



YAODAQ

Y e t A n O t h e r D A Q

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Chapter 1

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Chapter 3

Namespace Index

3.1 Namespace List

Here is a list of all namespaces with brief descriptions:

spdlog	19
yaodaq	19

Chapter 4

Hierarchical Index

4.1 Class Hierarchy

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

ix::ConnectionState	
yaodaq::ConnectionState	25
std::exception	
yaodaq::Exception	26
yaodaq::Identifier	28
yaodaq::Interrupt	30
yaodaq::Key	31
yaodaq::LoggerHandler	32
yaodaq::Looper	34
yaodaq::Message	36
yaodaq::Open	40
source_location	
yaodaq::Exception	26
semver::version	
yaodaq::Version	43
ix::WebSocket	
yaodaq::WebsocketClient	45
ix::WebSocketServer	
yaodaq::WebsocketServer	47

Chapter 5

Data Structure Index

5.1 Data Structures

Here are the data structures with brief descriptions:

yaodag::ConnectionState	25
yaodag::Exception	26
yaodag::Identifier	28
yaodag::Interrupt	30
yaodag::Key	31
yaodag::LoggerHandler	32
yaodag::Looper	34
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yaodag::WebsocketClient	45
yaodag::WebsocketServer	47

Chapter 6

File Index

6.1 File List

Here is a list of all files with brief descriptions:

yaodag/Classification.hpp	51
yaodag/ConnectionState.hpp	52
yaodag/Exception.hpp	53
yaodag/Identifier.hpp	54
yaodag/Interrupt.hpp	54
yaodag/IXWebsocketMessage.hpp	55
yaodag/Key.hpp	56
yaodag/LoggerHandler.hpp	56
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yaodag/Message.hpp	58
yaodag/MessageType.hpp	59
yaodag/Severity.hpp	60
yaodag/Signal.hpp	60
yaodag/StatusCode.hpp	61
yaodag/Version.hpp	62
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yaodag/ConnectionState.cpp	64
yaodag/Exception.cpp	65
yaodag/Identifier.cpp	66
yaodag/Interrupt.cpp	67
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yaodag/LoggerHandler.cpp	69
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yaodag/Message.cpp	71
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yaodag/WebsocketClient.cpp	73
yaodag/WebsocketServer.cpp	75

Chapter 7

Namespace Documentation

7.1 spdlog Namespace Reference

Typedefs

- using [sink_ptr](#) = std::shared_ptr< spdlog::sinks::sink >

7.1.1 Detailed Description

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7.1.2 Typedef Documentation

7.1.2.1 sink_ptr

using [spdlog::sink_ptr](#) = typedef std::shared_ptr<spdlog::sinks::sink>
Definition at line 15 of file [LoggerHandler.hpp](#).

7.2 yaodag Namespace Reference

Data Structures

- class [ConnectionState](#)
- class [Exception](#)
- class [Identifier](#)
- class [Interrupt](#)
- class [Key](#)
- class [LoggerHandler](#)
- class [Looper](#)
- class [Message](#)
- class [Open](#)
- class [Version](#)
- class [WebsocketClient](#)
- class [WebsocketServer](#)

Enumerations

- enum class [Domain](#) : std::uint_least8_t { [Unknown](#) = 0 , [Application](#) = 1 , [Web](#) = 2 }

