My Project

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Chapter 1

Curling: Modern C++ libcurl Wrapper

Curling is a lightweight, header-only C++17 wrapper around libcurl for making HTTP requests with a modern design and safe resource handling.

1.1 Features

- RAII and smart-pointer-based resource management
- MIME support for file uploads
- Fluent API for intuitive chaining
- Proxy and authentication support
- Persistent cookie management

1.2 Example

```
curling::Request req;
req.setMethod(curling::Request::Method::POST)
   .setURL("https://example.com")
   .addHeader("Content-Type: application/json")
   .setBody(R"({"key": "value"})");
curling::Response res = req.send();
std::cout << res.toString();
```

Chapter 2

Namespace Index

2.1 Namespace List

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

curling 11
curling::detail
Util/helper section 12

Chapter 3

Hierarchical Index

3.1 Class Hierarchy

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

curling::CurlHandleDeleter 13
curling::CurlMimeDeleter 14
curling::CurlSlistDeleter 14
curling::Request 20
curling::Response 32
std::runtime_error
    curling::CurlingException 13
        curling::HeaderException 15
        curling::InitializationException 16
        curling::LogicException 17
        curling::MimeException 18
        curling::RequestException 31

Chapter 4

Class Index

4.1 Class List

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

curling::CurlHandleDeleter 13
curling::CurlingException
    Base exception class for Curling errors 13
curling::CurlMimeDeleter 14
curling::CurlSlistDeleter 14
curling::HeaderException
    Thrown when header operations fail 15
curling::InitializationException
    Thrown when curl initialization fails 16
curling::LogicException
    Thrown when library logic prohibits an operation 17
curling::MimeException
    Thrown when MIME operations fail 18
curling::Request
    Provides a fluent wrapper for HTTP requests via libcurl 20
curling::RequestException
    Thrown when a request operation fails 31
curling::Response
    Represents an HTTP response 32

Chapter 5

File Index

5.1 File List

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

include/curling.hpp 33

Chapter 6

Namespace Documentation

6.1 curling Namespace Reference

Namespaces

- namespace detail

  Util/helper section.

Classes

- struct CurlHandleDeleter
- class CurlingException

  Base exception class for Curling errors.
- struct CurlMimeDeleter
- struct CurlSlistDeleter
- class HeaderException

  Thrown when header operations fail.
- class InitializationException

  Thrown when curl initialization fails.
- class LogicException

  Thrown when library logic prohibits an operation.
- class MimeException

  Thrown when MIME operations fail.
- class Request

  Provides a fluent wrapper for HTTP requests via libcurl.
- class RequestException

  Thrown when a request operation fails.
- struct Response

  Represents an HTTP response.

Typedefs

- using **CurlPtr** = std::unique_ptr< CURL, CurlHandleDeleter >
- using **CurlSlistPtr** = std::unique_ptr< curl_slist, CurlSlistDeleter >
- using **CurlMimePtr** = std::unique_ptr< curl_mime, CurlMimeDeleter >

Functions

- std::string **version** ()

Variables

- constexpr int **version_major** = 1
- constexpr int **version_minor** = 1
- constexpr int **version_patch** = 0

6.1.1 Detailed Description

Note

If you use Method::MIME (multipart POST), you must reset the Request before switching to another method. Attempting to change it afterward throws logic_error.

Curling internally manages curl_global_init() and curl_global_cleanup() using std::once_flag. You don't need to do this manually.

Header keys in Response::headers are stored in lowercase to support case-insensitive lookup.

By default, cookies are persisted in "cookies.txt". Override this via setCookiePath().

Calling enableVerbose(true) enables libcurl's verbose output to stderr, which is useful for debugging.

Warning

This class is not thread-safe. Do not share a Request instance across threads. Each thread should use its own Request object.

6.2 curling::detail Namespace Reference

Util/helper section.

Functions

- void **ensureCurlGlobalInit** ()
- void **maybeCleanupGlobalCurl** () noexcept
- void **trim** (std::string &s)
- void **toLowerCase** (std::string &s)
- size_t **WriteCallback** (void ∗contents, size_t size, size_t nmemb, void ∗userp)
- size_t **HeaderCallback** (char ∗buffer, size_t size, size_t nitems, void ∗userdata)
- int **ProgressCallbackBridge** (void ∗clientp, curl_off_t dltotal, curl_off_t dlnow, curl_off_t ultotal, curl_off_t ulnow)

Variables

- std::once_flag **curlGlobalInitFlag**
- std::mutex **curlGlobalMutex**
- int **instanceCount** = 0

6.2.1 Detailed Description

Util/helper section.

