatePtr)
- query(ContainerId,Filter,QueryJoinDelegatePtr)

12.8.3 Constructor & Destructor Documentation

12.8.3.1 CloudBackend()

```
cbe::CloudBackend::CloudBackend (
            cbe::DefaultCtor  )
```

Default constructor.
Construct a new object with the `DefaultCtor` to enable the operator bool() test

12.8.4 Member Function Documentation

12.8.4.1 account()

```
cbe::Account cbe::CloudBackend::account ( )
```

Returns an account object with information on the user.

Returns

cbe::Account

12.8.4.2 addListener()

```
ListenerHandle cbe::CloudBackend::addListener (
            CloudBackendListenerDelegatePtr listener )
```

Listen for changes to specific items.
Adds a listener that will receive updates as changes occur on the account.

Note

removeListener() should always be called when no longer using the delegate.

Parameters

listener	Delegate is a shared pointer to the class delegate::CloudBackendListenerDelegate that the user has implemented

Returns

Handle identifying the registration of the listener.
To be used when de-registering with method removeListener(ListenerHandle).

12.8.4.3 castContainer()

```
static cbe::Container cbe::CloudBackend::castContainer (
```

```
            cbe::Item item )  [static]
```

Casts an item to a container.
Pointer to cbe::delegate::QueryDelegate that is passed into asynchronous version of method search()
If the provided cbe::Item "item" is not a cbe::Container "container", an empty container instance is returned

12.8.4.4 castObject()

```
static cbe::Object cbe::CloudBackend::castObject (
            cbe::Item item )  [static]
```

Casts an item to an object.
If the provided cbe::Item "item" is not a cbe::Object "object", an empty object instance is returned

12.8.4.5 clearCache()

```
bool cbe::CloudBackend::clearCache ( )
```

Clear the local cache.
Use if there is a local SDK memory issue.

Returns

true success

false failed

12.8.4.6 createAccount()

```
static cbe::UserId cbe::CloudBackend::createAccount (
            const std::string & username,
            const std::string & password,
            const std::string & email,
            const std::string & firstName,
            const std::string & lastName,
            const std::string & tenant,
            const std::string & client,
            CreateAccountDelegatePtr delegate )  [static]
```

Creates a user account.
This method is only granted to the tenant administrator.
Asynchronous version of this service function.

Parameters

username	Username for the new account
password	Password for the new account
email	Email address to owner of the new account
firstName	First name of the owner of the new account
lastName	Last name of the owner of the new account
tenant	The identifier for the tenant, formerly known as `source`.
client	Describing platform running the software. Names defined by the tenant administrator.
delegate	Pointer to a delegate::CreateAccountDelegate instance that is implemented by the user.

12.8.4.7 groupManager()

```
cbe::GroupManager cbe::CloudBackend::groupManager ( )
```

Gets the group manager.

Returns

cbe::GroupManager

12.8.4.8 logIn()

```
static cbe::CloudBackend cbe::CloudBackend::logIn (
            const std::string & username,
            const std::string & password,
            const std::string & tenant,
            const std::string & client,
            LogInDelegatePtr delegate )  [static]
```

Logs in to the CloudBackend service.
When finished with the usage of the CloudBackend service, call method CloudBackend::terminate() in all cases.
The authentication to the account is determined by `username`, `password` and `tenant`.
Asynchronous version of this service function.

Parameters

username	Name of the user to be signed in.
password	Password for the user to be signed in.
tenant	The identifier for the tenant, formerly known as `source`.
client	Identifier of what type of client the program is running on. This is used by the tenant for statistics and selective communication with the users. The tenant administrator defines what client names to use.
delegate	Pointer to a be::CloudBackend::LogInDelegate() instance that is implemented by the user to receive the response of this login request. This is accomplished in terms of the LogInDelegate callback functions onLogInSuccess() and onLogInError().

Example

Async login

```
#include "cbe/CloudBackend.h"
~~~
#include <condition_variable>
#include <mutex>
~~~
int main() {
  // First, declare and implement a LogInDelegate class
  class MyLogInDelegate : public cbe::delegate::LogInDelegate {
    std::mutex              mutex{};
    std::condition_variable conditionVariable{};
    // Indicates operation completed - success or failure
    bool                    called{};
  public:
    // Default construct this CloudBackend member. If the method
    // onLogInSuccess() will not not be called, this default constructed state
    // implies that this cloudBackend object is not valid due to a successful
    // log in
    cbe::CloudBackend cloudBackend{ cbe::DefaultCtor{} };
    // Default construct this cbe::delegate::Error member, If the method
    // onLogInError() will not not be called, this default constructed state
    // implies no error. Otherwise, thus error object will contain the error
    // information.
    cbe::delegate::Error error{};
    // Implement the cbe::delegate::LogInDelegate interface callbacks (private
    // cause they are only used by the SDK):
  private:
    // Callback called upon successful login.
    void onLogInSuccess(cbe::CloudBackend&& cloudBackend) final {
      {
        std::lock_guard<std::mutex> lock(mutex);
        // Put error member into the default constructed state to
        // indicate success (i.e., no error)
        error = cbe::delegate::Error{};
        // Change state of cloudBackend member to indicate success
        this->cloudBackend = std::move(cloudBackend);
```

```
        // Indicate operation completed, member cloudBackend non-default
        // constructed state indicates success
        called = true;
      }
      conditionVariable.notify_one();
    }
    // Callback called upon failed login.
    void onLogInError(Error&& error, cbe::util::Context&& context) final {
      {
        std::lock_guard<std::mutex> lock(mutex);
        // Put cloudBackend member into the default constructed state to
        // indicate no-success
        cloudBackend = cbe::CloudBackend{ cbe::DefaultCtor{} };
        // Change state of error member to indicate failure
        this->error = std::move(error);
        // Indicate operation completed, member member cloudBackend default
        // constructed state indicates failure
        called = true;
      }
      conditionVariable.notify_one();
    }
    // - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  public:
    void waitForRsp() {
      std::unique_lock<std::mutex> lock(mutex);
      conditionVariable.wait(lock, [this]{ return called; });
      // Reset called flag, so current delegate instance can be reused
      called = false;
    }
  }; // struct MyLogInDelegate
  ~~~
  ~~~
  // Second, initiate the login:
  static constexpr const char* const username = "~~~";
  static constexpr const char* const password = "~~~";
  static constexpr const char* const tenant   = "~~~";
  static constexpr const char* const client   = "linux_desktop";
  ~~~
  std::shared_ptr<MyLogInDelegate> myLogInDelegate =
                                    std::make_shared<MyLogInDelegate>();
  // Invoke the login (cast to return value to void to indicate is deliberately
  // discarded)
  cbe::CloudBackend cloudBackend = cbe::CloudBackend::logIn(username, password, tenant, client,
myLogInDelegate);
  // Await the login procedure to run to completion
  myLogInDelegate->waitForRsp();
  // Test if login failed
  if (myLogInDelegate->error) {
    std::cout « "Failed to login: error={" « myLogInDelegate->error « '}'
              « std::endl;
    //  Bail out!
    ~~~
  }
  // Since we have a complete CloudBackend object now, copy it from the delegate
  cloudBackend = myLogInDelegate->cloudBackend;
  // Dispose the delegate object, not needed anymore
  myLogInDelegate.reset();
  // Do your stuff
  ~~~
  // End of program, tell cbe to terminate the session
  cloudBackend.terminate();
}
```

12.8.4.9 operator bool()

`cbe::CloudBackend::operator bool ( ) const [explicit]`

Checks if the current instance is real.

An "unreal" instance implies typically a failed login event.

Relies on the `Default constructor` CloudBackend(cbe::DefaultCtor)

Returns

`true` : is real

`false` : unreal; got nullptr; if current instance is unbound/undefined. I.e., if it is only default constructed.

12.8.4.10 publishManager()

```
cbe::PublishManager cbe::CloudBackend::publishManager ( )
```

Gets the publish manager.

Returns

cbe::PublishManager

12.8.4.11 query() [1/4]

```
cbe::QueryChain cbe::CloudBackend::query (
            ContainerId containerId,
            Filter filter,
            QueryDelegatePtr queryDelegate )
```

Select Item's of a container (table) with a filter (where).
Same as query(ContainerId,QueryDelegatePtr), but with an additional parameter `filter`.

Parameters

filter	Filter specifying the constraints of the requested items.

12.8.4.12 query() [2/4]

```
cbe::QueryChainExt cbe::CloudBackend::query (
            ContainerId containerId,
            Filter filter,
            QueryJoinDelegatePtr queryJoinDelegate )
```

Join multiple tables using filter (where).
Same as query(ContainerId,delegate::QueryJoinDelegatePtr), but with an additional Filter parameter `filter`.

Parameters

filter	Filter specifying the constraints of the requested items.

12.8.4.13 query() [3/4]

```
cbe::QueryChain cbe::CloudBackend::query (
            ContainerId containerId,
            QueryDelegatePtr queryDelegate )
```

Select Item's of a container (table).
Inquires for a set of Items from the provided Container, identified by `containerId`. Response is delivered asynchronously via the delegate::QueryDelegate callback interface passed in as argument via parameter `query↩Delegate`.
This overload of join() accepting a QueryDelegate-pointer as parameter has two use cases:

1. To make a solely query() call **without** an additional chained join()-call.
2. To make a query() call **with** a desired chained join() call.
   In this latter case, the overloaded query()-functions:
   - query(ContainerId,delegate::QueryJoinDelegatePtr)
   - query(ContainerId,Filter,delegate::QueryJoinDelegatePtr)

   both accepting a QueryJoinDelegate as `delegate` argument, must be used.

Asynchronous version of this service function.

Parameters

containerId	Id of the container which contents will inquired.
queryDelegate	Pointer to a QueryDelegate instance, implemented by the user, that receives the response of this query request. I.e., either the QueryDelegate callback function onQuerySuccess() or onQueryError() will be called in the event of success, or failure respectively.

Example

Async query

```
~~~
std::shared_ptr<MyQueryDelegate> queryDelegate =
                                    std::make_shared<MyQueryDelegate>();
const cbe::ContainerId myContainerId =
                                   cloudBackend.account().rootContainer().id();
cloudBackend.query(myContainerId, queryDelegate);
queryDelegate->waitForRsp();
if (queryDelegate->errorInfo) {
  std::cout « "Query failed:" « std::endl;
  std::cout « "ErrorInfo = " « queryDelegate->errorInfo « std::endl;
} else {
  cbe::QueryResult::ItemsSnapshot itemsSnapshot =
                                queryDelegate->queryResult.getItemsSnapshot();
  for (auto& item : itemsSnapshot) {
      std::cout « item.name() « std::endl;
  }
}
~~~
```

To use the code above, we must first login and then declare a QueryDelegate class.
See also:

- Async login
  Here, we retrieve the `cloudBackend` object.
- Example QueryDelegatePtr of a QueryDelegate implementation class
  Here, class MyQueryDelegate is defined.

12.8.4.14 query() [4/4]

```
cbe::QueryChainExt cbe::CloudBackend::query (
            ContainerId containerId,
            QueryJoinDelegatePtr queryJoinDelegate )
```

Join multiple tables.
Same as query(ContainerId,delegate::QueryDelegatePtr), but with a QueryJoinDelegate as delegate, `query↩JoinDelegate`.

See also

query(ContainerId,delegate::QueryDelegatePtr)

Parameters

queryJoinDelegate	Pointer to a QueryJoinDelegate instance, implemented by the user, that receives the response of this query request. I.e., either its callback function onQueryJoinSuccess() or onQueryJoinError() will be called in the event of success or failure respectively.

12.8.4.15 queryWithPath() [1/2]

```
cbe::QueryChain cbe::CloudBackend::queryWithPath (
            std::string relativePath,
            cbe::ContainerId queryRoot,
            QueryDelegatePtr delegate )
```

Queries items of a container with a given path.

Note

`..` or `.` relative path options are not permitted.
Only top down search from start point, `queryRoot` id to downwards path in container tree.

Parameters

relativePath	The relative path from the `queryRoot`. E.g.: `/Documents/Pictures` from a `queryRoot` that has the nested containers `Documents` and `Pictures`.
queryRoot	The container id forming the root of this query.
delegate	Pointer to a delegate::QueryDelegate instance that is implemented by the user.

12.8.4.16 queryWithPath() [2/2]

```
cbe::QueryChain cbe::CloudBackend::queryWithPath (
            std::string relativePath,
            QueryDelegatePtr delegate )
```

Queries items of a container with a given path relative the home root container.
Same as queryWithPath(std::string, cbe::ContainerId, QueryDelegatePtr), but with the `queryRoot` parameter omitted. Instead, here the home root container is used as top container in the search tree.

12.8.4.17 removeListener()

```
void cbe::CloudBackend::removeListener (
            ListenerHandle handle )
```

Delete a specific listener.
Removes a listener that will receive updates as changes occur on the account

Parameters

handle	Handle previously retrieved from method addListener(CloudBackendListenerDelegatePtr).

12.8.4.18 search() [1/2]

```
cbe::QueryResult cbe::CloudBackend::search (
            cbe::Filter filter,
            cbe::ContainerId containerId,
            QueryDelegatePtr delegate )
```

Select Object's with specified key/values using filter.
Pointer to cbe::delegate::QueryDelegate that is passed into asynchronous version of method search()
Search the whole container with sub-containers related to Objects in the container hierarchy structure.
E.g., `Key = Name, Value Contract/Object/Song => Name:Contract1 .`
Search handles tags in combination / conjunction of keys and/or key values separated by |.
E.g., Name:∗|Country:Sweden|Country:Norway, this would search for objects with key Name of any value and where key Country is either Sweden or Norway.

See Filter.

Parameters

filter	is a cbe::Filter on which you can set how you want data to be ordered when searching. Remember to set the queryString to be keys/tags or key:value pairs that are separated by |.
containerId	is the ContainerId of the Container to start the search of Objects in. E.g., if starting in the rootContainer, the whole account will be searched for matching tags, key/value's.
delegate	is the callback pointer to where the API returns from either cache or Server.

12.8.4.19 search() [2/2]

```
cbe::QueryResult cbe::CloudBackend::search (
            std::string tags,
            cbe::ContainerId containerId,
            QueryDelegatePtr delegate )
```

Select Object's with specified key/values.
Search the whole container for tags related to Objects in the container structure.
E.g., `Key = Name, Value Contract/Object/Song => Name:Contract1 .`
Search handles tags in combination / conjunction of keys and/or key values separated by |.
E.g., Name:∗|Country:Sweden|Country:Norway.
This would search for objects with key Name of any value and where key Country is either Sweden or Norway.

Parameters

tags	Is a string of key tags or key:value pairs that are separated by |.
containerId	Is the cbe::ContainerId id of the rootContainer to start the search of objects in. E.g., if starting in the rootContainer, the whole account will be searched for matching tags, key/value's.
delegate	Is the callback pointer to where the API returns from either cache or Server.

12.8.4.20 shareManager()

```
cbe::ShareManager cbe::CloudBackend::shareManager ( )
```

Gets the share manager.

Returns

cbe::ShareManager

12.8.4.21 subscribeManager()

```
cbe::SubscribeManager cbe::CloudBackend::subscribeManager ( )
```

Gets the subscribe manager.

Returns

cbe::SubscribeManager

12.8.4.22 terminate()

```
void cbe::CloudBackend::terminate ( )
```

Terminates the CloudBackend service.
Shall also be called in connection with a failed log in.

12.8.4.23 version()

```
std::string cbe::CloudBackend::version ( ) const
```

Returns the version number of the SDK.

Returns

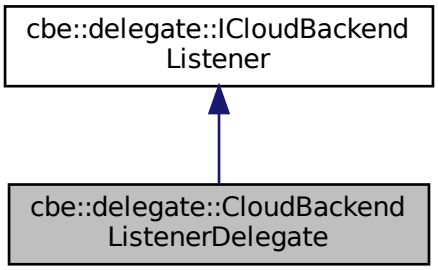
std::string

The documentation for this class was generated from the following file:

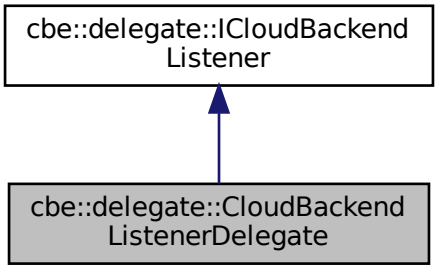
- include/cbe/CloudBackend.h

12.9 cbe::delegate::CloudBackendListenerDelegate Class Reference

Inheritance diagram for cbe::delegate::CloudBackendListenerDelegate:



Collaboration diagram for cbe::delegate::CloudBackendListenerDelegate:



Public Member Functions

- virtual void onRemoteObjectAdded (cbe::Object &&object) override
- virtual void onRemoteObjectMoved (cbe::Object &&object) override
- virtual void onRemoteObjectRemoved (cbe::ItemId objectId, std::string name) override
- virtual void onRemoteObjectRenamed (cbe::Object &&object) override
- virtual void onRemoteContainerAdded (cbe::Container &&container) override
- virtual void onRemoteContainerMoved (cbe::Container &&container) override
- virtual void onRemoteContainerRemoved (cbe::ItemId containerId, std::string name) override
- virtual void onRemoteContainerRenamed (cbe::Container &&container) override

12.9.1 Member Function Documentation

12.9.1.1 onRemoteContainerAdded()

```
virtual void cbe::delegate::CloudBackendListenerDelegate::onRemoteContainerAdded (
            cbe::Container && container )  [override], [virtual]
```

Called upon successful Create.

Parameters

container	Instance of container that is being created.

Implements cbe::delegate::ICloudBackendListener.

12.9.1.2 onRemoteContainerMoved()

```
virtual void cbe::delegate::CloudBackendListenerDelegate::onRemoteContainerMoved (
            cbe::Container && container )  [override], [virtual]
```

Called upon successful Move.

Parameters

container	Instance of container that is being moved.

Implements cbe::delegate::ICloudBackendListener.

12.9.1.3 onRemoteContainerRemoved()

```
virtual void cbe::delegate::CloudBackendListenerDelegate::onRemoteContainerRemoved (
            cbe::ItemId containerId,
            std::string name )  [override], [virtual]
```

Called upon successful Remove.

Parameters

containerId	Instance of the container that is being Removed.
name	Name of the container that is being removed.

Implements cbe::delegate::ICloudBackendListener.

12.9.1.4 onRemoteContainerRenamed()

```
virtual void cbe::delegate::CloudBackendListenerDelegate::onRemoteContainerRenamed (
            cbe::Container && container )  [override], [virtual]
```

Called upon successful Rename.

Parameters

container	Instance of container that is being Renamed.

Implements cbe::delegate::ICloudBackendListener.

12.9.1.5 onRemoteObjectAdded()

```
virtual void cbe::delegate::CloudBackendListenerDelegate::onRemoteObjectAdded (
            cbe::Object && object )  [override], [virtual]
```

Called upon successful create of an object.

Parameters

object	Instance of object that is being created.

Implements cbe::delegate::ICloudBackendListener.

12.9.1.6 onRemoteObjectMoved()

```
virtual void cbe::delegate::CloudBackendListenerDelegate::onRemoteObjectMoved (
            cbe::Object && object )  [override], [virtual]
```

Called upon successful move of an object.

Parameters

object	Instance of object that is being moved.

Implements cbe::delegate::ICloudBackendListener.

12.9.1.7 onRemoteObjectRemoved()

```
virtual void cbe::delegate::CloudBackendListenerDelegate::onRemoteObjectRemoved (
            cbe::ItemId objectId,
            std::string name )  [override], [virtual]
```

Called upon successful removal of an object.

Parameters

objectId	Instance of the object that is being Removed.
name	Name of the object that is being Removed.

Implements cbe::delegate::ICloudBackendListener.

12.9.1.8 onRemoteObjectRenamed()

```
virtual void cbe::delegate::CloudBackendListenerDelegate::onRemoteObjectRenamed (
```

cbe::Object && *object*) [override], [virtual]

Called upon successful renaming of an object.

Parameters

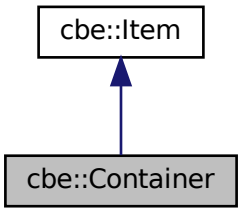
object	Instance of object that is being renamed.

Implements cbe::delegate::ICloudBackendListener.
The documentation for this class was generated from the following file:

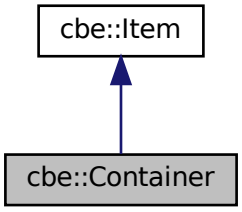
- include/cbe/delegate/CloudBackendListenerDelegate.h

12.10 cbe::Container Class Reference

A collection of Item, can also represent a table or folder.
`#include <Container.h>`
Inheritance diagram for cbe::Container:



Collaboration diagram for cbe::Container:



Public Types

- using CreateContainerDelegatePtr = delegate::CreateContainerDelegatePtr
- using MoveDelegatePtr = delegate::container::MoveDelegatePtr
- using RenameDelegatePtr = delegate::container::RenameDelegatePtr
- using RemoveDelegatePtr = delegate::container::RemoveDelegatePtr
- using CreateObjectDelegatePtr = delegate::CreateObjectDelegatePtr

- using UploadDelegatePtr = delegate::UploadDelegatePtr
- using QueryDelegatePtr = delegate::QueryDelegatePtr
- using QueryJoinDelegatePtr = std::shared_ptr< delegate::QueryJoinDelegate >
- using SetAclDelegatePtr = delegate::AclDelegatePtr
- using GetAclDelegatePtr = delegate::AclDelegatePtr
- using ShareDelegatePtr = delegate::ShareDelegatePtr
- using UnShareDelegatePtr = std::shared_ptr< delegate::UnShareDelegate >
- using PublishDelegatePtr = delegate::PublishDelegatePtr
- using UnPublishDelegatePtr = delegate::UnPublishDelegatePtr
- using UnSubscribeDelegatePtr = delegate::UnSubscribeDelegatePtr

Public Member Functions

- cbe::Container createContainer (const std::string &name, CreateContainerDelegatePtr delegate)

  Create a container.
- void move (cbe::ContainerId dstId, MoveDelegatePtr delegate)

  Move a container to a different parent.
- void rename (const std::string &name, RenameDelegatePtr delegate)

  Change the name of the container.
- void remove (RemoveDelegatePtr delegate)

  Delete the container.
- cbe::Object createObject (std::string name, cbe::KeyValues keyValues, CreateObjectDelegatePtr delegate)

  Create a new object.
- cbe::Object createObject (std::string name, CreateObjectDelegatePtr delegate)
- cbe::Object upload (const std::string &filePath, UploadDelegatePtr delegate)

  Upload object to container with file given by `filePath`.
- cbe::Object upload (const std::string &name, const std::string &path, UploadDelegatePtr delegate)

  Create an object in current container by uploading a file.
- cbe::Object upload (const std::string &name, std::uint64_t length, const char *byteData, UploadDelegatePtr delegate)

  Upload from local memory to an object.
- cbe::QueryChain query (QueryDelegatePtr queryDelegate)

  Select list of objects.
- cbe::QueryChain query (Filter filter, QueryDelegatePtr delegate)

  Select list of objects using filter.
- cbe::QueryChainExt query (delegate::QueryJoinDelegatePtr delegate)

  Select list of objects, for join.
- cbe::QueryChainExt query (Filter filter, delegate::QueryJoinDelegatePtr delegate)

  Select list of objects using filter, for join.
- cbe::QueryChain queryWithPath (std::string relativePath, QueryDelegatePtr delegate)

  Select list of objects in hierarchy.
- cbe::QueryResult search (std::string tags, QueryDelegatePtr delegate)

  Search by tags.
- cbe::QueryResult search (cbe::Filter filter, QueryDelegatePtr delegate)

  Search using filter.
- void setAcl (cbe::AclMap aclMap, SetAclDelegatePtr delegate)

  set ACL.
- void getAcl (GetAclDelegatePtr delegate)

  Retrieves its ACL map.
- void share (cbe::UserId toUserGroup, std::string description, ShareDelegatePtr delegate)

  Make accessible by other user.
- void unShare (cbe::ShareId shareId, UnShareDelegatePtr delegate)

Revoke a previous share.

- void publish (cbe::PublishAccess security, cbe::PublishVisibility privacy, std::string description, std::string password, PublishDelegatePtr delegate)

  Publishes a container and its content to any user.
- void unPublish (UnPublishDelegatePtr delegate)

  UnPublishes this container.
- void unSubscribe (UnSubscribeDelegatePtr delegate)

  UnSubscribes from this container.
- **Container** (cbe::DefaultCtor)

Friends

- class **Account**
- class **CloudBackend**
- class **Database**
- class **Filter**
- class **Group**
- class **QueryChain**

Additional Inherited Members

12.10.1 Detailed Description

A collection of Item, can also represent a table or folder.

12.10.2 Member Typedef Documentation

12.10.2.1 CreateContainerDelegatePtr

```
using cbe::Container::CreateContainerDelegatePtr = delegate::CreateContainerDelegatePtr
```

Pointer to cbe::delegate::CreateContainerDelegate that is passed into asynchronous version of method create↩ Container()

12.10.2.2 CreateObjectDelegatePtr

```
using cbe::Container::CreateObjectDelegatePtr = delegate::CreateObjectDelegatePtr
```

Pointer to cbe::delegate::CreateObjectDelegate that is passed into asynchronous version of method createObject()

12.10.2.3 GetAclDelegatePtr

```
using cbe::Container::GetAclDelegatePtr = delegate::AclDelegatePtr
```

Pointer to cbe::delegate::AclDelegate that is passed into asynchronous version of method getAcl()

12.10.2.4 MoveDelegatePtr

```
using cbe::Container::MoveDelegatePtr = delegate::container::MoveDelegatePtr
```

Pointer to cbe::delegate::MoveDelegate that is passed into asynchronous version of method move()

12.10.2.5 PublishDelegatePtr

```
using cbe::Container::PublishDelegatePtr = delegate::PublishDelegatePtr
```

Pointer to cbe::delegate::PublishDelegate that is passed into asynchronous version of method publish()

12.10.2.6 QueryDelegatePtr

```
using cbe::Container::QueryDelegatePtr = delegate::QueryDelegatePtr
```

Pointer to cbe::delegate::QueryDelegatePtr that is passed into asynchronous version of method query()

12.10.2.7 QueryJoinDelegatePtr

```
using cbe::Container::QueryJoinDelegatePtr = std::shared_ptr<delegate::QueryJoinDelegate>
```

Pointer to cbe::delegate::QueryJoinDelegate that is passed into asynchronous version of method query()

12.10.2.8 RemoveDelegatePtr

```
using cbe::Container::RemoveDelegatePtr = delegate::container::RemoveDelegatePtr
```

Pointer to cbe::delegate::RemoveDelegate that is passed into asynchronous version of method remove()

12.10.2.9 RenameDelegatePtr

```
using cbe::Container::RenameDelegatePtr = delegate::container::RenameDelegatePtr
```

Pointer to cbe::delegate::container::RenameDelegate that is passed into asynchronous version of method rename()

12.10.2.10 SetAclDelegatePtr

```
using cbe::Container::SetAclDelegatePtr = delegate::AclDelegatePtr
```

Pointer to cbe::delegate::SearchDelegate that is passed into asynchronous version of method search() Pointer to cbe::delegate::AclDelegate that is passed into asynchronous version of method setAcl()

12.10.2.11 ShareDelegatePtr

```
using cbe::Container::ShareDelegatePtr = delegate::ShareDelegatePtr
```

Pointer to cbe::delegate::ShareDelegate that is passed into asynchronous version of method share()

12.10.2.12 UnPublishDelegatePtr

```
using cbe::Container::UnPublishDelegatePtr = delegate::UnPublishDelegatePtr
```

Pointer to cbe::delegate::UnPublishDelegatePtr that is passed into asynchronous version of method unPublish()

12.10.2.13 UnShareDelegatePtr

```
using cbe::Container::UnShareDelegatePtr = std::shared_ptr<delegate::UnShareDelegate>
```

Pointer to cbe::delegate::UnShareDelegate that is passed into asynchronous version of method unShare()

12.10.2.14 UnSubscribeDelegatePtr

```
using cbe::Container::UnSubscribeDelegatePtr = delegate::UnSubscribeDelegatePtr
```

Pointer to cbe::delegate::UnPublishDelegate that is passed into asynchronous version of method unPublish() Pointer to cbe::delegate::UnSubscribeDelegate that is passed into asynchronous version of method unSubscribe()

12.10.2.15 UploadDelegatePtr

```
using cbe::Container::UploadDelegatePtr = delegate::UploadDelegatePtr
```

Pointer to cbe::delegate::UploadDelegate that is passed into asynchronous version of methods:

- upload(const std::string&,UploadDelegatePtr)
- upload(const std::string&,const std::string&,UploadDelegatePtr)
- upload(const std::string&,std::uint64_t,const char*,UploadDelegatePtr)

12.10.3 Member Function Documentation

12.10.3.1 createContainer()

```
cbe::Container cbe::Container::createContainer (
            const std::string & name,
            CreateContainerDelegatePtr delegate )
```

Create a container.
Creates a container inside this container to be used for adding objects.

Parameters

name	Name of the container to be created.
delegate	Pointer to a delegate::CreateContainerDelegate instance that is implemented by the user.

12.10.3.2 createObject() [1/2]

```
cbe::Object cbe::Container::createObject (
            std::string name,
            cbe::KeyValues keyValues,
            CreateObjectDelegatePtr delegate )
```

Create a new object.
Creates an object with indexed tags or indexed tags + non indexed tags a.k.a. metadata, key/value pairs.

Parameters

name	Name of the object.
keyValues	Optional map of key/value pairs (metadata).
delegate	Pointer to a delegate::CreateObjectDelegate instance that is implemented by the user.

Note

If an old object with the same name already exists that will be removed.
The object name may not contain characters < & : /
Any key name must start with a letter or _
The following key names are reserved and should not be used: category, content, id, link and date
Key names are case sensitive, hence variations with uppercase are permitted.

12.10.3.3 createObject() [2/2]

```
cbe::Object cbe::Container::createObject (
            std::string name,
            CreateObjectDelegatePtr delegate )
```

Same as createObject(std::string, cbe::KeyValues, CreateObjectDelegatePtr), but without the `keyValues` parameter.

12.10.3.4 getAcl()

```
void cbe::Container::getAcl (
            GetAclDelegatePtr delegate )
```

Retrieves its ACL map.
get the Access Control List `ACL` of the Container.

Parameters

delegate	Pointer to a delegate::AclDelegate instance that is implemented by the user.

12.10.3.5 move()

```
void cbe::Container::move (
            cbe::ContainerId dstId,
            MoveDelegatePtr delegate )
```

Move a container to a different parent.
Used to move container with its content to user specified location e.g., other container or to root container.

Parameters

dstId	id of the container to which it should be moved to.
delegate	Pointer to a delegate::container::MoveDelegate instance that is implemented by the user.

12.10.3.6 publish()

```
void cbe::Container::publish (
            cbe::PublishAccess security,
            cbe::PublishVisibility privacy,
            std::string description,
            std::string password,
            PublishDelegatePtr delegate )
```

Publishes a container and its content to any user.
Asynchronous version of this service function.
Can be revoked with unPublish()

Parameters

security	A cbe::PublishAccess enum
privacy	A cbe::PublishVisibility enum
description	Free text
password	Password
delegate	Pointer to a delegate::PublishDelegate instance that is implemented by the user.

12.10.3.7 query() [1/4]

```
cbe::QueryChainExt cbe::Container::query (
            delegate::QueryJoinDelegatePtr delegate )
```

Select list of objects, for join.
In line with function CloudBackend::query(ContainerId, delegate::QueryJoinDelegatePtr), but with its `Container↩Id` parameter excluded.

See also

CloudBackend::query(ContainerId, delegate::QueryJoinDelegatePtr)

12.10.3.8 query() [2/4]

```
cbe::QueryChainExt cbe::Container::query (
            Filter filter,
            delegate::QueryJoinDelegatePtr delegate )
```

Select list of objects using filter, for join.

In line with function CloudBackend::query(ContainerId, Filter, delegate::QueryJoinDelegatePtr), but with its `ContainerId` parameter excluded.

See also

CloudBackend::query(ContainerId, Filter, delegate::QueryJoinDelegatePtr)

12.10.3.9 query() [3/4]

```
cbe::QueryChain cbe::Container::query (
            Filter filter,
            QueryDelegatePtr delegate )
```

Select list of objects using filter.
In line with function CloudBackend::query(ContainerId, Filter, QueryDelegatePtr), but with its `ContainerId` parameter excluded.

See also

CloudBackend::query(ContainerId, Filter, QueryDelegatePtr)

12.10.3.10 query() [4/4]

```
cbe::QueryChain cbe::Container::query (
            QueryDelegatePtr queryDelegate )
```

Select list of objects.
In line with function CloudBackend::query(ContainerId, QueryDelegatePtr), but with its `ContainerId` parameter excluded.

See also

CloudBackend::query(ContainerId, QueryDelegatePtr)

12.10.3.11 queryWithPath()

```
cbe::QueryChain cbe::Container::queryWithPath (
            std::string relativePath,
            QueryDelegatePtr delegate )
```

Select list of objects in hierarchy.
Pointer to cbe::delegate::queryWithPathDelegate that is passed into asynchronous version of method queryWith↩Path()
Queries the container with a given relative path, returns container with objects.
E.g. /Documents/Pictures will return objects and subContainers for Pictures.

Note

.. or . path options are not available, top down Paths in the container tree are available.

Parameters

relativePath	container path, e.g. /Documents/Pictures
delegate	Pointer to a delegate::QueryDelegate instance that is implemented by the user.

12.10.3.12 remove()

```
void cbe::Container::remove (
            RemoveDelegatePtr delegate )
```

Delete the container.
Removes/deletes the container and all its content.

Parameters

delegate	Pointer to a delegate::container::RemoveDelegate instance that is implemented by the user.

12.10.3.13 rename()

```
void cbe::Container::rename (
            const std::string & name,
            RenameDelegatePtr delegate )
```

Change the name of the container.
Rename the container.

Parameters

name	New name of the container.
delegate	Pointer to a delegate::container::RenameDelegate instance that is implemented by the user.

12.10.3.14 search() [1/2]

```
cbe::QueryResult cbe::Container::search (
            cbe::Filter filter,
            QueryDelegatePtr delegate )
```

Search using filter.
Search the whole container with sub-containers related to Objects in the container hierarchy structure.
E.g. Key = Name, Value Contract/Object/Song => Name:Contract1.
Search handles tags in combination / conjunction of keys and/or key values separated by |.
E.g. Name:*|Country:Sweden|Country:Norway, this would search for objects with key Name of any value and where key Country is either Sweden or Norway.

Parameters

filter	is a cbe::Filter on which you can set how you want data to be ordered when searching. Remember to set the queryString to be keys/tags or key:value pairs that are separated by |.
delegate	Pointer to a delegate::QueryDelegate instance that is implemented by the user.

12.10.3.15 search() [2/2]

```
cbe::QueryResult cbe::Container::search (
            std::string tags,
            QueryDelegatePtr delegate )
```

Search by tags.
Pointer to cbe::delegate::QueryDelegate that is passed into asynchronous version of method search()
Search the whole container for tags related to Objects in the container structure.
E.g. Key = Name, Value Contract/Object/Song => Name:Contract1.
Search handles tags in combination of conjunctions of keys and/or key values separated by |.

E.g. Name:∗|Country:Sweden|Country:Norway, this would search for objects with key Name of any value and where key Country is either Sweden or Norway.

Parameters

tags	is a string of key tags or key:value pairs that are separated by |.
delegate	Pointer to a delegate::QueryDelegate instance that is implemented by the user.

12.10.3.16 setAcl()

```
void cbe::Container::setAcl (
            cbe::AclMap aclMap,
            SetAclDelegatePtr delegate )
```

set ACL.
Set the Access Control List ACL for the container. For containers set does set the whole container tree, so all its sub items as well. Remember this is set and not update so every time you set all ids that should be there should be added.