- enum class [Class](#) : std::uint_least8_t {
 [Unknown](#) = 0 , [Server](#) , [Client](#) , [Module](#) ,
 [Board](#) }
- enum class [Family](#) : std::uint_least16_t {
 [Unknown](#) = 0 , [WebSocketServer](#) , [WebSocketClient](#) , [Logger](#) ,
 [Controller](#) , [Configurator](#) , [SlowController](#) , [Viewer](#) ,
 [Analyser](#) , [FileWriter](#) }
- enum class [MessageType](#) : std::int_least16_t {
 [Open](#) = -1 , [Close](#) = -2 , [ConnectionError](#) = -3 , [Ping](#) = -4 ,
 [Pong](#) = -5 , [Fragment](#) = -6 , [Unknown](#) = 0 }
- enum class [Severity](#) : std::int_least16_t { [Info](#) = 1 , [Warning](#) = 10 , [Error](#) = 100 , [Critical](#) = 1000 }
- enum class [Signal](#) {
 [NO](#) = 0 , [ABRT](#) = static_cast<int>(Severity::Critical) + 1 , [FPE](#) = static_cast<int>(Severity::Critical) + 2 ,
 [ILL](#) = static_cast<int>(Severity::Critical) + 3 ,
 [SEGV](#) = static_cast<int>(Severity::Critical) + 4 , [INT](#) = static_cast<int>(Severity::Warning) + 1 , [TERM](#) =
 static_cast<int>(Severity::Warning) + 2 }
- enum class [StatusCode](#) : std::int_least32_t { [SUCCESS](#) = 0 , [LISTEN_ERROR](#) , [WRONG_NUMBER_PARAMETERS](#)
 , [CLIENT_WITH_SAME_NAME_ALREADY_CONNECTED](#) = 4999 }

Functions

- std::ostream & [operator<<](#) (std::ostream &os, const [MessageType](#) &messageTypes)

7.2.1 Detailed Description

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7.2.2 Enumeration Type Documentation

7.2.2.1 Class

```
enum class yaodag::Class : std::uint_least8_t [strong]
```

Enumerator

Unknown	
Server	
Client	
Module	
Board	

Definition at line 22 of file [Classification.hpp](#).

```
00023 {
00024     Unknown = 0,
00025     Server,
00026     Client,
00027     // Module is a client with start stop etc...
00028     Module,
00029     // Board is a module with a connector
00030     Board,
00031 };
```

7.2.2.2 Domain

```
enum class yaodag::Domain : std::uint_least8_t [strong]
```

Enumerator

Unknown	
Application	
Web	

Definition at line 14 of file [Classification.hpp](#).

```
00015 {
00016     Unknown    = 0,
00017     Application = 1,
00018     Web        = 2,
00019 };
```

7.2.2.3 Family

```
enum class yaodag::Family : std::uint_least16_t [strong]
```

Enumerator

Unknown	
WebSocketServer	
WebSocketClient	
Logger	
Controller	
Configurator	
SlowController	
Viewer	
Analyser	
FileWriter	

Definition at line 34 of file [Classification.hpp](#).

```
00035 {
00036     Unknown    = 0,
00037     WebSocketServer,
00038     WebSocketClient,
00039     Logger,
00040     Controller,
00041     Configurator,
00042     SlowController,
00043     Viewer,
00044     Analyser,
00045     FileWriter,
00046 };
```

7.2.2.4 MessageType

```
enum class yaodag::MessageType : std::int_least16_t [strong]
```

Enumerator

Open	
Close	
ConnectionError	
Ping	
Pong	
Fragment	
Unknown	

Definition at line 15 of file [MessageType.hpp](#).

```

00016 {
00017     // IXWebSocket MessageType (Message is not set here)
00018     Open          = -1,
00019     Close         = -2,
00020     ConnectionError = -3,
00021     Ping         = -4,
00022     Pong         = -5,
00023     Fragment     = -6,
00024     // Unknown should not be used !
00025     Unknown      = 0,
00026 };

```

7.2.2.5 Severity

```
enum class yaodag::Severity : std::int_least16_t [strong]
```

Enumerator

Info	
Warning	
Error	
Critical	

Definition at line 13 of file [Severity.hpp](#).

```

00014 {
00015     Info      = 1,
00016     Warning   = 10,
00017     Error     = 100,
00018     Critical  = 1000,
00019 };