Note

meant for internal library use only

Chapter 7

Class Documentation

7.1 curling::CurlHandleDeleter Struct Reference

`#include <curling.hpp>`

Public Member Functions

- void **operator()** (CURL *h) const noexcept

7.1.1 Detailed Description

SAFETY: RAII deleters for CURL handles

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

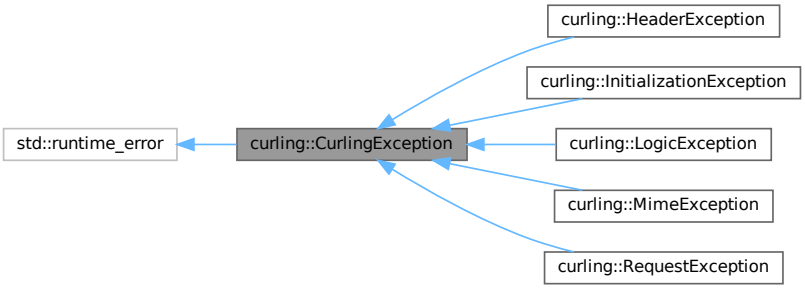
- include/curling.hpp

7.2 curling::CurlingException Class Reference

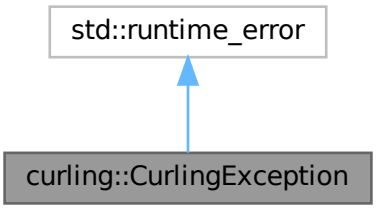
Base exception class for Curling errors.

`#include <curling.hpp>`

Inheritance diagram for curling::CurlingException:



Collaboration diagram for curling::CurlingException:



Public Member Functions

- **CurlingException** (const std::string &msg)

7.2.1 Detailed Description

Base exception class for Curling errors.

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

- include/curling.hpp

7.3 curling::CurlMimeDeleter Struct Reference

Public Member Functions

- void **operator()** (curl_mime ∗m) const noexcept

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

- include/curling.hpp

7.4 curling::CurlSlistDeleter Struct Reference

Public Member Functions

- void **operator()** (curl_slist ∗l) const noexcept

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

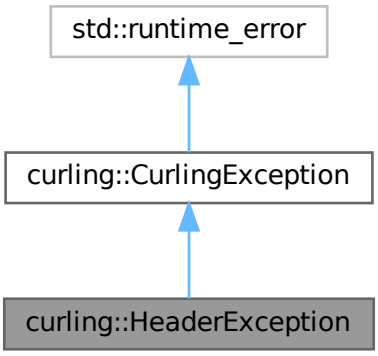
- include/curling.hpp

7.5 curling::HeaderException Class Reference

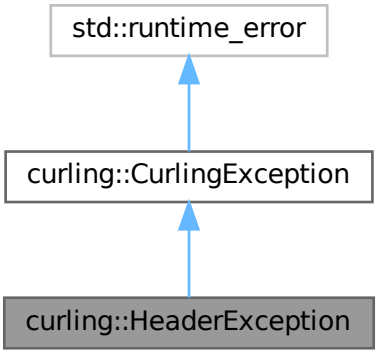
Thrown when header operations fail.

`#include <curling.hpp>`

Inheritance diagram for curling::HeaderException:



Collaboration diagram for curling::HeaderException:



Public Member Functions

- **HeaderException** (const std::string &msg)

Public Member Functions inherited from curling::CurlingException

- **CurlingException** (const std::string &msg)

7.5.1 Detailed Description

Thrown when header operations fail.

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

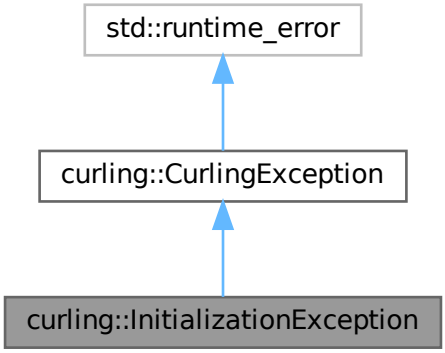
- include/curling.hpp

7.6 curling::InitializationException Class Reference

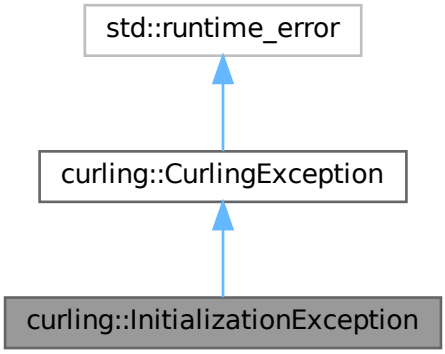
Thrown when curl initialization fails.