Parameters

aclMap	The desired permissions for current container.
delegate	Pointer to a delegate::AclDelegate instance that is implemented by the user.

12.10.3.17 share()

```
void cbe::Container::share (
            cbe::UserId toUserGroup,
            std::string description,
            ShareDelegatePtr delegate )
```

Make accessible by other user.
Shares a container and its content to a user. This provides the user the ability to access what has been shared to them via the listAvailableShares command. To allow users to view and change shared information see ACL .

Note

At present Sharing the container gives the user read permissions for the container and all its sub-items, this might change in the future.

Parameters

toUserGroup	takes a user id or group id to share to.
description	names the specific share between you and the user/group.
delegate	Pointer to a delegate::ShareDelegate instance that is implemented by the user.

12.10.3.18 unPublish()

```
void cbe::Container::unPublish (
            UnPublishDelegatePtr delegate )
```

UnPublishes this container.
Asynchronous version of this service function.
Revokes previous publish().

Parameters

delegate	Gets notified when the container has been unPublished (or if there was an error)

12.10.3.19 unShare()

```
void cbe::Container::unShare (
            cbe::ShareId shareId,
            UnShareDelegatePtr delegate )
```

Revoke a previous share.
unShare the container to a specific shareId created when sharing. Each share is unique between user/group and the one sharing. This is represented with a unique share id.

Parameters

shareId	is as mentioned the unique id for a share between the owner and other user/group.
delegate	Pointer to a delegate::UnShareDelegate instance that is implemented by the user.

12.10.3.20 unSubscribe()

```
void cbe::Container::unSubscribe (
            UnSubscribeDelegatePtr delegate )
```

UnSubscribes from this container.
Asynchronous version of this service function.
Revokes the subscription previously established with cbe::SubscribeManager::subscribe()

Parameters

delegate	Gets notified when the container has been unSubscribed (or if there was an error)

12.10.3.21 upload() [1/3]

```
cbe::Object cbe::Container::upload (
            const std::string & filePath,
            UploadDelegatePtr delegate )
```

Upload object to container with file given by `filePath`.
See upload(const std::string&,const std::string& path,UploadDelegatePtr)

Parameters

filePath	Fully qualified file name. I.e., the path, relative or absolute, including file name.

Example

Async creation of a cbe::Object by using **Container::upload()**

```
#include "cbe/Object.h"
#include "cbe/Container.h"
#include "cbe/delegate/UploadDelegate.h"
#include <condition_variable>
#include <fstream>            // std::ofstream
#include <mutex>
~~~
struct MyUploadDelegate : cbe::delegate::UploadDelegate {
  std::mutex              mutex{};
```

```
  std::condition_variable conditionVariable{};
  // Indicates operation completed - success or failure
  bool                    called{};
  // Default construct the result object. If the method
  // onUploadSuccess() has not been called, this default constructed state
  // implies that the object is not valid
  cbe::Object object{ cbe::DefaultCtor{} };
  void onUploadSuccess(cbe::Object&& object) final {
    {
      std::lock_guard<std::mutex> lock{mutex};
      // Change state of object member to indicate success
      this->object = std::move(object);
      // Indicate operation completed, member object indicates success
      called = true;
    }
    conditionVariable.notify_one();
  }
  void onUploadError(cbe::delegate::TransferError&& transferError,
                     cbe::util::Context&&           context) final {
    {
      std::lock_guard<std::mutex> lock{mutex};
      // Put object into the default constructed state to indicate no-success
      object = cbe::Object{ cbe::DefaultCtor{} };
      // Indicate operation completed, member object indicates failure
      called = true;
    }
    conditionVariable.notify_one();
  }
  cbe::Object waitForRsp() {
    std::unique_lock<std::mutex> lock{mutex};
    conditionVariable.wait(lock, [this]{ return called; });
    // Reset called flag, so current delegate instance can be reused
    called = false;
    // If object is still in its default constructed state, this implies a
    // failed cbe::object::upload() operation
    return object;
  }
}; // struct MyUploadDelegate
~~~
constexpr const char* const uploadPath = "/tmp/upload/";
constexpr const char* const myObjectFileName = "myObject";
const std::string           qualFileName =
                              std::string{uploadPath} + myObjectFileName;
std::ofstream ofs{qualFileName};
ofs « "Line 11\n"  « "Line 12\n" « "Line 13\n" « std::flush;
ofs.close();
// Access container previously created with cbe::Container::createContainer()
cbe::Container myContainer = ~~~;
std::shared_ptr<MyUploadDelegate> myUploadDelegate =
                                    std::make_shared<MyUploadDelegate>();
// Create an object named after file name in variable qualFileName
myContainer.upload(qualFileName, myUploadDelegate);
// Continuously, use the Object instance passed into the delegate.
cbe::Object object = myUploadDelegate->waitForRsp();
// Check if upload was successful
if (!object) {
  // Not, bail out
  ~~~
// }
~~~
```

Continues at: Async retrieving the Stream attached to a cbe::Object with the Object::getStreams()"

12.10.3.22 upload() [2/3]

```
cbe::Object cbe::Container::upload (
            const std::string & name,
            const std::string & path,
            UploadDelegatePtr delegate )
```

Create an object in current container by uploading a file.
Object is named by `name`, residing at `path`.
The object being created is instantly returned with a temporary id. When the response is retrieved from from the server, via callback method onUploadSuccess() the object will be updated with its final unique id.

Parameters

name	Name of local file name. The object, that is created, will be given the same name.

Parameters

path	Path to local folder where the file is located. The can be relative or absolute and **must end with a slash** (/).
delegate	Pointer to a delegate::UploadDelegate instance that is implemented by the user.

Returns

The created Object, first with its temporary id, and after successful with is final id.

12.10.3.23 upload() [3/3]

```
cbe::Object cbe::Container::upload (
            const std::string & name,
            std::uint64_t length,
            const char * byteData,
            UploadDelegatePtr delegate )
```

Upload from local memory to an object.

Parameters

name	name that the uploaded object will get
length	size of file in Bytes
byteData	(char pointer to an array containing the data).
delegate	Pointer to a delegate::UploadDelegate instance that is implemented by the user.

The documentation for this class was generated from the following file:

- include/cbe/Container.h

12.11 cbe::util::Context Struct Reference

Public Types

- using **ReportFn** = std::function< void(std::ostream &)>

Public Member Functions

- **Context** (ReportFn &&reportFn, const char fnName[ ])
- std::string **report** () const

Public Attributes

- std::string **fnName** {}

Friends

- std::ostream & **operator**<< (std::ostream &os, const Context &context)

The documentation for this struct was generated from the following file:

- include/cbe/util/Context.h

12.12 cbe::delegate::CreateAccountDelegate Class Reference

```
#include <CreateAccountDelegate.h>
```

Classes

- struct ErrorInfo

Public Types

- using **Success** = UserId
- using **Error** = delegate::Error

Public Member Functions

- virtual void onCreateAccountSuccess (UserId &&userId)=0
- virtual void onCreateAccountError (Error &&error, cbe::util::Context &&context)=0

12.12.1 Detailed Description

Delegate class for the asynchronous version of method:

- CloudBackend::CreateAccount

12.12.2 Member Function Documentation

12.12.2.1 onCreateAccountError()

```
virtual void cbe::delegate::CreateAccountDelegate::onCreateAccountError (
            Error && error,
            cbe::util::Context && context ) [pure virtual]
```

Called upon failed log in.

Parameters

error	Error information passed from CloudBackend SDK.
context	Additional context information about the original service call that has failed.

12.12.2.2 onCreateAccountSuccess()

```
virtual void cbe::delegate::CreateAccountDelegate::onCreateAccountSuccess (
            UserId && userId ) [pure virtual]
```

Called upon successful account creation.
The documentation for this class was generated from the following file:

- include/cbe/delegate/CreateAccountDelegate.h

12.13 cbe::delegate::CreateContainerDelegate Class Reference

```
#include <CreateContainerDelegate.h>
```

Classes

- struct ErrorInfo

Public Types

- using **Success** = cbe::Container
- using **Error** = delegate::Error

Public Member Functions

- virtual void onCreateContainerSuccess (cbe::Container &&container)=0
- virtual void onCreateContainerError (Error &&error, cbe::util::Context &&context)=0

12.13.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Container::createContainer()

12.13.2 Member Function Documentation

12.13.2.1 onCreateContainerError()

```
virtual void cbe::delegate::CreateContainerDelegate::onCreateContainerError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.13.2.2 onCreateContainerSuccess()

```
virtual void cbe::delegate::CreateContainerDelegate::onCreateContainerSuccess (
            cbe::Container && container )  [pure virtual]
```

Called upon successful CreateContainer.

Parameters

container	Instance of Container that is being created.

The documentation for this class was generated from the following file:

- include/cbe/delegate/CreateContainerDelegate.h

12.14 cbe::delegate::CreateGroupDelegate Class Reference

```
#include <CreateGroupDelegate.h>
```

Classes

- struct ErrorInfo

Public Types

- using **Success** = cbe::Group
- using **Error** = delegate::Error

Public Member Functions

- virtual void onCreateGroupSuccess (cbe::Group &&group)=0
- virtual void onCreateGroupError (Error &&error, cbe::util::Context &&context)=0

12.14.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Group::createGroup

12.14.2 Member Function Documentation

12.14.2.1 onCreateGroupError()

```
virtual void cbe::delegate::CreateGroupDelegate::onCreateGroupError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.14.2.2 onCreateGroupSuccess()

```
virtual void cbe::delegate::CreateGroupDelegate::onCreateGroupSuccess (
            cbe::Group && group )  [pure virtual]
```

Called upon successful create group.

Parameters

group	Instance of a cbe::Group.

The documentation for this class was generated from the following file:

- include/cbe/delegate/CreateGroupDelegate.h

12.15 cbe::delegate::CreateObjectDelegate Class Reference

```
#include <CreateObjectDelegate.h>
```

Classes

- struct ErrorInfo

Public Types

- using **Success** = cbe::Object
- using **Error** = delegate::Error

Public Member Functions

- virtual void onCreateObjectSuccess (cbe::Object &&object)=0
- virtual void onCreateObjectError (Error &&error, cbe::util::Context &&context)=0

12.15.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Container::createObject

12.15.2 Member Function Documentation

12.15.2.1 onCreateObjectError()

```
virtual void cbe::delegate::CreateObjectDelegate::onCreateObjectError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.15.2.2 onCreateObjectSuccess()

```
virtual void cbe::delegate::CreateObjectDelegate::onCreateObjectSuccess (
            cbe::Object && object )  [pure virtual]
```

Called upon successful CreateObject.

Parameters

object	Instance of Object that is being created.

The documentation for this class was generated from the following file:

- include/cbe/delegate/CreateObjectDelegate.h

12.16 cbe::delegate::CreateRoleDelegate Class Reference

```
#include <CreateRoleDelegate.h>
```

Classes

- struct ErrorInfo

Public Types

- using **Success** = cbe::Role
- using **Error** = delegate::Error

Public Member Functions

- virtual void onCreateRoleSuccess (cbe::Role &&role)=0
- virtual void onCreateRoleError (Error &&error, cbe::util::Context &&context)=0

12.16.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Role::createRole

12.16.2 Member Function Documentation

12.16.2.1 onCreateRoleError()

```
virtual void cbe::delegate::CreateRoleDelegate::onCreateRoleError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.16.2.2 onCreateRoleSuccess()

```
virtual void cbe::delegate::CreateRoleDelegate::onCreateRoleSuccess (
            cbe::Role && role )  [pure virtual]
```

Called upon successful create Role.

Parameters

Role	the role id of the created role.

The documentation for this class was generated from the following file:

- include/cbe/delegate/CreateRoleDelegate.h

12.17 cbe::Database Class Reference

A database.
`#include <Database.h>`

Public Member Functions

- std::string name () const

  The database name.
- cbe::DatabaseId databaseId () const

  The databaseId number.
- cbe::ContainerId containerId () const

  The containerId number.
- cbe::UserId ownerId () const

  The userId number of the owner.
- cbe::Date created () const

  Timestamp of when it was created.
- bool readLocked () const

  Checks if it has a read lock.
- bool writeLocked () const

  Checks if it has a write lock.
- cbe::Container rootContainer () const

  The top container of the database.
- **Database** (cbe::DefaultCtor)
- **operator bool** () const

12.17.1 Detailed Description

A database.

Example

Get the tenant Container object

```
cbe::DataBases myDatabases = cloudBackend.account().databases();
cbe::Container tenantContainer{ cbe::DefaultCtor{} };
for (auto myEntry : myDatabases) {
  if ( myEntry.first == "tenant" ) {
    tenantContainer = myEntry.second.rootContainer();
  }
}
return tenantContainer;
```

12.17.2 Member Function Documentation

12.17.2.1 containerId()

`cbe::ContainerId cbe::Database::containerId ( ) const`
The containerId number.
Refers to the top rootContainer of the database.

Returns

cbe::ContainerId

12.17.2.2 created()

`cbe::Date cbe::Database::created ( ) const`
Timestamp of when it was created.
Given in unix epoch number format.

Returns

cbe::Date

12.17.2.3 databaseId()

`cbe::DatabaseId cbe::Database::databaseId ( ) const`
The databaseId number.

Returns

cbe::DatabaseId

12.17.2.4 name()

`std::string cbe::Database::name ( ) const`
The database name.

Returns

std::string

12.17.2.5 ownerId()

`cbe::UserId cbe::Database::ownerId ( ) const`
The userId number of the owner.

Returns

cbe::UserId

12.17.2.6 readLocked()

`bool cbe::Database::readLocked ( ) const`
Checks if it has a read lock.

Returns

true

false

12.17.2.7 rootContainer()

`cbe::Container cbe::Database::rootContainer ( ) const`
The top container of the database.
The whole container object.

Returns

cbe::Container

12.17.2.8 writeLocked()

```
bool cbe::Database::writeLocked ( ) const
```

Checks if it has a write lock.

Returns

true

false

The documentation for this class was generated from the following file:

- include/cbe/Database.h

12.18 cbe::delegate::DownloadBinaryDelegate Class Reference

```
#include <DownloadBinaryDelegate.h>
```

Classes

- struct ErrorInfo

Public Types

- using **Success** = DownloadBinarySuccess
- using **Error** = TransferError

Public Member Functions

- virtual void onDownloadBinarySuccess (cbe::Object &&object, std::unique_ptr< char[ ]> data)=0
- virtual void onDownloadBinaryError (cbe::delegate::TransferError &&transferError, cbe::util::Context &&context)=0
- virtual void onChunkReceived (cbe::Object &&object, std::uint64_t received, std::uint64_t total)

12.18.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Object::download(DownloadBinaryDelegatePtr)

12.18.2 Member Function Documentation

12.18.2.1 onChunkReceived()

```
virtual void cbe::delegate::DownloadBinaryDelegate::onChunkReceived (
            cbe::Object && object,
            std::uint64_t received,
            std::uint64_t total )  [virtual]
```

Called when a chunk of data has been received.

Parameters

object	Object associated with current download.
received	Size, in number of bytes, of the received chunk.
total	Total number of bytes received so far.

12.18.2.2 onDownloadBinaryError()

```
virtual void cbe::delegate::DownloadBinaryDelegate::onDownloadBinaryError (
            cbe::delegate::TransferError && transferError,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.18.2.3 onDownloadBinarySuccess()

```
virtual void cbe::delegate::DownloadBinaryDelegate::onDownloadBinarySuccess (
            cbe::Object && object,
            std::unique_ptr< char[]> data )  [pure virtual]
```

Called upon successful Download.

Parameters

object	Instance of cbe::Object that is being downloaded.
data	The downloaded data of the object. The provided memory is an array of bytes (`char`) dynamically allocated by the SDK, and managed by the **`std::unique_ptr`**. So, no further precautions needed concerning the the disposal of this memory.

The documentation for this class was generated from the following file:

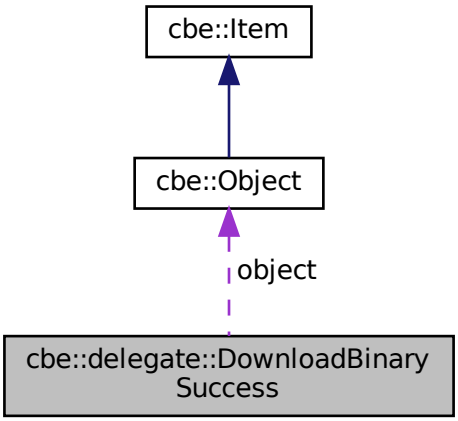
- include/cbe/delegate/DownloadBinaryDelegate.h

12.19 cbe::delegate::DownloadBinarySuccess Class Reference

Convenience type that bundles all parameters passed to method cbe::delegate::DownloadBinaryDelegate::onDownloadBinarySuccess

```
#include <DownloadBinarySuccess.h>
```

Collaboration diagram for cbe::delegate::DownloadBinarySuccess:



Public Member Functions

- **DownloadBinarySuccess** (cbe::DefaultCtor)
- **DownloadBinarySuccess** (cbe::Object &&object, std::unique_ptr< char[]> data)

- operator bool () const

  Checks if current instance is valid.

Public Attributes

- cbe::Object **object** {cbe::DefaultCtor{}}
- std::unique_ptr< char[ ]> **data** {}

12.19.1 Detailed Description

Convenience type that bundles all parameters passed to method cbe::delegate::DownloadBinaryDelegate::onDownloadBinarySuccess

12.19.2 Member Function Documentation

12.19.2.1 operator bool()

`cbe::delegate::DownloadBinarySuccess::operator bool ( ) const [explicit]`
Checks if current instance is valid.

Returns

`true`: is valid

The documentation for this class was generated from the following file:

- include/cbe/delegate/DownloadBinarySuccess.h

12.20 cbe::delegate::DownloadDelegate Class Reference

`#include <DownloadDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Success** = DownloadSuccess
- using **Error** = cbe::delegate::TransferError

Public Member Functions

- virtual void onDownloadSuccess (cbe::Object &&object, std::string path)=0
- virtual void onDownloadError (cbe::delegate::TransferError &&transferError, cbe::util::Context &&context)=0
- virtual void onChunkReceived (cbe::Object &&object, std::uint64_t received, std::uint64_t total)

12.20.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Object::download(const std::string&, DownloadDelegatePtr)
- cbe::Object::downloadStream(const std::string&,cbe::Stream,DownloadDelegatePtr)

12.20.2 Member Function Documentation

12.20.2.1 onChunkReceived()

```
virtual void cbe::delegate::DownloadDelegate::onChunkReceived (
            cbe::Object && object,
            std::uint64_t received,
            std::uint64_t total )  [virtual]
```

Called when a chunk of data has been received.

Parameters

object	Object associated with current download.
received	Size, in number of bytes, of the received chunk.
total	Total number of bytes received so far.

12.20.2.2 onDownloadError()

```
virtual void cbe::delegate::DownloadDelegate::onDownloadError (
            cbe::delegate::TransferError && transferError,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.20.2.3 onDownloadSuccess()

```
virtual void cbe::delegate::DownloadDelegate::onDownloadSuccess (
            cbe::Object && object,
            std::string path )  [pure virtual]
```

Called upon successful Download.

Parameters

object	Instance of object that is being Downloaded.
path	Path of object to be downloaded.

The documentation for this class was generated from the following file:

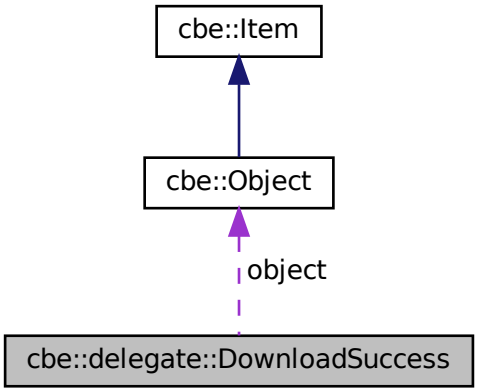
- include/cbe/delegate/DownloadDelegate.h

12.21 cbe::delegate::DownloadSuccess Class Reference

Convenience type that bundles all parameters passed to method cbe::delegate::DownloadDelegate::onDownloadSuccess.

`#include <DownloadSuccess.h>`

Collaboration diagram for cbe::delegate::DownloadSuccess:



Public Member Functions

- **DownloadSuccess** (cbe::DefaultCtor)
- **DownloadSuccess** (cbe::Object &&object, std::string path)
- operator bool () const

  Checks if current instance is valid.

Public Attributes

- cbe::Object **object** {cbe::DefaultCtor{}}
- std::string **path** {}

12.21.1 Detailed Description

Convenience type that bundles all parameters passed to method cbe::delegate::DownloadDelegate::onDownloadSuccess.

12.21.2 Member Function Documentation

12.21.2.1 operator bool()

`cbe::delegate::DownloadSuccess::operator bool ( ) const [explicit]`

Checks if current instance is valid.

Returns

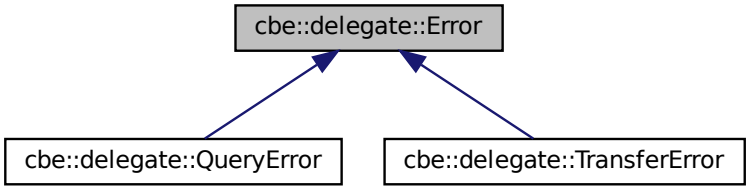
`true`: is valid

The documentation for this class was generated from the following file:

- include/cbe/delegate/DownloadSuccess.h

12.22 cbe::delegate::Error Class Reference

`#include <Error.h>`
Inheritance diagram for cbe::delegate::Error:



Public Member Functions

- operator bool () const

Public Attributes

- ErrorCode errorCode {}
- std::string reason {}
- std::string message {}

Friends

- std::ostream & operator<< (std::ostream &os, const Error &error)

12.22.1 Detailed Description

Entity class containing the error information

12.22.2 Member Function Documentation

12.22.2.1 operator bool()

`cbe::delegate::Error::operator bool ( ) const [explicit]`
Checks whether current object holds error information.

Returns

`true` implies that current object contains an error,l while `false` indicates no error.

12.22.3 Friends And Related Function Documentation

12.22.3.1 operator<<

```
std::ostream& operator<< (
            std::ostream & os,
            const Error & error )  [friend]
```
Output stream operator for CloudBackend::LogInDelegate::Error.

12.22.4 Member Data Documentation

12.22.4.1 errorCode

`ErrorCode cbe::delegate::Error::errorCode {}`
Mimics the general error code encoding in the www.

See also

`Wikipedia: List of HTTP status codes`

12.22.4.2 message

`std::string cbe::delegate::Error::message {}`
Human readable additional information about the error.

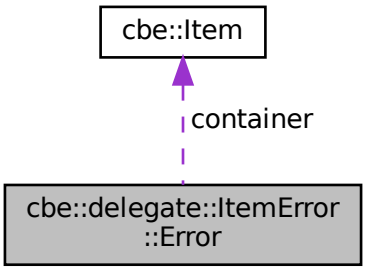
12.22.4.3 reason

`std::string cbe::delegate::Error::reason {}`
Human readable description of the reason for the failure.
The documentation for this class was generated from the following file:

- include/cbe/delegate/Error.h

12.23 cbe::delegate::ItemError::Error Struct Reference

Collaboration diagram for cbe::delegate::ItemError::Error:



Public Member Functions

- **Error** (Item container, ItemType type, ErrorCode errorCode, std::string &&reason, std::string &&message)

Public Attributes

- Item **container** {cbe::DefaultCtor{}}
- ItemType **type** {}
- ErrorCode **errorCode** {}
- std::string **reason** {}
- std::string **message** {}

The documentation for this struct was generated from the following file:

- include/cbe/delegate/ItemDelegateErrors.h

12.24 cbe::delegate::JoinError::Error Class Reference

Public Member Functions

- **Error** (ErrorCode errorCode, std::string &&reason, std::string &&message)

Public Attributes

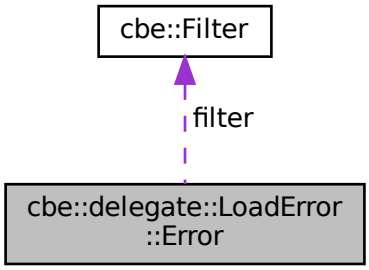
- ErrorCode **errorCode** {}
- std::string **reason** {}
- std::string **message** {}

The documentation for this class was generated from the following file:

- include/cbe/delegate/ItemDelegateErrors.h

12.25 cbe::delegate::LoadError::Error Class Reference

Collaboration diagram for cbe::delegate::LoadError::Error:



Public Member Functions

- **Error** (Filter &&filter, ErrorCode errorCode, std::string &&reason, std::string &&message)

Public Attributes

- Filter **filter** {}
- ErrorCode errorCode {}
- std::string **reason** {}
- std::string **message** {}

12.25.1 Member Data Documentation

12.25.1.1 errorCode

```
ErrorCode cbe::delegate::LoadError::Error::errorCode {}
```

Mimics the general error code encoding in the www.

See also

Wikipedia: List of HTTP status codes

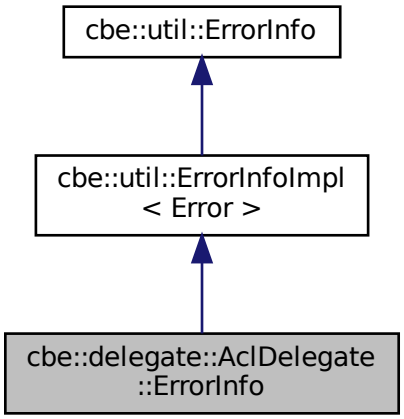
The documentation for this class was generated from the following file:

- include/cbe/delegate/ItemDelegateErrors.h

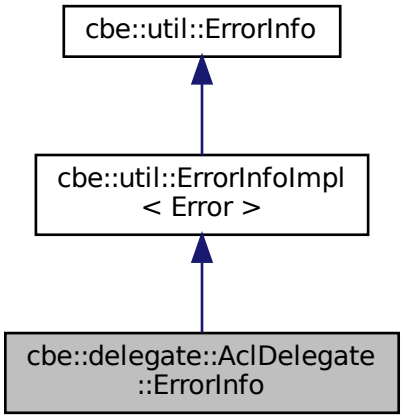
12.26 cbe::delegate::AclDelegate::ErrorInfo Struct Reference

```
#include <AclDelegate.h>
```

Inheritance diagram for cbe::delegate::AclDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::AclDelegate::ErrorInfo:



Additional Inherited Members

12.26.1 Detailed Description

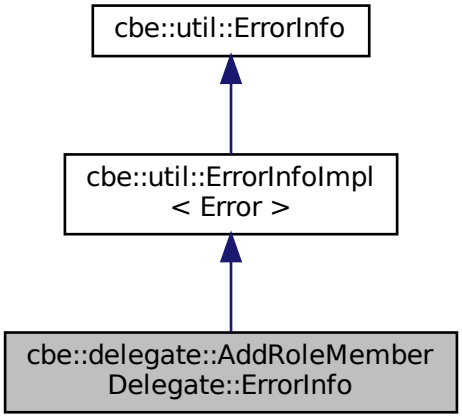
Contains all information about a failed GetACL.
The documentation for this struct was generated from the following file:

- include/cbe/delegate/AclDelegate.h

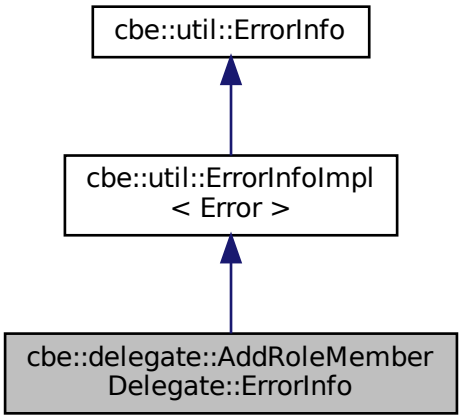
12.27 cbe::delegate::AddRoleMemberDelegate::ErrorInfo Struct Reference

`#include <AddRoleMemberDelegate.h>`

Inheritance diagram for cbe::delegate::AddRoleMemberDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::AddRoleMemberDelegate::ErrorInfo:



Additional Inherited Members

12.27.1 Detailed Description

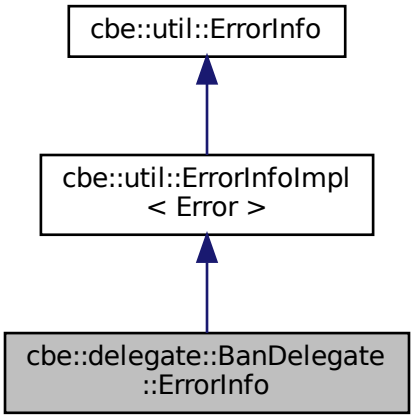
Contains all information about a failed AddMember.
The documentation for this struct was generated from the following file:

- include/cbe/delegate/AddRoleMemberDelegate.h

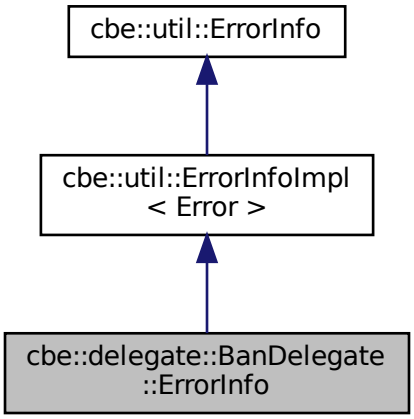
12.28 cbe::delegate::BanDelegate::ErrorInfo Struct Reference

`#include <BanDelegate.h>`

Inheritance diagram for cbe::delegate::BanDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::BanDelegate::ErrorInfo:



Additional Inherited Members

12.28.1 Detailed Description

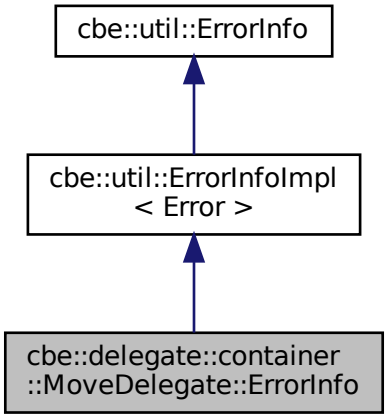
Contains all information about a failed Ban.
The documentation for this struct was generated from the following file:

- include/cbe/delegate/BanDelegate.h

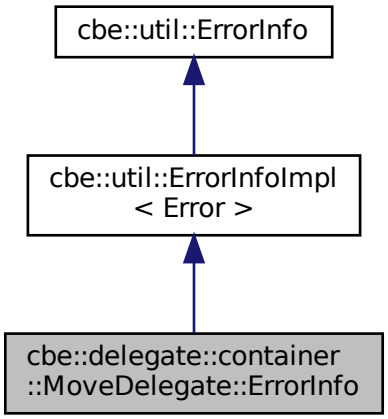
12.29 cbe::delegate::container::MoveDelegate::ErrorInfo Struct Reference

`#include <MoveDelegate.h>`

Inheritance diagram for cbe::delegate::container::MoveDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::container::MoveDelegate::ErrorInfo:



Additional Inherited Members

12.29.1 Detailed Description

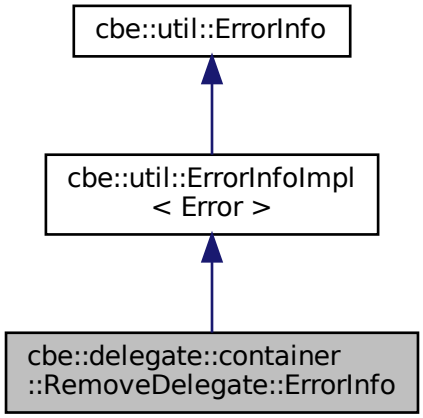
Contains all information about a failed Move.

