

liboqs-cpp

0.1

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Chapter 1

liboqs-cpp

[work in progress] C++ bindings for liboqs

Header-only C++ wrapper for liboqs

Chapter 2

Namespace Index

2.1 Namespace List

Here is a list of all namespaces with brief descriptions:

impl_details	Implementation details	11
oqs	Main namespace for the liboqs C++ wrapper	11
oqs::impl_details_	12
oqs_literals	12

Chapter 3

Hierarchical Index

3.1 Class Hierarchy

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

oqs::KeyEncapsulation::alg_details_	15
oqs::Signature::alg_details_	17
oqs::KeyEncapsulation	22
runtime_error	
oqs::MechanismNotEnabledError	27
oqs::MechanismNotSupportedError	29
oqs::Signature	30
oqs::impl_details_::Singleton< T >	39
oqs::KEMs	18
oqs::impl_details_::Singleton< const KEMs >	39
oqs::impl_details_::Singleton< const Sigs >	39
oqs::Sigs	35

Chapter 4

Class Index

4.1 Class List

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

oqs::KeyEncapsulation::alg_details_	
KEM algorithm details	15
oqs::Signature::alg_details_	
Signature algorithm details	17
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Singleton class, contains details about supported/enabled key exchange mechanisms (KEMs)	18
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Singleton class using CRTP pattern	39

Chapter 5

File Index

5.1 File List

Here is a list of all files with brief descriptions:

oqs_cpp.h	Main header file for the liboqs C++ wrapper	41
---------------------------	---	----

Chapter 6

Namespace Documentation

6.1 impl_details Namespace Reference

Implementation details.

6.1.1 Detailed Description

Implementation details.

6.2 oqs Namespace Reference

Main namespace for the liboqs C++ wrapper.

Namespaces

- [impl_details_](#)

Classes

- class [KEMs](#)
Singleton class, contains details about supported/enabled key exchange mechanisms ([KEMs](#))
- class [KeyEncapsulation](#)
Key encapsulation mechanisms.
- class [MechanismNotEnabledError](#)
Cryptographic scheme not enabled.
- class [MechanismNotSupportedError](#)
Cryptographic scheme not supported.
- class [Signature](#)
[Signature](#) mechanisms.
- class [Sigs](#)
Singleton class, contains details about supported/enabled signature mechanisms.

Typedefs

- using `byte` = `std::uint8_t`
byte (unsigned)
- using `bytes` = `std::vector< byte >`
vector of bytes (unsigned)

6.2.1 Detailed Description

Main namespace for the liboqs C++ wrapper.

6.2.2 Typedef Documentation

6.2.2.1 `byte`

```
using oqs::byte = typedef std::uint8_t
```

`byte` (unsigned)

6.2.2.2 `bytes`

```
using oqs::bytes = typedef std::vector<byte>
```

vector of bytes (unsigned)

6.3 `oqs::impl_details_` Namespace Reference

Classes

- class `Singleton`
`Singleton` class using CRTP pattern.

6.4 `oqs_literals` Namespace Reference

Functions

- `oqs::bytes operator""_bytes` (const char *c_str, std::size_t length)
User-defined literal operator for converting C-style strings to `oqs::bytes`.

6.4.1 Function Documentation

6.4.1.1 `operator""_bytes()`

```
oqs::bytes oqs_literals::operator""_bytes (
    const char * c_str,
    std::size_t length ) [inline]
```

User-defined literal operator for converting C-style strings to `oqs::bytes`.

Note

The null terminator is not included

Parameters

<i>c_str</i>	C-style string
<i>length</i>	C-style string length (deduced automatically by the compiler)

Returns

The byte representation of the input C-style string

Chapter 7

Class Documentation

7.1 oqs::KeyEncapsulation::alg_details_ Struct Reference

KEM algorithm details.

Public Attributes

- std::string [name](#)
- std::string [version](#)
- std::size_t [claimed_nist_level](#)
- bool [is_ind_cca](#)
- std::size_t [length_public_key](#)
- std::size_t [length_secret_key](#)
- std::size_t [length_ciphertext](#)
- std::size_t [length_shared_secret](#)

7.1.1 Detailed Description

KEM algorithm details.