`#include <curling.hpp>`

Inheritance diagram for curling::InitializationException:



Collaboration diagram for curling::InitializationException:



Public Member Functions

- **InitializationException** (const std::string &msg)

Public Member Functions inherited from curling::CurlingException

- **CurlingException** (const std::string &msg)

7.6.1 Detailed Description

Thrown when curl initialization fails.

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

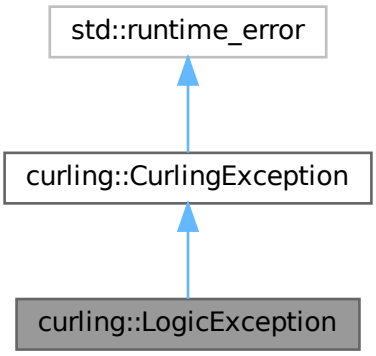
- include/curling.hpp

7.7 curling::LogicException Class Reference

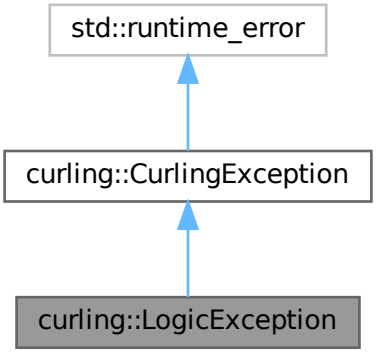
Thrown when library logic prohibits an operation.

`#include <curling.hpp>`

Inheritance diagram for curling::LogicException:



Collaboration diagram for curling::LogicException:



Public Member Functions

- **LogicException** (const std::string &msg)

Public Member Functions inherited from curling::CurlingException

- **CurlingException** (const std::string &msg)

7.7.1 Detailed Description

Thrown when library logic prohibits an operation.

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

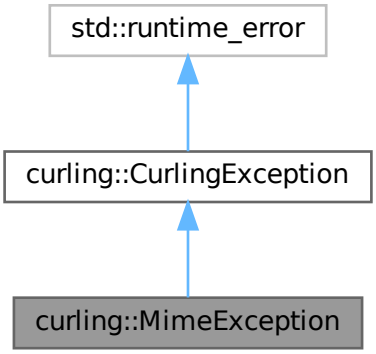
- include/curling.hpp

7.8 curling::MimeException Class Reference

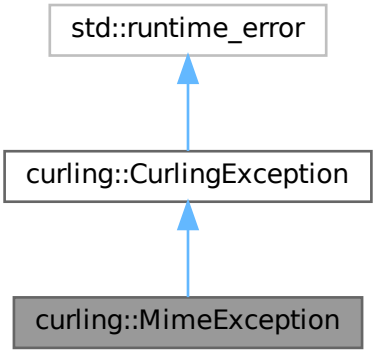
Thrown when MIME operations fail.

`#include <curling.hpp>`

Inheritance diagram for curling::MimeException:



Collaboration diagram for curling::MimeException:



Public Member Functions

- **MimeException** (const std::string &msg)

Public Member Functions inherited from curling::CurlingException

- **CurlingException** (const std::string &msg)

7.8.1 Detailed Description

Thrown when MIME operations fail.

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

- include/curling.hpp

7.9 curling::Request Class Reference

Provides a fluent wrapper for HTTP requests via libcurl.

`#include <curling.hpp>`

Public Types

- enum class Method { GET , POST , PUT , DEL , PATCH , HEAD , MIME }

  Supported HTTP methods.
- enum class AuthMethod { **BASIC** = CURLAUTH_BASIC , **NTLM** = CURLAUTH_NTLM , **DIGEST** = CURLAUTH_DIGEST }

  HTTP authentication schemes.
- enum class HttpVersion { DEFAULT , HTTP_1_1 , HTTP_2 , HTTP_3 }

  Specifies the HTTP version to be used for the request.
- using **ProgressCallback** = std::function< bool(curl_off_t dltotal, curl_off_t dlnow, curl_off_t ultotal, curl_off_t ulnow)>

Public Member Functions

- Request ()