```

7.2.2.6 Signal

```
enum class yaodag::Signal [strong]
```

Enumerator

NO	
ABRT	
FPE	
ILL	
SEGV	
INT	
TERM	

Definition at line 15 of file [Signal.hpp](#).

```

00016 {
00017     NO      = 0, // No Signal.
00018     // Critical
00019     ABRT = static_cast<int>( Severity::Critical ) + 1, // (Signal Abort) Abnormal termination, such as
is initiated by the abort function.
00020     FPE = static_cast<int>( Severity::Critical ) + 2, // (Signal Floating-Point Exception) Erroneous
arithmetic operation, such as zero divide or an operation resulting in overflow (not necessarily with
a floating-point operation).
00021     ILL = static_cast<int>( Severity::Critical ) + 3, // (Signal Illegal Instruction) Invalid function
image, such as an illegal instruction. This is generally due to a corruption in the code or to an
attempt to execute data.
00022     SEGV = static_cast<int>( Severity::Critical ) + 4, // (Signal Segmentation Violation) Invalid
access to storage: When a program tries to read or write outside the memory it has allocated.
00023     // Warning
00024     INT = static_cast<int>( Severity::Warning ) + 1, // (Signal Interrupt) Interactive attention
signal. Generally generated by the application user.
00025     TERM = static_cast<int>( Severity::Warning ) + 2, // (Signal Terminate) Termination request sent to
program.
00026 };

```

7.2.2.7 StatusCode

```
enum class yaodag::StatusCode : std::int_least32_t [strong]
```

Enumerator

SUCCESS	
LISTEN_ERROR	
WRONG_NUMBER_PARAMETERS	
CLIENT_WITH_SAME_NAME_ALREADY_CONNECTED	

Definition at line 13 of file [StatusCode.hpp](#).

```
00014 {  
00015     SUCCESS = 0,  
00016     LISTEN_ERROR,  
00017     WRONG_NUMBER_PARAMETERS,  
00018     CLIENT_WITH_SAME_NAME_ALREADY_CONNECTED = 4999,  
00019 };
```

7.2.3 Function Documentation

7.2.3.1 operator<<()

```
std::ostream & yaodag::operator<< (  
    std::ostream & os,  
    const MessageType & messageTypes ) [inline]
```

Definition at line 28 of file [MessageType.hpp](#).

```
00028 { return os << static_cast<std::int_least8_t>( messageTypes ) + 0; }
```

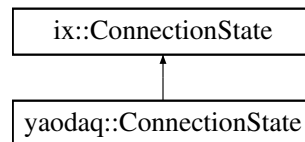

Chapter 8

Data Structure Documentation

8.1 yaodaq::ConnectionState Class Reference

```
#include <yaodaq/ConnectionState.hpp>
```

Inheritance diagram for yaodaq::ConnectionState:



Public Member Functions

- virtual void [computeId](#) (const std::string &host, const [Identifier](#) &id) final
- [ConnectionState](#) ()
- virtual [~ConnectionState](#) ()

8.1.1 Detailed Description

Definition at line 21 of file [ConnectionState.hpp](#).

8.1.2 Constructor & Destructor Documentation

8.1.2.1 ConnectionState()

```
yaodaq::ConnectionState::ConnectionState ( )
```

Definition at line 14 of file [ConnectionState.cpp](#).

```
00014 : ix::ConnectionState() {}
```

8.1.2.2 ~ConnectionState()

```
yaodaq::ConnectionState::~~ConnectionState ( ) [virtual]
```

Definition at line 16 of file [ConnectionState.cpp](#).

```
00017 {  
00018     std::lock_guard<std::mutex> guard( m_Mutex );  
00019     m_Ids.remove( m_Pair );  
00020 }
```

8.1.3 Member Function Documentation

8.1.3.1 computeId()

```
void yaodag::ConnectionState::computeId (
    const std::string & host,
    const Identifier & id ) [final], [virtual]
```

Definition at line 22 of file [ConnectionState.cpp](#).

```
00023 {
00024     std::lock_guard<std::mutex> guard( m_Mutex );
00025     m_Pair = std::pair<std::string, std::string>( host, id.getName() );
00026
00027     if( id.empty() ) { _id = std::to_string( _globalId++ ); }
00028     else
00029     {
00030         std::list<std::pair<std::string, std::string>::iterator found = std::find( m_Ids.begin(),
00031         m_Ids.end(), m_Pair );
00032         if( found == m_Ids.end() )
00033         {
00034             _id = id.getName();
00035             m_Ids.push_back( m_Pair );
00036         }
00037         else
00038         {
00039             setTerminated();
00040         }
00041     }
```

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

- [yaodag/ConnectionState.hpp](#)
- [yaodag/ConnectionState.cpp](#)