7.1.2 Member Data Documentation

7.1.2.1 claimed_nist_level

```
std::size_t oqs::KeyEncapsulation::alg_details_::claimed_nist_level
```

7.1.2.2 is_ind_cca

```
bool oqs::KeyEncapsulation::alg_details_::is_ind_cca
```

7.1.2.3 length_ciphertext

```
std::size_t oqs::KeyEncapsulation::alg_details_::length_ciphertext
```

7.1.2.4 length_public_key

```
std::size_t oqs::KeyEncapsulation::alg_details_::length_public_key
```

7.1.2.5 length_secret_key

```
std::size_t oqs::KeyEncapsulation::alg_details_::length_secret_key
```

7.1.2.6 length_shared_secret

```
std::size_t oqs::KeyEncapsulation::alg_details_::length_shared_secret
```

7.1.2.7 name

```
std::string oqs::KeyEncapsulation::alg_details_::name
```

7.1.2.8 version

```
std::string oqs::KeyEncapsulation::alg_details_::version
```

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

- [oqs_cpp.h](#)

7.2 oqs::Signature::alg_details_ Struct Reference

[Signature](#) algorithm details.

Public Attributes

- `std::string` [name](#)
- `std::string` [version](#)
- `std::size_t` [claimed_nist_level](#)
- `bool` [is_euf_cma](#)
- `std::size_t` [length_public_key](#)
- `std::size_t` [length_secret_key](#)
- `std::size_t` [length_signature](#)

7.2.1 Detailed Description

[Signature](#) algorithm details.

7.2.2 Member Data Documentation

7.2.2.1 `claimed_nist_level`

```
std::size_t oqs::Signature::alg_details_::claimed_nist_level
```

7.2.2.2 `is_euf_cma`

```
bool oqs::Signature::alg_details_::is_euf_cma
```

7.2.2.3 `length_public_key`

```
std::size_t oqs::Signature::alg_details_::length_public_key
```

7.2.2.4 `length_secret_key`

```
std::size_t oqs::Signature::alg_details_::length_secret_key
```

7.2.2.5 length_signature

```
std::size_t oqs::Signature::alg_details_::length_signature
```

7.2.2.6 name

```
std::string oqs::Signature::alg_details_::name
```

7.2.2.7 version

```
std::string oqs::Signature::alg_details_::version
```

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

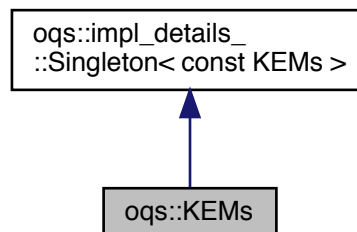
- [oqs_cpp.h](#)

7.3 oqs::KEMs Class Reference

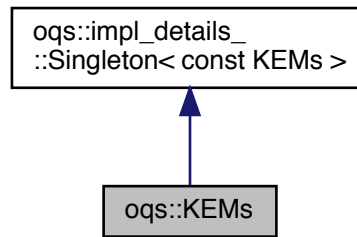
Singleton class, contains details about supported/enabled key exchange mechanisms ([KEMs](#))

```
#include <oqs_cpp.h>
```

Inheritance diagram for oqs::KEMs:



Collaboration diagram for oqs::KEMs:



Static Public Member Functions

- static `std::size_t max_number_KEMs ()`
Maximum number of supported [KEMs](#).
- static `bool is_KEM_supported (const std::string &alg_name)`
Checks whether the KEM algorithm `alg_name` is supported.
- static `bool is_KEM_enabled (const std::string &alg_name)`
Checks whether the KEM algorithm `alg_name` is enabled.
- static `std::string get_KEM_name (std::size_t alg_id)`
KEM algorithm name.
- static `std::vector< std::string > get_supported_KEMs ()`
List of supported KEM algorithms.
- static `std::vector< std::string > get_enabled_KEMs ()`
List of enabled KEM algorithms.

Private Member Functions

- `KEMs ()=default`
Private default constructor.

Friends

- class `impl_details_::Singleton< const KEMs >`

Additional Inherited Members

7.3.1 Detailed Description

Singleton class, contains details about supported/enabled key exchange mechanisms ([KEMs](#))

7.3.2 Constructor & Destructor Documentation

7.3.2.1 KEMs()

```
oqs::KEMs::KEMs ( ) [private], [default]
```

Private default constructor.