  Constructor initializes curl global state.
- ~**Request** () noexcept

  Destructor cleans up curl state if last instance.
- **Request** (Request &&) noexcept
- Request & **operator=** (Request &&) noexcept
- **Request** (const Request &)=delete
- Request & **operator=** (const Request &)=delete
- Request & setProgressCallback (ProgressCallback cb)

  Sets the progress callback function.
- Request & setMethod (Method m)

  Sets the HTTP method for the request.
- Request & setURL (const std::string &url)

  Sets the request URL.
- Request & setProxy (const std::string &url)

  Enables proxy usage.
- Request & setProxyAuth (const std::string &username, const std::string &password)

  Sets credentials for proxy authentication.
- Request & setProxyAuthMethod (AuthMethod method)

  Sets proxy authentication scheme.
- Request & setHttpAuth (const std::string &username, const std::string &password)

  Sets credentials for HTTP auth (Basic/Digest/NTLM).
- Request & setHttpAuthMethod (AuthMethod method)

  Sets HTTP authentication scheme.
- Request & addArg (const std::string &key, const std::string &value)

  Adds a query parameter to the URL.
- Request & addHeader (const std::string &header)

  Adds a custom HTTP header.

- Request & setBody (const std::string &body)

  Sets the body of the request (for POST/PUT/PATCH).
- Request & downloadToFile (const std::string &path)

  Enables download streaming to a file.
- Request & setTimeout (long seconds)

  Sets a timeout for the request (in seconds).
- Request & setConnectTimeout (long seconds)

  Sets connection timeout (in seconds).
- Request & setFollowRedirects (bool follow)

  Enables or disables automatic redirect-following.
- Request & setAuthToken (const std::string &token)

  Adds a Bearer token for Authorization header.
- Request & setCookiePath (const std::string &path)

  Overrides default cookie file for persistence.
- Request & setUserAgent (const std::string &userAgent)

  Sets the User-Agent header.
- Request & addFormField (const std::string &fieldName, const std::string &value)

  Adds a field to multipart/form-data.
- Request & addFormFile (const std::string &fieldName, const std::string &filePath)

  Adds a file to multipart upload.
- Request & enableVerbose (bool enabled=true)

  Enables or disables libcurl verbose output.
- Response send ()

  Executes the HTTP request.
- void **reset** ()

  Resets internal state to allow reuse.
- Request & **setHttpVersion** (HttpVersion version)

  Set the HTTP protocol version (http1.1, 2 or 3)
- template<typename T >
  Request & setRawOption (CURLoption opt, T value)

  Low level access to define curl options.

Friends

- int **detail::ProgressCallbackBridge** (void *clientp, curl_off_t dltotal, curl_off_t dlnow, curl_off_t ultotal, curl_off_t ulnow)

7.9.1 Detailed Description

Provides a fluent wrapper for HTTP requests via libcurl.

7.9.2 Member Enumeration Documentation

7.9.2.1 HttpVersion

```
enum class curling::Request::HttpVersion  [strong]
```

Specifies the HTTP version to be used for the request.

Allows explicit control over the HTTP version that libcurl should use when performing a request. If the selected version is not supported by the libcurl build or the server, fallback behavior may occur.

Note

If you request a version not supported by libcurl at runtime, Curling will throw a LogicException during configuration. If the server doesn't support the version (e.g., HTTP/2), libcurl may fall back to an older version without error.

Enumerator

DEFAULT	Let libcurl automatically negotiate the best supported HTTP version.
HTTP_1↩ _1	Force HTTP/1.1 for all requests.
HTTP_2	Force HTTP/2 (requires libcurl built with nghttp2 support).
HTTP_3	Force HTTP/3 (requires libcurl built with HTTP/3 support, e.g. with quiche or ngtcp2).

7.9.2.2 Method

```
enum class curling::Request::Method  [strong]
```

Supported HTTP methods.

Enumerator

GET	Standard GET.
POST	Standard POST.
PUT	PUT.
DEL	DELETE (named DEL to avoid macro clash)
PATCH	PATCH.
HEAD	HEAD request just headers.
MIME	Multipart/form-data POST.

7.9.3 Constructor & Destructor Documentation

7.9.3.1 Request()

```
curling::Request::Request ( )
```

Constructor initializes curl global state.

Exceptions

InitializationException	if initialization fails.

7.9.4 Member Function Documentation

7.9.4.1 addArg()

```
Request & curling::Request::addArg (
            const std::string & key,
            const std::string & value )
```

Adds a query parameter to the URL.