The documentation for this struct was generated from the following file:

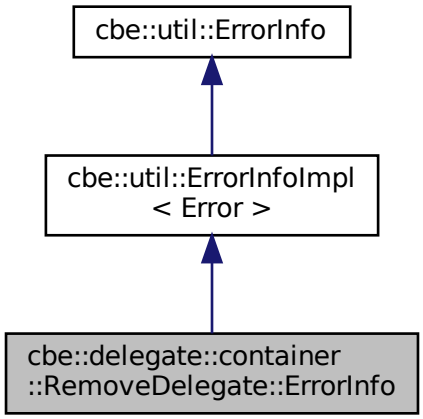
- include/cbe/delegate/container/MoveDelegate.h

12.30 cbe::delegate::container::RemoveDelegate::ErrorInfo Struct Reference

`#include <RemoveDelegate.h>`
Inheritance diagram for cbe::delegate::container::RemoveDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::container::RemoveDelegate::ErrorInfo:



Additional Inherited Members

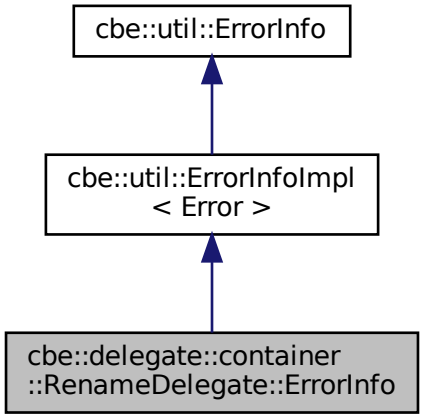
12.30.1 Detailed Description

Contains all information about a failed Remove.
The documentation for this struct was generated from the following file:

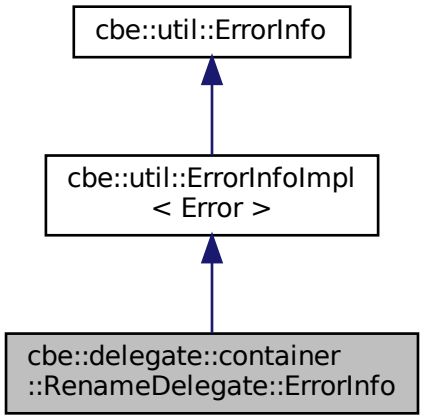
- include/cbe/delegate/container/RemoveDelegate.h

12.31 cbe::delegate::container::RenameDelegate::ErrorInfo Struct Reference

`#include <RenameDelegate.h>`
Inheritance diagram for cbe::delegate::container::RenameDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::container::RenameDelegate::ErrorInfo:



Additional Inherited Members

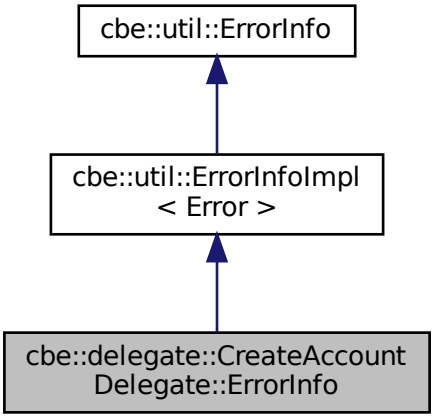
12.31.1 Detailed Description

Contains all information about a failed Rename.
The documentation for this struct was generated from the following file:

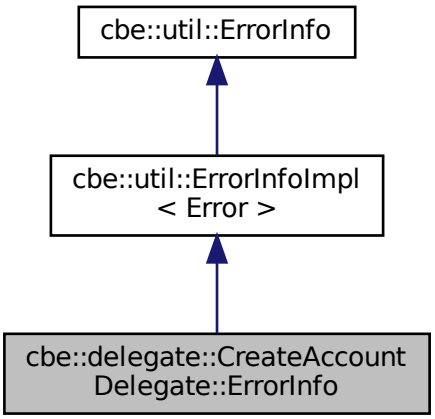
- include/cbe/delegate/container/RenameDelegate.h

12.32 cbe::delegate::CreateAccountDelegate::ErrorInfo Struct Reference

`#include <CreateAccountDelegate.h>`
Inheritance diagram for cbe::delegate::CreateAccountDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::CreateAccountDelegate::ErrorInfo:



Additional Inherited Members

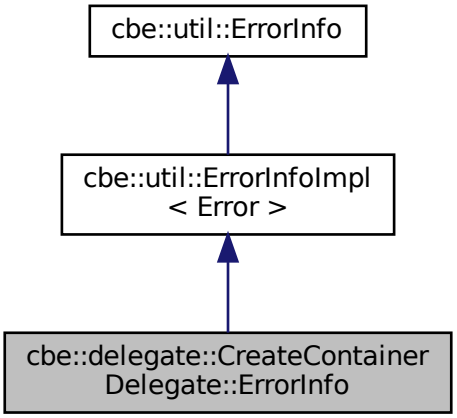
12.32.1 Detailed Description

Contains all information about a failed CreateAccount.
The documentation for this struct was generated from the following file:

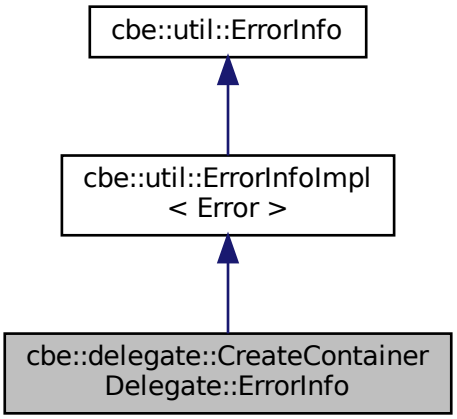
- include/cbe/delegate/CreateAccountDelegate.h

12.33 cbe::delegate::CreateContainerDelegate::ErrorInfo Struct Reference

`#include <CreateContainerDelegate.h>`
Inheritance diagram for cbe::delegate::CreateContainerDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::CreateContainerDelegate::ErrorInfo:



Additional Inherited Members

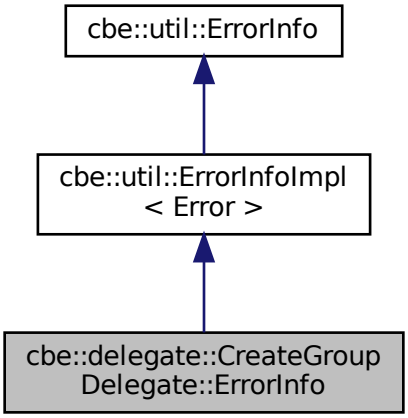
12.33.1 Detailed Description

Contains all information about a failed CreateContainer.
The documentation for this struct was generated from the following file:

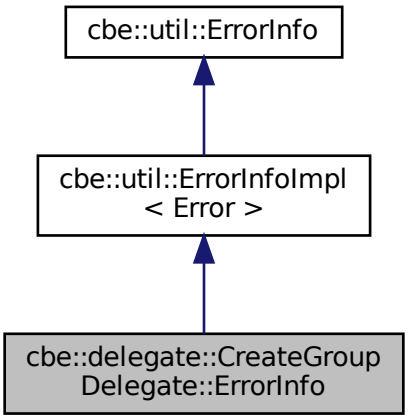
- include/cbe/delegate/CreateContainerDelegate.h

12.34 cbe::delegate::CreateGroupDelegate::ErrorInfo Struct Reference

`#include <CreateGroupDelegate.h>`
Inheritance diagram for cbe::delegate::CreateGroupDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::CreateGroupDelegate::ErrorInfo:



Additional Inherited Members

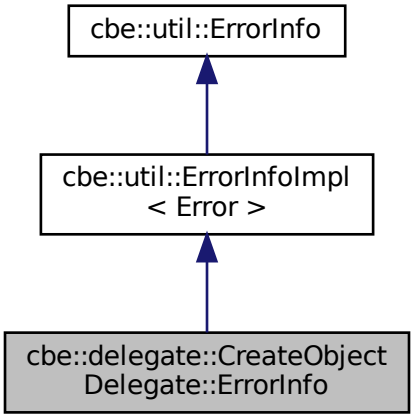
12.34.1 Detailed Description

Contains all information about a failed CreateGroup.
The documentation for this struct was generated from the following file:

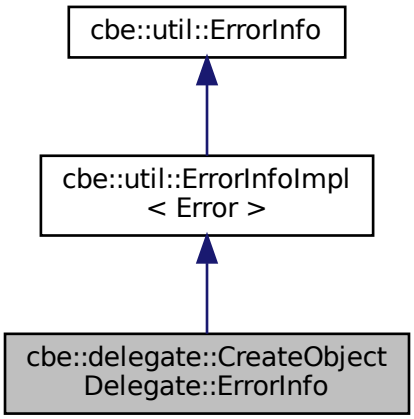
- include/cbe/delegate/CreateGroupDelegate.h

12.35 cbe::delegate::CreateObjectDelegate::ErrorInfo Struct Reference

`#include <CreateObjectDelegate.h>`
Inheritance diagram for cbe::delegate::CreateObjectDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::CreateObjectDelegate::ErrorInfo:



Additional Inherited Members

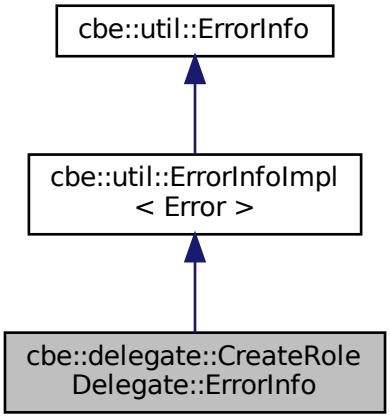
12.35.1 Detailed Description

Contains all information about a failed CreateObject.
The documentation for this struct was generated from the following file:

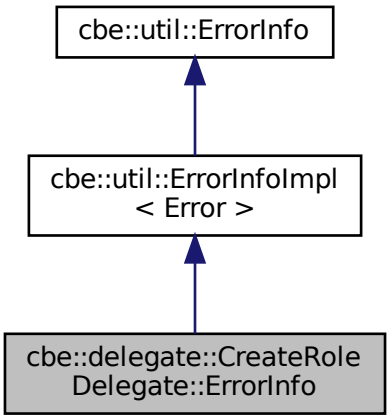
- include/cbe/delegate/CreateObjectDelegate.h

12.36 cbe::delegate::CreateRoleDelegate::ErrorInfo Struct Reference

`#include <CreateRoleDelegate.h>`
Inheritance diagram for cbe::delegate::CreateRoleDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::CreateRoleDelegate::ErrorInfo:



Additional Inherited Members

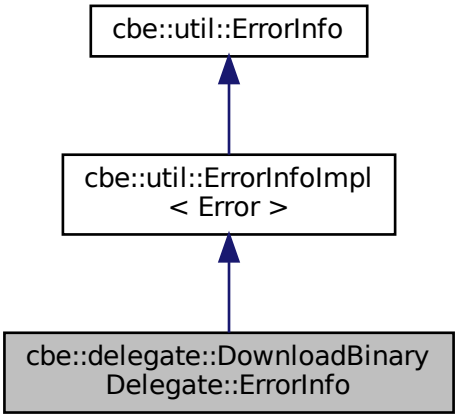
12.36.1 Detailed Description

Contains all information about a failed CreateRole.
The documentation for this struct was generated from the following file:

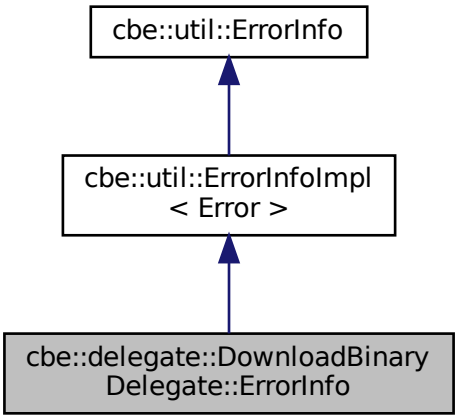
- include/cbe/delegate/CreateRoleDelegate.h

12.37 cbe::delegate::DownloadBinaryDelegate::ErrorInfo Struct Reference

`#include <DownloadBinaryDelegate.h>`
Inheritance diagram for cbe::delegate::DownloadBinaryDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::DownloadBinaryDelegate::ErrorInfo:



Additional Inherited Members

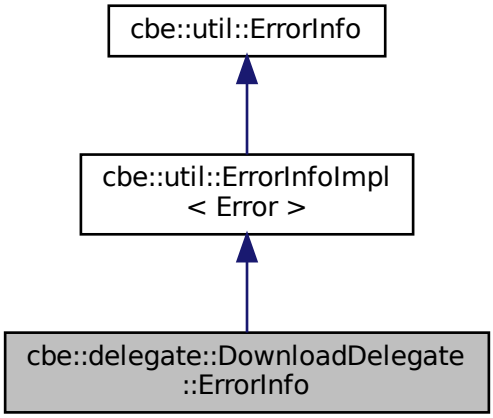
12.37.1 Detailed Description

Contains all information about a failed DownloadBinary.
The documentation for this struct was generated from the following file:

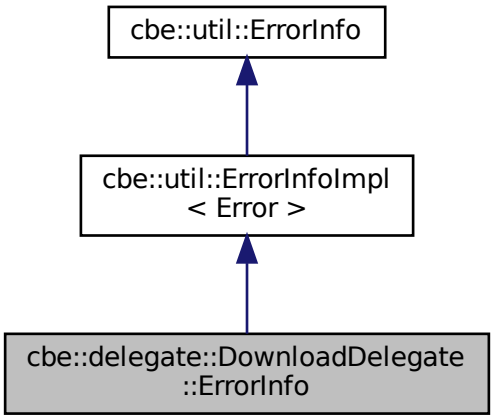
- include/cbe/delegate/DownloadBinaryDelegate.h

12.38 cbe::delegate::DownloadDelegate::ErrorInfo Struct Reference

`#include <DownloadDelegate.h>`
Inheritance diagram for cbe::delegate::DownloadDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::DownloadDelegate::ErrorInfo:



Additional Inherited Members

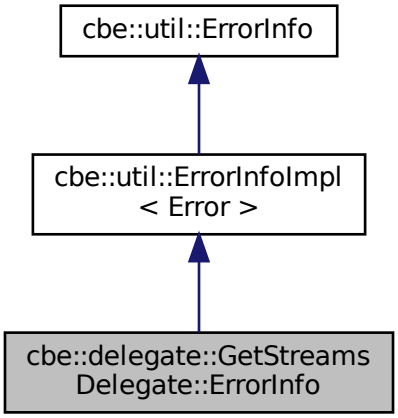
12.38.1 Detailed Description

Contains all information about a failed download.
The documentation for this struct was generated from the following file:

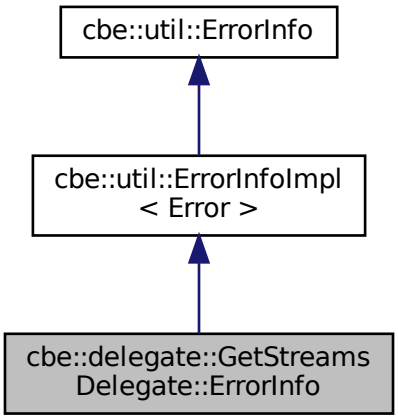
- include/cbe/delegate/DownloadDelegate.h

12.39 cbe::delegate::GetStreamsDelegate::ErrorInfo Struct Reference

`#include <GetStreamsDelegate.h>`
Inheritance diagram for cbe::delegate::GetStreamsDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::GetStreamsDelegate::ErrorInfo:



Additional Inherited Members

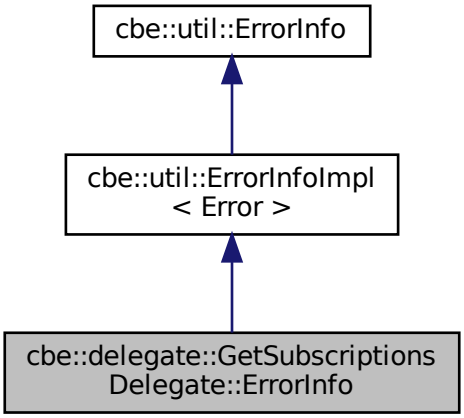
12.39.1 Detailed Description

Contains all information about a failed GetStreams.
The documentation for this struct was generated from the following file:

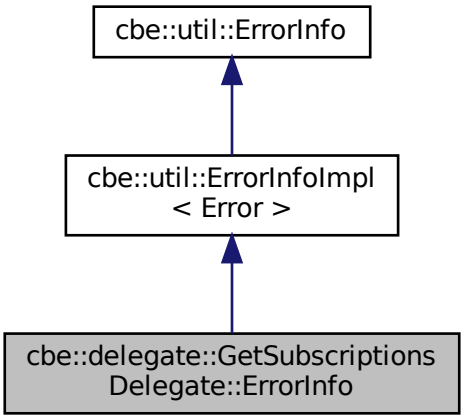
- include/cbe/delegate/GetStreamsDelegate.h

12.40 cbe::delegate::GetSubscriptionsDelegate::ErrorInfo Struct Reference

`#include <GetSubscriptionsDelegate.h>`
Inheritance diagram for cbe::delegate::GetSubscriptionsDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::GetSubscriptionsDelegate::ErrorInfo:



Additional Inherited Members

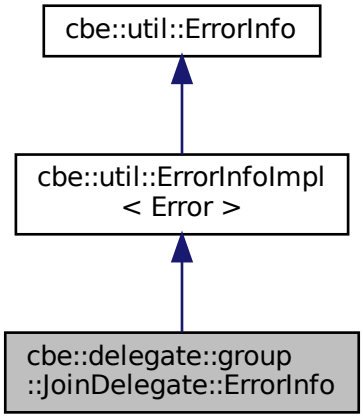
12.40.1 Detailed Description

Contains all information about a failed GetSubscriptions.
The documentation for this struct was generated from the following file:

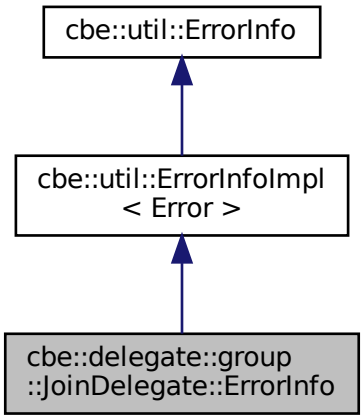
- include/cbe/delegate/GetSubscriptionsDelegate.h

12.41 cbe::delegate::group::JoinDelegate::ErrorInfo Struct Reference

`#include <JoinDelegate.h>`
Inheritance diagram for cbe::delegate::group::JoinDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::group::JoinDelegate::ErrorInfo:



Additional Inherited Members

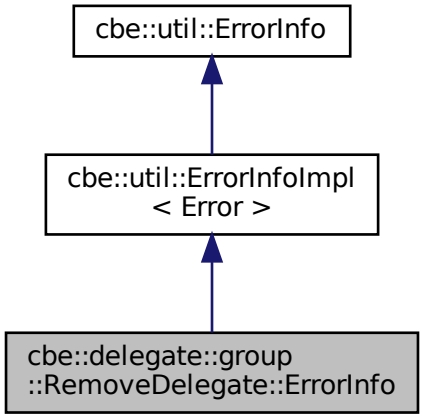
12.41.1 Detailed Description

Contains all information about a failed Join.
The documentation for this struct was generated from the following file:

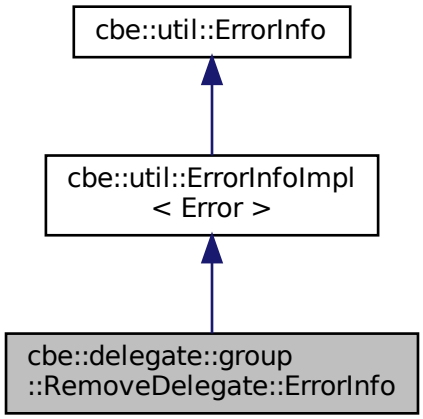
- include/cbe/delegate/group/JoinDelegate.h

12.42 cbe::delegate::group::RemoveDelegate::ErrorInfo Struct Reference

`#include <RemoveDelegate.h>`
Inheritance diagram for cbe::delegate::group::RemoveDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::group::RemoveDelegate::ErrorInfo:



Additional Inherited Members

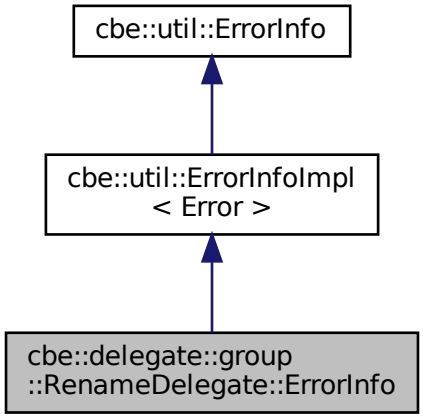
12.42.1 Detailed Description

Contains all information about a failed Remove.
The documentation for this struct was generated from the following file:

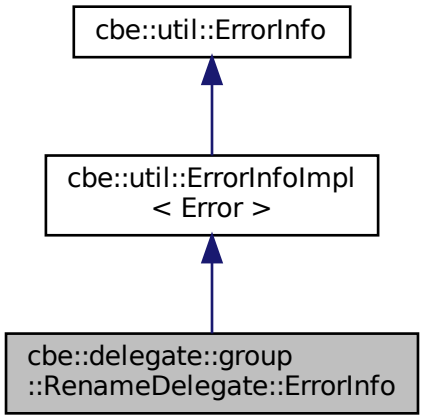
- include/cbe/delegate/group/RemoveDelegate.h

12.43 cbe::delegate::group::RenameDelegate::ErrorInfo Struct Reference

`#include <RenameDelegate.h>`
Inheritance diagram for cbe::delegate::group::RenameDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::group::RenameDelegate::ErrorInfo:



Additional Inherited Members

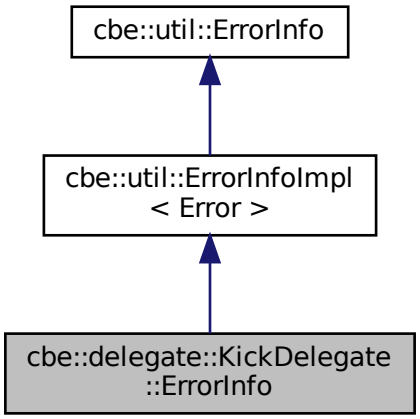
12.43.1 Detailed Description

Contains all information about a failed Rename.
The documentation for this struct was generated from the following file:

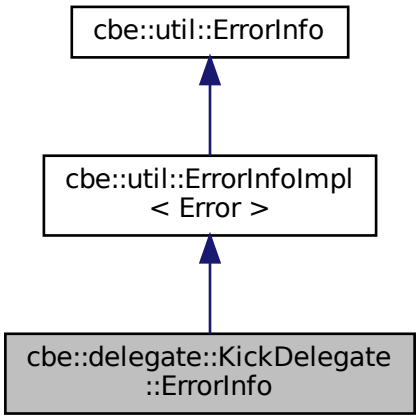
- include/cbe/delegate/group/RenameDelegate.h

12.44 cbe::delegate::KickDelegate::ErrorInfo Struct Reference

`#include <KickDelegate.h>`
Inheritance diagram for cbe::delegate::KickDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::KickDelegate::ErrorInfo:



Additional Inherited Members

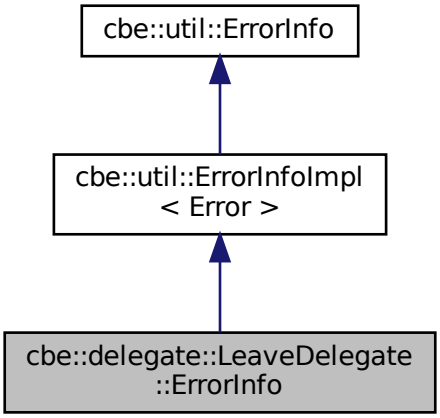
12.44.1 Detailed Description

Contains all information about a failed Kick.
The documentation for this struct was generated from the following file:

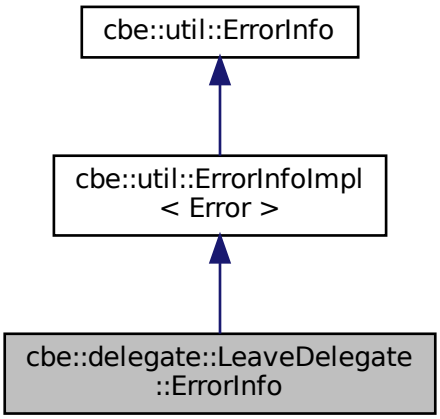
- include/cbe/delegate/KickDelegate.h

12.45 cbe::delegate::LeaveDelegate::ErrorInfo Struct Reference

`#include <LeaveDelegate.h>`
Inheritance diagram for cbe::delegate::LeaveDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::LeaveDelegate::ErrorInfo:



Additional Inherited Members

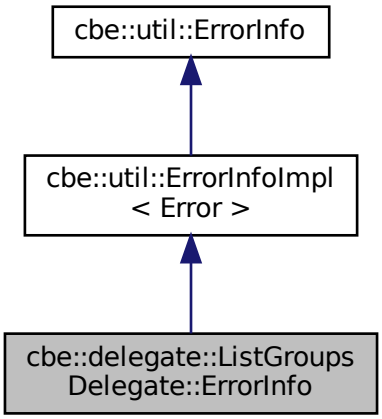
12.45.1 Detailed Description

Contains all information about a failed Leave.
The documentation for this struct was generated from the following file:

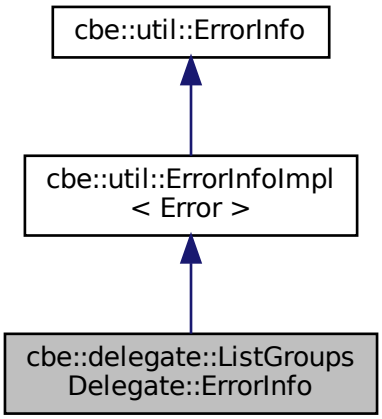
- include/cbe/delegate/LeaveDelegate.h

12.46 cbe::delegate::ListGroupsDelegate::ErrorInfo Struct Reference

`#include <ListGroupsDelegate.h>`
Inheritance diagram for cbe::delegate::ListGroupsDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::ListGroupsDelegate::ErrorInfo:



Additional Inherited Members

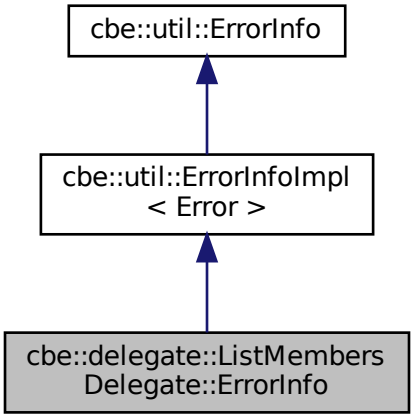
12.46.1 Detailed Description

Contains all information about a failed ListGroup.
The documentation for this struct was generated from the following file:

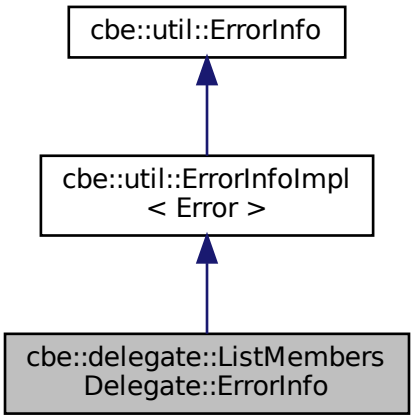
- include/cbe/delegate/ListGroupsDelegate.h

12.47 cbe::delegate::ListMembersDelegate::ErrorInfo Struct Reference

`#include <ListMembersDelegate.h>`
Inheritance diagram for cbe::delegate::ListMembersDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::ListMembersDelegate::ErrorInfo:



Additional Inherited Members

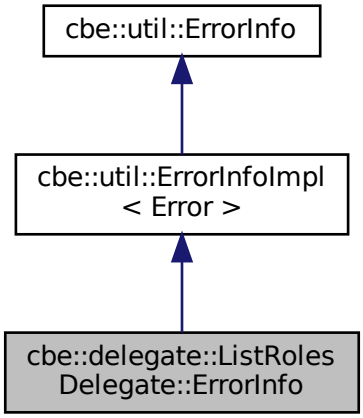
12.47.1 Detailed Description

Contains all information about a failed ListMembers.
The documentation for this struct was generated from the following file:

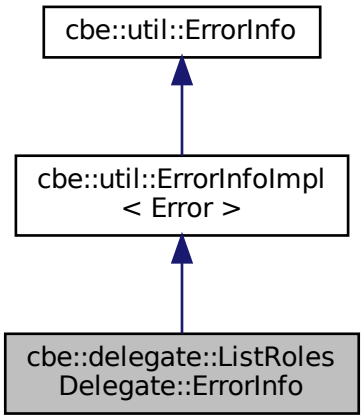
- include/cbe/delegate/ListMembersDelegate.h

12.48 cbe::delegate::ListRolesDelegate::ErrorInfo Struct Reference

`#include <ListRolesDelegate.h>`
Inheritance diagram for cbe::delegate::ListRolesDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::ListRolesDelegate::ErrorInfo:



Additional Inherited Members

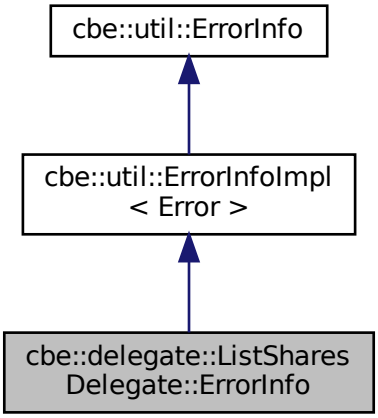
12.48.1 Detailed Description

Contains all information about a failed ListRoles.
The documentation for this struct was generated from the following file:

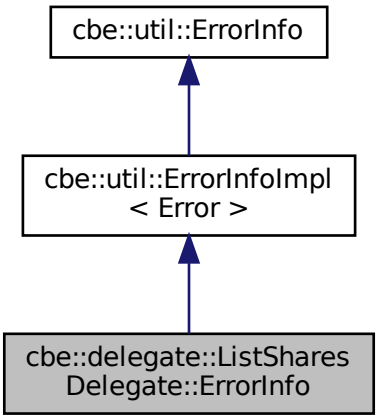
- include/cbe/delegate/ListRolesDelegate.h

12.49 cbe::delegate::ListSharesDelegate::ErrorInfo Struct Reference

`#include <ListSharesDelegate.h>`
Inheritance diagram for cbe::delegate::ListSharesDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::ListSharesDelegate::ErrorInfo:



Additional Inherited Members

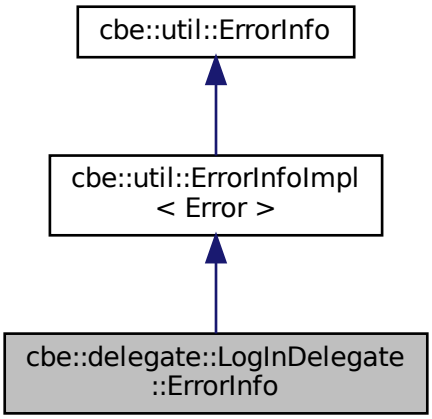
12.49.1 Detailed Description

Contains all information about a failed Share.
The documentation for this struct was generated from the following file:

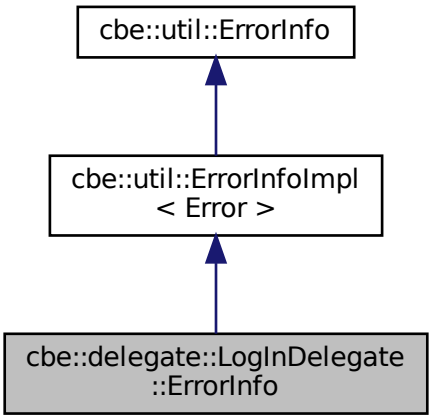
- include/cbe/delegate/ListSharesDelegate.h

12.50 cbe::delegate::LogInDelegate::ErrorInfo Struct Reference

`#include <LogInDelegate.h>`
Inheritance diagram for cbe::delegate::LogInDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::LogInDelegate::ErrorInfo:



Additional Inherited Members

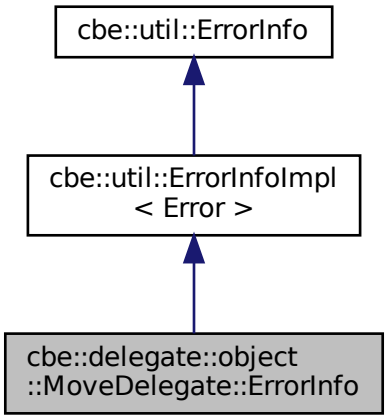
12.50.1 Detailed Description

Contains all information about a failed login.
The documentation for this struct was generated from the following file:

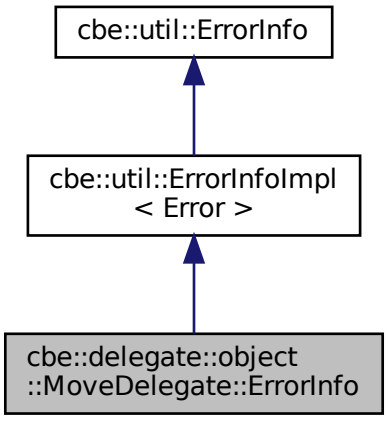
- include/cbe/delegate/LogInDelegate.h

12.51 cbe::delegate::object::MoveDelegate::ErrorInfo Struct Reference

`#include <MoveDelegate.h>`
Inheritance diagram for cbe::delegate::object::MoveDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::object::MoveDelegate::ErrorInfo:



Additional Inherited Members

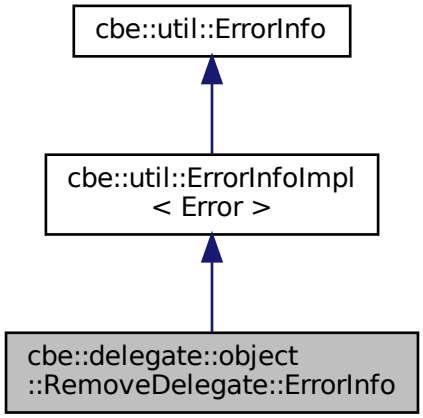
12.51.1 Detailed Description

Contains all information about a failed Move.
The documentation for this struct was generated from the following file:

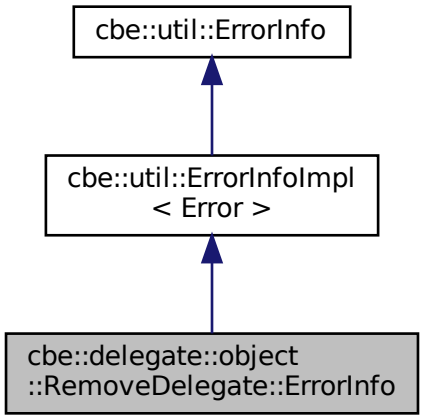
- include/cbe/delegate/object/MoveDelegate.h

12.52 cbe::delegate::object::RemoveDelegate::ErrorInfo Struct Reference

`#include <RemoveDelegate.h>`
Inheritance diagram for cbe::delegate::object::RemoveDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::object::RemoveDelegate::ErrorInfo:



Additional Inherited Members

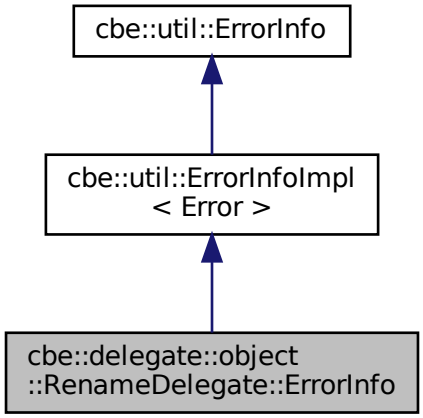
12.52.1 Detailed Description

Contains all information about a failed Remove.
The documentation for this struct was generated from the following file:

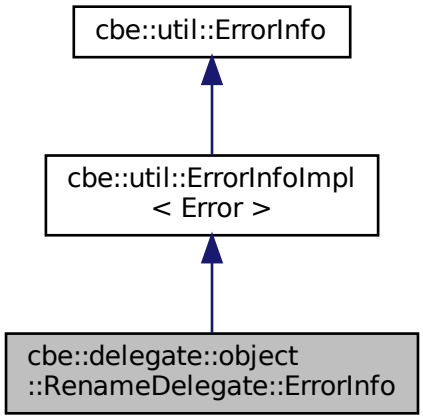
- include/cbe/delegate/object/RemoveDelegate.h

12.53 cbe::delegate::object::RenameDelegate::ErrorInfo Struct Reference

`#include <RenameDelegate.h>`
Inheritance diagram for cbe::delegate::object::RenameDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::object::RenameDelegate::ErrorInfo:



Additional Inherited Members

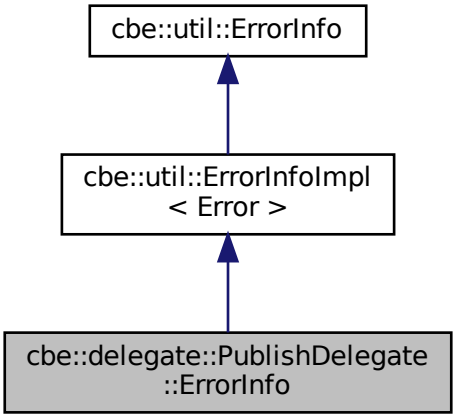
12.53.1 Detailed Description

Contains all information about a failed Rename.
The documentation for this struct was generated from the following file:

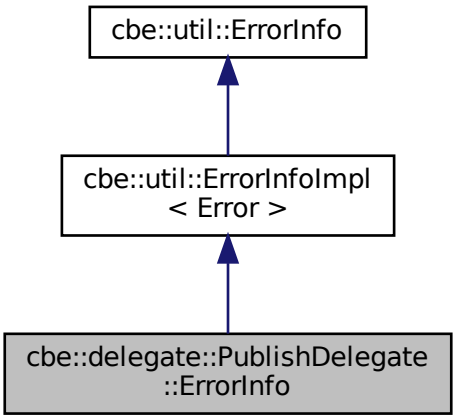
- include/cbe/delegate/object/RenameDelegate.h

12.54 cbe::delegate::PublishDelegate::ErrorInfo Struct Reference

`#include <PublishDelegate.h>`
Inheritance diagram for cbe::delegate::PublishDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::PublishDelegate::ErrorInfo:



Additional Inherited Members

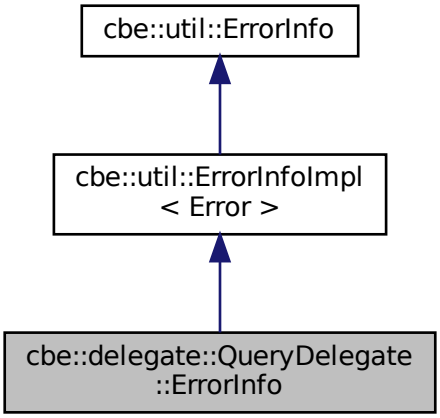
12.54.1 Detailed Description

Contains all information about a failed Publish.
The documentation for this struct was generated from the following file:

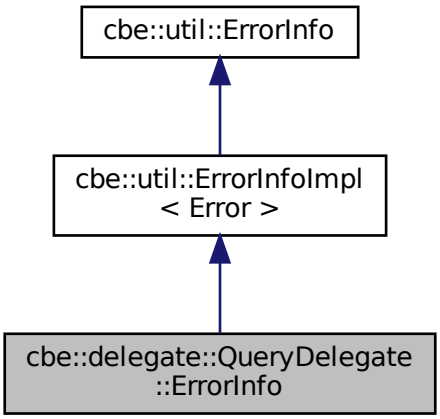
- include/cbe/delegate/PublishDelegate.h