Note

Use [oqs::KEMs::get_instance\(\)](#) to create an instance

7.3.3 Member Function Documentation

7.3.3.1 get_enabled_KEMs()

```
static std::vector<std::string> oqs::KEMs::get_enabled_KEMs ( ) [inline], [static]
```

List of enabled KEM algorithms.

Returns

List of enabled KEM algorithms

7.3.3.2 get_KEM_name()

```
static std::string oqs::KEMs::get_KEM_name (
    std::size_t alg_id ) [inline], [static]
```

KEM algorithm name.

Parameters

<i>alg_{id}</i>	Cryptographic algorithm numerical id
-------------------------	--------------------------------------

Returns

KEM algorithm name

7.3.3.3 get_supported_KEMs()

```
static std::vector<std::string> oqs::KEMs::get_supported_KEMs ( ) [inline], [static]
```

List of supported KEM algorithms.

Returns

List of supported KEM algorithms

7.3.3.4 is_KEM_enabled()

```
static bool oqs::KEMs::is_KEM_enabled (
    const std::string & alg_name ) [inline], [static]
```

Checks whether the KEM algorithm *alg_name* is enabled.

Parameters

<i>alg_name</i>	Cryptographic algorithm name
-----------------	------------------------------

Returns

True if the KEM algorithm is enabled, false otherwise

7.3.3.5 is_KEM_supported()

```
static bool oqs::KEMs::is_KEM_supported (
    const std::string & alg_name ) [inline], [static]
```

Checks whether the KEM algorithm *alg_name* is supported.

Parameters

<i>alg_name</i>	Cryptographic algorithm name
-----------------	------------------------------

Returns

True if the KEM algorithm is supported, false otherwise

7.3.3.6 max_number_KEMs()

```
static std::size_t oqs::KEMs::max_number_KEMs ( ) [inline], [static]
```

Maximum number of supported [KEMs](#).

Returns

Maximum number of supported [KEMs](#)

7.3.4 Friends And Related Function Documentation

7.3.4.1 impl_details_::Singleton< const KEMs >

```
friend class impl_details_::Singleton< const KEMs > [friend]
```

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

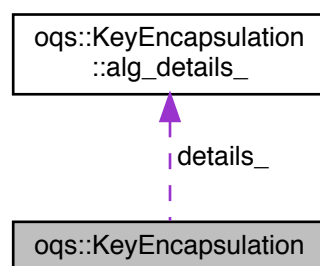
- [oqs_cpp.h](#)

7.4 oqs::KeyEncapsulation Class Reference

Key encapsulation mechanisms.

```
#include <oqs_cpp.h>
```

Collaboration diagram for oqs::KeyEncapsulation:



Classes

- struct [alg_details_](#)
KEM algorithm details.

Public Member Functions

- [KeyEncapsulation](#) (const std::string &alg_name, const [bytes](#) &secret_key={})
Constructs an instance of [oqs::KeyEncapsulation](#).
- virtual [~KeyEncapsulation](#) ()
Virtual default destructor.
- const [alg_details_](#) & [get_details](#) () const
KEM algorithm details.
- [bytes](#) [generate_keypair](#) ()
Generate public key.
- [bytes](#) [export_secret_key](#) () const
Export secret key.
- std::pair< [bytes](#), [bytes](#) > [encap_secret](#) (const [bytes](#) &public_key) const
Encapsulate secret.
- [bytes](#) [decap_secret](#) (const [bytes](#) &ciphertext) const
Decapsulate secret.

Private Attributes

- const std::string [alg_name_](#)
cryptographic algorithm name
- std::shared_ptr<::OQS_KEM > [kem_](#)
liboqs smart pointer to ::OQS_KEM
- [bytes](#) [secret_key_](#) {}
secret key
- struct [oqs::KeyEncapsulation::alg_details_](#) [details_](#)

Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [alg_details_](#) &rhs)
std::ostream extraction operator for the KEM algorithm details
- std::ostream & [operator<<](#) (std::ostream &os, const [KeyEncapsulation](#) &rhs)
std::ostream extraction operator for [oqs::KeyEncapsulation](#)

7.4.1 Detailed Description

Key encapsulation mechanisms.