8.2 yaodag::Exception Class Reference

```
#include <yaodag/Exception.hpp>
```

Inheritance diagram for yaodag::Exception:



Public Member Functions

- [Exception](#) ()=delete
- [Exception](#) (const [StatusCode](#) &statusCode, const std::string &[description](#), const source_location &location=source_location::current())
- [~Exception](#) () noexcept override=default
- const char * [what](#) () const noexcept final
- const char * [description](#) () const noexcept
- std::int_least32_t [code](#) () const noexcept

Static Public Member Functions

- static void [setFormat](#) (const std::string &format)
- static void [setStyle](#) (const fmt::text_style &style={})

8.2.1 Detailed Description

Definition at line 19 of file [Exception.hpp](#).

8.2.2 Constructor & Destructor Documentation

8.2.2.1 Exception() [1/2]

```
yaodag::Exception::Exception ( ) [delete]
```

8.2.2.2 Exception() [2/2]

```
yaodag::Exception::Exception (
    const StatusCode & statusCode,
    const std::string & description,
    const source_location & location = source_location::current() )
```

Definition at line 14 of file [Exception.cpp](#).

```
00014 : source_location( location ), m_Code( static\_cast<std::int_least32_t>( statusCode ) ), m_Description(
    description ) { constructMessage(); }
```

8.2.2.3 ~Exception()

```
yaodag::Exception::~~Exception ( ) [override], [default], [noexcept]
```

8.2.3 Member Function Documentation

8.2.3.1 code()

```
std::int_least32_t yaodag::Exception::code ( ) const [noexcept]
```

Definition at line 20 of file [Exception.cpp](#).

```
00020 { return m_Code; }
```

8.2.3.2 description()

```
const char * yaodag::Exception::description ( ) const [noexcept]
```

Definition at line 18 of file [Exception.cpp](#).

```
00018 { return m_Description.c_str(); }
```

8.2.3.3 setFormat()

```
static void yaodag::Exception::setFormat (
    const std::string & format ) [inline], [static]
```

Definition at line 24 of file [Exception.hpp](#).

```
00024 { m_Format = format; }
```

8.2.3.4 setStyle()

```
static void yaodag::Exception::setStyle (
    const fmt::text_style & style = {} ) [inline], [static]
```

Definition at line 26 of file [Exception.hpp](#).

```
00026 {} ) { m_Style = style; }
```

8.2.3.5 what()

```
const char * yaodag::Exception::what ( ) const [final], [noexcept]
```

Definition at line 16 of file [Exception.cpp](#).

```
00016 { return m_Message.c_str(); }
```

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

- [yaodag/Exception.hpp](#)
- [yaodag/Exception.cpp](#)

8.3 yaodaq::Identifier Class Reference

```
#include <yaodaq/Identifier.hpp>
```

Public Member Functions

- [Identifier](#) ()=default
- [Identifier](#) (const std::string &type, const std::string &name)
- void [generateKey](#) (const [Domain](#) &domain=[Domain::Unknown](#), const [Class](#) &c_lass=[Class::Unknown](#), const [Family](#) &family=[Family::Unknown](#))
- std::string [getDomain](#) () const
- std::string [getClass](#) () const
- std::string [getFamily](#) () const
- std::string [getType](#) () const
- std::string [getName](#) () const
- [Key](#) [getKey](#) () const
- std::string [get](#) () const
- bool [empty](#) () const

Static Public Member Functions

- static [Identifier](#) [parse](#) (const std::string &)

8.3.1 Detailed Description

Definition at line 16 of file [Identifier.hpp](#).