12.55 cbe::delegate::QueryDelegate::ErrorInfo Struct Reference

`#include <QueryDelegate.h>`
Inheritance diagram for cbe::delegate::QueryDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::QueryDelegate::ErrorInfo:



Additional Inherited Members

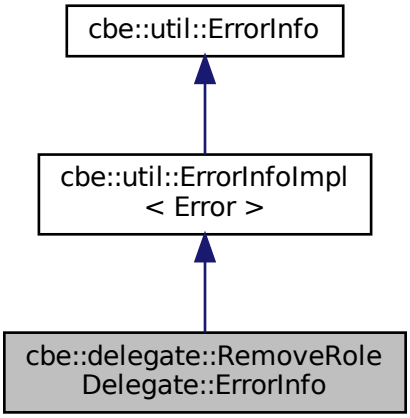
12.55.1 Detailed Description

Contains all information about a failed query.
The documentation for this struct was generated from the following file:

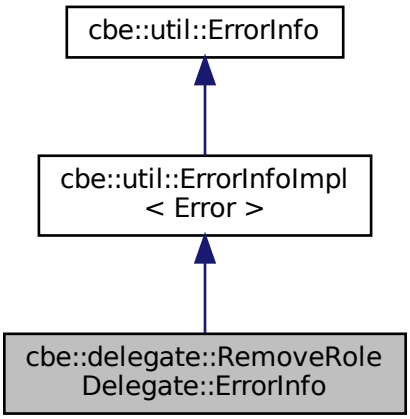
- include/cbe/delegate/QueryDelegate.h

12.56 cbe::delegate::RemoveRoleDelegate::ErrorInfo Struct Reference

`#include <RemoveRoleDelegate.h>`
Inheritance diagram for cbe::delegate::RemoveRoleDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::RemoveRoleDelegate::ErrorInfo:



Additional Inherited Members

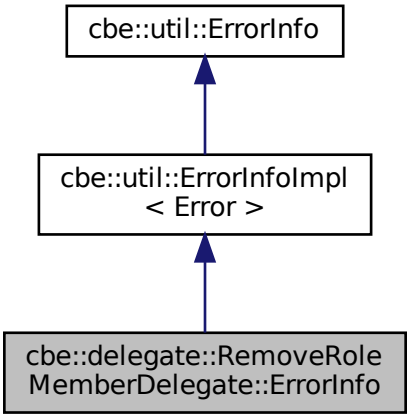
12.56.1 Detailed Description

Contains all information about a failed RemoveRole.
The documentation for this struct was generated from the following file:

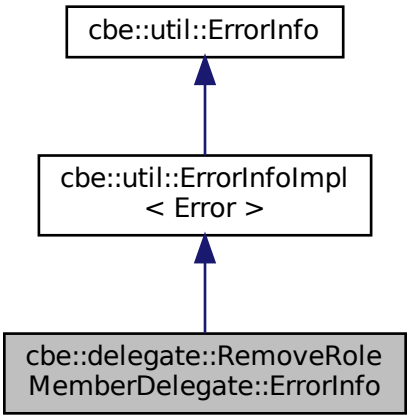
- include/cbe/delegate/RemoveRoleDelegate.h

12.57 cbe::delegate::RemoveRoleMemberDelegate::ErrorInfo Struct Reference

`#include <RemoveRoleMemberDelegate.h>`
Inheritance diagram for cbe::delegate::RemoveRoleMemberDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::RemoveRoleMemberDelegate::ErrorInfo:



Additional Inherited Members

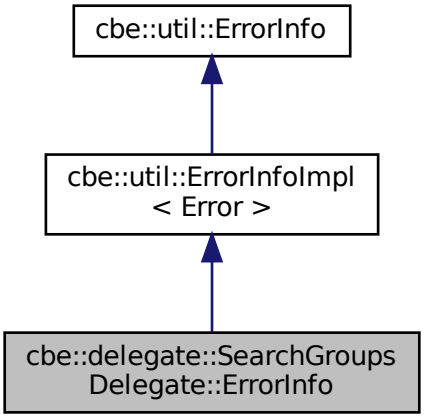
12.57.1 Detailed Description

Contains all information about a failed RemoveMember.
The documentation for this struct was generated from the following file:

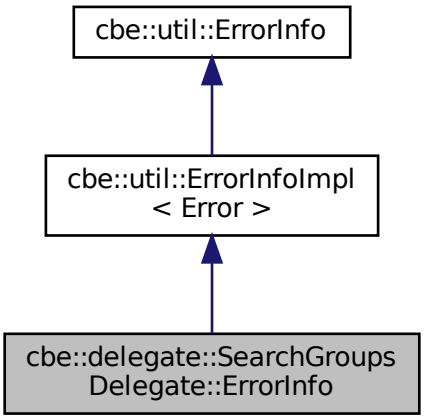
- include/cbe/delegate/RemoveRoleMemberDelegate.h

12.58 cbe::delegate::SearchGroupsDelegate::ErrorInfo Struct Reference

`#include <SearchGroupsDelegate.h>`
Inheritance diagram for cbe::delegate::SearchGroupsDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::SearchGroupsDelegate::ErrorInfo:



Additional Inherited Members

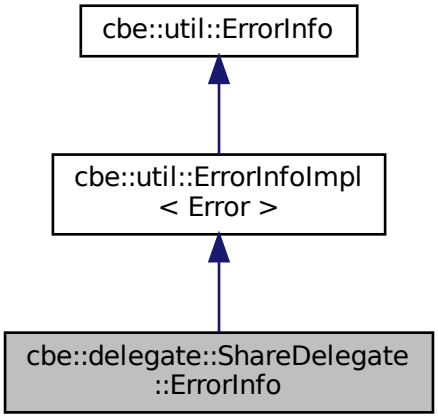
12.58.1 Detailed Description

Contains all information about a failed SearchGroups.
The documentation for this struct was generated from the following file:

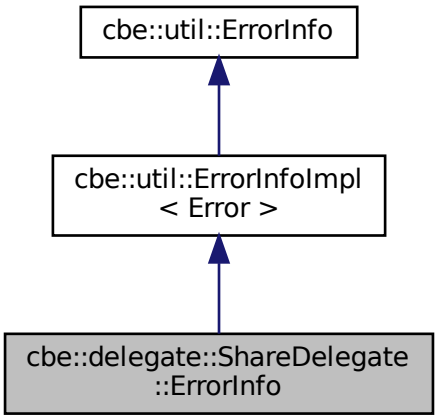
- include/cbe/delegate/SearchGroupsDelegate.h

12.59 cbe::delegate::ShareDelegate::ErrorInfo Struct Reference

`#include <ShareDelegate.h>`
Inheritance diagram for cbe::delegate::ShareDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::ShareDelegate::ErrorInfo:



Additional Inherited Members

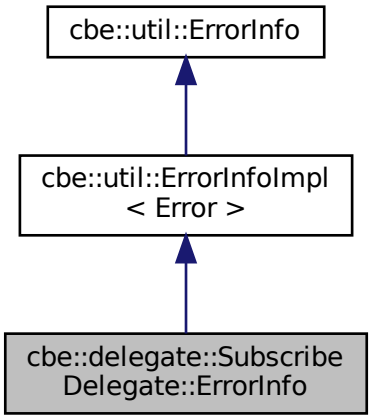
12.59.1 Detailed Description

Contains all information about a failed Share.
The documentation for this struct was generated from the following file:

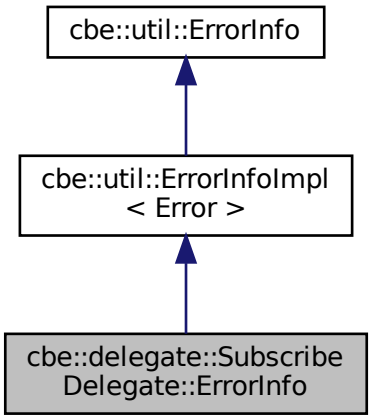
- include/cbe/delegate/ShareDelegate.h

12.60 cbe::delegate::SubscribeDelegate::ErrorInfo Struct Reference

`#include <SubscribeDelegate.h>`
Inheritance diagram for cbe::delegate::SubscribeDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::SubscribeDelegate::ErrorInfo:



Additional Inherited Members

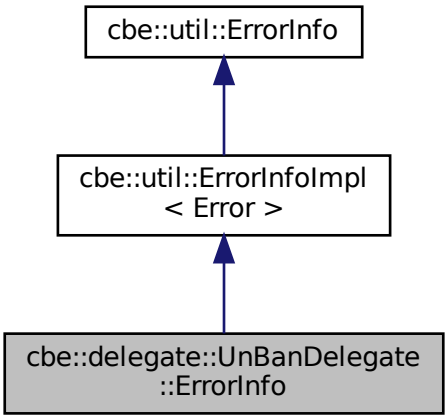
12.60.1 Detailed Description

Contains all information about a failed subscribe.
The documentation for this struct was generated from the following file:

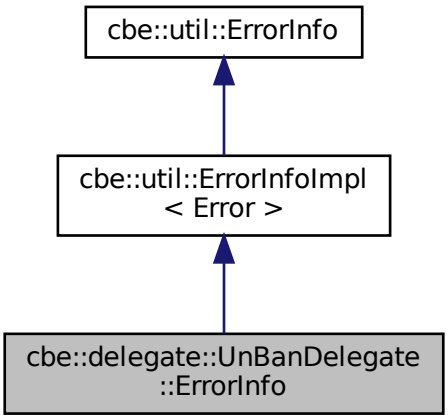
- include/cbe/delegate/SubscribeDelegate.h

12.61 cbe::delegate::UnBanDelegate::ErrorInfo Struct Reference

`#include <UnBanDelegate.h>`
Inheritance diagram for cbe::delegate::UnBanDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::UnBanDelegate::ErrorInfo:



Additional Inherited Members

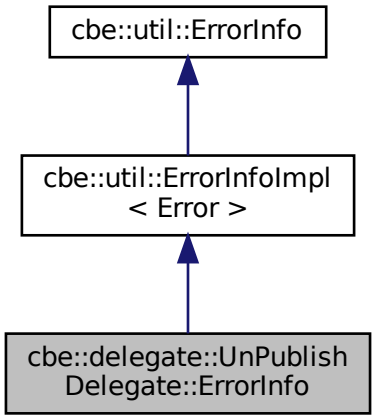
12.61.1 Detailed Description

Contains all information about a failed UnBan.
The documentation for this struct was generated from the following file:

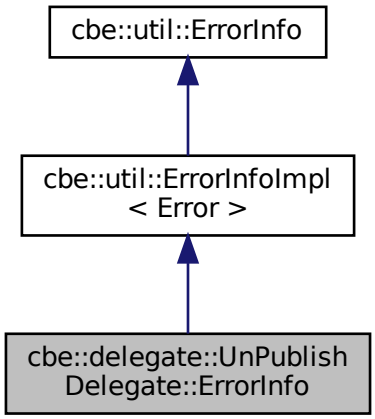
- include/cbe/delegate/UnBanDelegate.h

12.62 cbe::delegate::UnPublishDelegate::ErrorInfo Struct Reference

`#include <UnPublishDelegate.h>`
Inheritance diagram for cbe::delegate::UnPublishDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::UnPublishDelegate::ErrorInfo:



Additional Inherited Members

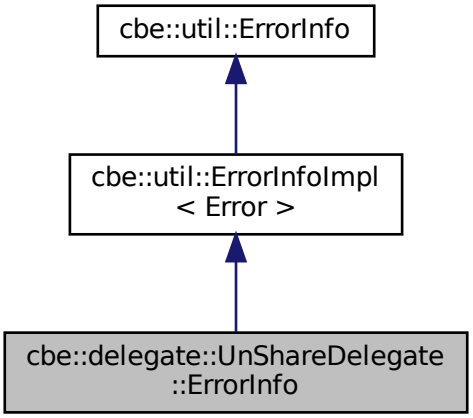
12.62.1 Detailed Description

Contains all information about a failed UnPublish.
The documentation for this struct was generated from the following file:

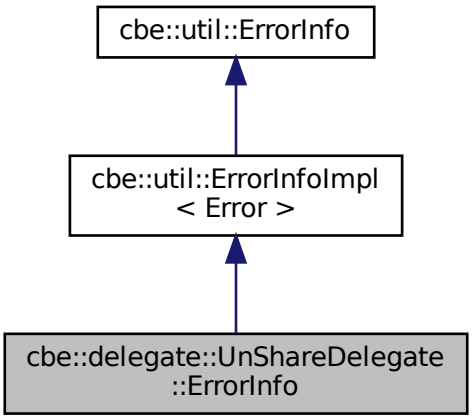
- include/cbe/delegate/UnPublishDelegate.h

12.63 cbe::delegate::UnShareDelegate::ErrorInfo Struct Reference

`#include <UnShareDelegate.h>`
Inheritance diagram for cbe::delegate::UnShareDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::UnShareDelegate::ErrorInfo:



Additional Inherited Members

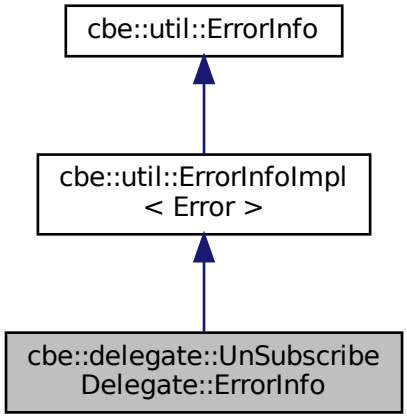
12.63.1 Detailed Description

Contains all information about a failed UnShare.
The documentation for this struct was generated from the following file:

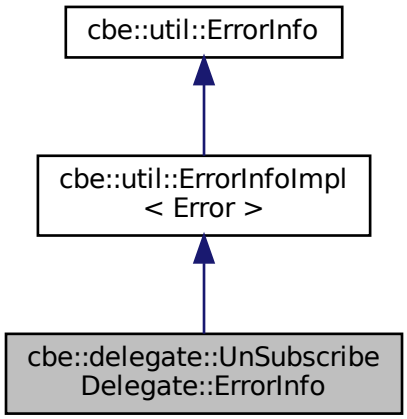
- include/cbe/delegate/UnShareDelegate.h

12.64 cbe::delegate::UnSubscribeDelegate::ErrorInfo Struct Reference

`#include <UnSubscribeDelegate.h>`
Inheritance diagram for cbe::delegate::UnSubscribeDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::UnSubscribeDelegate::ErrorInfo:



Additional Inherited Members

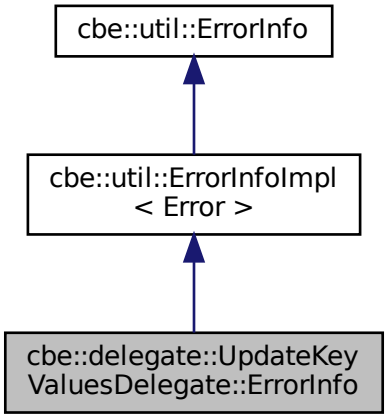
12.64.1 Detailed Description

Contains all information about a failed UnSubscribe.
The documentation for this struct was generated from the following file:

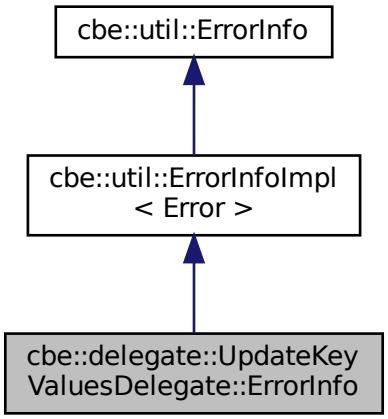
- include/cbe/delegate/UnSubscribeDelegate.h

12.65 cbe::delegate::UpdateKeyValuesDelegate::ErrorInfo Struct Reference

`#include <UpdateKeyValuesDelegate.h>`
Inheritance diagram for cbe::delegate::UpdateKeyValuesDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::UpdateKeyValuesDelegate::ErrorInfo:



Additional Inherited Members

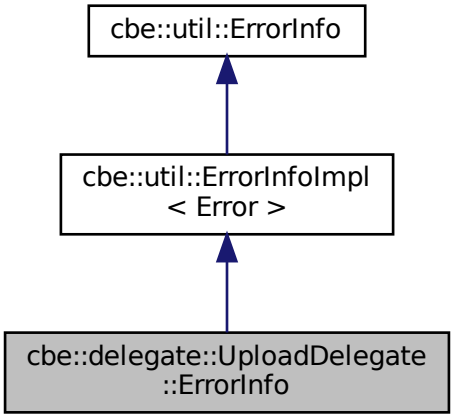
12.65.1 Detailed Description

Contains all information about a failed UpdateKeyValues.
The documentation for this struct was generated from the following file:

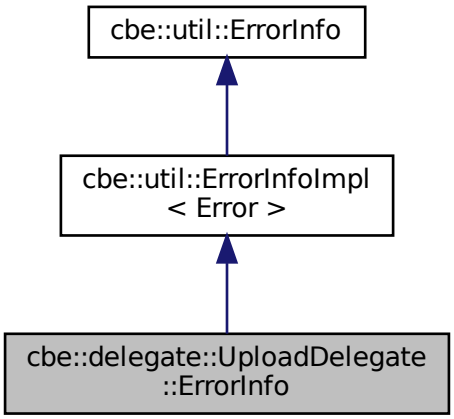
- include/cbe/delegate/UpdateKeyValuesDelegate.h

12.66 cbe::delegate::UploadDelegate::ErrorInfo Struct Reference

`#include <UploadDelegate.h>`
Inheritance diagram for cbe::delegate::UploadDelegate::ErrorInfo:



Collaboration diagram for cbe::delegate::UploadDelegate::ErrorInfo:



Additional Inherited Members

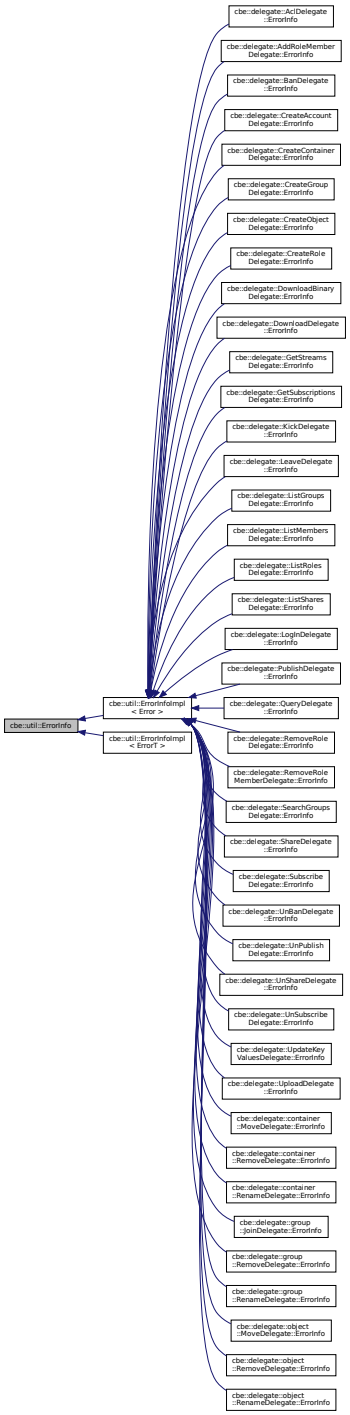
12.66.1 Detailed Description

Contains all information about a failed Upload.
The documentation for this struct was generated from the following file:

- include/cbe/delegate/UploadDelegate.h

12.67 cbe::util::ErrorInfo Struct Reference

Inheritance diagram for cbe::util::ErrorInfo:



Public Member Functions

- virtual void **printError** (std::ostream &os) const =0
- **operator bool** () const

Public Attributes

- std::string **contextStr** {}

Protected Member Functions

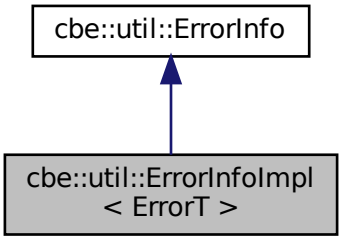
- **ErrorInfo** (Context &&context)

The documentation for this struct was generated from the following file:

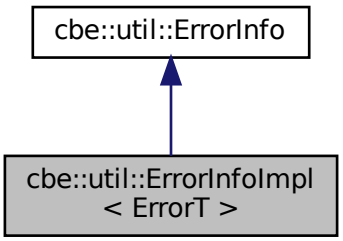
- include/cbe/util/ErrorInfo.h

12.68 cbe::util::ErrorInfoImpl< ErrorT > Struct Template Reference

Inheritance diagram for cbe::util::ErrorInfoImpl< ErrorT >:



Collaboration diagram for cbe::util::ErrorInfoImpl< ErrorT >:



Public Types

- using **Base** = ErrorInfoImpl< ErrorT >

Public Member Functions

- **ErrorInfoImpl** (Context &&context, ErrorT &&error)
- template<class ErrorT2 >
  ErrorInfoImpl & **operator=** (ErrorInfoImpl< ErrorT2 > &&rh)

- void **printError** (std::ostream &os) const final
- template<class ErrorT2 >
  ErrorInfoImpl< ErrorT > & **operator=** (ErrorInfoImpl< ErrorT2 > &&rh)

Public Attributes

- ErrorT **error** {}

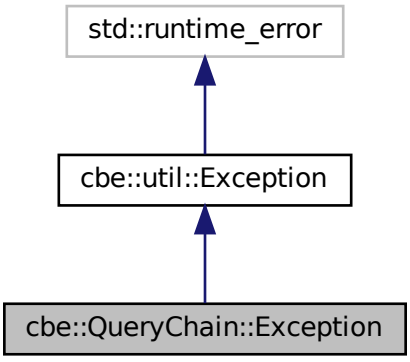
Additional Inherited Members

The documentation for this struct was generated from the following file:

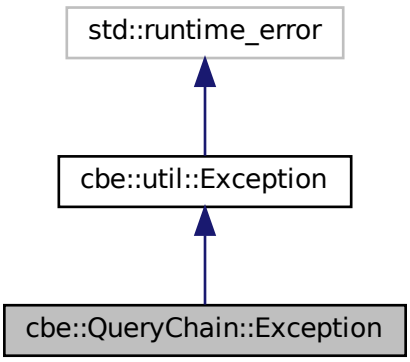
- include/cbe/util/ErrorInfo.h

12.69 cbe::QueryChain::Exception Struct Reference

Inheritance diagram for cbe::QueryChain::Exception:



Collaboration diagram for cbe::QueryChain::Exception:



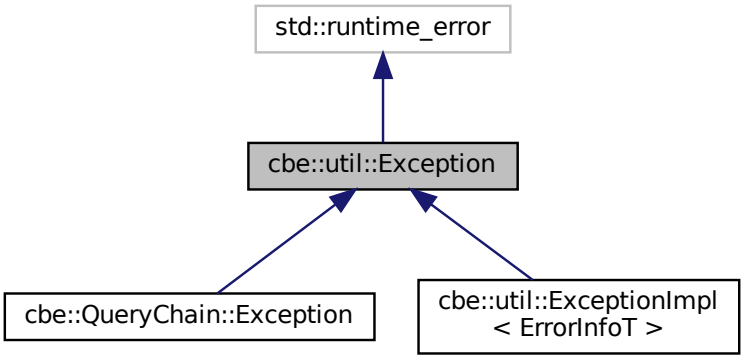
Additional Inherited Members

The documentation for this struct was generated from the following file:

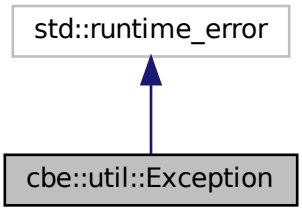
- include/cbe/QueryChain.h

12.70 cbe::util::Exception Struct Reference

`#include <Exception.h>`
Inheritance diagram for cbe::util::Exception:



Collaboration diagram for cbe::util::Exception:



Public Member Functions

- template<typename... Ts>
  Exception (Ts &&... args)
- std::string **typeAsString** () const
- template<class CbeExceptionT >
  const CbeExceptionT * derivedCbeException () const

  Examines whether current exception is of type `CbeExceptionT`.

12.70.1 Detailed Description

X

12.70.2 Member Function Documentation

12.70.2.1 derivedCbeException()

```
template<class CbeExceptionT >
const CbeExceptionT* cbe::util::Exception::derivedCbeException ( ) const  [inline]
```

Examines whether current exception is of type `CbeExceptionT`.

Template Parameters

CbeExceptionT	Subtype of cbe::util::Exception to be examined.

Returns

Pointer to the requested exception, nullptr implies no such subclass type.

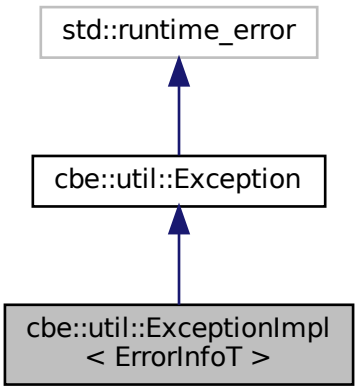
The documentation for this struct was generated from the following file:

- include/cbe/util/Exception.h

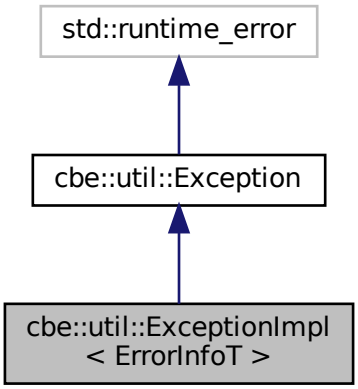
12.71 cbe::util::ExceptionImpl< ErrorInfoT > Struct Template Reference

`#include <Exception.h>`

Inheritance diagram for cbe::util::ExceptionImpl< ErrorInfoT >:



Collaboration diagram for cbe::util::ExceptionImpl< ErrorInfoT >:



Public Types

- using **Base** = ExceptionImpl< ErrorInfoT >

Public Member Functions

- **ExceptionImpl** (ErrorInfoT &&errorInfo)

Public Attributes

- const ErrorInfoT **errorInfo**

12.71.1 Detailed Description

template<class ErrorInfoT>
struct cbe::util::ExceptionImpl< ErrorInfoT >

XX
The documentation for this struct was generated from the following file:

- include/cbe/util/Exception.h

12.72 cbe::Filter Class Reference

Use to select Item that meets specific criterias when doing a query.
`#include <Filter.h>`

Public Member Functions

- **Filter** (const Filter &rh)
- **Filter** (Filter &&rh)
- Filter & **operator=** (const Filter &rh)
- Filter & **operator=** (Filter &&rh)
- cbe::ItemType getDataType () const

  Returns the requested data type.

- std::string getQuery () const

  Returns the query string that was set on the filter.
- bool getAscending () const

  Returns the settings on how the data was sorted and displayed.
- bool getDeleted () const

  Determines if deleted objects in the bin are included.
- bool getContainerFirst () const

  Determines if containers should be sorted before objects.
- bool isJoinedResult () const

  Determines if the resultset comes from a joined query.
- std::uint32_t getOffset () const

  Determines the offset of items to be skiped.
- std::uint32_t getCount () const

  Returns the size of the resultset of the query.
- bool getByPassCache () const

  Returns if skipping the cache was used or not.
- cbe::FilterOrder getItemOrder () const

  Returns the order the query was sorted.
- cbe::Container container ()

  Returns the parent container that was queried, if it is in the cache. This is after a query was done, not before.
- cbe::Filter & setDataType (cbe::ItemType itemType)

  Set which `datatypes` to query for.
- cbe::Filter & setQuery (std::string query)

  Set the query string.
- cbe::Filter & setAscending (bool ascending)

  Sets the order, `ascending` , in which data should be displayed.
- cbe::Filter & setDeleted (bool deleted)

  Whether to include deleted items.
- cbe::Filter & setContainerFirst (bool containerFirst)

  If `Container` should be displayed before `Object`.
- cbe::Filter & setOffset (std::uint32_t offset)

  Set the offset for paging.
- cbe::Filter & setCount (std::uint32_t count)

  Set the maximum resultset.
- cbe::Filter & setItemOrder (cbe::FilterOrder order)

  Set the order of how data will be shown by the enum of FilterOrder.
- cbe::Filter & setByPassCache (bool byPassCache)

  Set to ignore the local SDK cache.

Friends

- class **CloudBackend**
- class **Container**
- class **QueryChain**
- class **QueryResult**
- std::ostream & **operator**<< (std::ostream &os, const Filter &filter)
- CBI::ItemDelegatePtr **delegate::createCbiQueryDelegate** (delegate::QueryDelegatePtr, cbe::util::Context &&)
- CBI::ItemDelegatePtr **delegate::createCbiQueryDelegate** (delegate::QueryJoinDelegatePtr, cbe::util::Context &&)

12.72.1 Detailed Description

Use to select Item that meets specific criterias when doing a query.
Filtering on metadata KeyValues can be done with setQuery() and only to query for Object, not Container.

12.72.2 Member Function Documentation

12.72.2.1 getDataType()

```
cbe::ItemType cbe::Filter::getDataType ( ) const
```

Returns the requested data type.
Such as ItemType e.g.,

- cbe::ItemType::Container
- cbe::ItemType::Object
- cbe::ItemType::Group

12.72.2.2 getItemOrder()

```
cbe::FilterOrder cbe::Filter::getItemOrder ( ) const
```

Returns the order the query was sorted.
Check enum `FilterOrder` to see options for sorting.

12.72.2.3 getOffset()

```
std::uint32_t cbe::Filter::getOffset ( ) const
```

Determines the offset of items to be skiped.
Returns the offset of items in the beginning of total resultset to be skiped, that was used for the filter in the query.

12.72.2.4 getQuery()

```
std::string cbe::Filter::getQuery ( ) const
```

Returns the query string that was set on the filter.
Query string e.g.,

- name:Abc∗
- age:100
- price<200
- size>40

12.72.2.5 setAscending()

```
cbe::Filter& cbe::Filter::setAscending (
            bool ascending )
```

Sets the order, `ascending` , in which data should be displayed.

Parameters

ascending	true = sorted in increasing order false = sorted in decreasing order

12.72.2.6 setByPassCache()

```
cbe::Filter& cbe::Filter::setByPassCache (
            bool byPassCache )
```

Set to ignore the local SDK cache.
Instead allways fetch the resultset from the cloud.

Parameters

byPassCache	true = skip the SDK cache and ask the cloud. default is to use the cache when available.

12.72.2.7 setContainerFirst()

```
cbe::Filter& cbe::Filter::setContainerFirst (
            bool containerFirst )
```

If `Container` should be displayed before `Object`.

Parameters

containerFirst	true = sort containers at the top of the resultset. default is to not sort for this.

12.72.2.8 setCount()

```
cbe::Filter& cbe::Filter::setCount (
            std::uint32_t count )
```

Set the maximum resultset.
Set the maximum number of items you want to get from a container.
E.g.: a container has 50 items but you only want the 10 first in ascending order then set ascending to true and setCount to 10.

Parameters

count	maximum number of items to return

12.72.2.9 setDataType()

```
cbe::Filter& cbe::Filter::setDataType (
            cbe::ItemType itemType )
```

Set which `datatypes` to query for.

Parameters

itemType	as defined in Types.h

12.72.2.10 setDeleted()

```
cbe::Filter& cbe::Filter::setDeleted (
            bool deleted )
```

Whether to include deleted items.

Parameters

deleted	true = include items in the bin default is false

12.72.2.11 setItemOrder()

```
cbe::Filter& cbe::Filter::setItemOrder (
            cbe::FilterOrder order )
```

Set the order of how data will be shown by the enum of FilterOrder.
E.g.: Title first, Relevance, published e.t.c.

Parameters

order	see the enum `FilterOrder` in Types.h

12.72.2.12 setOffset()

```
cbe::Filter& cbe::Filter::setOffset (
            std::uint32_t offset )
```

Set the offset for paging.
Offset is the item offset where to start your resultset.
E.g.: There is already a query resultset of the first 100 items and to get the rest you put setOffset() to 100 to get the next resultset from 101-.

Parameters

offset	first item start number of the complete resultset to return

12.72.2.13 setQuery()

```
cbe::Filter& cbe::Filter::setQuery (
            std::string query )
```

Set the query string.
E.g., firstname:∗ (would search for all objects with the metadata key labeled `firstname`).
Search string e.g.,

- name:Abc∗
- age:100
- price<200
- size>40

Note

If used with rootContainer id as the dataId to search in, the whole account will be searched.

Parameters

query	is a string of key tags or key:value pairs. E.g. Name:∗|Country:Sweden|Country:Norway This will search for objects with key Name but any value and where key Country is either Sweden or Norway.

The documentation for this class was generated from the following file:

- include/cbe/Filter.h

12.73 cbe::delegate::GetStreamsDelegate Class Reference

`#include <GetStreamsDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Success** = cbe::Streams
- using **Error** = delegate::Error

Public Member Functions

- virtual void onGetStreamsSuccess (cbe::Streams &&streams)=0
- virtual void onGetStreamsError (Error &&error, cbe::util::Context &&context)=0

12.73.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Object::getStreams()
  See Example of retrieving the Stream attached to a cbe::Object with Object::getStreams()

12.73.2 Member Function Documentation

12.73.2.1 onGetStreamsError()

```
virtual void cbe::delegate::GetStreamsDelegate::onGetStreamsError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.73.2.2 onGetStreamsSuccess()

```
virtual void cbe::delegate::GetStreamsDelegate::onGetStreamsSuccess (
            cbe::Streams && streams )  [pure virtual]
```

Called upon successful Object::GetStreams.

Parameters

streams	The currently loaded stream(s) attached to the requested object.

The documentation for this class was generated from the following file:

- include/cbe/delegate/GetStreamsDelegate.h

12.74 cbe::delegate::GetSubscriptionsDelegate Class Reference

`#include <GetSubscriptionsDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Success** = cbe::QueryResult
- using **Error** = delegate::Error

Public Member Functions

- virtual void onGetSubscriptionsSuccess (cbe::QueryResult &&object)=0
- virtual void onGetSubscriptionsError (Error &&error, cbe::util::Context &&context)=0

12.74.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::SubscribeManager::getSubscriptions

12.74.2 Member Function Documentation

12.74.2.1 onGetSubscriptionsError()

```
virtual void cbe::delegate::GetSubscriptionsDelegate::onGetSubscriptionsError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.74.2.2 onGetSubscriptionsSuccess()

```
virtual void cbe::delegate::GetSubscriptionsDelegate::onGetSubscriptionsSuccess (
            cbe::QueryResult && object )  [pure virtual]
```

Called upon successful GetSubscriptions.

Parameters

object	Instance of object that is being streamed.

The documentation for this class was generated from the following file:

- include/cbe/delegate/GetSubscriptionsDelegate.h

12.75 cbe::Group Class Reference

A group of members.