7.4.2 Constructor & Destructor Documentation

7.4.2.1 KeyEncapsulation()

```
oqs::KeyEncapsulation::KeyEncapsulation (
    const std::string & alg_name,
    const bytes & secret_key = {} ) [inline]
```

Constructs an instance of [oqs::KeyEncapsulation](#).

Parameters

<i>alg_name</i>	Cryptographic algorithm name
<i>secret_key</i>	Secret key (optional)

7.4.2.2 ~KeyEncapsulation()

```
virtual oqs::KeyEncapsulation::~~KeyEncapsulation ( ) [inline], [virtual]
```

Virtual default destructor.

7.4.3 Member Function Documentation

7.4.3.1 decap_secret()

```
bytes oqs::KeyEncapsulation::decap_secret (
    const bytes & ciphertext ) const [inline]
```

Decapsulate secret.

Parameters

<i>ciphertext</i>	Ciphertext
-------------------	------------

Returns

Shared secret

7.4.3.2 encap_secret()

```
std::pair<bytes, bytes> oqs::KeyEncapsulation::encap_secret (
    const bytes & public_key ) const [inline]
```

Encapsulate secret.

Parameters

<i>public_key</i>	Public key
-------------------	------------

Returns

Pair consisting of 1) ciphertext, and 2) shared secret

7.4.3.3 export_secret_key()

```
bytes oqs::KeyEncapsulation::export_secret_key ( ) const [inline]
```

Export secret key.

Returns

Secret key

7.4.3.4 generate_keypair()

```
bytes oqs::KeyEncapsulation::generate_keypair ( ) [inline]
```

Generate public key.

Returns

Public key

7.4.3.5 get_details()

```
const alg_details_& oqs::KeyEncapsulation::get_details ( ) const [inline]
```

KEM algorithm details.

Returns

KEM algorithm details

7.4.4 Friends And Related Function Documentation**7.4.4.1 operator<< [1/2]**

```
std::ostream& operator<< (
    std::ostream & os,
    const alg_details_ & rhs ) [friend]
```

std::ostream extraction operator for the KEM algorithm details

Parameters

<i>os</i>	Output stream
<i>rhs</i>	Algorithm details instance

Returns

Reference to the output stream

7.4.4.2 operator<< [2/2]

```
std::ostream& operator<< (
    std::ostream & os,
    const KeyEncapsulation & rhs ) [friend]
```

std::ostream extraction operator for [oqs::KeyEncapsulation](#)

Parameters

<i>os</i>	Output stream
<i>rhs</i>	Key encapsulation instance

Returns

Reference to the output stream

7.4.5 Member Data Documentation**7.4.5.1 alg_name_**

```
const std::string oqs::KeyEncapsulation::alg_name_ [private]
```

cryptographic algorithm name

7.4.5.2 details_

```
struct oqs::KeyEncapsulation::alg_details_ oqs::KeyEncapsulation::details_ [private]
```

7.4.5.3 kem_

```
std::shared_ptr<::OQS_KEM> oqs::KeyEncapsulation::kem_ [private]
```

Initial value:

```
{nullptr, [] (::OQS_KEM* p) {
                                ::OQS_KEM_free(p);
}}
```

liboqs smart pointer to ::OQS_KEM

7.4.5.4 secret_key_

```
bytes oqs::KeyEncapsulation::secret_key_ {} [private]
```

secret key

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

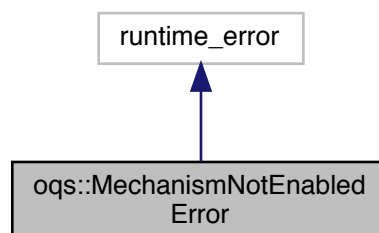
- [oqs_cpp.h](#)

7.5 oqs::MechanismNotEnabledError Class Reference

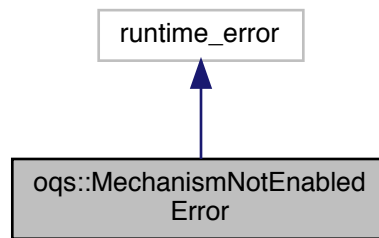
Cryptographic scheme not enabled.

```
#include <oqs_cpp.h>
```

Inheritance diagram for oqs::MechanismNotEnabledError:



Collaboration diagram for oqs::MechanismNotEnabledError:



Public Member Functions

- [MechanismNotEnabledError](#) (const std::string &alg_name)
Constructor.

