

GT 4.2.0 C Common Libraries: Developer's Guide

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Introduction

The C Common Libraries provide an abstraction layer for data types, libc system calls, and data structures used throughout the Globus Toolkit and useful for applications that use the Globus Toolkit.

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Chapter 1. Before you begin

1. Feature summary

Features new in release GT 4.2.0:

- `globus_range_list` abstraction added
- `globus_logging` abstraction added
- In this release we added `globus_options`. This is some common code for parsing options from the command line, environment variables, or configuration files.

2. Tested platforms

The C common libraries work on any platform on which the toolkit is supported. See [supported platforms](#).

3. Backward compatibility summary

API changes since GT version 4.0.x

- `globus_range_list` abstraction added
- `globus_logging` abstraction added

All of the GT 3.2 API is still functional in GT 4.2.0.

4. Technology dependencies

C Common Libraries only depend on the `globus_core` module.

5. Security Considerations for C Common Libraries

There are no security considerations for the C Common Libraries.

Chapter 2. Usage scenarios

C Common libraries will need to be used if virtually any other toolkit component is used, since many data types are abstract and require the C common libraries to manipulate.

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Chapter 3. Architecture and design overview

Not available at this time.

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Chapter 4. APIs

1. Component API

See the [C API pages](#)¹ for other API documentation on globus_common.

2. Internationalization Infrastructure

The Globus Toolkit C Common Library now has optional infrastructure support for internationalization, which is used by GridFTP and its dependencies (non-ws authorization/authentication and XIO).

This means that user-presented strings are wrapped in a lookup function, which, if the globus_i18n module is installed and the GLOBUS_I18N environment variable is set to "YES", will lookup the string in a resource bundle using ICU4C. If GLOBUS_I18N is set to "NO", or the globus_i18n module is not installed, or the string value cannot be found in the resource bundle, the default string (exactly what was being looked up) is returned.

3. Developer Information

There are two functions that are used for string lookup.

The first is the preferred function; you supply a module descriptor and the string that you want to look up:

```
globus_common_i18n_get_string(  
    globus_module_descriptor_t * module,  
    char * key);
```

The second function is used if you need to look up a particular locale. A NULL value for locale will look up from the default locale:

```
globus_common_i18n_get_string_by_key(  
    char * locale,  
    char * resource_name,  
    char * key);
```

Typically, one or more macros will be defined on a per-module basis that supply the module descriptor, to reduce clutter in the code. Within the toolkit, these are typically `___?SL` where `???` are some mnemonic for the module in question (for example `_GCSL` is defined for `globus_common`).

The resource bundles used for the string lookups are created using ICU4C (see [IBM documentation on Resource Bundles](#))².

Our resource bundles are very simple; they contain simply a set of keys and strings. The key is actually the string itself: it is hashed using the `globus_hashtable_string_hash` function, then converted to contain only invariant characters (`#!@[]^{}~` are converted to `'_'`). See `globus_i18n_resource_init.c` in the `globus_i18n` source for an example of creating keys.

¹ <http://www.globus.org/api/c-globus-4.2.0/>

² <http://oss.software.ibm.com/icu/userguide/ResourceManagement.html>

While resource bundles for the Globus Toolkit are not by default created as part of the build process nor distributed in our binary distributions, there is a tool distributed with the `globus_i18n` package that makes them simple to construct.

Invoking `globus-i18n-resource-create <module name>` from the top level directory of a built (or at least configured) source package will generate a resource bundle for that package which can then be moved to `$GLOBUS_LOCATION/share/i18n/`.

`globus-i18n-resource-create` is part of the `globus_i18n` package, and will be installed if `--enable-i18n` was given as a configure option to the installer. `globus-i18n-resource-create` uses `globus-i18n-resource-init` and `genrb` from ICU4C to create the resource bundles.

Resource bundles must be installed in `$GLOBUS_LOCATION/share/i18n/`.

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Chapter 5. Environment variable interface

1. Environmental variables for C Common Libraries

- `GLOBUS_ERROR_VERBOSE=1` can be set to enable verbose error messages.
- `GLOBUS_ERROR_OUTPUT=1` can be set to enable output of all errors (including some that should be ignored).

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Chapter 6. Debugging

General C debugging techniques apply when developing with the C common libraries.

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Chapter 7. Troubleshooting

There are no specific troubleshooting techniques for the C common libraries.

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Chapter 8. Related Documentation

See the [C API pages](#)¹ for more information about this component.

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¹ <http://www.globus.org/api/c-globus-4.2.0/>