`#include <Group.h>`

Public Types

- using **Requests** = std::vector< cbe::Request >
- using CreateGroupDelegatePtr = delegate::CreateGroupDelegatePtr
- using JoinDelegatePtr = delegate::group::JoinDelegatePtr
- using LeaveDelegatePtr = delegate::LeaveDelegatePtr
- using RemoveDelegatePtr = delegate::group::RemoveDelegatePtr
- using RenameDelegatePtr = delegate::group::RenameDelegatePtr
- using ListMembersDelegatePtr = delegate::ListMembersDelegatePtr
- using ListBannedMembersDelegatePtr = delegate::ListMembersDelegatePtr
- using ListRolesDelegatePtr = delegate::ListRolesDelegatePtr
- using CreateRoleDelegatePtr = delegate::CreateRoleDelegatePtr
- using RemoveRoleDelegatePtr = delegate::RemoveRoleDelegatePtr

Public Member Functions

- std::string name () const
- cbe::GroupId id () const
- cbe::GroupId parentId () const
- cbe::Container groupContainer () const
- cbe::Visibility getVisibility () const
- bool joined () const
- Requests requests () const
- cbe::Group createGroup (std::string name, std::string memberAlias, cbe::Visibility visibility, CreateGroupDelegatePtr delegate)

  Create a new Group.
- void join (std::string alias, cbe::Visibility memberVisibility, std::string applicationComment, JoinDelegatePtr delegate)

  Synchronous [exception] Ask to join a group. In this first version All members will be Public, meaning visible for other member inside the group. All groups will also be open so all join requests should be accepted directly.
- void leave (LeaveDelegatePtr delegate)

  Leave group.
- void remove (RemoveDelegatePtr delegate)

  Remove group.
- void rename (std::string newName, RenameDelegatePtr delegate)

  Rename the Group; group id does not change.
- void listMembers (ListMembersDelegatePtr delegate)

  List all members in the group.
- void listBannedMembers (ListBannedMembersDelegatePtr delegate)

  Lists all banned former members, or users.
- void listRoles (ListRolesDelegatePtr delegate)

  Lists all roles in the group.
- void createRole (std::string name, CreateRoleDelegatePtr delegate)

  Creates a new role in the group.
- void removeRole (RoleId roleId, RemoveRoleDelegatePtr delegate)
- Group (cbe::DefaultCtor)

  Default constructor.
- operator bool () const

  Checks if the current instance is real.

Friends

- class **GroupManager**
- class **GroupQueryResult**

12.75.1 Detailed Description

A group of members.

12.75.2 Member Typedef Documentation

12.75.2.1 CreateGroupDelegatePtr

```
using cbe::Group::CreateGroupDelegatePtr = delegate::CreateGroupDelegatePtr
```

Pointer to CreateGroupDelegate that is passed into:
Group::createGroup(std::string,std::string,CreateGroupDelegatePtr,cbe::Visibility).

12.75.2.2 CreateRoleDelegatePtr

```
using cbe::Group::CreateRoleDelegatePtr = delegate::CreateRoleDelegatePtr
```

Pointer to cbe::delegate::CreateRoleDelegate that is passed into asynchronous version of method createRole()

12.75.2.3 JoinDelegatePtr

```
using cbe::Group::JoinDelegatePtr = delegate::group::JoinDelegatePtr
```

Pointer to cbe::delegate::group::JoinDelegate that is passed into asynchronous version of method join()

12.75.2.4 LeaveDelegatePtr

```
using cbe::Group::LeaveDelegatePtr = delegate::LeaveDelegatePtr
```

Pointer to cbe::delegate::LeaveDelegate that is passed into asynchronous version of method leave()

12.75.2.5 ListBannedMembersDelegatePtr

```
using cbe::Group::ListBannedMembersDelegatePtr = delegate::ListMembersDelegatePtr
```

Pointer to cbe::delegate::ListMembersDelegate that is passed into asynchronous version of method listBannedMembers()

12.75.2.6 ListMembersDelegatePtr

```
using cbe::Group::ListMembersDelegatePtr = delegate::ListMembersDelegatePtr
```

Pointer to cbe::delegate::ListMembersDelegate that is passed into asynchronous version of method listMembers()

12.75.2.7 ListRolesDelegatePtr

```
using cbe::Group::ListRolesDelegatePtr = delegate::ListRolesDelegatePtr
```

Pointer to cbe::delegate::ListRolesDelegate that is passed into asynchronous version of method listRoles()

12.75.2.8 RemoveDelegatePtr

```
using cbe::Group::RemoveDelegatePtr = delegate::group::RemoveDelegatePtr
```

Pointer to cbe::delegate::RemoveDelegate that is passed into asynchronous version of method remove()

12.75.2.9 RemoveRoleDelegatePtr

```
using cbe::Group::RemoveRoleDelegatePtr = delegate::RemoveRoleDelegatePtr
```

Pointer to cbe::delegate::RemoveRoleDelegate that is passed into asynchronous version of method removeRole()

12.75.2.10 RenameDelegatePtr

```
using cbe::Group::RenameDelegatePtr = delegate::group::RenameDelegatePtr
```

Pointer to cbe::delegate::RenameDelegate that is passed into asynchronous version of method rename()

12.75.3 Constructor & Destructor Documentation

12.75.3.1 Group()

```
cbe::Group::Group (
            cbe::DefaultCtor  )
```

Default constructor.
Construct a new object with the `DefaultCtor` to enable the operator bool() test

12.75.4 Member Function Documentation

12.75.4.1 createGroup()

```
cbe::Group cbe::Group::createGroup (
            std::string name,
            std::string memberAlias,
            cbe::Visibility visibility,
            CreateGroupDelegatePtr delegate )
```

Create a new Group.

Note

Can only be used by Tenant admin/owners to create new groups.

Parameters

name	of the group
memberAlias	another popular name
delegate	Pointer to a delegate::CreateGroupDelegate instance that is implemented by the user.
visibility	default: public

Returns

cbe::Group

See also

Types.h for cbe::visibility enum cbe::Visibility::PublicGroup or cbe::Visibility::Private

12.75.4.2 createRole()

```
void cbe::Group::createRole (
            std::string name,
            CreateRoleDelegatePtr delegate )
```

Creates a new role in the group.

Parameters

name	The name of the role.
delegate	Pointer to a delegate::CreateRoleDelegate instance that is implemented by the user.

12.75.4.3 getVisibility()

```
cbe::Visibility cbe::Group::getVisibility ( ) const
```

Visibility of the Group, Public is searchable and Private is not. In this early version you can create Private groups but the ability to invite has been blocked. (work in progress)

See also

Types.h for cbe::PublishVisibility enum

12.75.4.4 groupContainer()

```
cbe::Container cbe::Group::groupContainer ( ) const
```

Every group has a drive/container where resources can be shared with the members of the group. Works like a shared container.

12.75.4.5 id()

```
cbe::GroupId cbe::Group::id ( ) const
```

Returns the id number of the group.

12.75.4.6 join()

```
void cbe::Group::join (
            std::string alias,
            cbe::Visibility memberVisibility,
            std::string applicationComment,
            JoinDelegatePtr delegate )
```

Synchronous [exception] Ask to join a group. In this first version All members will be Public, meaning visible for other member inside the group. All groups will also be open so all join requests should be accepted directly.

Note

This is completely different from the query chain join.

Parameters

alias	name
delegate	Pointer to a delegate::group::JoinDelegate instance that is implemented by the user.
memberVisibility	default: public
applicationComment	message to the owner regarding the application to join

12.75.4.7 joined()

```
bool cbe::Group::joined ( ) const
```

Searched groups are obtained through the GroupQuery response. This list of groups have non-joined and joined groups. Already joined groups can be found on the `groupManager.groups()` and they are also cached. The joined bool is used to easily sort out groups in the GroupQuery.

12.75.4.8 leave()

```
void cbe::Group::leave (
            LeaveDelegatePtr delegate )
```

Leave group.

Parameters

delegate	Pointer to a delegate::LeaveDelegate instance that is implemented by the user.

12.75.4.9 listBannedMembers()

```
void cbe::Group::listBannedMembers (
            ListBannedMembersDelegatePtr delegate )
```

Lists all banned former members, or users.

Parameters

delegate	Pointer to a delegate::ListMembersDelegate instance that is implemented by the user.

12.75.4.10 listMembers()

```
void cbe::Group::listMembers (
            ListMembersDelegatePtr delegate )
```

List all members in the group.
The member list is then retrieved via the delegate callback function cbe::delegate::ListMembersDelegate::onListMembersSuccess()

Parameters

delegate	Pointer to a delegate::ListMembersDelegate instance that is implemented by the user.

12.75.4.11 listRoles()

```
void cbe::Group::listRoles (
            ListRolesDelegatePtr delegate )
```

Lists all roles in the group.

Parameters

delegate	Pointer to a delegate::ListRolesDelegate instance that is implemented by the user.

12.75.4.12 name()

```
std::string cbe::Group::name ( ) const
```

Returns the name of the group.

12.75.4.13 operator bool()

```
cbe::Group::operator bool ( ) const  [explicit]
```

Checks if the current instance is real.
An "unreal" instance implies typically a failed event.
Relies on the `Default constructor` Group(cbe::DefaultCtor)

Returns

`true` : is real

`false` : unreal; got nullptr; if current instance is unbound/undefined. I.e., if it is only default constructed.

12.75.4.14 parentId()

```
cbe::GroupId cbe::Group::parentId ( ) const
```

Group's Parent id number.

12.75.4.15 remove()

```
void cbe::Group::remove (
            RemoveDelegatePtr delegate )
```

Remove group.

Note

This is exlusive for Tenant group owners.

Parameters

delegate	Pointer to a delegate::group::RemoveDelegate instance that is implemented by the user.

12.75.4.16 removeRole()

```
void cbe::Group::removeRole (
            RoleId roleId,
            RemoveRoleDelegatePtr delegate )
```

```
 @brief Removes a role in the group.

 @param roleId The id of the role to remove.

 @param delegate Pointer to a delegate::RemoveRoleDelegate instance
```

that is implemented by the user.

12.75.4.17 rename()

```
void cbe::Group::rename (
            std::string newName,
            RenameDelegatePtr delegate )
```

Rename the Group; group id does not change.

Parameters

newName	the new name for the group
delegate	Pointer to a delegate::group::RenameDelegate instance that is implemented by the user.

12.75.4.18 requests()

```
Requests cbe::Group::requests ( ) const
```

Requests to join the group. To retrieve the list call listJoinRequests(cbe::GroupDelegatePtr delegate) on the group object.
The documentation for this class was generated from the following file:

- include/cbe/Group.h

12.76 cbe::GroupFilter Class Reference

To filter when searching a list of Group.
`#include <GroupFilter.h>`

Public Member Functions

- **GroupFilter** (const GroupFilter &rh)
- **GroupFilter** (GroupFilter &&rh)
- GroupFilter & **operator=** (const GroupFilter &rh)
- GroupFilter & **operator=** (GroupFilter &&rh)
- std::string getQuery () const
- std::string getFilter () const
- bool getAscending () const
- bool getDeleted () const
- bool getPublicFirst () const
- uint32_t getOffset () const
- uint32_t getCount () const
- std::string getOrder () const
- cbe::FilterOrder getGroupOrder () const
- cbe::GroupFilter & setQuery (std::string)
- cbe::GroupFilter & setFilter (std::string)
- cbe::GroupFilter & setAscending (bool)
- cbe::GroupFilter & setDeleted (bool)
- cbe::GroupFilter & setOffset (uint32_t)
- cbe::GroupFilter & setCount (uint32_t)

Friends

- class **Group**
- class **GroupQueryResult**
- class **GroupManager**
- class **delegate::SearchGroupDelegate**
- std::ostream & operator<< (std::ostream &os, const GroupFilter &GroupFilter)

12.76.1 Detailed Description

To filter when searching a list of Group.

12.76.2 Member Function Documentation

12.76.2.1 getAscending()

`bool cbe::GroupFilter::getAscending ( ) const`
Returns the settings on how the data was sorted and displayed.

12.76.2.2 getCount()

`uint32_t cbe::GroupFilter::getCount ( ) const`
Returns the value of the count that was set for the query.

12.76.2.3 getDeleted()

```
bool cbe::GroupFilter::getDeleted ( ) const
```
If deleted objects in the bin are included.

12.76.2.4 getFilter()

```
std::string cbe::GroupFilter::getFilter ( ) const
```
the filter in question

12.76.2.5 getGroupOrder()

```
cbe::FilterOrder cbe::GroupFilter::getGroupOrder ( ) const
```
Returns the order the query was sorted check enum FilterOrder to see options for sorting.

12.76.2.6 getOffset()

```
uint32_t cbe::GroupFilter::getOffset ( ) const
```
Returns the offset that was used for the filter in the query.

12.76.2.7 getOrder()

```
std::string cbe::GroupFilter::getOrder ( ) const
```
get the filterorder as a string.

12.76.2.8 getPublicFirst()

```
bool cbe::GroupFilter::getPublicFirst ( ) const
```
If public groups should be sorted before private.

12.76.2.9 getQuery()

```
std::string cbe::GroupFilter::getQuery ( ) const
```
Returns the query string that was set on the filter. E.g., name:Abc∗

12.76.2.10 setAscending()

```
cbe::GroupFilter& cbe::GroupFilter::setAscending (
            bool  )
```
Sets the Order in which data should be displayed: Acending meaning alfabetical

12.76.2.11 setCount()

```
cbe::GroupFilter& cbe::GroupFilter::setCount (
            uint32_t  )
```
Set the Number of items you want to get from a container. So if a container has 50 items but you only want the 10 first in ascending order then set ascending to true and setCount to 10.

12.76.2.12 setDeleted()

```
cbe::GroupFilter& cbe::GroupFilter::setDeleted (
            bool  )
```
If you want to see deleted groups set deleted to true.

12.76.2.13 setFilter()

```
cbe::GroupFilter& cbe::GroupFilter::setFilter (
            std::string  )
```
Not fully tested but should be a regular expression.

12.76.2.14 setOffset()

```
cbe::GroupFilter& cbe::GroupFilter::setOffset (
            uint32_t  )
```

Set the offset for paging, offset is the item offset where to start your query. i.e: There is already a query of the first 99 items and to get the rest you have setOffest to 100 to get the next set.

12.76.2.15 setQuery()

```
cbe::GroupFilter& cbe::GroupFilter::setQuery (
            std::string  )
```

Set the query string, e.g: Name:∗ (would search for all objects with the metadata key of Name).

Note

If used with rootContainer id as the dataId, search in the whole account will be done.

12.76.3 Friends And Related Function Documentation

12.76.3.1 operator<<

```
std::ostream& operator<< (
            std::ostream & os,
            const GroupFilter & GroupFilter )  [friend]
```

Set the order of how data will be shown by the enum of FilterOrder ex: Titel first, published e.t.c
The documentation for this class was generated from the following file:

- include/cbe/GroupFilter.h

12.77 cbe::GroupManager Class Reference

For managing the groups.
`#include <GroupManager.h>`

Public Types

- using ListGroupsDelegatePtr = delegate::ListGroupsDelegatePtr
- using SearchGroupsDelegatePtr = delegate::SearchGroupsDelegatePtr

Public Member Functions

- void listGroups (ListGroupsDelegatePtr delegate)
- void searchGroups (cbe::GroupFilter filter, SearchGroupsDelegatePtr delegate, cbe::GroupId parentGroup↩Id=0)
- cbe::GroupId getTenantId () const
- GroupManager (cbe::DefaultCtor)

  Default constructor.
- operator bool () const

  Checks if the current instance is real.

Friends

- class **CloudBackend**

12.77.1 Detailed Description

For managing the groups.

12.77.2 Member Typedef Documentation

12.77.2.1 ListGroupsDelegatePtr

```
using cbe::GroupManager::ListGroupsDelegatePtr = delegate::ListGroupsDelegatePtr
```

Pointer to cbe::delegate::ListGroupsDelegate that is passed into asynchronous version of method listGroups()

12.77.2.2 SearchGroupsDelegatePtr

```
using cbe::GroupManager::SearchGroupsDelegatePtr = delegate::SearchGroupsDelegatePtr
```

Pointer to SearchGroupsDelegate that is passed into:

- cbe::GroupManager::searchGroups()

12.77.3 Constructor & Destructor Documentation

12.77.3.1 GroupManager()

```
cbe::GroupManager::GroupManager (
            cbe::DefaultCtor  )
```

Default constructor.
Construct a new object with the `DefaultCtor` to enable the operator bool() test

12.77.4 Member Function Documentation

12.77.4.1 getTenantId()

```
cbe::GroupId cbe::GroupManager::getTenantId ( ) const
```

Pointer to cbe::delegate::SearchGroupsDelegate that is passed into asynchronous version of method search↩ Groups() Returns the tenant id of the Tenant user group that the user is in.

12.77.4.2 listGroups()

```
void cbe::GroupManager::listGroups (
            ListGroupsDelegatePtr delegate )
```

List all current joined groups.

Parameters

delegate	Pointer to a delegate::ListGroupsDelegate instance that is implemented by the user.

12.77.4.3 operator bool()

```
cbe::GroupManager::operator bool ( ) const  [explicit]
```

Checks if the current instance is real.
An "unreal" instance implies typically a failed event.
Relies on the `Default constructor` GroupManager(cbe::DefaultCtor)

Returns

`true` : is real

`false` : unreal; got nullptr; if current instance is unbound/undefined. I.e., if it is only default constructed.

12.77.4.4 searchGroups()

```
void cbe::GroupManager::searchGroups (
            cbe::GroupFilter filter,
            SearchGroupsDelegatePtr delegate,
            cbe::GroupId parentGroupId = 0 )
```

Search for open public groups.

Parameters

filter	is a group filter to set search criteria for open public groups. Look att class GroupFilter for more information.
delegate	Pointer to a delegate::SearchGroupsDelegate instance that is implemented by the user.
parentGroupId	is the id of the group to be searched within. If this is not set the tenant id will be used.

The documentation for this class was generated from the following file:

- include/cbe/GroupManager.h

12.78 cbe::GroupQueryResult Class Reference

Resultset of data retrieved in a search for Group.

`#include <GroupQueryResult.h>`

Public Types

- using **GroupsSnapshot** = std::vector< Group >

Public Member Functions

- **GroupQueryResult** (cbe::DefaultCtor)
- cbe::GroupFilter filter () const
- GroupsSnapshot getGroupsSnapshot () const
- uint64_t GroupsLoaded () const
- uint64_t totalCount () const
- bool containsGroup (uint64_t groupId)
- **operator bool** () const

Friends

- class **GroupManager**
- class **CloudBackend**
- std::ostream & **operator**<< (std::ostream &os, const GroupQueryResult &groupQuery)

12.78.1 Detailed Description

Resultset of data retrieved in a search for Group.

12.78.2 Member Function Documentation

12.78.2.1 containsGroup()

```
bool cbe::GroupQueryResult::containsGroup (
            uint64_t groupId )
```

asking if the group with groupId was loaded in the query.

Parameters

groupId	the group id number in question

12.78.2.2 filter()

```
cbe::GroupFilter cbe::GroupQueryResult::filter ( ) const
```

Returns a copy of the filter used for query.

12.78.2.3 getGroupsSnapshot()

```
GroupsSnapshot cbe::GroupQueryResult::getGroupsSnapshot ( ) const
```

Returns a copy of a vector containing the groups for the queryResult. The queryResult will update when new data comes in but the copy will not. If iterating, make sure to create a variable for a local copy.

Returns

vector<cbe::Group> containing the groups matching the query.

12.78.2.4 GroupsLoaded()

```
uint64_t cbe::GroupQueryResult::GroupsLoaded ( ) const
```

Number of groups loaded in the queryResult.

12.78.2.5 totalCount()

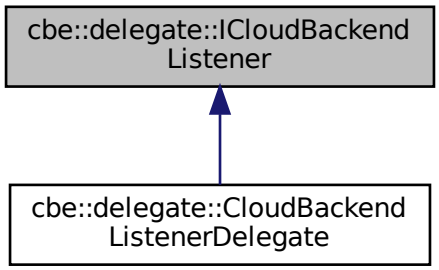
```
uint64_t cbe::GroupQueryResult::totalCount ( ) const
```

Total number of Groups in the cloud matching the query result. This may be more than loaded.
The documentation for this class was generated from the following file:

- include/cbe/GroupQueryResult.h

12.79 cbe::delegate::ICloudBackendListener Class Reference

Inheritance diagram for cbe::delegate::ICloudBackendListener:



Public Member Functions

- virtual void onRemoteObjectAdded (cbe::Object &&object)=0
- virtual void onRemoteObjectMoved (cbe::Object &&object)=0
- virtual void onRemoteObjectRemoved (cbe::ItemId objectId, std::string name)=0
- virtual void onRemoteObjectRenamed (cbe::Object &&object)=0
- virtual void onRemoteContainerAdded (cbe::Container &&container)=0
- virtual void onRemoteContainerMoved (cbe::Container &&container)=0
- virtual void onRemoteContainerRemoved (cbe::ItemId containerId, std::string name)=0
- virtual void onRemoteContainerRenamed (cbe::Container &&container)=0

12.79.1 Member Function Documentation

12.79.1.1 onRemoteContainerAdded()

```
virtual void cbe::delegate::ICloudBackendListener::onRemoteContainerAdded (
            cbe::Container && container )  [pure virtual]
```

Called upon successful Create.

Parameters

container	Instance of container that is being created.

Implemented in cbe::delegate::CloudBackendListenerDelegate.

12.79.1.2 onRemoteContainerMoved()

```
virtual void cbe::delegate::ICloudBackendListener::onRemoteContainerMoved (
            cbe::Container && container )  [pure virtual]
```

Called upon successful Move.

Parameters

container	Instance of container that is being moved.

Implemented in cbe::delegate::CloudBackendListenerDelegate.

12.79.1.3 onRemoteContainerRemoved()

```
virtual void cbe::delegate::ICloudBackendListener::onRemoteContainerRemoved (
            cbe::ItemId containerId,
            std::string name )  [pure virtual]
```

Called upon successful Remove.

Parameters

containerId	Instance of the container that is being Removed.
name	Name of the container that is being removed.

Implemented in cbe::delegate::CloudBackendListenerDelegate.

12.79.1.4 onRemoteContainerRenamed()

```
virtual void cbe::delegate::ICloudBackendListener::onRemoteContainerRenamed (
            cbe::Container && container )  [pure virtual]
```

Called upon successful Rename.

Parameters

container	Instance of container that is being Renamed.

Implemented in cbe::delegate::CloudBackendListenerDelegate.

12.79.1.5 onRemoteObjectAdded()

```
virtual void cbe::delegate::ICloudBackendListener::onRemoteObjectAdded (
            cbe::Object && object )  [pure virtual]
```

Called upon successful create of an object.

Parameters

object	Instance of object that is being created.

Implemented in cbe::delegate::CloudBackendListenerDelegate.

12.79.1.6 onRemoteObjectMoved()

```
virtual void cbe::delegate::ICloudBackendListener::onRemoteObjectMoved (
            cbe::Object && object )  [pure virtual]
```

Called upon successful move of an object.

Parameters

object	Instance of object that is being moved.

Implemented in cbe::delegate::CloudBackendListenerDelegate.

12.79.1.7 onRemoteObjectRemoved()

```
virtual void cbe::delegate::ICloudBackendListener::onRemoteObjectRemoved (
            cbe::ItemId objectId,
            std::string name )  [pure virtual]
```

Called upon successful removal of an object.

Parameters

objectId	Instance of the object that is being Removed.
name	Name of the object that is being Removed.

Implemented in cbe::delegate::CloudBackendListenerDelegate.

12.79.1.8 onRemoteObjectRenamed()

```
virtual void cbe::delegate::ICloudBackendListener::onRemoteObjectRenamed (
            cbe::Object && object )  [pure virtual]
```

Called upon successful renaming of an object.

Parameters

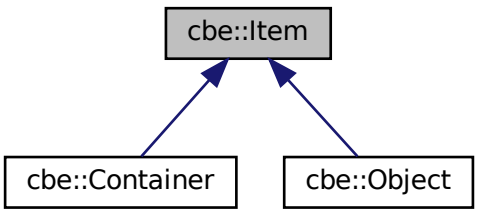
object	Instance of object that is being renamed.

Implemented in cbe::delegate::CloudBackendListenerDelegate.
The documentation for this class was generated from the following file:

- include/cbe/delegate/ICloudBackendListener.h

12.80 cbe::Item Class Reference

A set made up of Container and Object.
`#include <Item.h>`
Inheritance diagram for cbe::Item:



Public Member Functions

- cbe::ShareIds getShareIds () const
- cbe::ShareId getShareFromUserId (cbe::UserId userId)
- cbe::UserId getUserFromShareId (cbe::UserId shareId)
- std::string aclTag () const

- std::string description () const
- cbe::ItemId id () const
- cbe::ContainerId parentId () const
- cbe::ContainerId oldParentId () const
- std::string name () const
- std::string path () const
- cbe::UserId ownerId () const
- cbe::ContainerId driveId () const
- std::string username () const
- bool idLoaded () const
- bool dataLoaded () const
- cbe::Date created () const
- cbe::Date updated () const
- cbe::Date deleted () const
- cbe::ItemType type () const
- bool hasPublished () const
- Publish getPublished () const
- bool hasSubscribe () const
- Subscribe getSubscribe () const
- bool **operator**< (const cbe::Item &rh) const
- AclMap aclMap () const
- operator bool () const

  Checks if the inherited instance is real.

Protected Member Functions

- **Item** (std::shared_ptr< Impl > pImpl)
- template<class ImplT >
  ImplT & **castImpl** () const

Friends

- class **CloudBackend**
- class **Container**
- class **Object**
- class **PublishManager**
- class **QueryResult**
- class **SubscribeManager**
- std::ostream & **operator**<< (std::ostream &os, const Item &item)

12.80.1 Detailed Description

A set made up of Container and Object.
Class for an Item. This is class is the base class of Objects and Containers.

12.80.2 Member Function Documentation

12.80.2.1 aclMap()

```
AclMap cbe::Item::aclMap ( ) const
```

Retrieve the map of the permissions the users and groups for this item.

12.80.2.2 aclTag()

```
std::string cbe::Item::aclTag ( ) const
```
the ACL of the item

12.80.2.3 created()

```
cbe::Date cbe::Item::created ( ) const
```
Returns the creation date in Unix epoch time.

12.80.2.4 dataLoaded()

```
bool cbe::Item::dataLoaded ( ) const
```
if data was loaded

12.80.2.5 deleted()

```
cbe::Date cbe::Item::deleted ( ) const
```
Returns the deleted date, if applicable (i.e. is in the bin), in Unix epoch time

12.80.2.6 description()

```
std::string cbe::Item::description ( ) const
```
A item text description where applicable

12.80.2.7 driveId()

```
cbe::ContainerId cbe::Item::driveId ( ) const
```
Returns which drive number the container resides on.

12.80.2.8 getPublished()

```
Publish cbe::Item::getPublished ( ) const
```
Gets the publish information

See also

hasPublished()

12.80.2.9 getShareFromUserId()

```
cbe::ShareId cbe::Item::getShareFromUserId (
            cbe::UserId userId )
```
Get the shareId by reference of userId

12.80.2.10 getShareIds()

```
cbe::ShareIds cbe::Item::getShareIds ( ) const
```
a map of share ids for this item

12.80.2.11 getSubscribe()

```
Subscribe cbe::Item::getSubscribe ( ) const
```
Gets the subscribe information

See also

hasSubscribe()

12.80.2.12 getUserFromShareId()

```
cbe::UserId cbe::Item::getUserFromShareId (
            cbe::UserId shareId )
```

Get the userId reference of shareId

12.80.2.13 hasPublished()

```
bool cbe::Item::hasPublished ( ) const
```

Checks if it has published info and if `getPublished()` returns a valid object.

12.80.2.14 hasSubscribe()

```
bool cbe::Item::hasSubscribe ( ) const
```

Checks if it has subscribe info and if `getSubscribe()` returns a valid object.

12.80.2.15 id()

```
cbe::ItemId cbe::Item::id ( ) const
```

Returns an Items id.

12.80.2.16 idLoaded()

```
bool cbe::Item::idLoaded ( ) const
```

if the query did get a resultset.

12.80.2.17 name()

```
std::string cbe::Item::name ( ) const
```

Returns the name of the item.

12.80.2.18 oldParentId()

```
cbe::ContainerId cbe::Item::oldParentId ( ) const
```

Returns the id of the Items old parent container id in cases where the item has just been moved.

12.80.2.19 operator bool()

```
cbe::Item::operator bool ( ) const  [explicit]
```

Checks if the inherited instance is real.
An "unreal" instance implies typically a failed event.
Relies on the `Default constructor` cbe::DefaultCtor

Returns

`true` : is real

`false` : unreal; got nullptr; if current instance is unbound/undefined. I.e., if it is only default constructed.

12.80.2.20 ownerId()

```
cbe::UserId cbe::Item::ownerId ( ) const
```

Returns the owner id number.

12.80.2.21 parentId()

```
cbe::ContainerId cbe::Item::parentId ( ) const
```

Returns the id of the Items parent container id.

12.80.2.22 path()

```
std::string cbe::Item::path ( ) const
```
Returns the path if applicable.

12.80.2.23 type()

```
cbe::ItemType cbe::Item::type ( ) const
```
Container or Object, see enum in Types.h

12.80.2.24 updated()

```
cbe::Date cbe::Item::updated ( ) const
```
Returns the updated date/time in Unix epoch time

12.80.2.25 username()

```
std::string cbe::Item::username ( ) const
```
Returns the username of the owner if applicable.
The documentation for this class was generated from the following file:

- include/cbe/Item.h

12.81 cbe::delegate::ItemError Class Reference

```
#include <ItemDelegateErrors.h>
```

Classes

- struct Error

Public Member Functions

- virtual void onItemError (Error &&error, cbe::util::Context &&context)=0

Friends

- std::ostream & **operator**<< (std::ostream &os, const ItemError::Error &error)

12.81.1 Detailed Description

Entity class containing the information passed into method **`onItemError()`** in cbe interface

12.81.2 Member Function Documentation

12.81.2.1 onItemError()

```
virtual void cbe::delegate::ItemError::onItemError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```
Called upon failed service calls like:

- move
- remove
- rename

The documentation for this class was generated from the following file:

- include/cbe/delegate/ItemDelegateErrors.h

12.82 cbe::delegate::group::JoinDelegate Class Reference

`#include <JoinDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Success** = cbe::Group
- using **Error** = delegate::Error

Public Member Functions

- virtual void onJoinSuccess (cbe::Group &&group)=0
- virtual void onJoinError (Error &&error, cbe::util::Context &&context)=0

12.82.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Group::join

Note

This is different from the query chain join.

12.82.2 Member Function Documentation

12.82.2.1 onJoinError()

```
virtual void cbe::delegate::group::JoinDelegate::onJoinError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.82.2.2 onJoinSuccess()

```
virtual void cbe::delegate::group::JoinDelegate::onJoinSuccess (
            cbe::Group && group )  [pure virtual]
```

Called upon successful Join.
The documentation for this class was generated from the following file:

- include/cbe/delegate/group/JoinDelegate.h

12.83 cbe::delegate::JoinDelegate Class Reference

`#include <JoinDelegate.h>`

Public Types

- using **Success** = cbe::QueryResult
- using **JoinError** = QueryError
- using **Error** = JoinError
- using ErrorInfo = QueryJoinDelegate::ErrorInfo

Public Member Functions

- virtual void onJoinSuccess (cbe::QueryResult &&queryResult)=0
- virtual void onJoinError (JoinError &&error, cbe::util::Context &&context)=0

12.83.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::QueryChain::join()

Note

This is different from the group join.

12.83.2 Member Typedef Documentation

12.83.2.1 ErrorInfo

```
using cbe::delegate::JoinDelegate::ErrorInfo = QueryJoinDelegate::ErrorInfo
```

Contains all information about a failed join.

12.83.3 Member Function Documentation

12.83.3.1 onJoinError()

```
virtual void cbe::delegate::JoinDelegate::onJoinError (
            JoinError && error,
            cbe::util::Context && context )  [pure virtual]
```

Called upon a failed join() call.

Parameters

error	Error information passed from CloudBackend SDK.
context	Additional context information about the original service call that has failed.

12.83.3.2 onJoinSuccess()

```
virtual void cbe::delegate::JoinDelegate::onJoinSuccess (
            cbe::QueryResult && queryResult )  [pure virtual]
```

Called upon successful query.

Parameters

queryResult	Instance of a QueryResult containing the result set.

The documentation for this class was generated from the following file:

- include/cbe/delegate/JoinDelegate.h

12.84 cbe::delegate::JoinError Class Reference

```
#include <ItemDelegateErrors.h>
```

Classes

- class Error

Public Member Functions

- virtual void onJoinError (Error &&error, cbe::util::Context &&context)=0

Friends

- std::ostream & **operator**<< (std::ostream &os, const JoinError::Error &error)

12.84.1 Detailed Description

Entity class containing the information passed into method **`onJoinError()`** in cbe interface

12.84.2 Member Function Documentation

12.84.2.1 onJoinError()

```
virtual void cbe::delegate::JoinError::onJoinError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called upon a failed join() call.

Parameters

error	Error information passed from CloudBackend SDK.
context	Additional context information about the original service call that has failed.

The documentation for this class was generated from the following file:

- include/cbe/delegate/ItemDelegateErrors.h

12.85 cbe::delegate::KickDelegate Class Reference

```
#include <KickDelegate.h>
```

Classes

- struct ErrorInfo

Public Types

- using **Success** = KickSuccess
- using **Error** = delegate::Error

Public Member Functions

- virtual void onKickSuccess (std::string &&memberName, cbe::MemberId memberId)=0
- virtual void onKickError (Error &&error, cbe::util::Context &&context)=0

12.85.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Member::kick

12.85.2 Member Function Documentation

12.85.2.1 onKickError()

```
virtual void cbe::delegate::KickDelegate::onKickError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.85.2.2 onKickSuccess()

```
virtual void cbe::delegate::KickDelegate::onKickSuccess (
            std::string && memberName,
            cbe::MemberId memberId )  [pure virtual]
```

Called upon successful ban.

Parameters

memberName	Name of the member being kicked.
memberId	Id of the member being kicked.

The documentation for this class was generated from the following file:

- include/cbe/delegate/KickDelegate.h

12.86 cbe::delegate::KickSuccess Class Reference

Convenience type that bundles all parameters passed to method cbe::delegate::KickDelegate::onKickSuccess.

```
#include <KickDelegate.h>
```

Public Member Functions

- **KickSuccess** (cbe::DefaultCtor)
- **KickSuccess** (std::string &&memberName, cbe::MemberId memberId)

Public Attributes

- std::string **memberName** {}
- cbe::MemberId **memberId** {}

12.86.1 Detailed Description

Convenience type that bundles all parameters passed to method cbe::delegate::KickDelegate::onKickSuccess.
The documentation for this class was generated from the following file:

- include/cbe/delegate/KickDelegate.h

12.87 cbe::delegate::LeaveDelegate Class Reference

```
#include <LeaveDelegate.h>
```

Classes

- struct ErrorInfo

Public Types

- using **Success** = LeaveSuccess
- using **Error** = delegate::Error

Public Member Functions

- virtual void onLeaveSuccess (std::string &&memberName, cbe::MemberId memberId)=0
- virtual void onLeaveError (Error &&error, cbe::util::Context &&context)=0

12.87.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Group::leave

12.87.2 Member Function Documentation

12.87.2.1 onLeaveError()

```
virtual void cbe::delegate::LeaveDelegate::onLeaveError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.87.2.2 onLeaveSuccess()

```
virtual void cbe::delegate::LeaveDelegate::onLeaveSuccess (
            std::string && memberName,
            cbe::MemberId memberId )  [pure virtual]
```

Called upon successful leave.
The documentation for this class was generated from the following file:

- include/cbe/delegate/LeaveDelegate.h

12.88 cbe::delegate::LeaveSuccess Class Reference

Public Member Functions

- **LeaveSuccess** (cbe::DefaultCtor)
- **LeaveSuccess** (std::string &&memberName, cbe::MemberId memberId)
- operator bool () const

  Checks if current instance is valid.

Public Attributes

- std::string **memberName** {}
- cbe::MemberId **memberId** {}

12.88.1 Member Function Documentation

12.88.1.1 operator bool()

```
cbe::delegate::LeaveSuccess::operator bool ( ) const  [explicit]
```

Checks if current instance is valid.

Returns

`true`: is valid

The documentation for this class was generated from the following file:

- include/cbe/delegate/LeaveDelegate.h

12.89 cbe::delegate::ListGroupsDelegate Class Reference

```
#include <ListGroupsDelegate.h>
```

Classes

- struct ErrorInfo

Public Types

- using **Groups** = std::vector< cbe::Group >
- using **Success** = Groups
- using **Error** = delegate::Error

Public Member Functions

- virtual void onListGroupsSuccess (Groups &&groups)=0
- virtual void onListGroupsError (delegate::Error &&error, cbe::util::Context &&context)=0

12.89.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::GroupManager::listGroups

12.89.2 Member Function Documentation

12.89.2.1 onListGroupsError()

```
virtual void cbe::delegate::ListGroupsDelegate::onListGroupsError (
            delegate::Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.89.2.2 onListGroupsSuccess()

```
virtual void cbe::delegate::ListGroupsDelegate::onListGroupsSuccess (
            Groups && groups )  [pure virtual]
```

Called upon successful listGroup

Parameters

groups	Ref to vector of cbe::Group holding the joined groups.