Parameters

key	Parameter name.
value	Parameter value.

Returns

∗this

7.9.4.2 addFormField()

```
Request & curling::Request::addFormField (
            const std::string & fieldName,
            const std::string & value )
```

Adds a field to multipart/form-data.

Parameters

fieldName	Field name.
value	Field value.

Returns

∗this

Exceptions

MimeException	on internal curl errors.

7.9.4.3 addFormFile()

```
Request & curling::Request::addFormFile (
            const std::string & fieldName,
            const std::string & filePath )
```

Adds a file to multipart upload.

Parameters

fieldName	Field name.
filePath	Path to file on disk.

Returns

∗this

Exceptions

MimeException	on internal curl errors.

7.9.4.4 addHeader()

```
Request & curling::Request::addHeader (
            const std::string & header )
```

Adds a custom HTTP header.

Parameters

header	A full header line, e.g. "Accept: application/json".

Returns

∗this

7.9.4.5 downloadToFile()

```
Request & curling::Request::downloadToFile (
            const std::string & path )
```

Enables download streaming to a file.

Parameters

path	Local file path for saving response.

Returns

∗this

7.9.4.6 enableVerbose()

```
Request & curling::Request::enableVerbose (
            bool enabled = true )
```

Enables or disables libcurl verbose output.

Parameters

enabled	True to enable verbose mode.

Returns

∗this

7.9.4.7 send()

```
Response curling::Request::send ( )
```

Executes the HTTP request.

Returns

Response object with status, body, headers.

Exceptions

RequestException	on failure.

7.9.4.8 setAuthToken()

```
Request & curling::Request::setAuthToken (
            const std::string & token )
```

Adds a Bearer token for Authorization header.

Parameters

token	Bearer token string.

Returns

*this

7.9.4.9 setBody()

```
Request & curling::Request::setBody (
            const std::string & body )
```

Sets the body of the request (for POST/PUT/PATCH).

Parameters

body	Request body content.

Returns

*this

7.9.4.10 setConnectTimeout()

```
Request & curling::Request::setConnectTimeout (
            long seconds )
```

Sets connection timeout (in seconds).

Parameters

seconds	Timeout in seconds.

Returns

*this

7.9.4.11 setCookiePath()

```
Request & curling::Request::setCookiePath (
            const std::string & path )
```

Overrides default cookie file for persistence.

Parameters

path	File path for storing cookies.

Returns

*this

7.9.4.12 setFollowRedirects()

```
Request & curling::Request::setFollowRedirects (
            bool follow )
```

Enables or disables automatic redirect-following.

Parameters

follow	True to follow redirects.

Returns

*this

7.9.4.13 setHttpAuth()

```
Request & curling::Request::setHttpAuth (
            const std::string & username,
            const std::string & password )
```

Sets credentials for HTTP auth (Basic/Digest/NTLM).

Parameters

username	Username.
password	Password.

Returns

*this

7.9.4.14 setHttpAuthMethod()

```
Request & curling::Request::setHttpAuthMethod (
            AuthMethod method )
```

Sets HTTP authentication scheme.

Parameters

method	Authentication method.

Returns

∗this

7.9.4.15 setMethod()

```
Request & curling::Request::setMethod (
            Method m )
```

Sets the HTTP method for the request.

Parameters

m	Enum value for HTTP method.

Returns

∗this

7.9.4.16 setProgressCallback()

```
Request & curling::Request::setProgressCallback (
            ProgressCallback cb )
```

Sets the progress callback function.

Parameters

cb	Callback receiving download/upload progress. Return true to abort.

Returns

∗this

7.9.4.17 setProxy()

```
Request & curling::Request::setProxy (
            const std::string & url )
```

Enables proxy usage.

Parameters

url	Proxy URL.

Returns

∗this

7.9.4.18 setProxyAuth()

```
Request & curling::Request::setProxyAuth (
            const std::string & username,
            const std::string & password )
```

Sets credentials for proxy authentication.

Parameters

username	Proxy username.
password	Proxy password.

Returns

∗this

7.9.4.19 setProxyAuthMethod()

```
Request & curling::Request::setProxyAuthMethod (
            AuthMethod method )
```

Sets proxy authentication scheme.

Parameters

method	Authentication method.

Returns

∗this

7.9.4.20 setRawOption()

```
template<typename T >
Request & curling::Request::setRawOption (
            CURLoption opt,
            T value )  [inline]
```

Low level access to define curl options.