8.3.2 Constructor & Destructor Documentation

8.3.2.1 Identifier() [1/2]

```
yaodaq::Identifier::Identifier ( ) [default]
```

8.3.2.2 Identifier() [2/2]

```
yaodaq::Identifier::Identifier (
    const std::string & type,
    const std::string & name )
```

Definition at line 26 of file [Identifier.cpp](#).

```
00026 : m_Type( type ), m_Name( name ) {}
```

8.3.3 Member Function Documentation

8.3.3.1 empty()

```
bool yaodaq::Identifier::empty ( ) const
```

Definition at line 19 of file [Identifier.cpp](#).

```
00020 {
00021     if( get() == Identifier().get() ) return true;
00022     else
00023         return false;
00024 }
```

8.3.3.2 generateKey()

```
void yaodaq::Identifier::generateKey (
    const Domain & domain = Domain::Unknown,
    const Class & c_class = Class::Unknown,
    const Family & family = Family::Unknown )
```

Definition at line 28 of file [Identifier.cpp](#).

```
00028 { m_Key = Key( domain, c_class, family ); }
```

8.3.3.3 get()

```
std::string yaodaq::Identifier::get ( ) const
```

Definition at line 42 of file [Identifier.cpp](#).

```
00042 { return fmt::format( "{0}/{1}/{2}/{3}/{4}", getDomain(), getClass(), getFamily(), getType(),
    getName() ); }
```

8.3.3.4 getClass()

```
std::string yaodaq::Identifier::getClass ( ) const
```

Definition at line 32 of file [Identifier.cpp](#).

```
00032 { return static_cast<std::string>( magic_enum::enum_name( magic_enum::enum_cast<Class>(
    m_Key.getClass() ).value() ) ); }
```

8.3.3.5 getDomain()

```
std::string yaodaq::Identifier::getDomain ( ) const
```

Definition at line 30 of file [Identifier.cpp](#).

```
00030 { return static_cast<std::string>( magic_enum::enum_name( magic_enum::enum_cast<Domain>(
    m_Key.getDomain() ).value() ) ); }
```

8.3.3.6 getFamily()

```
std::string yaodaq::Identifier::getFamily ( ) const
```

Definition at line 34 of file [Identifier.cpp](#).

```
00034 { return static_cast<std::string>( magic_enum::enum_name( magic_enum::enum_cast<Family>(
    m_Key.getFamily() ).value() ) ); }
```

8.3.3.7 getKey()

```
Key yaodaq::Identifier::getKey ( ) const
```

Definition at line 40 of file [Identifier.cpp](#).

```
00040 { return m_Key; }
```

8.3.3.8 getName()

```
std::string yaodaq::Identifier::getName ( ) const
```

Definition at line 38 of file [Identifier.cpp](#).

```
00038 { return m_Name; }
```

8.3.3.9 getType()

```
std::string yaodaq::Identifier::getType ( ) const
```

Definition at line 36 of file [Identifier.cpp](#).

```
00036 { return m_Type; }
```

8.3.3.10 parse()

```
Identifier yaodaq::Identifier::parse (
    const std::string & id ) [static]
```

Definition at line 44 of file [Identifier.cpp](#).

```
00045 {
00046     std::vector<std::string> result;
00047     std::string tmp = id;
00048     std::string separator = "/";
00049     std::size_t second_pos = tmp.find( separator );
00050     while( second_pos != std::string::npos )
00051     {
00052         if( 0 != second_pos )
00053         {
00054             std::string word = tmp.substr( 0, second_pos - 0 );
00055             result.push_back( word );
00056         }
00057         else
00058             result.push_back( "" );
00059         tmp = tmp.substr( second_pos + separator.length() );
00060         second_pos = tmp.find( separator );
00061         if( second_pos == std::string::npos ) result.push_back( tmp );
00062     }
00063     if( result.size() == 5 )
00064     {
00065         Identifier identifier( result[3], result[4] );
00066         identifier.generateKey( magic_enum::enum_cast<Domain>( result[0] ).value(),
00067                                magic_enum::enum_cast<Class>( result[1] ).value(), magic_enum::enum_cast<Family>( result[2] ).value() );
00067         return identifier;
00068     }
00069     else
00070     {
00071         throw Exception( StatusCode::WRONG_NUMBER_PARAMETERS, "Number of parameters in key should be 5
00072                                (Domain/Class/Family/Type/Name) !" );
00072     }
00073 }
```

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

- [yaodaq/Identifier.hpp](#)
- [yaodaq/Identifier.cpp](#)

8.4 yaodaq::Interrupt Class Reference

```
#include <yaodaq/Interrupt.hpp>
```

Public Member Functions

- [Interrupt](#) ()
- void [init](#) ()
- void [restore](#) ()
- [Signal](#) [getSignal](#) ()
- [~Interrupt](#) ()

8.4.1 Detailed Description

Definition at line 19 of file [Interrupt.hpp](#).