The documentation for this class was generated from the following file:

- include/cbe/delegate/ListGroupsDelegate.h

12.90 cbe::delegate::ListMembersDelegate Class Reference

`#include <ListMembersDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Members** = std::vector< cbe::Member >
- using **Success** = Members
- using **Error** = delegate::Error

Public Member Functions

- virtual void onListMembersSuccess (Members &&members)=0
- virtual void onListMembersError (Error &&error, cbe::util::Context &&context)=0

12.90.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Group::listMembers

12.90.2 Member Function Documentation

12.90.2.1 onListMembersError()

```
virtual void cbe::delegate::ListMembersDelegate::onListMembersError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.90.2.2 onListMembersSuccess()

```
virtual void cbe::delegate::ListMembersDelegate::onListMembersSuccess (
            Members && members )  [pure virtual]
```

Called upon successful ListMembers.

Parameters

members	Vector of cbe::Member holding the members of a group.

The documentation for this class was generated from the following file:

- include/cbe/delegate/ListMembersDelegate.h

12.91 cbe::delegate::ListRolesDelegate Class Reference

`#include <ListRolesDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Roles** = std::vector< cbe::Role >
- using **Success** = Roles
- using **Error** = delegate::Error

Public Member Functions

- virtual void onListRolesSuccess (Roles &&roles)=0
- virtual void onListRolesError (Error &&error, cbe::util::Context &&context)=0

12.91.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Group::ListRoles

12.91.2 Member Function Documentation

12.91.2.1 onListRolesError()

```
virtual void cbe::delegate::ListRolesDelegate::onListRolesError (
            Error && error,
            cbe::util::Context && context ) [pure virtual]
```

Called if an error is encountered.

12.91.2.2 onListRolesSuccess()

```
virtual void cbe::delegate::ListRolesDelegate::onListRolesSuccess (
            Roles && roles ) [pure virtual]
```

Called upon successful ListRoles.

Parameters

roles	A unordered map with role id as key and role name as value of a group.

The documentation for this class was generated from the following file:

- include/cbe/delegate/ListRolesDelegate.h

12.92 cbe::delegate::ListSharesDelegate Class Reference

`#include <ListSharesDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Success** = cbe::QueryResult
- using **Error** = delegate::Error

Public Member Functions

- virtual void onListSharesSuccess (cbe::QueryResult &&qResult)=0
- virtual void onListSharesError (Error &&error, cbe::util::Context &&context)=0

12.92.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::ShareManager::listMyShares

12.92.2 Member Function Documentation

12.92.2.1 onListSharesError()

```
virtual void cbe::delegate::ListSharesDelegate::onListSharesError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.92.2.2 onListSharesSuccess()

```
virtual void cbe::delegate::ListSharesDelegate::onListSharesSuccess (
            cbe::QueryResult && qResult )  [pure virtual]
```

Called upon successful Share.

Parameters

qResult	Instance of cbe::QueryResult containing list of shares.

The documentation for this class was generated from the following file:

- include/cbe/delegate/ListSharesDelegate.h

12.93 cbe::delegate::LoadError Class Reference

```
#include <ItemDelegateErrors.h>
```

Classes

- class Error

Public Member Functions

- virtual void onLoadError (Error &&error, cbe::util::Context &&context)=0

Friends

- std::ostream & **operator**<< (std::ostream &os, const LoadError::Error &error)

12.93.1 Detailed Description

Entity class containing the information passed into method **`onLoadError()`** in cbe interface

12.93.2 Member Function Documentation

12.93.2.1 onLoadError()

```
virtual void cbe::delegate::LoadError::onLoadError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called upon a failed query() or join() call.

Parameters

error	Error information passed from CloudBackend SDK.
context	Additional context information about the original service call that has failed.

The documentation for this class was generated from the following file:

- include/cbe/delegate/ItemDelegateErrors.h

12.94 cbe::delegate::LogInDelegate Class Reference

```
#include <LogInDelegate.h>
```

Classes

- struct ErrorInfo

Public Types

- using **Error** = cbe::delegate::Error
- using Success = CloudBackend

Public Member Functions

- virtual void onLogInSuccess (CloudBackend &&cloudBackend)=0
- virtual void onLogInError (Error &&error, cbe::util::Context &&context)=0

12.94.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::CloudBackend::logIn(const std::string&,const std::string&,const std::string&,cbe::delegate::LogIn↩ DelegatePtr)
  See Example of asynchronous login

12.94.2 Member Typedef Documentation

12.94.2.1 Success

```
using cbe::delegate::LogInDelegate::Success = CloudBackend
```

Type of object delivered on success. I.e., the object delivered through success callback onLogInSuccess(CloudBackend&&).

12.94.3 Member Function Documentation

12.94.3.1 onLogInError()

```
virtual void cbe::delegate::LogInDelegate::onLogInError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called upon failed log in.

Parameters

error	Error information passed from CloudBackend SDK.
context	Additional context information about the original service call that has failed.

12.94.3.2 onLogInSuccess()

```
virtual void cbe::delegate::LogInDelegate::onLogInSuccess (
            CloudBackend && cloudBackend )  [pure virtual]
```

Called upon successful log in.

Parameters

cloudBackend	Instance of a CloudBackend holding the session.

The documentation for this class was generated from the following file:

- include/cbe/delegate/LogInDelegate.h

12.95 cbe::MatchesID< IdT > Class Template Reference

Search lists with ID.
`#include <Utility.h>`

Public Member Functions

- **MatchesID** (const IdT &id)
- template<class ItemT >
  bool **operator()** (const ItemT &item) const

12.95.1 Detailed Description

template<typename IdT>
class cbe::MatchesID< IdT >

Search lists with ID.
Example:

```
bool alreadyExists = std::find_if(vector.begin(), vector.end(),
                                  cbe::MatchesID<uint64_t>(id)) != vector.end();
```

The documentation for this class was generated from the following file:

- include/cbe/Utility.h

12.96 cbe::Member Class Reference

A of member of a Group.
`#include <Member.h>`

Public Types

- using KickDelegatePtr = delegate::KickDelegatePtr
- using BanDelegatePtr = delegate::BanDelegatePtr
- using UnBanDelegatePtr = delegate::UnBanDelegatePtr

Public Member Functions

- void kick (std::string kickComment, KickDelegatePtr delegate)
- void ban (std::string banComment, BanDelegatePtr delegate)
- void unBan (UnBanDelegatePtr delegate)
- cbe::MemberId memberId () const
- std::string name () const
- cbe::Visibility visibility () const
- cbe::GroupId groupId () const
- cbe::MemberBanInfo getMemberBanInfo ()

  Gets the member ban info map.
- Member (cbe::DefaultCtor)

  Default constructor.
- operator bool () const

  Checks if the current instance is real.

Friends

- class **Group**
- class **Role**

12.96.1 Detailed Description

A of member of a Group.

12.96.2 Member Typedef Documentation

12.96.2.1 BanDelegatePtr

```
using cbe::Member::BanDelegatePtr = delegate::BanDelegatePtr
```

Pointer to cbe::delegate::KickDelegate that is passed into asynchronous version of method kick() Pointer to Ban↩ Delegate that is passed into:

- cbe::Member::ban(std::string,BanDelegatePtr)

12.96.2.2 KickDelegatePtr

```
using cbe::Member::KickDelegatePtr = delegate::KickDelegatePtr
```

Pointer to KickDelegate that is passed into:

- cbe::Member::kick(std::string,KickDelegatePtr)

12.96.2.3 UnBanDelegatePtr

```
using cbe::Member::UnBanDelegatePtr = delegate::UnBanDelegatePtr
```

Pointer to cbe::delegate::BanDelegate that is passed into asynchronous version of method ban() Pointer to Un↩ BanDelegate that is passed into:

- cbe::Member::unBan(UnBanDelegatePtr)

12.96.3 Constructor & Destructor Documentation

12.96.3.1 Member()

```
cbe::Member::Member (
            cbe::DefaultCtor  )
```

Default constructor.
Construct a new object with the `DefaultCtor` to enable the operator bool() test

12.96.4 Member Function Documentation

12.96.4.1 ban()

```
void cbe::Member::ban (
            std::string banComment,
            BanDelegatePtr delegate )
```

Ban or evict a member from a group

Parameters

banComment	Free text describing the reason for this decision
delegate	Shared pointer to the class in which you implement cbe::delegate::BanDelegate to receive the callback upon completion of this request.

12.96.4.2 groupId()

```
cbe::GroupId cbe::Member::groupId ( ) const
```

the group id number

12.96.4.3 kick()

```
void cbe::Member::kick (
            std::string kickComment,
            KickDelegatePtr delegate )
```

Kick out a member from a group

Parameters

kickComment	free text describing the reason for this decision
delegate	a shared pointer to the class in which you implement cbe::delegate::KickDelegate to receive the callback on server completion.

12.96.4.4 memberId()

```
cbe::MemberId cbe::Member::memberId ( ) const
```

Pointer to cbe::delegate::UnBanDelegate that is passed into asynchronous version of method unBan() the member id number

12.96.4.5 name()

```
std::string cbe::Member::name ( ) const
```

Returns the member name.

12.96.4.6 operator bool()

```
cbe::Member::operator bool ( ) const  [explicit]
```

Checks if the current instance is real.
An "unreal" instance implies typically a failed event.
Relies on the `Default constructor` Member(cbe::DefaultCtor)

Returns

`true` : is real

`false` : unreal; got nullptr; if current instance is unbound/undefined. I.e., if it is only default constructed.

12.96.4.7 unBan()

```
void cbe::Member::unBan (
            UnBanDelegatePtr delegate )
```

Revoke a ban of a member from a group

Parameters

delegate	a shared pointer to the class in which you implement cbe::delegate::UnBanDelegate to receive the callback on server completion.

12.96.4.8 visibility()

```
cbe::Visibility cbe::Member::visibility ( ) const
```

see the enum `Visibility` in Types.h
The documentation for this class was generated from the following file:

- include/cbe/Member.h

12.97 cbe::delegate::container::MoveDelegate Class Reference

`#include <MoveDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Success** = cbe::Container
- using **Error** = delegate::Error

Public Member Functions

- virtual void onMoveSuccess (cbe::Container &&container)=0
- virtual void onMoveError (Error &&error, cbe::util::Context &&context)=0

12.97.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Container::move

12.97.2 Member Function Documentation

12.97.2.1 onMoveError()

```
virtual void cbe::delegate::container::MoveDelegate::onMoveError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.97.2.2 onMoveSuccess()

```
virtual void cbe::delegate::container::MoveDelegate::onMoveSuccess (
            cbe::Container && container )  [pure virtual]
```

Called upon successful Move.

Parameters

container	Instance of container that is being moved.

The documentation for this class was generated from the following file:

- include/cbe/delegate/container/MoveDelegate.h

12.98 cbe::delegate::object::MoveDelegate Class Reference

```
#include <MoveDelegate.h>
```

Classes

- struct ErrorInfo

Public Types

- using **Success** = cbe::Object
- using **Error** = delegate::Error

Public Member Functions

- virtual void onMoveSuccess (cbe::Object &&object)=0
- virtual void onMoveError (Error &&error, cbe::util::Context &&context)=0

12.98.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Object::move

12.98.2 Member Function Documentation

12.98.2.1 onMoveError()

```
virtual void cbe::delegate::object::MoveDelegate::onMoveError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.98.2.2 onMoveSuccess()

```
virtual void cbe::delegate::object::MoveDelegate::onMoveSuccess (
            cbe::Object && object )  [pure virtual]
```

Called upon successful Move.

Parameters

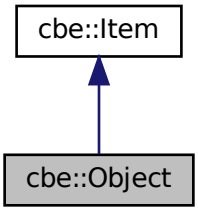
object	Instance of object that is being moved.

The documentation for this class was generated from the following file:

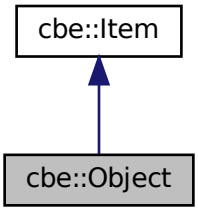
- include/cbe/delegate/object/MoveDelegate.h

12.99 cbe::Object Class Reference

Holder of a set of data, can represent a table row.
`#include <Object.h>`
Inheritance diagram for cbe::Object:



Collaboration diagram for cbe::Object:



Public Types

- using MoveDelegatePtr = delegate::object::MoveDelegatePtr
- using RenameDelegatePtr = delegate::object::RenameDelegatePtr
- using RemoveDelegatePtr = delegate::object::RemoveDelegatePtr
- using DownloadDelegatePtr = delegate::DownloadDelegatePtr

- using DownloadBinaryDelegatePtr = delegate::DownloadBinaryDelegatePtr
- using UploadDelegatePtr = delegate::UploadDelegatePtr
- using UpdateKeyValuesDelegatePtr = delegate::UpdateKeyValuesDelegatePtr
- using GetStreamsDelegatePtr = delegate::GetStreamsDelegatePtr
- using Streams = cbe::Streams

  Collection of Stream objects.
- using GetAclDelegatePtr = delegate::AclDelegatePtr
- using SetAclDelegatePtr = delegate::AclDelegatePtr
- using ShareDelegatePtr = delegate::ShareDelegatePtr
- using UnShareDelegatePtr = delegate::UnShareDelegatePtr
- using PublishDelegatePtr = delegate::PublishDelegatePtr
- using UnPublishDelegatePtr = delegate::UnPublishDelegatePtr
- using UnSubscribeDelegatePtr = delegate::UnSubscribeDelegatePtr

Public Member Functions

- void move (cbe::ContainerId dstId, MoveDelegatePtr delegate)

  Relocates an object to a different container.
- void rename (const std::string &name, RenameDelegatePtr delegate)

  Rename object.
- void remove (RemoveDelegatePtr delegate)

  Remove the object from cloud and locally.
- void download (const std::string &path, DownloadDelegatePtr delegate)

  Download the data of current object to the the local file system.
- void download (std::size_t &&sizeLimit, DownloadBinaryDelegatePtr delegate)

  Download the binary data associated with current object.
- void downloadStream (const std::string &path, cbe::Stream stream, DownloadDelegatePtr delegate)
- void uploadStream (const std::string &filePath, cbe::StreamId streamId, UploadDelegatePtr delegate)

  Upload a file for adding a new or replacing existing stream attached to this object.
- void updateKeyValues (KeyValues keyValues, UpdateKeyValuesDelegatePtr delegate)

  Adds key/value pair data to the object.
- void updateKeyValues (UpdateKeyValuesDelegatePtr delegate)

  Deletes all key/value pairs of data to the object.
- void getStreams (GetStreamsDelegatePtr delegate)

  Downloads the streams meta data associated with current object to the SDK's cache.
- std::string getMimeType () const

  Returns the mime type of the object.
- uint64_t length () const

  Returns the binary length/size in bytes of current object.
- cbe::object_t getObjectType () const

  Returns the Object type.
- cbe::KeyValues keyValues ()

  Returns all the key/values for current object as a map.
- void getAcl (GetAclDelegatePtr delegate)

  Returns the Access Control List for current Object.
- void setAcl (cbe::AclMap aclMap, SetAclDelegatePtr delegate)

  Sets the Access Control List for current object.
- void share (cbe::UserId toUserGroup, std::string description, ShareDelegatePtr delegate)

  Share current object to a user.
- void unShare (cbe::ShareId shareId, UnShareDelegatePtr delegate)

  Unshare the object to a specific shareId created when sharing.

- void publish (cbe::PublishAccess security, cbe::PublishVisibility privacy, std::string description, std::string password, PublishDelegatePtr delegate)

  Publishes current object to any user.
- void unPublish (UnPublishDelegatePtr delegate)

  UnPublishes current object.
- void unSubscribe (UnSubscribeDelegatePtr delegate)

  UnSubscribes from this object.
- std::string url ()

  URL to current object.
- **Object** (cbe::DefaultCtor)

Friends

- class **CloudBackend**
- class **Container**

Additional Inherited Members

12.99.1 Detailed Description

Holder of a set of data, can represent a table row.

Note

The object name may not contain characters < & : /
Any key name must start with a letter or _
The following key names are reserved and should not be used: category, content, id, link and date
Key names are case sensitive, hence variations with uppercase are permitted.

12.99.2 Member Typedef Documentation

12.99.2.1 DownloadBinaryDelegatePtr

```
using cbe::Object::DownloadBinaryDelegatePtr = delegate::DownloadBinaryDelegatePtr
```

Pointer to cbe::delegate::DownloadBinaryDelegate that is passed into asynchronous version of method download()

12.99.2.2 DownloadDelegatePtr

```
using cbe::Object::DownloadDelegatePtr = delegate::DownloadDelegatePtr
```

Pointer to cbe::delegate::DownloadDelegate that is passed into asynchronous version of methods:

- download(const std::string&,DownloadDelegatePtr)
- downloadStream(const std::string&,cbe::Stream,DownloadDelegatePtr)

12.99.2.3 GetAclDelegatePtr

```
using cbe::Object::GetAclDelegatePtr = delegate::AclDelegatePtr
```

Pointer to cbe::delegate::AclDelegate that is passed into asynchronous version of method getAcl()

12.99.2.4 GetStreamsDelegatePtr

```
using cbe::Object::GetStreamsDelegatePtr = delegate::GetStreamsDelegatePtr
```

Pointer to cbe::delegate::GetStreamsDelegate that is passed into asynchronous version of method getStream()

12.99.2.5 MoveDelegatePtr

```
using cbe::Object::MoveDelegatePtr = delegate::object::MoveDelegatePtr
```

Pointer to cbe::delegate::object::MoveDelegate that is passed into asynchronous version of method move()

12.99.2.6 PublishDelegatePtr

```
using cbe::Object::PublishDelegatePtr = delegate::PublishDelegatePtr
```

Pointer to cbe::delegate::PublishDelegate that is passed into asynchronous version of method publish()

12.99.2.7 RemoveDelegatePtr

```
using cbe::Object::RemoveDelegatePtr = delegate::object::RemoveDelegatePtr
```

Pointer to cbe::delegate::object::RenameDelegate that is passed into asynchronous version of method remove()

12.99.2.8 RenameDelegatePtr

```
using cbe::Object::RenameDelegatePtr = delegate::object::RenameDelegatePtr
```

Pointer to cbe::delegate::object::RenameDelegate that is passed into asynchronous version of method rename()

12.99.2.9 SetAclDelegatePtr

```
using cbe::Object::SetAclDelegatePtr = delegate::AclDelegatePtr
```

Pointer to cbe::delegate::AclDelegate that is passed into asynchronous version of method setAcl()

12.99.2.10 ShareDelegatePtr

```
using cbe::Object::ShareDelegatePtr = delegate::ShareDelegatePtr
```

Pointer to cbe::delegate::ShareDelegate that is passed into asynchronous version of method share()

12.99.2.11 Streams

```
using cbe::Object::Streams = cbe::Streams
```

Collection of Stream objects.
See cbe::Streams

12.99.2.12 UnPublishDelegatePtr

```
using cbe::Object::UnPublishDelegatePtr = delegate::UnPublishDelegatePtr
```

Pointer to cbe::delegate::UnPublishDelegate that is passed into asynchronous version of method unPublish()

12.99.2.13 UnShareDelegatePtr

```
using cbe::Object::UnShareDelegatePtr = delegate::UnShareDelegatePtr
```

Pointer to cbe::delegate::UnShareDelegate that is passed into asynchronous version of method unShare()

12.99.2.14 UnSubscribeDelegatePtr

```
using cbe::Object::UnSubscribeDelegatePtr = delegate::UnSubscribeDelegatePtr
```

Pointer to cbe::delegate::UnSubscribeDelegate that is passed into asynchronous version of method unSubscribe()

12.99.2.15 UpdateKeyValuesDelegatePtr

```
using cbe::Object::UpdateKeyValuesDelegatePtr = delegate::UpdateKeyValuesDelegatePtr
```

Pointer to cbe::delegate::UpdateKeyValuesDelegate that is passed into asynchronous version of method update↩
KeyValues()

12.99.2.16 UploadDelegatePtr

```
using cbe::Object::UploadDelegatePtr = delegate::UploadDelegatePtr
```

Pointer to cbe::delegate::UploadDelegate that is passed into asynchronous version of method uploadStream()

12.99.3 Member Function Documentation

12.99.3.1 download() [1/2]

```
void cbe::Object::download (
            const std::string & path,
            DownloadDelegatePtr delegate )
```

Download the data of current object to the the local file system.
Asynchronous version of this service function.
The data will be contained in file, named after the name of current object (method name()), to the location given by parameter `path`.

Parameters

path	Folder location, on the local file system, of the file to be downloaded. This string must end with a slash ("/").
delegate	Pointer to a delegate::DownloadDelegate instance that is implemented by the user.

12.99.3.2 download() [2/2]

```
void cbe::Object::download (
            std::size_t && sizeLimit,
            DownloadBinaryDelegatePtr delegate )
```

Download the binary data associated with current object.
Asynchronous version of this service function.
The data, delivered as a BLOB (Binary Large OBject), via parameter `data` in the the callback method cbe::delegate::DownloadBinaryDelegate::onDownloadBinarySuccess().

Parameters

delegate	Pointer to a delegate::DownloadBinaryDelegate instance that is implemented by the user.
sizeLimit	Blocks anything larger than the size limit the user inputs. Prevents accidental downloads of too large objects on to the device.

12.99.3.3 downloadStream()

```
void cbe::Object::downloadStream (
            const std::string & path,
            cbe::Stream stream,
            DownloadDelegatePtr delegate )
```

Download a stream of an Object to local filesystem.
Asynchronous version of this service function.

Parameters

path	Folder location, on the local file system, of the file to be downloaded. This string must end with a slash ("/").

Parameters

stream	Get which stream you want by first calling getStream() and then choose which one to download.
delegate	Pointer to a delegate::DownloadDelegate instance that is implemented by the user.

Example

Async downloading the data attached to a cbe::Object via a Stream with **Object::downloadStream()**
Continuation of: Async uploading data to a cbe::Object via a Stream with Object::uploadStream()

```
~~~
#include "cbe/delegate/DownloadDelegate.h"
~~~
struct MyDownloadDelegate : cbe::delegate::DownloadDelegate {
  std::mutex              mutex{};
  std::condition_variable conditionVariable{};
  bool                    called{};
  Success success{};
  void onDownloadSuccess(cbe::Object&& object,
                         std::string   path) final {
    {
      std::lock_guard<std::mutex> lock{mutex};
      success = Success{std::move(object), std::move(path)};
      called = true;
    }
    conditionVariable.notify_one();
  }
  void onDownloadError(cbe::delegate::TransferError&& transferError,
                       cbe::util::Context&&           context) final {
    {
      std::lock_guard<std::mutex> lock{mutex};
      success = Success{};
      called = true;
    }
    conditionVariable.notify_one();
  }
  cbe::Object waitForRsp() {
    std::unique_lock<std::mutex> lock{mutex};
    conditionVariable.wait(lock, [this]{ return called; } );
    // Reset called flag, so current delegate instance can be reused
    called = false;
    // If object is still default constructed, this implies a failed
    // cbe::Object::downloadStream() operation
    return success.object;
  }
}; // struct MyDownloadDelegate
~~~
std::shared_ptr<MyDownloadDelegate> myDownloadDelegate =
                            std::make_shared<MyDownloadDelegate>();
constexpr const char* const downloadPath = "/tmp/download/";
for (const auto& stream : streams2) {
  const auto path =  std::string{downloadPath} +
                      std::to_string(stream.streamId);
  object.downloadStream(path, stream, myDownloadDelegate);
  if (!myDownloadDelegate->waitForRsp()) {
    // Failure, bail out
    ~~~
  }
}
```

12.99.3.4 getAcl()

```
void cbe::Object::getAcl (
            GetAclDelegatePtr delegate )
```

Returns the Access Control List for current Object.
Asynchronous version of this service function.

Parameters

delegate	Pointer to a delegate::AclDelegate instance that is implemented by the user.

12.99.3.5 getMimeType()

```
std::string cbe::Object::getMimeType ( ) const
```

Returns the mime type of the object.
E.g., application/pdf, audio/wav, image/jpg, text/xml, video/mp4 etc.

12.99.3.6 getObjectType()

```
cbe::object_t cbe::Object::getObjectType ( ) const
```

Returns the Object type.
See cbe::ObjectType.

12.99.3.7 getStreams()

```
void cbe::Object::getStreams (
            GetStreamsDelegatePtr delegate )
```

Downloads the streams meta data associated with current object to the SDK's cache.
Asynchronous version of this service function.
The meta data i delivered as cbe::Streams via the delegate callback method cbe::delegate::GetStreamsDelegate::onGetStreamsSucce
Further, the actual stream data are retrieved through method downloadStream(const std::string&,cbe::Stream,DownloadDelegatePtr).

Note

This method must be re-called if you upload more streams, see `uploadStream()`

Parameters

delegate	Pointer to a delegate::GetStreamsDelegate instance that is implemented by the user.

Example

Async retrieving the Streams attached to a cbe::Object with the **Object::getStreams()**
Continuation of: Async creation of a cbe::Object by using Container::upload()

```
~~~
#include "cbe/delegate/GetStreamsDelegate.h"
#include "cbe/util/Optional.h"
~~~
struct MyGetStreamsDelegate : cbe::delegate::GetStreamsDelegate {
  std::mutex              mutex{};
  std::condition_variable conditionVariable{};
  bool                    called{};
  // Represents the result stream meta data as a cbe::Optional. Where an empty
  // Optional implies an error
  cbe::util::Optional<cbe::Streams> streams{};
  void onGetStreamsSuccess(cbe::Streams&& streams) final {
    {
      std::lock_guard<std::mutex> lock{mutex};
      this->streams = std::move(streams);
      called = true;
    }
    conditionVariable.notify_one();
  }
  void onGetStreamsError(cbe::delegate::Error&& error,
                         cbe::util::Context&&   context) final {
    {
      std::lock_guard<std::mutex> lock{mutex};
      object = cbe::Object{ cbe::DefaultCtor{} };
      called = true;
    }
    conditionVariable.notify_one();
  }
  cbe::util::Optional<cbe::Streams>  waitForRsp() {
    std::unique_lock<std::mutex> lock{mutex};
    conditionVariable.wait(lock, [this]{ return called; } );
    // Reset called flag, so current delegate instance can be reused
    called = false;
    // If streams  is still default constructed, this implies a failed
    // cbe::Object::getStreams() operation
```

```
    return std::move(streams);
  }
}; // struct MyGetStreamsDelegate
~~~
std::shared_ptr<MyGetStreamsDelegate> getStreamsDelegate =
                                    std::make_shared<MyGetStreamsDelegate>();
object.getStreams(getStreamsDelegate);
// Simply make use of the Optional bool type conversion operator on the return
// value from the waitForRsp() method to determine the outcome of the
// getStreams() invocation above
cbe::util::Optional<cbe::Streams> streamsOpt1 =
                                    getStreamsDelegate->waitForRsp();
if (!streamsOpt1) {
  // Failure, bail out
  ~~~
}
// Now, streamsOpt1 contains the streams meta data, so move it to variable
// streams1
const cbe::Object::Streams streams1 = std::move(*streamsOpt1);
~~~
```

Continues at: Async uploading data to a cbe::Object via a Stream with Object::uploadStream()

12.99.3.8 move()

```
void cbe::Object::move (
            cbe::ContainerId dstId,
            MoveDelegatePtr delegate )
```

Relocates an object to a different container.
Asynchronous version of this service function.

Parameters

dstId	Id of the destination container.
delegate	Pointer to a delegate::object::MoveDelegate instance that is implemented by the user.

12.99.3.9 publish()

```
void cbe::Object::publish (
            cbe::PublishAccess security,
            cbe::PublishVisibility privacy,
            std::string description,
            std::string password,
            PublishDelegatePtr delegate )
```

Publishes current object to any user.
Asynchronous version of this service function.
Can be revoked with unPublish()

Parameters

security	A cbe::PublishAccess enum
privacy	A cbe::WebShareVisibility enum
description	Free text
password	Password
delegate	Pointer to a delegate::PublishDelegate instance that is implemented by the user.

12.99.3.10 remove()

```
void cbe::Object::remove (
```

```
            RemoveDelegatePtr delegate )
```

Remove the object from cloud and locally.
Asynchronous version of this service function.

Parameters

delegate	Pointer to a delegate::object::RemoveDelegate instance that is implemented by the user.

12.99.3.11 rename()

```
void cbe::Object::rename (
            const std::string & name,
            RenameDelegatePtr delegate )
```

Rename object.
Asynchronous version of this service function.

Parameters

name	string name of the object.
delegate	Pointer to a delegate::object::RenameDelegate instance that is implemented by the user.

12.99.3.12 setAcl()

```
void cbe::Object::setAcl (
            cbe::AclMap aclMap,
            SetAclDelegatePtr delegate )
```

Sets the Access Control List for current object.
Asynchronous version of this service function.

Parameters

aclMap	The desired permission for current object.
delegate	Pointer to a delegate::AclDelegate instance that is implemented by the user.

12.99.3.13 share()

```
void cbe::Object::share (
            cbe::UserId toUserGroup,
            std::string description,
            ShareDelegatePtr delegate )
```

Share current object to a user.
Asynchronous version of this service function.
Notifies the user that a share has ocurred so that the user can check what permissions the have been given. Sharing gives read permissions as of right now but might change in the future.

Parameters

toUserGroup	Takes a user id or group id (lastly named is for the future) and share to.
description	Names the specific share between you and the user/group.
delegate	Pointer to a delegate::ShareDelegatePtr instance that is implemented by the user.

12.99.3.14 unPublish()

```
void cbe::Object::unPublish (
            UnPublishDelegatePtr delegate )
```

UnPublishes current object.
Asynchronous version of this service function.
Revokes previous publish().

Parameters

delegate	Pointer to a delegate::UnPublishDelegate instance that is implemented by the user.

12.99.3.15 unShare()

```
void cbe::Object::unShare (
            cbe::ShareId shareId,
            UnShareDelegatePtr delegate )
```

Unshare the object to a specific shareId created when sharing.
Asynchronous version of this service function.
Each share is unique between user/group and the one sharing. This is represented with a unique share id.

Parameters

shareId	The unique id for a share between the owner and other user/group.
delegate	Pointer to a delegate::UnShareDelegate instance that is implemented by the user.

12.99.3.16 unSubscribe()

```
void cbe::Object::unSubscribe (
            UnSubscribeDelegatePtr delegate )
```

UnSubscribes from this object.
Asynchronous version of this service function.
Revokes the subscription previously established with cbe::SubscribeManager::subscribe()

Parameters

delegate	Pointer to a delegate::UnSubscribeDelegate instance that is implemented by the user.

12.99.3.17 updateKeyValues() [1/2]

```
void cbe::Object::updateKeyValues (
            KeyValues keyValues,
            UpdateKeyValuesDelegatePtr delegate )
```

Adds key/value pair data to the object.
Asynchronous version of this service function.

Note

All existing key will be overwritten, new created.
Any key name must start with a letter or _
The following key names are reserved and should not be used: category, content, id, link and date
Key names are case sensitive, hence variations with uppercase are permitted.

Parameters

keyValues	Map of key/value pairs (metadata).
delegate	Pointer to a delegate::UpdateKeyValuesDelegate instance that is implemented by the user.

12.99.3.18 updateKeyValues() [2/2]

```
void cbe::Object::updateKeyValues (
            UpdateKeyValuesDelegatePtr delegate )
```

Deletes all key/value pairs of data to the object.
Same as updateKeyValues(KeyValues,UpdateKeyValuesDelegatePtr), but without the `keyValues` parameter.

Note

Any and all existing key/values will be erased.

12.99.3.19 uploadStream()

```
void cbe::Object::uploadStream (
            const std::string & filePath,
            cbe::StreamId streamId,
            UploadDelegatePtr delegate )
```

Upload a file for adding a new or replacing existing stream attached to this object.
Asynchronous version of this service function.
Requires that method getStreams(GetStreamsDelegatePtr) is called to identify all streams associated with current object.

Parameters

filePath	Fully qualified file name. I.e., the path, relative or absolute, including file name.
streamId	If the stream id already exists, it will be overwritten.
delegate	Pointer to a delegate::UploadDelegate instance that is implemented by the user.

Example

Async uploading data to a cbe::Object via a Stream with **Object::uploadStream()**
Continuation of: Async retrieving the Streams attached to a cbe::Object with the Object::getStreams()

```
~~~
#include "cbe/delegate/UploadDelegate.h"
~~~
#include <algorithm>  // std::max_element
#include <vector>     // std::cbegin, std::cend
~~~
struct MyUploadDelegate : cbe::delegate::UploadDelegate {
  std::mutex              mutex{};
  std::condition_variable conditionVariable{};
  bool                    called{};
  // Default construct, further see comment for object member in
  // MyUploadDelegate above
  cbe::Object object{ cbe::DefaultCtor{} };
```

```
  void onUploadSuccess(cbe::Object&& object) final {
    {
      std::lock_guard<std::mutex> lock{mutex};
      this->object = std::move(object);
      called = true;
    }
    conditionVariable.notify_one();
  }
  void onUploadError(cbe::delegate::TransferError&& transferError,
                     cbe::util::Context&&           context) final {
    {
      std::lock_guard<std::mutex> lock{mutex};
      object = cbe::Object{ cbe::DefaultCtor{} };
      called = true;
    }
    conditionVariable.notify_one();
  }
  cbe::Object waitForRsp() {
    std::unique_lock<std::mutex> lock{mutex};
    conditionVariable.wait(lock, [this]{ return called; } );
    // Reset called flag, so current delegate instance can be reused
    called = false;
    // If object is still default constructed, this implies a failed
    // cbe::Object::uploadStream() operation
    return object;
  }
}; // struct MyUploadDelegate
~~~
constexpr const char* const myFile2Name = "myStream2";
const std::string           qualFile2Name = std::string{uploadPath} + myFile2Name;

std::ofstream ofs2{qualFile2Name};
ofs2 « "Line 21\n"  « "Line 22\n" « "Line 23\n" « "Line 24\n"
     « std::flush;
ofs2.close();
const auto nextStreamId =
            std::max_element(std::cbegin(streams1), std::cend(streams1),
                             [](const cbe::Stream& stream1,
                                const cbe::Stream& stream2) {
                               return stream1.streamId < stream2.streamId;
                             })->streamId + 1;
std::shared_ptr<MyUploadDelegate> myUploadDelegate =
                                  std::make_shared<MyUploadDelegate>();
object.uploadStream(qualFile2Name, nextStreamId, myUploadDelegate);
// Use of the bool type conversion operator to detect success or failure
// as above
if (!myUploadDelegate->waitForRsp()) {
  // Failure, bail out
  ~~~
}
object.getStreams(getStreamsDelegate);
auto streamsOpt2 = getStreamsDelegate->waitForRsp();
if (!streamsOpt2) {
  // Failure, bail out
  ~~~
}
const auto streams2 = std::move(*streamsOpt2);
~~~
```

Continues at: Async downloading the data attached to a cbe::Object via a Stream with Object::downloadStream()

The documentation for this class was generated from the following file:

- include/cbe/Object.h

12.100 cbe::util::Optional< T > Class Template Reference

Class template Optional manages an optional contained value - i.e., a value that is either present or absent.
`#include <Optional.h>`

Classes

- class BadAccess

  Thrown by value() method when accessing an object that does not contain a value.

Public Member Functions

- Optional ()=default

Creates an empty Optional, i.e., no value present.

- Optional (const T &value)

  Copy value ctor.
- Optional (T &&value) noexcept(std::is_nothrow_move_constructible< T >::value)

  Move value ctor.
- Optional (const Optional &rh)

  Copy ctor.
- Optional (Optional &&rh) noexcept(std::is_nothrow_move_constructible< T >::value)

  Move ctor.
- Optional & operator= (const Optional &rh)

  Copy assignment operator.
- Optional & operator= (Optional &&rh) noexcept

  Move assignment operator.
- T & value ()

  Value access non-const method.
- T & **operator*** ()
- T * **operator->** ()
- const T & value () const

  Value access const method.
- const T & **operator*** () const
- const T * **operator->** () const
- bool hasValue () const noexcept

  Checks whether a value is present.
- operator bool () const noexcept

  Checks whether a value is present.
- void reset ()

  Invalidates possible contained value. The contained value will be destructed.
- void swap (Optional &other) noexcept

  Swaps the contents with those of other.
- template<typename... ArgTs>
  void emplace (ArgTs &&... args)

  Constructs the contained value in-place. If `*this` already contains a value before the call, the contained value is destroyed by calling its destructor.

12.100.1 Detailed Description

template<typename T>
class cbe::util::Optional< T >

Class template Optional manages an optional contained value - i.e., a value that is either present or absent.

Template Parameters

T	Type of the contained value

12.100.2 Member Function Documentation

12.100.2.1 operator bool()

```
template<typename T >
cbe::util::Optional< T >::operator bool ( ) const  [inline], [explicit], [noexcept]
```

Checks whether a value is present.