7.5.1 Detailed Description

Cryptographic scheme not enabled.

7.5.2 Constructor & Destructor Documentation

7.5.2.1 MechanismNotEnabledError()

```
oqs::MechanismNotEnabledError::MechanismNotEnabledError (  
    const std::string & alg_name ) [inline]
```

Constructor.

Parameters

<code>alg_name</code>	Cryptographic algorithm name
-----------------------	------------------------------

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

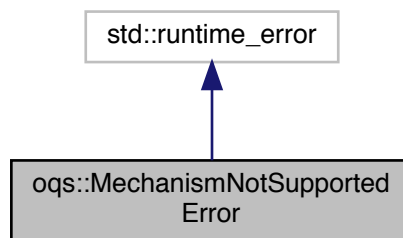
- [oqs_cpp.h](#)

7.6 oqs::MechanismNotSupportedError Class Reference

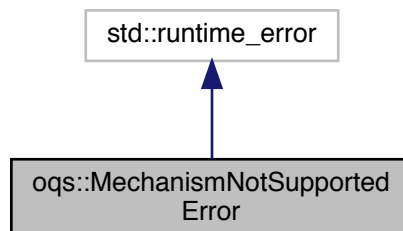
Cryptographic scheme not supported.

```
#include <oqs_cpp.h>
```

Inheritance diagram for oqs::MechanismNotSupportedError:



Collaboration diagram for oqs::MechanismNotSupportedError:



Public Member Functions

- [MechanismNotSupportedError](#) (const std::string &alg_name)
Constructor.

7.6.1 Detailed Description

Cryptographic scheme not supported.

7.6.2 Constructor & Destructor Documentation

7.6.2.1 MechanismNotSupportedError()

```
oqs::MechanismNotSupportedError::MechanismNotSupportedError (
    const std::string & alg_name ) [inline]
```

Constructor.

Parameters

<i>alg_name</i>	Cryptographic algorithm name
-----------------	------------------------------

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

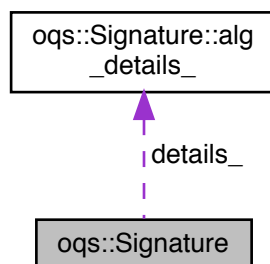
- [oqs_cpp.h](#)

7.7 oqs::Signature Class Reference

[Signature](#) mechanisms.

```
#include <oqs_cpp.h>
```

Collaboration diagram for oqs::Signature:



Classes

- struct [alg_details_](#)
Signature algorithm details.

Public Member Functions

- [Signature](#) (const std::string &alg_name, const [bytes](#) &secret_key={})
Constructs an instance of [oqs::Signature](#).
- virtual [~Signature](#) ()
Virtual default destructor.
- const [alg_details_](#) & [get_details](#) () const
[Signature](#) algorithm details.
- [bytes](#) [generate_keypair](#) ()
Generate public key.
- [bytes](#) [export_secret_key](#) () const
Export secret key.
- [bytes](#) [sign](#) (const [bytes](#) &message)
Sign message.
- bool [verify](#) (const [bytes](#) &message, const [bytes](#) &signature, const [bytes](#) &public_key)
Verify signature.

Private Attributes

- const std::string [alg_name_](#)
cryptographic algorithm name
- std::shared_ptr<::OQS_SIG > [sig_](#)
liboqs smart pointer to ::OQS_SIG
- [bytes](#) [secret_key_](#) {}
secret key
- struct [oqs::Signature::alg_details_](#) [details_](#)

Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [alg_details_](#) &rhs)
std::ostream extraction operator for the signature algorithm details
- std::ostream & [operator<<](#) (std::ostream &os, const [Signature](#) &rhs)
std::ostream extraction operator for [oqs::Signature](#)

7.7.1 Detailed Description

[Signature](#) mechanisms.