Warning

Should be used with caution. Meant for the libcurl advanced users.

7.9.4.21 setTimeout()

```
Request & curling::Request::setTimeout (
            long seconds )
```

Sets a timeout for the request (in seconds).

Parameters

seconds	Timeout in seconds.

Returns

∗this

7.9.4.22 setURL()

```
Request & curling::Request::setURL (
            const std::string & url )
```

Sets the request URL.

Parameters

url	URL to fetch.

Returns

∗this

7.9.4.23 setUserAgent()

```
Request & curling::Request::setUserAgent (
            const std::string & userAgent )
```

Sets the User-Agent header.

Parameters

userAgent	Agent string.

Returns

∗this

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

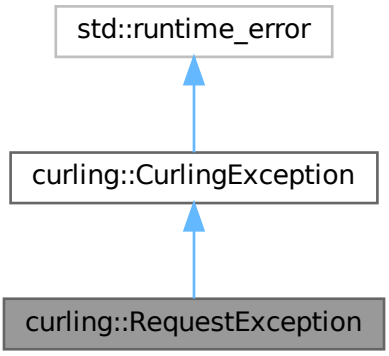
- include/curling.hpp

7.10 curling::RequestException Class Reference

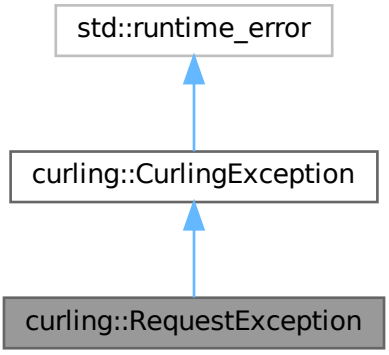
Thrown when a request operation fails.

`#include <curling.hpp>`

Inheritance diagram for curling::RequestException:



Collaboration diagram for curling::RequestException:



Public Member Functions

- **RequestException** (const std::string &msg)

Public Member Functions inherited from curling::CurlingException

- **CurlingException** (const std::string &msg)

7.10.1 Detailed Description

Thrown when a request operation fails.

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

- include/curling.hpp

7.11 curling::Response Struct Reference

Represents an HTTP response.

`#include <curling.hpp>`

Public Member Functions

- std::string **toString** () const
- std::vector< std::string > **getHeader** (const std::string &key) const

Public Attributes

- long **httpCode**

  HTTP status code.
- std::string **body**

  Response body.
- std::map< std::string, std::vector< std::string > > **headers**

  Header map (key: lowercase).

7.11.1 Detailed Description

Represents an HTTP response.

Contains the HTTP status code, body, and headers.