8.4.2 Constructor & Destructor Documentation

8.4.2.1 Interrupt()

```
yaodaq::Interrupt::Interrupt ( )
```

Definition at line 19 of file [Interrupt.cpp](#).

```
00019 { init(); }
```

8.4.2.2 ~Interrupt()

yaodaq::Interrupt::~~Interrupt ()

Definition at line 42 of file [Interrupt.cpp](#).

```
00042 { restore(); }
```

8.4.3 Member Function Documentation

8.4.3.1 getSignal()

[Signal](#) yaodaq::Interrupt::getSignal ()

Definition at line 44 of file [Interrupt.cpp](#).

```
00045 {
00046     if( m_Signal.load() != Signal::NO )
00047     {
00048         std::lock_guard<std::mutex> guard( m_mutex );
00049         init();
00050     }
00051     return m_Signal.load();
00052 }
```

8.4.3.2 init()

void yaodaq::Interrupt::init ()

Definition at line 31 of file [Interrupt.cpp](#).

```
00032 {
00033     setSignal( Signal::TERM );
00034     setSignal( Signal::TERM );
00035     setSignal( Signal::SEGV );
00036     setSignal( Signal::INT );
00037     setSignal( Signal::ILL );
00038     setSignal( Signal::ABRT );
00039     setSignal( Signal::FPE );
00040 }
```

8.4.3.3 restore()

void yaodaq::Interrupt::restore ()

Definition at line 21 of file [Interrupt.cpp](#).

```
00022 {
00023     std::signal( SIGTERM, SIG_DFL );
00024     std::signal( SIGSEGV, SIG_DFL );
00025     std::signal( SIGINT, SIG_DFL );
00026     std::signal( SIGILL, SIG_DFL );
00027     std::signal( SIGABRT, SIG_DFL );
00028     std::signal( SIGFPE, SIG_DFL );
00029 }
```

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

- [yaodaq/Interrupt.hpp](#)
- [yaodaq/Interrupt.cpp](#)

8.5 yaodaq::Key Class Reference

```
#include <yaodaq/Key.hpp>
```

Public Member Functions

- [Key](#) ()=default
- [Key](#) (const [Domain](#) &domain, const [Class](#) &c_lass, const [Family](#) &family)
- std::int_least8_t [getDomain](#) () const
- std::int_least8_t [getClass](#) () const
- std::int_least16_t [getFamily](#) () const
- std::int_least32_t [getKey](#) () const

8.5.1 Detailed Description

Definition at line 15 of file [Key.hpp](#).

8.5.2 Constructor & Destructor Documentation

8.5.2.1 Key() [1/2]

```
yaodaq::Key::Key ( ) [default]
```

8.5.2.2 Key() [2/2]

```
yaodaq::Key::Key (
    const Domain & domain,
    const Class & c_class,
    const Family & family ) [explicit]
```

Definition at line 11 of file [Key.cpp](#).

```
00011 { m_Key = ( static_cast<std::int_least8_t>( domain ) << 24 ) + ( static_cast<std::int_least8_t>( c_class
    ) << 16 ) + static_cast<std::int_least16_t>( family ); }
```

8.5.3 Member Function Documentation

8.5.3.1 getClass()

```
std::int_least8_t yaodaq::Key::getClass ( ) const
```

Definition at line 15 of file [Key.cpp](#).

```
00015 { return ( m_Key >> 16 ) & 0xFF; }
```

8.5.3.2 getDomain()

```
std::int_least8_t yaodaq::Key::getDomain ( ) const
```

Definition at line 13 of file [Key.cpp](#).

```
00013 { return ( m_Key >> 24 ) & 0xFF; }
```

8.5.3.3 getFamily()

```
std::int_least16_t yaodaq::Key::getFamily ( ) const
```

Definition at line 17 of file [Key.cpp](#).

```
00017 { return (m_Key)&0xFFFF; }
```