7.7.2 Constructor & Destructor Documentation

7.7.2.1 Signature()

```
oqs::Signature::Signature (
    const std::string & alg_name,
    const bytes & secret_key = {} ) [inline]
```

Constructs an instance of [oqs::Signature](#).

Parameters

<i>alg_name</i>	Cryptographic algorithm name
<i>secret_key</i>	Secret key (optional)

7.7.2.2 ~Signature()

```
virtual oqs::Signature::~~Signature ( ) [inline], [virtual]
```

Virtual default destructor.

7.7.3 Member Function Documentation

7.7.3.1 export_secret_key()

```
bytes oqs::Signature::export_secret_key ( ) const [inline]
```

Export secret key.

Returns

Secret key

7.7.3.2 generate_keypair()

```
bytes oqs::Signature::generate_keypair ( ) [inline]
```

Generate public key.

Returns

Public key

7.7.3.3 get_details()

```
const alg_details_& oqs::Signature::get_details ( ) const [inline]
```

[Signature](#) algorithm details.

Returns

[Signature](#) algorithm details

7.7.3.4 sign()

```
bytes oqs::Signature::sign (
    const bytes & message ) [inline]
```

Sign message.

Parameters

<i>message</i>	Message
----------------	---------

Returns

Message signature

7.7.3.5 verify()

```
bool oqs::Signature::verify (
    const bytes & message,
    const bytes & signature,
    const bytes & public_key ) [inline]
```

Verify signature.

Parameters

<i>message</i>	Message
<i>signature</i>	Signature
<i>public_key</i>	Public key

Returns

True if the signature is valid, false otherwise

7.7.4 Friends And Related Function Documentation

7.7.4.1 operator<< [1/2]

```
std::ostream& operator<< (
    std::ostream & os,
    const alg_details_ & rhs ) [friend]
```

std::ostream extraction operator for the signature algorithm details

Parameters

<i>os</i>	Output stream
<i>rhs</i>	Algorithm details

Returns

Reference to the output stream

7.7.4.2 operator<< [2/2]

```
std::ostream& operator<< (
    std::ostream & os,
    const Signature & rhs ) [friend]
```

std::ostream extraction operator for [oqs::Signature](#)

Parameters

<i>os</i>	Output stream
<i>rhs</i>	Signature instance

Returns

Reference to the output stream

7.7.5 Member Data Documentation**7.7.5.1 alg_name_**

```
const std::string oqs::Signature::alg_name_ [private]
```

cryptographic algorithm name

7.7.5.2 details_

```
struct oqs::Signature::alg_details_ oqs::Signature::details_ [private]
```

7.7.5.3 secret_key_

```
bytes oqs::Signature::secret_key_ {} [private]
```

secret key

7.7.5.4 sig_

```
std::shared_ptr<::OQS_SIG> oqs::Signature::sig_ [private]
```

Initial value:

```
{nullptr, [] (::OQS_SIG* p) {  
                                ::OQS_SIG_free(p);  
                                }}  
}
```

liboqs smart pointer to ::OQS_SIG

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

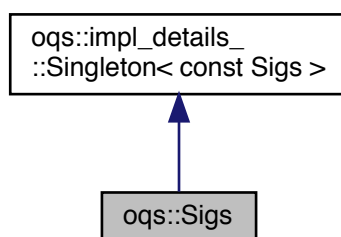
- [oqs_cpp.h](#)

7.8 oqs::Sigs Class Reference

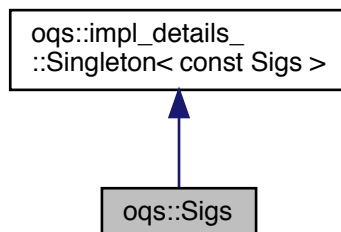
Singleton class, contains details about supported/enabled signature mechanisms.

```
#include <oqs_cpp.h>
```

Inheritance diagram for oqs::Sigs:



Collaboration diagram for oqs::Sigs:



Static Public Member Functions

- static std::size_t [max_number_Sigs](#) ()
Maximum number of supported signatures.
- static bool [is_Sig_supported](#) (const std::string &alg_name)
Checks whether the signature algorithm alg_name is supported.
- static bool [is_Sig_enabled](#) (const std::string &alg_name)
Checks whether the signature algorithm alg_name is enabled.
- static std::string [get_Sig_name](#) (std::size_t alg_id)
Signature algorithm name.
- static std::vector< std::string > [get_supported_Sigs](#) ()
List of supported signature algorithms.
- static std::vector< std::string > [get_enabled_Sigs](#) ()
List of enabled KEM algorithms.