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

- include/curling.hpp

Chapter 8

File Documentation

8.1 curling.hpp

```
00001 /*
00002  * Copyright (c) 2025 Paul Caron
00003  *
00004  * This file is part of Curling - a modern C++ wrapper for libcurl.
00005  *
00006  * Licensed under the MIT License. You may obtain a copy of the license at
00007  * https://opensource.org/licenses/MIT
00008  */
00009
00010
00066 #pragma once
00067 #include <string>
00068 #include <map>
00069 #include <vector>
00070 #include <sstream>
00071 #include <mutex>
00072 #include <stdexcept>
00073 #include <algorithm>
00074 #include <cctype>
00075 #include <memory>
00076 #include <functional>
00077 #include <curl/curl.h>
00078
00079 namespace curling {
00080
00081 inline constexpr int version_major = 1;
00082 inline constexpr int version_minor = 1;
00083 inline constexpr int version_patch = 0;
00084
00085 inline std::string version() {
00086     std::ostringstream oss;
00087     oss « version_major « '.' « version_minor « '.' « version_patch;
00088     return oss.str();
00089 }
00090
00095 namespace detail {
00096
00097 inline std::once_flag curlGlobalInitFlag;
00098 inline std::mutex curlGlobalMutex;
00099
00100 inline int instanceCount = 0;
00101
00102 inline void ensureCurlGlobalInit(){
00103     std::call_once(curlGlobalInitFlag, []{
00104         curl_global_init(CURL_GLOBAL_DEFAULT);
00105     });
00106     std::lock_guard<std::mutex> lock(curlGlobalMutex);
00107     ++instanceCount;
00108 }
00109
00110 inline void maybeCleanupGlobalCurl() noexcept {
00111     std::lock_guard<std::mutex> lock(curlGlobalMutex);
00112     if(--instanceCount==0){
00113         curl_global_cleanup();
00114     }
00115 }
00116
00117 inline void trim(std::string& s) {
```

```
00118     s.erase(s.begin(), std::find_if(s.begin(), s.end(), [](unsigned char ch){
00119         return !std::isspace(ch);
00120     }));
00121     s.erase(std::find_if(s.rbegin(), s.rend(), [](unsigned char ch){
00122         return !std::isspace(ch);
00123     }).base(), s.end());
00124 }
00125
00126 inline void toLowerCase(std::string& s) {
00127     std::transform(s.begin(), s.end(), s.begin(),
00128                    [](unsigned char c) { return std::tolower(c); });
00129 }
00130
00131
00132 inline size_t WriteCallback(void* contents, size_t size, size_t nmemb, void* userp) {
00133     auto responseStream = static_cast<std::ostringstream*>(userp);
00134     responseStream->write(static_cast<char*>(contents), size * nmemb);
00135     return size * nmemb;
00136 }
00137
00138 inline size_t HeaderCallback(char* buffer, size_t size, size_t nitems, void* userdata) {
00139     auto* headerMap = static_cast<std::map<std::string, std::vector<std::string>>*>(userdata);
00140     std::string headerLine(buffer, size * nitems);
00141
00142     if (headerLine.empty()) return 0; // skip the separation line
00143
00144     auto colonPos = headerLine.find(":");
00145     if (colonPos != std::string::npos) {
00146         std::string key = headerLine.substr(0, colonPos);
00147         std::string value = headerLine.substr(colonPos + 1);
00148         detail::trim(key);
00149         detail::trim(value);
00150         detail::toLowerCase(key);
00151         (*headerMap)[key].push_back(value);
00152     }
00153
00154     return size * nitems;
00155 }
00156
00157 inline int ProgressCallbackBridge(void* clientp, curl_off_t dltotal, curl_off_t dlnow,
00158                                   curl_off_t ultotal, curl_off_t ulnow);
00159
00160
00161 }//detail end
00162
00167 class CurlingException : public std::runtime_error {
00168 public:
00169     explicit CurlingException(const std::string& msg) : std::runtime_error(msg) {}
00170 };
00171
00175 class InitializationException : public CurlingException {
00176 public:
00177     explicit InitializationException(const std::string& msg) : CurlingException(msg) {}
00178 };
00179
00183 class RequestException : public CurlingException {
00184 public:
00185     explicit RequestException(const std::string& msg) : CurlingException(msg) {}
00186 };
00187
00191 class HeaderException : public CurlingException {
00192 public:
00193     explicit HeaderException(const std::string& msg) : CurlingException(msg) {}
00194 };
00195
00199 class MimeException : public CurlingException {
00200 public:
00201     explicit MimeException(const std::string& msg) : CurlingException(msg) {}
00202 };
00203
00207 class LogicException : public CurlingException {
00208 public:
00209     explicit LogicException(const std::string& msg) : CurlingException(msg) {}
00210 };
00211
00213 struct CurlHandleDeleter { void operator()(CURL* h) const noexcept { if (h) curl_easy_cleanup(h); }};
00214 struct CurlSlistDeleter { void operator()(curl_slist* l) const noexcept { if (l)
    curl_slist_free_all(l); }};
00215 struct CurlMimeDeleter { void operator()(curl_mime* m) const noexcept { if (m) curl_mime_free(m); }};
00216
00217 using CurlPtr = std::unique_ptr<CURL, CurlHandleDeleter>;
00218 using CurlSlistPtr = std::unique_ptr<curl_slist, CurlSlistDeleter>;
00219 using CurlMimePtr = std::unique_ptr<curl_mime, CurlMimeDeleter>;
00220
00227 struct Response {
00228     long httpCode;
00229     std::string body;
```

```