```
cbe::util::Optional<int> inquireInt(const char* prompt) {
  while (true) {
    std::cout « prompt « ": ";
    std::string answer;
    std::cin » answer;
    try {
      return std::stoi(answer); // I.e., return cbe::util::Optional<int>{std::stoi(answer)}
    }
    catch (...) {
      // Invalid input
      return {}; // I.e., return cbe::util::Optional<int>{};
    }
  }
}
~~~
auto n = inquireInt("Please, give an integer value");
if (n) {
  std::cout « "Thanks for the number" « *n « "!\n";
} else {
  std::cout « "Not a number!\n";
}
~~~
```

The documentation for this class was generated from the following file:

- include/cbe/util/Optional.h

12.101 cbe::Publish Class Reference

Managing a `published` Item.

`#include <Publish.h>`

Public Member Functions

- void setTitle (const std::string &title)

  Set the Title of this publication.
- void setSecurity (cbe::PublishAccess security)

  Set the Security of this publication.
- void setPrivacy (cbe::PublishVisibility privacy)

  Set the Privacy of this publication.
- void setPassword (const std::string &password)

  Set the Password of this publication.
- void setDescription (const std::string &description)

  Set the Description of this publication.
- std::string getTitle () const
- cbe::PublishAccess getSecurity () const
- cbe::PublishVisibility getPrivacy () const
- std::string getPassword () const
- std::string getDescription () const
- cbe::PublishId getPublishId () const
- Publish (cbe::DefaultCtor)

  Default constructor.
- operator bool () const

  Checks if the current instance is real.

Friends

- class **CloudBackend**
- class **Item**

12.101.1 Detailed Description

Managing a `published` Item.

12.101.2 Constructor & Destructor Documentation

12.101.2.1 Publish()

```
cbe::Publish::Publish (
            cbe::DefaultCtor  )
```

Default constructor.
Construct a new object with the `DefaultCtor` to enable the operator bool() test

12.101.3 Member Function Documentation

12.101.3.1 getDescription()

```
std::string cbe::Publish::getDescription ( ) const
```

Gets the description

12.101.3.2 getPassword()

```
std::string cbe::Publish::getPassword ( ) const
```

Checks if a password has been set.

Returns

"true" : if a password has been set

"" : empty string if not.

12.101.3.3 getPrivacy()

```
cbe::PublishVisibility cbe::Publish::getPrivacy ( ) const
```

Gets the privacy setting, see cbe::PublishVisibility enum

12.101.3.4 getPublishId()

```
cbe::PublishId cbe::Publish::getPublishId ( ) const
```

Gets the publish id number

12.101.3.5 getSecurity()

```
cbe::PublishAccess cbe::Publish::getSecurity ( ) const
```

Gets the security setting, see cbe::PublishAccess enum

12.101.3.6 getTitle()

```
std::string cbe::Publish::getTitle ( ) const
```

Gets the title

12.101.3.7 operator bool()

```
cbe::Publish::operator bool ( ) const  [explicit]
```

Checks if the current instance is real.
An "unreal" instance implies typically a failed event.
Relies on the `Default constructor` Publish(cbe::DefaultCtor)

Returns

`true` : is real

`false` : unreal; got nullptr; if current instance is unbound/undefined. I.e., if it is only default constructed.

12.101.3.8 setDescription()

```
void cbe::Publish::setDescription (
            const std::string & description )
```

Set the Description of this publication.

Parameters

description	free text

12.101.3.9 setPassword()

```
void cbe::Publish::setPassword (
            const std::string & password )
```

Set the Password of this publication.

Parameters

password	text

12.101.3.10 setPrivacy()

```
void cbe::Publish::setPrivacy (
            cbe::PublishVisibility privacy )
```

Set the Privacy of this publication.

Parameters

privacy	of type cbe::PublishVisibility enum

12.101.3.11 setSecurity()

```
void cbe::Publish::setSecurity (
            cbe::PublishAccess security )
```

Set the Security of this publication.

Parameters

security	of type cbe::PublishAccess enum

12.101.3.12 setTitle()

```
void cbe::Publish::setTitle (
```

```
            const std::string & title )
```

Set the Title of this publication.

Parameters

title	name

The documentation for this class was generated from the following file:

- include/cbe/Publish.h

12.102 cbe::delegate::PublishDelegate Class Reference

`#include <PublishDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Success** = PublishSuccess
- using **Error** = delegate::Error

Public Member Functions

- virtual void onPublishSuccess (cbe::Items &&items)=0
- virtual void onPublishError (Error &&error, cbe::util::Context &&context)=0

12.102.1 Detailed Description

Delegate class for the asynchronous version of methods:

- cbe::Container::publish
- cbe::Object::publish

12.102.2 Member Function Documentation

12.102.2.1 onPublishError()

```
virtual void cbe::delegate::PublishDelegate::onPublishError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.102.2.2 onPublishSuccess()

```
virtual void cbe::delegate::PublishDelegate::onPublishSuccess (
            cbe::Items && items )  [pure virtual]
```

Called upon successful publish.

Parameters

items	Instance of items that are being published.

The documentation for this class was generated from the following file:

- include/cbe/delegate/PublishDelegate.h

12.103 cbe::PublishManager Class Reference

Managing the list of web shares.
`#include <PublishManager.h>`

Public Member Functions

- cbe::Items getPublished () const

  Lists publications that are shared with other userids.
- PublishManager (cbe::DefaultCtor)

  Default constructor.
- operator bool () const

  Checks if the current instance is real.

Friends

- class **CloudBackend**

12.103.1 Detailed Description

Managing the list of web shares.

12.103.2 Constructor & Destructor Documentation

12.103.2.1 PublishManager()

```
cbe::PublishManager::PublishManager (
            cbe::DefaultCtor  )
```

Default constructor.
Construct a new object with the `DefaultCtor` to enable the operator bool() test

12.103.3 Member Function Documentation

12.103.3.1 getPublished()

```
cbe::Items cbe::PublishManager::getPublished ( ) const
```

Lists publications that are shared with other userids.
Listing is done independently of where in the actual container/subcontainer tree the items are located.
(Publications are also known as web shares.)

Returns

The publications in terms of items.

12.103.3.2 operator bool()

`cbe::PublishManager::operator bool ( ) const [explicit]`
Checks if the current instance is real.
An "unreal" instance implies typically a failed event.
Relies on the `Default constructor` PublishManager(cbe::DefaultCtor)

Returns

`true` : is real

`false` : unreal; got nullptr; if current instance is unbound/undefined. I.e., if it is only default constructed.

The documentation for this class was generated from the following file:

- include/cbe/PublishManager.h

12.104 cbe::delegate::PublishSuccess Class Reference

Convenience type that bundles the parameter passed to method cbe::delegate::ShareDelegate::onShareSuccess.
`#include <PublishSuccess.h>`

Public Member Functions

- **PublishSuccess** (cbe::DefaultCtor)
- **PublishSuccess** (cbe::Items &&items)
- operator bool () const

  Checks if current instance is valid.

Public Attributes

- cbe::Items **items** {}

12.104.1 Detailed Description

Convenience type that bundles the parameter passed to method cbe::delegate::ShareDelegate::onShareSuccess.

12.104.2 Member Function Documentation

12.104.2.1 operator bool()

`cbe::delegate::PublishSuccess::operator bool ( ) const [explicit]`
Checks if current instance is valid.

Returns

`true`: is valid

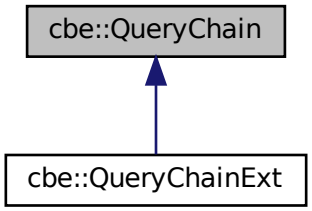
The documentation for this class was generated from the following file:

- include/cbe/delegate/PublishSuccess.h

12.105 cbe::QueryChain Class Reference

To do a search for Object combining more than one Container table.
`#include <QueryChain.h>`

Inheritance diagram for cbe::QueryChain:



Classes

- struct Exception

Public Types

- using **JoinDelegatePtr** = delegate::JoinDelegatePtr

Public Member Functions

- QueryChain join (Container containerToQuery, std::string key1, std::string key2, JoinDelegatePtr joinDelegate)
- QueryChain join (Container containerToQuery, std::string key1, std::string key2, Filter constraints, JoinDelegatePtr joinDelegate)
- QueryChain join (Container containerToQuery, std::string key1, std::string key2, Container containerForResults, JoinDelegatePtr joinDelegate)
- QueryChain join (Container containerToQuery, std::string key1, std::string key2, Filter constraints, Container containerForResults, JoinDelegatePtr joinDelegate)
- QueryResult getQueryResult () const
- **QueryChain** (cbe::DefaultCtor)
- **operator bool** () const

Friends

- class **CloudBackend**
- class **Container**
- class **QueryChainSync**

12.105.1 Detailed Description

To do a search for Object combining more than one Container table.
[Async] QueryChain is used when a query() is carried out with a solely QueryDelegate.
Anyway, if a subsequent join() will be used, an additional JoinDelegate is required in the join()-call.

12.105.2 Member Function Documentation

12.105.2.1 getQueryResult()

```
QueryResult cbe::QueryChain::getQueryResult ( ) const
```

Returns the QueryResult provided to the delegate after the the last query() or join() call. If this method is called before the delegate call, an empty QueryResult is returned.

12.105.2.2 join() [1/4]

```
QueryChain cbe::QueryChain::join (
            Container containerToQuery,
            std::string key1,
            std::string key2,
            Container containerForResults,
            JoinDelegatePtr joinDelegate )
```

Same as join(Container,std::string,std::string,delegate::JoinDelegatePtr), but with an additional Container parameter `containerForResults`.

Parameters

containerForResults	Can be the Container from the previous query if desired items should be from that container.

12.105.2.3 join() [2/4]

```
QueryChain cbe::QueryChain::join (
            Container containerToQuery,
            std::string key1,
            std::string key2,
            Filter constraints,
            Container containerForResults,
            JoinDelegatePtr joinDelegate )
```

Same as join(Container,std::string,std::string,Container,delegate::JoinDelegatePtr), but with an additional Filter parameter `constraints`.

Parameters

constraints	A filter that provides any constraints for the query.

12.105.2.4 join() [3/4]

```
QueryChain cbe::QueryChain::join (
            Container containerToQuery,
            std::string key1,
            std::string key2,
            Filter constraints,
            JoinDelegatePtr joinDelegate )
```

Same as join(Container,std::string,std::string,delegate::JoinDelegatePtr), but with an additional Filter parameter `constraints`.

Parameters

constraints	A filter that provides any constraints for the query.

12.105.2.5 join() [4/4]

```
QueryChain cbe::QueryChain::join (
            Container containerToQuery,
            std::string key1,
            std::string key2,
            JoinDelegatePtr joinDelegate )
```

Performs a join request in conjunction with a query, or previous join, to get related items from another container.
Asynchronous version of this service function.

Parameters

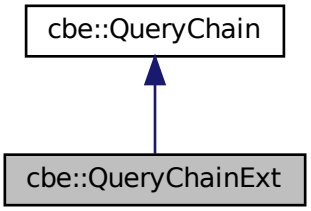
containerToQuery	The container of which the join shall be done with.
key1	The key from the previous query on which to perform the join.
key2	The key on objects in `containerToQuery` on which to perform the join
joinDelegate	Pointer to a JoinDelegate instance, implemented by the user, that receives the response of this query request. I.e., either of the JoinDelegate callback functions onJoinSuccess() or onJoinError() will be called.

The documentation for this class was generated from the following file:

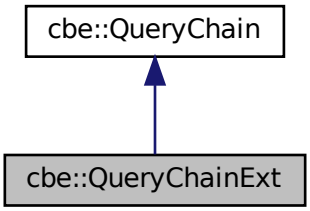
- include/cbe/QueryChain.h

12.106 cbe::QueryChainExt Class Reference

Extension of class QueryChain.
`#include <QueryChain.h>`
Inheritance diagram for cbe::QueryChainExt:



Collaboration diagram for cbe::QueryChainExt:



Public Member Functions

- QueryChainExt join (Container containerToQuery, std::string key1, std::string key2)
- QueryChainExt join (Container containerToQuery, std::string key1, std::string key2, Filter constraints)
- QueryChainExt join (Container containerToQuery, std::string key1, std::string key2, Container containerFor↩ Results)
- QueryChainExt join (Container containerToQuery, std::string key1, std::string key2, Filter constraints, Container containerForResults)
- QueryChain join (Container containerToQuery, std::string key1, std::string key2, JoinDelegatePtr join↩ Delegate)
- QueryChain join (Container containerToQuery, std::string key1, std::string key2, Filter constraints, Join↩ DelegatePtr joinDelegate)
- QueryChain join (Container containerToQuery, std::string key1, std::string key2, Container containerFor↩ Results, JoinDelegatePtr joinDelegate)
- QueryChain join (Container containerToQuery, std::string key1, std::string key2, Filter constraints, Container containerForResults, JoinDelegatePtr joinDelegate)

Friends

- class **CloudBackend**
- class **Container**

Additional Inherited Members

12.106.1 Detailed Description

Extension of class QueryChain.
[Async] QueryChainExt is used when the query is carried out with subsequent intended join in mind.
I.e., we have passed a QueryJoinDelegate to the previous call and that will then be reused in the trailing join()-call.
It is an extension of class QueryChain offering join() methods that do not require a new delegate.
Instead, these will use the delegate passed as argument in the previous invocation in the call chain — i.e.:

- CloudBackend::query(ContainerId,delegate::QueryJoinDelegatePtr) and overloads.
- Container::query(delegate::QueryJoinDelegatePtr) and overloads.
- QueryChain::join(Container,std::string,std::string,JoinDelegatePtr) and overloads.

12.106.2 Member Function Documentation

12.106.2.1 join() [1/8]

```
QueryChainExt cbe::QueryChainExt::join (
            Container containerToQuery,
            std::string key1,
            std::string key2 )
```

Performs a join request in line with function join() in class QueryChain.
If a call to this join function is chained with a previous call to a query, only such a query functions accepting a QueryJoinDelegate can be used as:

- CloudBackend::query(ContainerId,delegate::QueryJoinDelegatePtr)
- CloudBackend::query(ContainerId,Filter,delegate::QueryJoinDelegatePtr)
- Container::query(delegate::QueryJoinDelegatePtr)
- Container::query(Filter,delegate::QueryJoinDelegatePtr)

Asynchronous version of this service function.

See also

QueryChain::join(Container,std::string,std::string,delegate::JoinDelegatePtr)

12.106.2.2 join() [2/8]

```
QueryChainExt cbe::QueryChainExt::join (
            Container containerToQuery,
            std::string key1,
            std::string key2,
            Container containerForResults )
```

See also

QueryChain::join(Container,std::string,std::string,Container,delegate::JoinDelegatePtr)

12.106.2.3 join() [3/8]

```
QueryChain cbe::QueryChain::join
```

Same as join(Container,std::string,std::string,delegate::JoinDelegatePtr), but with an additional Container parameter `containerForResults`.

Parameters

containerForResults	Can be the Container from the previous query if desired items should be from that container.

12.106.2.4 join() [4/8]

```
QueryChainExt cbe::QueryChainExt::join (
            Container containerToQuery,
            std::string key1,
            std::string key2,
            Filter constraints )
```

See also

QueryChain::join(Container,std::string,std::string,Filter,delegate::JoinDelegatePtr)

12.106.2.5 join() [5/8]

```
QueryChainExt cbe::QueryChainExt::join (
            Container containerToQuery,
            std::string key1,
            std::string key2,
            Filter constraints,
            Container containerForResults )
```

See also

QueryChain::join(Container,std::string,std::string,Filter,Container,delegate::JoinDelegatePtr)

12.106.2.6 join() [6/8]

QueryChain cbe::QueryChain::join

Same as join(Container,std::string,std::string,Container,delegate::JoinDelegatePtr), but with an additional Filter parameter `constraints`.

Parameters

constraints	A filter that provides any constraints for the query.

12.106.2.7 join() [7/8]

QueryChain cbe::QueryChain::join

Same as join(Container,std::string,std::string,delegate::JoinDelegatePtr), but with an additional Filter parameter `constraints`.

Parameters

constraints	A filter that provides any constraints for the query.

12.106.2.8 join() [8/8]

QueryChain cbe::QueryChain::join

Performs a join request in conjunction with a query, or previous join, to get related items from another container. **Asynchronous** version of this service function.

Parameters

containerToQuery	The container of which the join shall be done with.
key1	The key from the previous query on which to perform the join.
key2	The key on objects in `containerToQuery` on which to perform the join
joinDelegate	Pointer to a JoinDelegate instance, implemented by the user, that receives the response of this query request. I.e., either of the JoinDelegate callback functions onJoinSuccess() or onJoinError() will be called.

The documentation for this class was generated from the following file:

- include/cbe/QueryChain.h

12.107 cbe::delegate::QueryDelegate Class Reference

`#include <QueryDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Success** = cbe::QueryResult
- using **Error** = QueryError

Public Member Functions

- virtual void onQuerySuccess (cbe::QueryResult &&queryResult)=0
- virtual void onQueryError (cbe::delegate::QueryError &&error, cbe::util::Context &&context)=0

12.107.1 Detailed Description

Delegate class for the asynchronous version of methods:

- CloudBackend::queryWithPath(), and its overloads
- CloudBackend::query(), and its overloads
- CloudBackend::search(), and its overloads
- Container::queryWithPath()
- Container::query(), and its overloads
- Container::search(), and its overloads

Example

```
#include "cbe/delegate/QueryDelegate.h"
~~~
#include <condition_variable>
#include <mutex>
~~~
class MyQueryDelegate :  public cbe::delegate::QueryDelegate {
  std::mutex              mutex{};
  std::condition_variable conditionVariable{};
  // Indicates operation completed - success or failure
  bool                    called = false;
public:
  cbe::QueryResult  queryResult{cbe::DefaultCtor{}};
  ErrorInfo         errorInfo{};
private:
  // Called upon successful query.
  void onQuerySuccess(cbe::QueryResult&& queryResult) final {
    {
      std::lock_guard<std::mutex> lock{mutex};
      // Change state of queryResult member to indicate success
      this->queryResult = std::move(queryResult);
      // Indicate operation completed, member queryResult indicates success
      called = true;
      // If delegate is reused, clear possibly error state
      errorInfo = ErrorInfo{};
    }
    conditionVariable.notify_one();
  } // onQuerySuccess()
  // Called upon a failed query() or join() call.
  void onQueryError(cbe::delegate::QueryError&& error,
                    cbe::util::Context&&        context) final {
```

```
      {
        std::lock_guard<std::mutex> lock{mutex};
        // Activate errorInfo member to indicate no-success
        errorInfo = ErrorInfo{std::move(context), std::move(error)};
        // Indicate operation completed, member object indicates failure
        called = true;
        // If delegate is reused, clear possibly success state
        queryResult = QueryResult{cbe::DefaultCtor{}};
      }
      conditionVariable.notify_one();
    } // onQueryError()
  public:
    void waitForRsp() {
      std::unique_lock<std::mutex> lock{mutex};
      conditionVariable.wait(lock, [this] { return called; });
      // Reset called flag, so current delegate instance can be reused
      called = false;
    } // waitForRsp()
  }; // class MyQueryDelegate
```

Usage of the class above, see Example of asynchronous query

12.107.2 Member Function Documentation

12.107.2.1 onQueryError()

```
virtual void cbe::delegate::QueryDelegate::onQueryError (
            cbe::delegate::QueryError && error,
            cbe::util::Context && context )  [pure virtual]
```

Called upon a failed query() or join() call.

Parameters

error	Error information passed from CloudBackend SDK.
context	Additional context information about the original service call that has failed.

12.107.2.2 onQuerySuccess()

```
virtual void cbe::delegate::QueryDelegate::onQuerySuccess (
            cbe::QueryResult && queryResult )  [pure virtual]
```

Called upon successful query.

Parameters

queryResult	Instance of a QueryResult containing the result set.

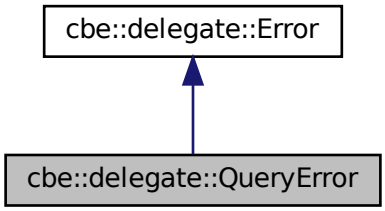
The documentation for this class was generated from the following file:

- include/cbe/delegate/QueryDelegate.h

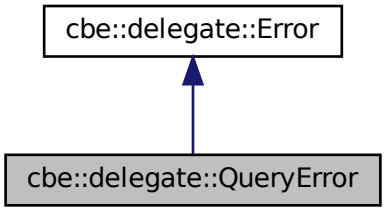
12.108 cbe::delegate::QueryError Class Reference

```
#include <QueryError.h>
```

Inheritance diagram for cbe::delegate::QueryError:



Collaboration diagram for cbe::delegate::QueryError:



Public Member Functions

- **QueryError** (ErrorCode errorCode, std::string &&reason, std::string &&message)
- **QueryError** (Filter &&filter, ErrorCode errorCode, std::string &&reason, std::string &&message)
- bool **hasFilter** () const
- const Filter & **getFilter** () const

Friends

- std::ostream & **operator**<< (std::ostream &os, const QueryError &error)

Additional Inherited Members

12.108.1 Detailed Description

Contains error information delivered from CloudBackend SDK i connection with a failed query, or join
The documentation for this class was generated from the following file:

- include/cbe/delegate/QueryError.h

12.109 cbe::delegate::QueryJoinDelegate Class Reference

`#include <QueryJoinDelegate.h>`

Public Types

- using **Success** = cbe::QueryResult
- using **QueryJoinError** = QueryError
- using **Error** = QueryJoinError
- using ErrorInfo = QueryDelegate::ErrorInfo

Public Member Functions

- virtual void onQueryJoinSuccess (cbe::QueryResult &&queryResult)=0
- virtual void onQueryJoinError (QueryJoinError &&error, cbe::util::Context &&context)=0

12.109.1 Detailed Description

Delegate callback interface for asynchronous methods:

- CloudBackend::query(ContainerId,delegate::QueryJoinDelegatePtr) and overloads.
- Container::query(delegate::QueryJoinDelegatePtr) and overloads.

12.109.2 Member Typedef Documentation

12.109.2.1 ErrorInfo

```
using cbe::delegate::QueryJoinDelegate::ErrorInfo = QueryDelegate::ErrorInfo
```

Contains all information about a failed query.

12.109.3 Member Function Documentation

12.109.3.1 onQueryJoinError()

```
virtual void cbe::delegate::QueryJoinDelegate::onQueryJoinError (
            QueryJoinError && error,
            cbe::util::Context && context ) [pure virtual]
```

Called upon a failed query() or join() call.

Parameters

error	Error information passed from CloudBackend SDK.
context	Additional context information about the original service call that has failed.

12.109.3.2 onQueryJoinSuccess()

```
virtual void cbe::delegate::QueryJoinDelegate::onQueryJoinSuccess (
            cbe::QueryResult && queryResult ) [pure virtual]
```

Called upon successful query.

Parameters

queryResult	Instance of a QueryResult containing the result set.

The documentation for this class was generated from the following file:

- include/cbe/delegate/QueryJoinDelegate.h

12.110 cbe::delegate::QueryLoaded Struct Reference

Public Member Functions

- virtual void onQuerySuccess (cbe::QueryResult &&queryResult)=0

12.110.1 Member Function Documentation

12.110.1.1 onQuerySuccess()

```
virtual void cbe::delegate::QueryLoaded::onQuerySuccess (
            cbe::QueryResult && queryResult ) [pure virtual]
```

Called upon successful query.

Parameters

queryResult	Instance of a QueryResult containing the result set.

The documentation for this struct was generated from the following file:

- include/cbe/delegate/QueryLoaded.h

12.111 cbe::QueryResult Class Reference

resultset of data retrieved.

```
#include <QueryResult.h>
```

Public Types

- using ItemsSnapshot = std::vector< Item >

  A vector of items to hold a snapshot.

Public Member Functions

- Filter filter () const
- ItemsSnapshot getItemsSnapshot () const

  Returns a copy of a vector containing the items for this QueryResult.
- std::uint64_t itemsLoaded () const
- std::uint64_t totalCount () const
- std::uint64_t objectsLoaded () const
- std::uint64_t containersLoaded () const
- bool containsItem (ItemId itemId) const
- QueryResult (cbe::DefaultCtor)

  Default constructor.
- operator bool () const

  Checks if the current instance is real.

Friends

- class **CloudBackend**
- class **Container**

- class **QueryChain**
- class **QueryChainSync**
- class **ShareManager**
- class **SubscribeManager**
- std::ostream & **operator**<< (std::ostream &os, const QueryResult &queryResult)
- CBI::ItemDelegatePtr **delegate::createCbiQueryDelegate** (delegate::QueryDelegatePtr, cbe::util::Context &&)
- CBI::ItemDelegatePtr **delegate::createCbiQueryDelegate** (delegate::QueryJoinDelegatePtr, cbe::util::Context &&)
- CBI::ItemDelegatePtr **delegate::createCbiJoinDelegate** (delegate::JoinDelegatePtr, cbe::util::Context &&)

12.111.1 Detailed Description

resultset of data retrieved.

12.111.2 Constructor & Destructor Documentation

12.111.2.1 QueryResult()

```
cbe::QueryResult::QueryResult (
            cbe::DefaultCtor  )
```

Default constructor.
Construct a new object with the `DefaultCtor` to enable the operator bool() test

12.111.3 Member Function Documentation

12.111.3.1 containersLoaded()

```
std::uint64_t cbe::QueryResult::containersLoaded ( ) const
```

Returns number of `containers` loaded in to the query result.

12.111.3.2 containsItem()

```
bool cbe::QueryResult::containsItem (
            ItemId itemId ) const
```

Checks if the Item with id is in the result-set.

Parameters

itemId	id number of the item asked for

12.111.3.3 filter()

```
Filter cbe::QueryResult::filter ( ) const
```

Returns a copy of the filter used for query.

12.111.3.4 getItemsSnapshot()

```
ItemsSnapshot cbe::QueryResult::getItemsSnapshot ( ) const
```

Returns a copy of a vector containing the items for this QueryResult.
The QueryResult will be updated when new data comes in, but the returned copy will not.

Note

If iterating, make sure to create a variable for a local copy.

Returns

The items matching the query.

12.111.3.5 itemsLoaded()

`std::uint64_t cbe::QueryResult::itemsLoaded ( ) const`
Number of `items` loaded in current QueryResult.

12.111.3.6 objectsLoaded()

`std::uint64_t cbe::QueryResult::objectsLoaded ( ) const`
Returns number of `objects` loaded in to the query result.

12.111.3.7 operator bool()

`cbe::QueryResult::operator bool ( ) const [explicit]`
Checks if the current instance is real.
An "unreal" instance implies typically a failed event.
Relies on the `Default constructor` QueryResult(cbe::DefaultCtor)

Returns

`true` : is real

`false` : unreal; got nullptr; if current instance is unbound/undefined. I.e., if it is only default constructed.

12.111.3.8 totalCount()

`std::uint64_t cbe::QueryResult::totalCount ( ) const`
total number of items in the cloud matching the query result. This may be more than loaded.
The documentation for this class was generated from the following file:

- include/cbe/QueryResult.h

12.112 cbe::delegate::container::RemoveDelegate Class Reference

`#include <RemoveDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Success** = RemoveSuccess
- using **Error** = delegate::Error

Public Member Functions

- virtual void onRemoveSuccess (cbe::ItemId containerId, std::string name)=0
- virtual void onRemoveError (Error &&error, cbe::util::Context &&context)=0

12.112.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Container::remove

12.112.2 Member Function Documentation

12.112.2.1 onRemoveError()

```
virtual void cbe::delegate::container::RemoveDelegate::onRemoveError (
            Error && error,
            cbe::util::Context && context ) [pure virtual]
```

Called if an error is encountered.

12.112.2.2 onRemoveSuccess()

```
virtual void cbe::delegate::container::RemoveDelegate::onRemoveSuccess (
            cbe::ItemId containerId,
            std::string name ) [pure virtual]
```

Called upon successful Remove.

Parameters

containerId	Id of the cbe::Container being removed.
name	Name of container that is being removed.

The documentation for this class was generated from the following file:

- include/cbe/delegate/container/RemoveDelegate.h

12.113 cbe::delegate::group::RemoveDelegate Class Reference

```
#include <RemoveDelegate.h>
```

Classes

- struct ErrorInfo

Public Types

- using **Success** = RemoveSuccess
- using **Error** = delegate::Error

Public Member Functions

- virtual void onRemoveSuccess (cbe::GroupId groupId, std::string &&groupName)=0
- virtual void onRemoveError (Error &&error, cbe::util::Context &&context)=0

12.113.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Group::remove

12.113.2 Member Function Documentation

12.113.2.1 onRemoveError()

```
virtual void cbe::delegate::group::RemoveDelegate::onRemoveError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.113.2.2 onRemoveSuccess()

```
virtual void cbe::delegate::group::RemoveDelegate::onRemoveSuccess (
            cbe::GroupId groupId,
            std::string && groupName )  [pure virtual]
```

Called upon successful remove.

Parameters

groupId	Id of the cbe::Group being removed.
groupName	Name of the group being removed.

The documentation for this class was generated from the following file:

- include/cbe/delegate/group/RemoveDelegate.h

12.114 cbe::delegate::object::RemoveDelegate Class Reference

```
#include <RemoveDelegate.h>
```

Classes

- struct ErrorInfo

Public Types

- using **Success** = RemoveSuccess
- using **Error** = delegate::Error

Public Member Functions

- virtual void onRemoveSuccess (cbe::ItemId objectId, std::string name)=0
- virtual void onRemoveError (Error &&error, cbe::util::Context &&context)=0

12.114.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Object::remove

12.114.2 Member Function Documentation

12.114.2.1 onRemoveError()

```
virtual void cbe::delegate::object::RemoveDelegate::onRemoveError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.114.2.2 onRemoveSuccess()

```
virtual void cbe::delegate::object::RemoveDelegate::onRemoveSuccess (
            cbe::ItemId objectId,
            std::string name )  [pure virtual]
```

Called upon successful object remove.

Parameters

objectId	Id of object being removed.
name	Name of object being removed.

The documentation for this class was generated from the following file:

- include/cbe/delegate/object/RemoveDelegate.h

12.115 cbe::delegate::RemoveRoleDelegate Class Reference

`#include <RemoveRoleDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Success** = cbe::RoleId
- using **Error** = delegate::Error

Public Member Functions

- virtual void onRemoveRoleSuccess (cbe::RoleId &&roleId)=0
- virtual void onRemoveRoleError (Error &&error, cbe::util::Context &&context)=0

12.115.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Role::removeRole

12.115.2 Member Function Documentation

12.115.2.1 onRemoveRoleError()

```
virtual void cbe::delegate::RemoveRoleDelegate::onRemoveRoleError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.115.2.2 onRemoveRoleSuccess()

```
virtual void cbe::delegate::RemoveRoleDelegate::onRemoveRoleSuccess (
            cbe::RoleId && roleId )  [pure virtual]
```

Called upon successful removal of the Role.

Parameters

Role	the role id of the removed role.

The documentation for this class was generated from the following file:

- include/cbe/delegate/RemoveRoleDelegate.h

12.116 cbe::delegate::RemoveRoleMemberDelegate Class Reference

```
#include <RemoveRoleMemberDelegate.h>
```

Classes

- struct ErrorInfo

Public Types

- using **Success** = MemberId
- using **Error** = delegate::Error

Public Member Functions

- virtual void onRemoveRoleMemberSuccess (MemberId memberId)=0
- virtual void onRemoveRoleMemberError (Error &&error, cbe::util::Context &&context)=0

12.116.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Group::RemoveMember

12.116.2 Member Function Documentation

12.116.2.1 onRemoveRoleMemberError()

```
virtual void cbe::delegate::RemoveRoleMemberDelegate::onRemoveRoleMemberError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.116.2.2 onRemoveRoleMemberSuccess()

```
virtual void cbe::delegate::RemoveRoleMemberDelegate::onRemoveRoleMemberSuccess (
            MemberId memberId )  [pure virtual]
```

Called upon successful RemoveMember.
The documentation for this class was generated from the following file:

- include/cbe/delegate/RemoveRoleMemberDelegate.h

12.117 cbe::delegate::container::RemoveSuccess Class Reference

Convenience type that bundles all parameters passed to method cbe::delegate::container::RemoveDelegate::onRemoveSuccess.
`#include <RemoveDelegate.h>`

Public Member Functions

- **RemoveSuccess** (cbe::DefaultCtor)
- **RemoveSuccess** (cbe::ItemId containerId, std::string name)

Public Attributes

- cbe::ItemId **containerId** {}
- std::string **name** {}

12.117.1 Detailed Description

Convenience type that bundles all parameters passed to method cbe::delegate::container::RemoveDelegate::onRemoveSuccess.
The documentation for this class was generated from the following file:

- include/cbe/delegate/container/RemoveDelegate.h

12.118 cbe::delegate::group::RemoveSuccess Class Reference

Convenience type that bundles all parameters passed to method cbe::delegate::group::RemoveDelegate::onRemoveSuccess.
`#include <RemoveDelegate.h>`

Public Member Functions

- **RemoveSuccess** (cbe::DefaultCtor)
- **RemoveSuccess** (cbe::GroupId groupId, std::string &&groupName)

Public Attributes

- cbe::GroupId **groupId** {}
- std::string **groupName** {}

12.118.1 Detailed Description

Convenience type that bundles all parameters passed to method cbe::delegate::group::RemoveDelegate::onRemoveSuccess.
The documentation for this class was generated from the following file:

- include/cbe/delegate/group/RemoveDelegate.h

12.119 cbe::delegate::object::RemoveSuccess Class Reference

Convenience type that bundles all parameters passed to method cbe::delegate::object::onRemoveSuccess.
`#include <RemoveDelegate.h>`

Public Member Functions

- **RemoveSuccess** (cbe::DefaultCtor)
- **RemoveSuccess** (cbe::ItemId objectId, std::string name)
- operator bool () const

  Checks if current instance is valid.

Public Attributes

- cbe::ItemId **objectId** {}
- std::string **name** {}

12.119.1 Detailed Description

Convenience type that bundles all parameters passed to method cbe::delegate::object::onRemoveSuccess.