Private Member Functions

- [Sigs](#) ()=default
Private default constructor.

Friends

- class [impl_details_::Singleton](#)< const Sigs >

Additional Inherited Members

7.8.1 Detailed Description

Singleton class, contains details about supported/enabled signature mechanisms.

7.8.2 Constructor & Destructor Documentation

7.8.2.1 Sigs()

```
oqs::Sigs::Sigs ( ) [private], [default]
```

Private default constructor.

Note

Use [oqs::Sigs::get_instance\(\)](#) to create an instance

7.8.3 Member Function Documentation

7.8.3.1 get_enabled_Sigs()

```
static std::vector<std::string> oqs::Sigs::get_enabled_Sigs ( ) [inline], [static]
```

List of enabled KEM algorithms.

Returns

List of enabled KEM algorithms

7.8.3.2 get_Sig_name()

```
static std::string oqs::Sigs::get_Sig_name (
    std::size_t alg_id ) [inline], [static]
```

[Signature](#) algorithm name.

Parameters

$alg \leftrightarrow$ _id	Cryptographic algorithm numerical id
------------------------------	--------------------------------------

Returns

[Signature](#) algorithm name

7.8.3.3 get_supported_Sigs()

```
static std::vector<std::string> oqs::Sigs::get_supported_Sigs ( ) [inline], [static]
```

List of supported signature algorithms.

Returns

List of supported signature algorithms

7.8.3.4 is_Sig_enabled()

```
static bool oqs::Sigs::is_Sig_enabled (
    const std::string & alg_name ) [inline], [static]
```

Checks whether the signature algorithm *alg_name* is enabled.

Parameters

<i>alg_name</i>	Cryptographic algorithm name
-----------------	------------------------------

Returns

True if the signature algorithm is enabled, false otherwise

7.8.3.5 is_Sig_supported()

```
static bool oqs::Sigs::is_Sig_supported (
    const std::string & alg_name ) [inline], [static]
```

Checks whether the signature algorithm *alg_name* is supported.

Parameters

<i>alg_name</i>	Cryptographic algorithm name
-----------------	------------------------------

Returns

True if the signature algorithm is supported, false otherwise

7.8.3.6 max_number_Sigs()

```
static std::size_t oqs::Sigs::max_number_Sigs ( ) [inline], [static]
```

Maximum number of supported signatures.

Returns

Maximum number of supported signatures

7.8.4 Friends And Related Function Documentation**7.8.4.1 impl_details::Singleton< const Sigs >**

```
friend class impl_details::Singleton< const Sigs > [friend]
```

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

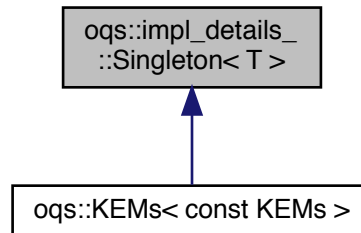
- [oqs_cpp.h](#)

7.9 oqs::impl_details_::Singleton< T > Class Template Reference

[Singleton](#) class using CRTP pattern.

```
#include <oqs_cpp.h>
```

Inheritance diagram for oqs::impl_details_::Singleton< T >:



Static Public Member Functions

- static T & [get_instance](#) () noexcept(std::is_nothrow_constructible< T >::value)
[Singleton](#) instance (thread-safe) via CRTP pattern.

Protected Member Functions

- [Singleton](#) () noexcept=default
- [Singleton](#) (const [Singleton](#) &)=delete
- [Singleton](#) & [operator=](#) (const [Singleton](#) &)=delete
- virtual [~Singleton](#) ()=default

7.9.1 Detailed Description

```
template<typename T>
class oqs::impl_details_::Singleton< T >
```

[Singleton](#) class using CRTP pattern.