00230     std::map<std::string, std::vector<std::string» headers;
00231
00232     std::string toString() const {
00233         std::ostringstream oss;
00234         oss « "status: " « httpCode « "\nbody:\n" « body « "\nheaders:\n";
00235         for (auto const& h : headers) {
00236             oss « h.first « ": ";
00237             for (auto const& v : h.second) oss « v « " ";
00238             oss « "\n";
00239         }
00240         return oss.str();
00241     }
00242     std::vector<std::string> getHeader(const std::string& key) const {
00243         std::string lowered = key;
00244         detail::toLowerCase(lowered);
00245         auto it = headers.find(lowered);
00246         return (it != headers.end()) ? it->second : std::vector<std::string>{};
00247     }
00248 };
00249
00254 class Request {
00255 public:
00256     using ProgressCallback = std::function<bool(curl_off_t dltotal, curl_off_t dlnow,
00257                                                 curl_off_t ultotal, curl_off_t ulnow)>;
00258
00263     enum class Method {
00264         GET,
00265         POST,
00266         PUT,
00267         DEL,
00268         PATCH,
00269         HEAD,
00270         MIME
00271     };
00272
00277     enum class AuthMethod {
00278         BASIC = CURLAUTH_BASIC,
00279         NTLM = CURLAUTH_NTLM,
00280         DIGEST = CURLAUTH_DIGEST
00281     };
00282
00296     enum class HttpVersion {
00297         DEFAULT,
00298         HTTP_1_1,
00299         HTTP_2,
00300         HTTP_3
00301     };
00302
00307     Request();
00308
00312     ~Request() noexcept;
00313
00314     Request(Request&&) noexcept;
00315     Request& operator=(Request&&) noexcept;
00316
00317     Request(const Request&) = delete;
00318     Request& operator=(const Request&) = delete;
00319
00325     Request& setProgressCallback(ProgressCallback cb);
00326
00332     Request& setMethod(Method m);
00333
00339     Request& setURL(const std::string& url);
00340
00346     Request& setProxy(const std::string& url);
00347
00354     Request& setProxyAuth(const std::string& username, const std::string& password);
00355
00361     Request& setProxyAuthMethod(AuthMethod method);
00362
00369     Request& setHttpAuth(const std::string& username, const std::string& password);
00370
00376     Request& setHttpAuthMethod(AuthMethod method);
00377
00384     Request& addArg(const std::string& key, const std::string& value);
00385
00391     Request& addHeader(const std::string& header);
00392
00398     Request& setBody(const std::string& body);
00399
00405     Request& downloadToFile(const std::string& path);
00406
00412     Request& setTimeout(long seconds);
00413
00419     Request& setConnectTimeout(long seconds);
00420
00426     Request& setFollowRedirects(bool follow);
```

```
00427
00433     Request& setAuthToken(const std::string& token);
00434
00440     Request& setCookiePath(const std::string& path);
00441
00447     Request& setUserAgent(const std::string& userAgent);
00448
00456     Request& addFormField(const std::string& fieldName, const std::string& value);
00457
00465     Request& addFormFile(const std::string& fieldName, const std::string& filePath);
00466
00472     Request& enableVerbose(bool enabled = true);
00473
00479     Response send();
00480
00484     void reset();
00485
00489     Request& setHttpVersion(HttpVersion version);
00490
00496     template<typename T>
00497     Request& setRawOption(CURLoption opt, T value) {
00498         static_assert(std::is_pointer<T>::value || std::is_arithmetic<T>::value,
00499                       "setRawOption only supports pointer or arithmetic types");
00500         curl_easy_setopt(curlHandle.get(), opt, value);
00501         return *this;
00502     }
00503
00504     friend int detail::ProgressCallbackBridge(void* clientp, curl_off_t dltotal, curl_off_t dlnow,
00505                                               curl_off_t ultotal, curl_off_t ulnow);
00506
00507
00508 private:
00509     Method method;
00510     CurlPtr curlHandle;
00511     CurlSlistPtr list;//headers;
00512     std::string url, args, body, cookieFile, cookieJar;
00513     CurlMimePtr mime;
00514     std::string downloadFilePath;
00515     ProgressCallback progressCallback;
00516     HttpVersion httpVersion = HttpVersion::DEFAULT;
00517
00518     void clean() noexcept;
00519     void updateURL();
00520 };
00521
00522 static_assert(!std::is_copy_constructible_v<Request> && !std::is_copy_assignable_v<Request>,
00523               "curling::Request is not copyable: it is thread-unsafe and must not be shared between
      threads. One instance per thread.");
00524
00525 namespace detail{
00526 inline int ProgressCallbackBridge(void* clientp, curl_off_t dltotal, curl_off_t dlnow,
00527                                   curl_off_t ultotal, curl_off_t ulnow) {
00528     auto* req = static_cast<Request*>(clientp);
00529     if (req->progressCallback) {
00530         bool shouldCancel = req->progressCallback(dltotal, dlnow, ultotal, ulnow);
00531         return shouldCancel ? 1 : 0; // Returning non-zero aborts transfer
00532     }
00533     return 0;
00534 }
00535 } // namespace detail
00536
00537 } // namespace curling
00538
```

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