12.119.2 Member Function Documentation

12.119.2.1 operator bool()

```
cbe::delegate::object::RemoveSuccess::operator bool ( ) const  [explicit]
```

Checks if current instance is valid.

Returns

`true`: is valid

The documentation for this class was generated from the following file:

- include/cbe/delegate/object/RemoveDelegate.h

12.120 cbe::delegate::container::RenameDelegate Class Reference

```
#include <RenameDelegate.h>
```

Classes

- struct ErrorInfo

Public Types

- using **Success** = cbe::Container
- using **Error** = delegate::Error

Public Member Functions

- virtual void onRenameSuccess (cbe::Container &&container)=0
- virtual void onRenameError (Error &&error, cbe::util::Context &&context)=0

12.120.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Container::rename

12.120.2 Member Function Documentation

12.120.2.1 onRenameError()

```
virtual void cbe::delegate::container::RenameDelegate::onRenameError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.120.2.2 onRenameSuccess()

```
virtual void cbe::delegate::container::RenameDelegate::onRenameSuccess (
            cbe::Container && container )  [pure virtual]
```

Called upon successful Rename.

Parameters

container	Instance of container that is being Renamed.

The documentation for this class was generated from the following file:

- include/cbe/delegate/container/RenameDelegate.h

12.121 cbe::delegate::group::RenameDelegate Class Reference

```
#include <RenameDelegate.h>
```

Classes

- struct ErrorInfo

Public Types

- using **Success** = RenameSuccess
- using **Error** = delegate::Error

Public Member Functions

- virtual void onRenameSuccess (cbe::Group &&group, std::string &&newName)=0
- virtual void onRenameError (Error &&error, cbe::util::Context &&context)=0

12.121.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Group::rename

12.121.2 Member Function Documentation

12.121.2.1 onRenameError()

```
virtual void cbe::delegate::group::RenameDelegate::onRenameError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.121.2.2 onRenameSuccess()

```
virtual void cbe::delegate::group::RenameDelegate::onRenameSuccess (
            cbe::Group && group,
            std::string && newName )  [pure virtual]
```

Called upon successful rename.
The documentation for this class was generated from the following file:

- include/cbe/delegate/group/RenameDelegate.h

12.122 cbe::delegate::object::RenameDelegate Class Reference

`#include <RenameDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Success** = cbe::Object
- using **Error** = delegate::Error

Public Member Functions

- virtual void onRenameSuccess (cbe::Object &&object)=0
- virtual void onRenameError (Error &&error, cbe::util::Context &&context)=0

12.122.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Object::rename

12.122.2 Member Function Documentation

12.122.2.1 onRenameError()

```
virtual void cbe::delegate::object::RenameDelegate::onRenameError (
            Error && error,
            cbe::util::Context && context ) [pure virtual]
```

Called if an error is encountered.

12.122.2.2 onRenameSuccess()

```
virtual void cbe::delegate::object::RenameDelegate::onRenameSuccess (
            cbe::Object && object ) [pure virtual]
```

Called upon successful Rename.

Parameters

object	Instance of object that are being renamed.

The documentation for this class was generated from the following file:

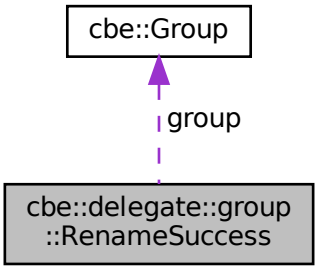
- include/cbe/delegate/object/RenameDelegate.h

12.123 cbe::delegate::group::RenameSuccess Class Reference

Convenience type that bundles all parameters passed to method cbe::delegate::group::RenameDelegate::onRenameSuccess.

`#include <RenameSuccess.h>`

Collaboration diagram for cbe::delegate::group::RenameSuccess:



Public Member Functions

- **RenameSuccess** (cbe::DefaultCtor)
- **RenameSuccess** (cbe::Group &&group, std::string &&newName)
- operator bool () const

  Checks if current instance is valid.

Public Attributes

- cbe::Group **group** {cbe::DefaultCtor{}}
- std::string **newName** {}

12.123.1 Detailed Description

Convenience type that bundles all parameters passed to method cbe::delegate::group::RenameDelegate::onRenameSuccess.

12.123.2 Member Function Documentation

12.123.2.1 operator bool()

`cbe::delegate::group::RenameSuccess::operator bool ( ) const [explicit]`
Checks if current instance is valid.

Returns

`true`: is valid

The documentation for this class was generated from the following file:

- include/cbe/delegate/group/RenameSuccess.h

12.124 cbe::Request Struct Reference

`#include <Member.h>`

Public Member Functions

- **Request** (cbe::UserId userId, std::string alias, std::string applicationComment, cbe::Date date)

Public Attributes

- cbe::UserId **userId** {}
- std::string **alias** {}
- std::string **applicationComment** {}
- cbe::Date **date** {}

12.124.1 Detailed Description

Contains information on a request for a Member to join a group.
The documentation for this struct was generated from the following file:

- include/cbe/Member.h

12.125 cbe::Role Class Reference

User role information.
`#include <Role.h>`

Public Types

- using ListMembersDelegatePtr = delegate::ListMembersDelegatePtr
- using AddRoleMemberDelegatePtr = delegate::AddRoleMemberDelegatePtr
- using RemoveRoleMemberDelegatePtr = delegate::RemoveRoleMemberDelegatePtr

Public Member Functions

- std::string name () const
- cbe::RoleId id () const
- cbe::GroupId groupId () const
- void listMembers (ListMembersDelegatePtr delegate)

  Lists the members of this role,.
- void addRoleMember (MemberId memberId, AddRoleMemberDelegatePtr delegate)

  Adds a member to this role.
- void removeRoleMember (MemberId memberId, RemoveRoleMemberDelegatePtr delegate)

  Removes a member to this role.
- Role (cbe::DefaultCtor)

  Default constructor.
- operator bool () const

  Checks if the current instance is real.

Friends

- class **Group**

12.125.1 Detailed Description

User role information.

12.125.2 Member Typedef Documentation

12.125.2.1 AddRoleMemberDelegatePtr

```
using cbe::Role::AddRoleMemberDelegatePtr = delegate::AddRoleMemberDelegatePtr
```

Pointer to cbe::delegate::ListMembersDelegate that is passed into asynchronous version of method listMembers() Pointer to AddRoleMemberDelegate that is passed into:

- cbe::Group::AddRoleMember(AddRoleMemberDelegatePtr).

12.125.2.2 ListMembersDelegatePtr

```
using cbe::Role::ListMembersDelegatePtr = delegate::ListMembersDelegatePtr
```

Pointer to cbe::delegate::ListMembersDelegate that is passed into asynchronous version of method listMembers()

12.125.2.3 RemoveRoleMemberDelegatePtr

```
using cbe::Role::RemoveRoleMemberDelegatePtr = delegate::RemoveRoleMemberDelegatePtr
```

Pointer to cbe::delegate::AddRoleMemberDelegate that is passed into asynchronous version of method AddRole↩ Member() Pointer to RemoveRoleMember that is passed into:
Group::RemoveRoleMember(std::string, RemoveRoleMemberDelegatePtr).

12.125.3 Constructor & Destructor Documentation

12.125.3.1 Role()

```
cbe::Role::Role (
            cbe::DefaultCtor  )
```

Default constructor.
Pointer to cbe::delegate::RemoveRoleMember that is passed into asynchronous version of method RemoveRole↩ Member()
Construct a new object with the `DefaultCtor` to enable the operator bool() test

12.125.4 Member Function Documentation

12.125.4.1 addRoleMember()

```
void cbe::Role::addRoleMember (
            MemberId memberId,
            AddRoleMemberDelegatePtr delegate )
```

Adds a member to this role.

Parameters

member↩ Id	The id of the member to add to the role.
delegate	Pointer to a delegate::AddRoleMemberDelegate instance that is implemented by the user.

12.125.4.2 groupId()

```
cbe::GroupId cbe::Role::groupId ( ) const
```

Id of the group the role belongs to.

12.125.4.3 id()

```
cbe::RoleId cbe::Role::id ( ) const
```
Id of the role.

12.125.4.4 listMembers()

```
void cbe::Role::listMembers (
            ListMembersDelegatePtr delegate )
```
Lists the members of this role,.

Parameters

delegate	Pointer to a delegate::ListMembersDelegate instance that is implemented by the user.

12.125.4.5 name()

```
std::string cbe::Role::name ( ) const
```
Name of the role.

12.125.4.6 operator bool()

```
cbe::Role::operator bool ( ) const  [explicit]
```
Checks if the current instance is real.
An "unreal" instance implies typically a failed event.
Relies on the `Default constructor` Role(cbe::DefaultCtor)

Returns

`true` : is real

`false` : unreal; got nullptr; if current instance is unbound/undefined. I.e., if it is only default constructed.

12.125.4.7 removeRoleMember()

```
void cbe::Role::removeRoleMember (
            MemberId memberId,
            RemoveRoleMemberDelegatePtr delegate )
```
Removes a member to this role.

Parameters

memberId	The id of the member to remove from the role.
delegate	Pointer to a delegate::RemoveRoleMember instance that is implemented by the user.

The documentation for this class was generated from the following file:

- include/cbe/Role.h

12.126 cbe::delegate::SearchGroupsDelegate Class Reference

```
#include <SearchGroupsDelegate.h>
```

Classes

- struct ErrorInfo

Public Types

- using **Success** = cbe::GroupQueryResult
- using **Error** = delegate::Error

Public Member Functions

- virtual void onSearchGroupsSuccess (cbe::GroupQueryResult &&queryResult)=0
- virtual void onSearchGroupsError (delegate::Error &&error, cbe::util::Context &&context)=0

12.126.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::GroupManager::searchGroups()

12.126.2 Member Function Documentation

12.126.2.1 onSearchGroupsError()

```
virtual void cbe::delegate::SearchGroupsDelegate::onSearchGroupsError (
            delegate::Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.126.2.2 onSearchGroupsSuccess()

```
virtual void cbe::delegate::SearchGroupsDelegate::onSearchGroupsSuccess (
            cbe::GroupQueryResult && queryResult )  [pure virtual]
```

Called upon successful search.

Parameters

queryResult	Ref. instance of cbe::GroupQueryResult holding the result of the search.

The documentation for this class was generated from the following file:

- include/cbe/delegate/SearchGroupsDelegate.h

12.127 cbe::ShareData Struct Reference

```
#include <Utility.h>
```

Public Member Functions

- template<class ShareDataT >
  ShareData (ShareDataT &&rh)
- **ShareData** (uint64_t id, bool isUserId)

Public Attributes

- uint64_t **id**
- bool **isUserId**

12.127.1 Detailed Description

This is the data used from shares(shareId) to keep track of user/group-id relating to a shareid

The documentation for this struct was generated from the following file:

- include/cbe/Utility.h

12.128 cbe::delegate::ShareDelegate Class Reference

`#include <ShareDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Success** = ShareSuccess
- using **Error** = delegate::Error

Public Member Functions

- virtual void onShareSuccess (cbe::ShareId shareId)=0
- virtual void onShareError (Error &&error, cbe::util::Context &&context)=0

12.128.1 Detailed Description

Delegate class for the asynchronous version of methods:

- cbe::Container::share
- cbe::Object::share

12.128.2 Member Function Documentation

12.128.2.1 onShareError()

```
virtual void cbe::delegate::ShareDelegate::onShareError (
            Error && error,
            cbe::util::Context && context ) [pure virtual]
```

Called if an error is encountered.

12.128.2.2 onShareSuccess()

```
virtual void cbe::delegate::ShareDelegate::onShareSuccess (
            cbe::ShareId shareId ) [pure virtual]
```

Called upon successful share.

Parameters

shareId	Id of the share. Can be used when unsharing. See Asynchronous version of cbe::Object::unshare()

The documentation for this class was generated from the following file:

- include/cbe/delegate/ShareDelegate.h

12.129 cbe::ShareManager Class Reference

Managing Shares.
`#include <ShareManager.h>`

Public Types

- using ListSharesDelegatePtr = delegate::ListSharesDelegatePtr

Public Member Functions

- void listAvailableShares (ListSharesDelegatePtr delegate)

  Lists the shares exposed by other users to current user. This will give specific share information.
- void listMyShares (ListSharesDelegatePtr delegate)

  Lists the shares exposed by current user. This will give specific share information.
- ShareManager (cbe::DefaultCtor)

  Default constructor.
- operator bool () const

  Checks if the current instance is real.

Friends

- class **CloudBackend**

12.129.1 Detailed Description

Managing Shares.
This class represents a list of Shares.

12.129.2 Member Typedef Documentation

12.129.2.1 ListSharesDelegatePtr

```
using cbe::ShareManager::ListSharesDelegatePtr = delegate::ListSharesDelegatePtr
```

Pointer to ListSharesDelegate that is passed into:

- ShareManager::listAvailableShares(ListSharesDelegatePtr)
- ShareManager::listMyShares(ListSharesDelegatePtr)

12.129.3 Constructor & Destructor Documentation

12.129.3.1 ShareManager()

```
cbe::ShareManager::ShareManager (
            cbe::DefaultCtor  )
```

Default constructor.
Pointer to cbe::delegate::ListSharesDelegate that is passed into asynchronous version of method listMyShares()
Construct a new object with the `DefaultCtor` to enable the operator bool() test

12.129.4 Member Function Documentation

12.129.4.1 listAvailableShares()

```
void cbe::ShareManager::listAvailableShares (
            ListSharesDelegatePtr delegate )
```

Lists the shares exposed by other users to current user. This will give specific share information.

Parameters

delegate	Pointer to a delegate::ListSharesDelegate instance that is implemented by the user.

12.129.4.2 listMyShares()

```
void cbe::ShareManager::listMyShares (
            ListSharesDelegatePtr delegate )
```

Lists the shares exposed by current user. This will give specific share information.
Pointer to cbe::delegate::ListSharesDelegate that is passed into asynchronous version of method listAvailableShares()

Parameters

delegate	Pointer to a delegate::ListSharesDelegate instance that is implemented by the user.

12.129.4.3 operator bool()

```
cbe::ShareManager::operator bool ( ) const  [explicit]
```

Checks if the current instance is real.
An "unreal" instance implies typically a failed event.
Relies on the `Default constructor` ShareManager(cbe::DefaultCtor)

Returns

`true` : is real

`false` : unreal; got nullptr; if current instance is unbound/undefined. I.e., if it is only default constructed.

The documentation for this class was generated from the following file:

- include/cbe/ShareManager.h

12.130 cbe::delegate::ShareSuccess Class Reference

Convenience type that bundles the parameter passed to method cbe::delegate::ShareDelegate::onShareSuccess.
`#include <ShareDelegate.h>`

Public Member Functions

- **ShareSuccess** (cbe::DefaultCtor)
- **ShareSuccess** (cbe::ShareId shareId)
- operator bool () const

  Checks if current instance is valid.

Public Attributes

- cbe::ShareId **shareId** = 0

12.130.1 Detailed Description

Convenience type that bundles the parameter passed to method cbe::delegate::ShareDelegate::onShareSuccess.

12.130.2 Member Function Documentation

12.130.2.1 operator bool()

```
cbe::delegate::ShareSuccess::operator bool ( ) const  [explicit]
```

Checks if current instance is valid.

Returns

`true`: is valid

The documentation for this class was generated from the following file:

- include/cbe/delegate/ShareDelegate.h

12.131 cbe::Stream Class Reference

A data file attached to Object.

```
#include <Stream.h>
```

Public Attributes

- cbe::StreamId streamId {}
- std::size_t length {}

Friends

- class **Object**

12.131.1 Detailed Description

A data file attached to Object.
An object kan have zero, one or many streams.

12.131.2 Member Data Documentation

12.131.2.1 length

```
std::size_t cbe::Stream::length {}
```

the size in Bytes

12.131.2.2 streamId

```
cbe::StreamId cbe::Stream::streamId {}
```

the id number of the stream
The documentation for this class was generated from the following file:

- include/cbe/Stream.h

12.132 cbe::Subscribe Class Reference

Managing a subscribed Item.

```
#include <Subscribe.h>
```

Public Member Functions

- cbe::Date getDate () const
- std::string getTitle () const
- std::string getDescription () const
- std::string getPassword () const
- cbe::PublishAccess getSecurity () const
- cbe::PublishVisibility getPrivacy () const
- cbe::SubscribeId getSubscribeId () const
- cbe::PublishId getPublishId () const
- cbe::UserId getOwner () const
- void unSubscribe ()
- **Subscribe** (cbe::DefaultCtor)
- **operator bool** () const

Friends

- class **CloudBackend**
- class **Item**

12.132.1 Detailed Description

Managing a subscribed Item.
To inspect the settings of a subscription.

12.132.2 Member Function Documentation

12.132.2.1 getDate()

```
cbe::Date cbe::Subscribe::getDate ( ) const
```

Gets the date as unix epoch number

12.132.2.2 getDescription()

```
std::string cbe::Subscribe::getDescription ( ) const
```

Gets the description

12.132.2.3 getOwner()

```
cbe::UserId cbe::Subscribe::getOwner ( ) const
```

Gets the owner id number

12.132.2.4 getPassword()

```
std::string cbe::Subscribe::getPassword ( ) const
```

Checks if a password has been set.

Returns

"true" : if a password has been set

"" : empty string if not.

12.132.2.5 getPrivacy()

```
cbe::PublishVisibility cbe::Subscribe::getPrivacy ( ) const
```

Gets the privacy see cbe::PublishVisibility enum

12.132.2.6 getPublishId()

`cbe::PublishId cbe::Subscribe::getPublishId ( ) const`
Gets the publish id number

12.132.2.7 getSecurity()

`cbe::PublishAccess cbe::Subscribe::getSecurity ( ) const`
Gets the security see cbe::PublishAccess enum

12.132.2.8 getSubscribeId()

`cbe::SubscribeId cbe::Subscribe::getSubscribeId ( ) const`
Gets the subscribe id number

12.132.2.9 getTitle()

`std::string cbe::Subscribe::getTitle ( ) const`
Gets the title

12.132.2.10 unSubscribe()

`void cbe::Subscribe::unSubscribe ( )`
unSubscribe to this subscription.
The documentation for this class was generated from the following file:

- include/cbe/Subscribe.h

12.133 cbe::delegate::SubscribeDelegate Class Reference

`#include <SubscribeDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Success** = cbe::Items
- using **Error** = delegate::Error

Public Member Functions

- virtual void onSubscribeSuccess (cbe::Items &&success)=0
- virtual void onSubscribeError (Error &&error, cbe::util::Context &&context)=0

12.133.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::SubscribeManager::subscribe

12.133.2 Member Function Documentation

12.133.2.1 onSubscribeError()

```
virtual void cbe::delegate::SubscribeDelegate::onSubscribeError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.133.2.2 onSubscribeSuccess()

```
virtual void cbe::delegate::SubscribeDelegate::onSubscribeSuccess (
            cbe::Items && success )  [pure virtual]
```

Called upon successful subscribe.

Parameters

success	Instance of Items that are being subscribed.

The documentation for this class was generated from the following file:

- include/cbe/delegate/SubscribeDelegate.h

12.134 cbe::SubscribeManager Class Reference

For managing subscriptions.
`#include <SubscribeManager.h>`

Public Types

- using GetSubscriptionsDelegatePtr = delegate::GetSubscriptionsDelegatePtr
- using SubscribeDelegatePtr = delegate::SubscribeDelegatePtr

Public Member Functions

- void getSubscriptions (GetSubscriptionsDelegatePtr subscribeDelegate)

  List your current subscriptions.
- void subscribe (cbe::UserId sharingUserId, std::string sharingUserName, cbe::PublishId publishId, std::string publishName, std::string password, std::string subscribeName, SubscribeDelegatePtr subscribeDelegate)

  Subscribes to a Publish using all parameters.
- void subscribe (std::string sharingUserName, std::string publishName, SubscribeDelegatePtr subscribe↩ Delegate)

  Subscribes to a Publish using names.
- void subscribe (cbe::UserId sharingUserId, cbe::PublishId publishId, std::string subscribeName, SubscribeDelegatePtr subscribeDelegate)

  Subscribes to a Publish using ids.
- **SubscribeManager** (cbe::DefaultCtor)
- **operator bool** () const

Friends

- class **CloudBackend**

12.134.1 Detailed Description

For managing subscriptions.

12.134.2 Member Typedef Documentation

12.134.2.1 GetSubscriptionsDelegatePtr

```
using cbe::SubscribeManager::GetSubscriptionsDelegatePtr = delegate::GetSubscriptionsDelegatePtr
```

Pointer to GetSubscriptionsDelegate that is passed into asynchronous version of method:

- getSubscriptions()

12.134.2.2 SubscribeDelegatePtr

```
using cbe::SubscribeManager::SubscribeDelegatePtr = delegate::SubscribeDelegatePtr
```

Pointer to cbe::delegate::GetSubscriptionsDelegate that is passed into asynchronous version of method getSubscriptions() Pointer to SubscribeDelegate that is passed into asynchronous version of method:

- subscribe()

12.134.3 Member Function Documentation

12.134.3.1 getSubscriptions()

```
void cbe::SubscribeManager::getSubscriptions (
            GetSubscriptionsDelegatePtr subscribeDelegate )
```

List your current subscriptions.
Listing is done independently of where in the actual directory tree the files are located.

Parameters

subscribeDelegate	Pointer to a delegate::GetSubscriptionsDelegate instance that is implemented by the user.

12.134.3.2 subscribe() [1/3]

```
void cbe::SubscribeManager::subscribe (
            cbe::UserId sharingUserId,
            cbe::PublishId publishId,
            std::string subscribeName,
            SubscribeDelegatePtr subscribeDelegate )  [inline]
```

Subscribes to a Publish using ids.
Overload of subscribe()

Parameters

sharingUserId	User id of the owner of the publish
publishId	publish id (publish id)
subscribeName	Name of created subscribe (usually same as the publish)
subscribeDelegate	Gets notified of the result

12.134.3.3 subscribe() [2/3]

```
void cbe::SubscribeManager::subscribe (
            cbe::UserId sharingUserId,
            std::string sharingUserName,
            cbe::PublishId publishId,
```

```
            std::string publishName,
            std::string password,
            std::string subscribeName,
            SubscribeDelegatePtr subscribeDelegate )
```

Subscribes to a Publish using all parameters.
Subscribe to a Publish that was issued by some other user (or yourself).
A Publish must not require a password, if required it should be provided by the publisher.
The retrieved subscription may be revoked with cbe::Object::unSubscribe() or cbe::Container::unSubscribe().
Subscribes to a publish shared by some other user (or yourself).

Parameters

sharingUserId	User id of the owner of the publish or 0 if sharingUserName should be used instead
sharingUserName	User name of the owner of the publish or empty if sharingUserId should be used instead
publishId	Publish id or 0 if publishName should be used instead
publishName	Publish name or empty if publishId should be used instead
password	Required password or an empty string if no password
subscribeName	Name of created favorite (usually same as the publish)
subscribeDelegate	Gets notified of the result

12.134.3.4 subscribe() [3/3]

```
void cbe::SubscribeManager::subscribe (
            std::string sharingUserName,
            std::string publishName,
            SubscribeDelegatePtr subscribeDelegate )  [inline]
```

Subscribes to a Publish using names.
Pointer to cbe::delegate::SubscribeDelegate that is passed into asynchronous version of method subscribe()
Overload of subscribe()

Parameters

sharingUserName	User name of the owner of the publish
publishName	Publish name that will also be the name of created favorite.
subscribeDelegate	Gets notified of the result

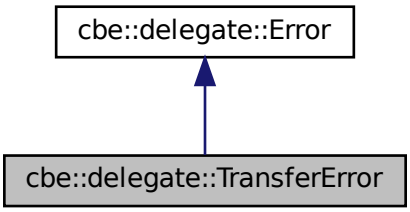
The documentation for this class was generated from the following file:

- include/cbe/SubscribeManager.h

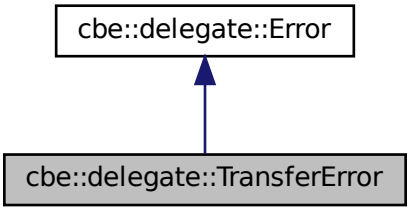
12.135 cbe::delegate::TransferError Class Reference

```
#include <TransferError.h>
```

Inheritance diagram for cbe::delegate::TransferError:



Collaboration diagram for cbe::delegate::TransferError:



Public Member Functions

- **TransferError** (Error &&error, std::string name, cbe::ObjectId objectId, cbe::ContainerId parentId)

Public Attributes

- std::string **name** {}
- cbe::ObjectId **objectId** {}
- cbe::ContainerId **parentId** {}

Friends

- std::ostream & **operator**<< (std::ostream &os, const TransferError &transferError)

12.135.1 Detailed Description

Contains error information delivered from CloudBackend SDK in connection with a failed transfer, i.e., upload/download.
The documentation for this class was generated from the following file:

- include/cbe/delegate/TransferError.h

12.136 cbe::delegate::UnBanDelegate Class Reference

`#include <UnBanDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Success** = UnBanSuccess
- using **Error** = delegate::Error

Public Member Functions

- virtual void onUnBanSuccess (std::string &&memberName, cbe::MemberId memberId)=0
- virtual void onUnBanError (Error &&error, cbe::util::Context &&context)=0

12.136.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Member::unBan

12.136.2 Member Function Documentation

12.136.2.1 onUnBanError()

```
virtual void cbe::delegate::UnBanDelegate::onUnBanError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.136.2.2 onUnBanSuccess()

```
virtual void cbe::delegate::UnBanDelegate::onUnBanSuccess (
            std::string && memberName,
            cbe::MemberId memberId )  [pure virtual]
```

Called upon successful unBan.

Parameters

memberName	Name of the member being unbanned.
memberId	Id of the member being unbanned.

The documentation for this class was generated from the following file:

- include/cbe/delegate/UnBanDelegate.h

12.137 cbe::delegate::UnBanSuccess Class Reference

Convenience type that bundles all parameters passed to method cbe::delegate::UnBanDelegate::onUnBanSuccess.

`#include <UnBanDelegate.h>`

Public Member Functions

- **UnBanSuccess** (cbe::DefaultCtor)
- **UnBanSuccess** (std::string &&memberName, cbe::MemberId memberId)

Public Attributes

- std::string **memberName** {}
- cbe::MemberId **memberId** {}

12.137.1 Detailed Description

Convenience type that bundles all parameters passed to method cbe::delegate::UnBanDelegate::onUnBanSuccess.
The documentation for this class was generated from the following file:

- include/cbe/delegate/UnBanDelegate.h

12.138 cbe::delegate::UnPublishDelegate Class Reference

`#include <UnPublishDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Success** = UnPublishSuccess
- using **Error** = delegate::Error

Public Member Functions

- virtual void onUnPublishSuccess (cbe::PublishId publishId, cbe::ItemId itemId)=0
- virtual void onUnPublishError (Error &&error, cbe::util::Context &&context)=0

12.138.1 Detailed Description

Delegate class for the asynchronous version of methods:

- cbe::Container::unPublish
- cbe::Object::unPublish

12.138.2 Member Function Documentation

12.138.2.1 onUnPublishError()

```
virtual void cbe::delegate::UnPublishDelegate::onUnPublishError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error was encountered.

12.138.2.2 onUnPublishSuccess()

```
virtual void cbe::delegate::UnPublishDelegate::onUnPublishSuccess (
            cbe::PublishId publishId,
            cbe::ItemId itemId )  [pure virtual]
```

Called upon successful unPublish.

Parameters

publish↩ Id	Id of the publictoion being published.
itemId	Id of the item - cbe::Object or cbe::Container - that has been unPublished

The documentation for this class was generated from the following file:

- include/cbe/delegate/UnPublishDelegate.h

12.139 cbe::delegate::UnPublishSuccess Class Reference

Convenience type that bundles all parameters passed to method cbe::delegate::UnPublishDelegate::onUnPublishError.

`#include <UnPublishDelegate.h>`

Public Member Functions

- **UnPublishSuccess** (cbe::DefaultCtor)
- **UnPublishSuccess** (cbe::PublishId publishId, cbe::ItemId itemId)
- operator bool () const

  Checks if current instance is valid.

Public Attributes

- cbe::PublishId **publishId** {}
- cbe::ItemId **itemId** {}

12.139.1 Detailed Description

Convenience type that bundles all parameters passed to method cbe::delegate::UnPublishDelegate::onUnPublishError.

12.139.2 Member Function Documentation

12.139.2.1 operator bool()

`cbe::delegate::UnPublishSuccess::operator bool ( ) const [explicit]`

Checks if current instance is valid.

Returns

`true`: is valid

The documentation for this class was generated from the following file:

- include/cbe/delegate/UnPublishDelegate.h

12.140 cbe::delegate::UnShareDelegate Class Reference

`#include <UnShareDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Success** = UnShareSuccess
- using **Error** = delegate::Error

Public Member Functions

- virtual void onUnShareSuccess (std::string &&message)=0
- virtual void onUnShareError (Error &&error, cbe::util::Context &&context)=0

12.140.1 Detailed Description

Delegate class for the asynchronous version of methods:

- cbe::Container::unShare()
- cbe::Object::unShare()

12.140.2 Member Function Documentation

12.140.2.1 onUnShareError()

```
virtual void cbe::delegate::UnShareDelegate::onUnShareError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.140.2.2 onUnShareSuccess()

```
virtual void cbe::delegate::UnShareDelegate::onUnShareSuccess (
            std::string && message )  [pure virtual]
```

Called upon successful UnShare.

Parameters

message	Message of the Unshare.

The documentation for this class was generated from the following file:

- include/cbe/delegate/UnShareDelegate.h

12.141 cbe::delegate::UnShareSuccess Class Reference

Convenience type that bundles the parameter passed to method cbe::delegate::ShareDelegate::onShareSuccess.

`#include <UnShareDelegate.h>`

Public Member Functions

- **UnShareSuccess** (cbe::DefaultCtor)
- **UnShareSuccess** (std::string &&message)
- operator bool () const

  Checks if current instance is valid.

Public Attributes

- std::string **message** {}

12.141.1 Detailed Description

Convenience type that bundles the parameter passed to method cbe::delegate::ShareDelegate::onShareSuccess.

12.141.2 Member Function Documentation

12.141.2.1 operator bool()

```
cbe::delegate::UnShareSuccess::operator bool ( ) const  [explicit]
```

Checks if current instance is valid.

Returns

`true`: is valid

The documentation for this class was generated from the following file:

- include/cbe/delegate/UnShareDelegate.h

12.142 cbe::delegate::UnSubscribeDelegate Class Reference

```
#include <UnSubscribeDelegate.h>
```

Classes

- struct ErrorInfo

Public Types

- using **Success** = UnSubscribeSuccess
- using **Error** = delegate::Error

Public Member Functions

- virtual void onUnSubscribeSuccess (cbe::PublishId publishId, cbe::ItemId itemId)=0
- virtual void onUnSubscribeError (Error &&error, cbe::util::Context &&context)=0

12.142.1 Detailed Description

Delegate class for the asynchronous version of methods:

- cbe::Container::unSubscribe
- cbe::Object::unSubscribe

12.142.2 Member Function Documentation

12.142.2.1 onUnSubscribeError()

```
virtual void cbe::delegate::UnSubscribeDelegate::onUnSubscribeError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.142.2.2 onUnSubscribeSuccess()

```
virtual void cbe::delegate::UnSubscribeDelegate::onUnSubscribeSuccess (
            cbe::PublishId publishId,
            cbe::ItemId itemId )  [pure virtual]
```

Called upon successful UnSubscribe.

Parameters

publish↩ Id	The PublishId of the UnSubscribe.
itemId	Instance of ItemId that is being UnSubscribed.

The documentation for this class was generated from the following file:

- include/cbe/delegate/UnSubscribeDelegate.h

12.143 cbe::delegate::UnSubscribeSuccess Class Reference

Convenience type that bundles all parameters passed to method cbe::delegate::UnSubscribeDelegate::onUnSubscribeSuccess.

`#include <UnSubscribeDelegate.h>`

Public Member Functions

- **UnSubscribeSuccess** (cbe::PublishId publishId, cbe::ItemId itemId)
- operator bool () const

  Checks if current instance is valid.

Public Attributes

- cbe::PublishId **publishId** {}
- cbe::ItemId **itemId** {}

12.143.1 Detailed Description

Convenience type that bundles all parameters passed to method cbe::delegate::UnSubscribeDelegate::onUnSubscribeSuccess.

12.143.2 Member Function Documentation

12.143.2.1 operator bool()

`cbe::delegate::UnSubscribeSuccess::operator bool ( ) const [explicit]`

Checks if current instance is valid.

Returns

`true`: is valid

The documentation for this class was generated from the following file:

- include/cbe/delegate/UnSubscribeDelegate.h

12.144 cbe::delegate::UpdateKeyValuesDelegate Class Reference

`#include <UpdateKeyValuesDelegate.h>`

Classes

- struct ErrorInfo

Public Types

- using **Success** = cbe::Object
- using **Error** = delegate::Error

Public Member Functions

- virtual void onUpdateKeyValuesSuccess (cbe::Object &&object)=0
- virtual void onUpdateKeyValuesError (Error &&error, cbe::util::Context &&context)=0

12.144.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Object::updateKeyValues()

12.144.2 Member Function Documentation

12.144.2.1 onUpdateKeyValuesError()

```
virtual void cbe::delegate::UpdateKeyValuesDelegate::onUpdateKeyValuesError (
            Error && error,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.144.2.2 onUpdateKeyValuesSuccess()

```
virtual void cbe::delegate::UpdateKeyValuesDelegate::onUpdateKeyValuesSuccess (
            cbe::Object && object )  [pure virtual]
```

Called upon successful UpdateKeyValues.

Parameters

object	Instance of object that is getting its Key/Values updated.

The documentation for this class was generated from the following file:

- include/cbe/delegate/UpdateKeyValuesDelegate.h

12.145 cbe::delegate::UploadDelegate Class Reference

```
#include <UploadDelegate.h>
```

Classes

- struct ErrorInfo

Public Types

- using **Success** = cbe::Object
- using **Error** = TransferError

Public Member Functions

- virtual void onUploadSuccess (cbe::Object &&object)=0
- virtual void onUploadError (cbe::delegate::TransferError &&transferError, cbe::util::Context &&context)=0
- virtual void onChunkSent (cbe::Object &&object, std::uint64_t sent, std::uint64_t total)

12.145.1 Detailed Description

Delegate class for the asynchronous version of method:

- cbe::Container::upload(const std::string&,UploadDelegatePtr)
  See Async example of creation of a cbe::Object by using Container::upload()
- cbe::Container::upload(const std::string&,const std::string&,UploadDelegatePtr)
- cbe::Object::uploadStream(const std::string&,cbe::StreamId,UploadDelegatePtr)

12.145.2 Member Function Documentation

12.145.2.1 onChunkSent()

```
virtual void cbe::delegate::UploadDelegate::onChunkSent (
            cbe::Object && object,
            std::uint64_t sent,
            std::uint64_t total )  [virtual]
```

Called when a chunk of data has been sent.

Parameters

object	Object associated with current upload.
sent	Size, in number of bytes, of the sent chunk.
total	Total number of bytes sent so far.

12.145.2.2 onUploadError()

```
virtual void cbe::delegate::UploadDelegate::onUploadError (
            cbe::delegate::TransferError && transferError,
            cbe::util::Context && context )  [pure virtual]
```

Called if an error is encountered.

12.145.2.3 onUploadSuccess()

```
virtual void cbe::delegate::UploadDelegate::onUploadSuccess (
            cbe::Object && object )  [pure virtual]
```

Called upon successful Upload.

Parameters

object	Instance of object that is being uploaded.

The documentation for this class was generated from the following file:

- include/cbe/delegate/UploadDelegate.h

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