Template Parameters

<i>T</i>	Class type of which instance will become a Singleton
----------	--

7.9.2 Constructor & Destructor Documentation

7.9.2.1 Singleton() [1/2]

```
template<typename T>
oqs::impl_details_::Singleton< T >::Singleton ( ) [protected], [default], [noexcept]
```

7.9.2.2 Singleton() [2/2]

```
template<typename T>
oqs::impl_details_::Singleton< T >::Singleton (
    const Singleton< T > & ) [protected], [delete]
```

7.9.2.3 ~Singleton()

```
template<typename T>
virtual oqs::impl_details_::Singleton< T >::~~Singleton ( ) [protected], [virtual], [default]
```

7.9.3 Member Function Documentation

7.9.3.1 get_instance()

```
template<typename T>
static T& oqs::impl_details_::Singleton< T >::get_instance ( ) [inline], [static], [noexcept]
```

[Singleton](#) instance (thread-safe) via CRTP pattern.

Note

Code from <https://github.com/vsoftco/qpp/blob/master/include/internal/classes/singleton.h>

Returns

[Singleton](#) instance

7.9.3.2 operator=()

```
template<typename T>
Singleton& oqs::impl_details_::Singleton< T >::operator= (
    const Singleton< T > & ) [protected], [delete]
```

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

- [oqs_cpp.h](#)

Chapter 8

File Documentation

8.1 oqs_cpp.h File Reference

Main header file for the liboqs C++ wrapper.

```
#include <oqs/oqs.h>
#include <algorithm>
#include <cstdint>
#include <cstdlib>
#include <cstring>
#include <exception>
#include <memory>
#include <ostream>
#include <string>
#include <utility>
#include <vector>
```

Include dependency graph for oqs_cpp.h:



Classes

- class [oqs::impl_details_::Singleton< T >](#)
Singleton class using CRTP pattern.
- class [oqs::MechanismNotSupportedError](#)
Cryptographic scheme not supported.
- class [oqs::MechanismNotEnabledError](#)
Cryptographic scheme not enabled.
- class [oqs::KEMs](#)
Singleton class, contains details about supported/enabled key exchange mechanisms ([KEMs](#))
- class [oqs::KeyEncapsulation](#)
Key encapsulation mechanisms.

- struct [oqs::KeyEncapsulation::alg_details_](#)
KEM algorithm details.
- class [oqs::Sigs](#)
Singleton class, contains details about supported/enabled signature mechanisms.
- class [oqs::Signature](#)
Signature mechanisms.
- struct [oqs::Signature::alg_details_](#)
Signature algorithm details.

Namespaces

- [oqs](#)
Main namespace for the liboqs C++ wrapper.
- [impl_details](#)
Implementation details.
- [oqs::impl_details_](#)
- [oqs_literals](#)

Typedefs

- using [oqs::byte](#) = std::uint8_t
byte (unsigned)
- using [oqs::bytes](#) = std::vector< byte >
vector of bytes (unsigned)

Functions

- std::ostream & [operator<<](#) (std::ostream &os, const [oqs::bytes](#) &rhs)
- std::ostream & [operator<<](#) (std::ostream &os, const std::vector< std::string > &rhs)
- [oqs::bytes oqs_literals::operator""_bytes](#) (const char *c_str, std::size_t length)
User-defined literal operator for converting C-style strings to [oqs::bytes](#).

8.1.1 Detailed Description

Main header file for the liboqs C++ wrapper.

8.1.2 Function Documentation

8.1.2.1 [operator<<\(\)](#) [1/2]

```
std::ostream& operator<< (
    std::ostream & os,
    const oqs::bytes & rhs ) [inline]
```

std::ostream extraction operator for [oqs::bytes](#)

Parameters

<i>os</i>	Output stream
<i>rhs</i>	Signature instance

Returns

Reference to the output stream

8.1.2.2 operator<<() [2/2]

```
std::ostream& operator<< (  
    std::ostream & os,  
    const std::vector< std::string > & rhs ) [inline]
```

::ostream extraction operator for vectors of strings

Parameters

<i>os</i>	Output stream
<i>rhs</i>	Signature instance

Returns

Reference to the output stream

8.2 /Users/vlad/ClionProjects/liboqs-cpp/README.md File Reference

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