8.5.3.4 getKey()

```
std::int_least32_t yaodaq::Key::getKey ( ) const
```

Definition at line 19 of file [Key.cpp](#).

```
00019 { return m_Key; }
```

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

- [yaodaq/Key.hpp](#)
- [yaodaq/Key.cpp](#)

8.6 yaodaq::LoggerHandler Class Reference

```
#include <yaodaq/LoggerHandler.hpp>
```


Public Types

- enum class [Verbosity](#) {
[Off](#) , [Trace](#) , [Debug](#) , [Info](#) ,
[Warn](#) , [Error](#) , [Critical](#) }

Public Member Functions

- [LoggerHandler](#) ()
- [~LoggerHandler](#) ()
- void [setVerbosity](#) (const [Verbosity](#) &verbosity)
- void [setName](#) (const std::string &)
- std::shared_ptr< spdlog::logger > [logger](#) ()
- void [addSink](#) (const [spdlog::sink_ptr](#) &)
- void [clearSinks](#) ()

8.6.1 Detailed Description

Definition at line 21 of file [LoggerHandler.hpp](#).

8.6.2 Member Enumeration Documentation

8.6.2.1 Verbosity

```
enum class yaodaq::LoggerHandler::Verbosity [strong]
```

Enumerator

Off	
Trace	
Debug	
Info	
Warn	
Error	
Critical	

Definition at line 24 of file [LoggerHandler.hpp](#).

```
00025 {
00026     Off,
00027     Trace,
00028     Debug,
00029     Info,
00030     Warn,
00031     Error,
00032     Critical
00033 };
```

8.6.3 Constructor & Destructor Documentation

8.6.3.1 LoggerHandler()

```
yaodaq::LoggerHandler::LoggerHandler ( )
```

Definition at line 12 of file [LoggerHandler.cpp](#).

```
00012 { init(); }
```

8.6.3.2 ~LoggerHandler()

yaodaq::LoggerHandler::~~LoggerHandler ()
 Definition at line 20 of file [LoggerHandler.cpp](#).
 00020 {}

8.6.4 Member Function Documentation

8.6.4.1 addSink()

void yaodaq::LoggerHandler::addSink (
 const [spdlog::sink_ptr](#) & sink)
 Definition at line 45 of file [LoggerHandler.cpp](#).
 00046 {
 00047 m_Sinks.push_back(sink);
 00048 init();
 00049 }

8.6.4.2 clearSinks()

void yaodaq::LoggerHandler::clearSinks ()
 Definition at line 51 of file [LoggerHandler.cpp](#).
 00052 {
 00053 m_Sinks.clear();
 00054 init();
 00055 }

8.6.4.3 logger()

std::shared_ptr< [spdlog::logger](#) > yaodaq::LoggerHandler::logger ()
 Definition at line 43 of file [LoggerHandler.cpp](#).
 00043 { [return](#) std::shared_ptr<[spdlog::logger](#)>(m_Logger); }

8.6.4.4 setName()

void yaodaq::LoggerHandler::setName (
 const std::string & name)
 Definition at line 14 of file [LoggerHandler.cpp](#).
 00015 {
 00016 m_Name = name;
 00017 init();
 00018 }

8.6.4.5 setVerbosity()

void yaodaq::LoggerHandler::setVerbosity (
 const [Verbosity](#) & verbosity)
 Definition at line 22 of file [LoggerHandler.cpp](#).
 00023 {
 00024 m_Verbosity = verbosity;
 00025 init();
 00026 }

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

- [yaodaq/LoggerHandler.hpp](#)
- [yaodaq/LoggerHandler.cpp](#)

8.7 yaodaq::Looper Class Reference

```
#include <yaodaq/Looper.hpp>
```

Public Member Functions

- [Looper](#) ()
- [Signal loop](#) ()
- [Signal getSignal](#) ()
- void [supressInstance](#) ()
- [~Looper](#) ()

Static Public Member Functions

- static int [getInstance](#) ()

8.7.1 Detailed Description

Definition at line 15 of file [Looper.hpp](#).

8.7.2 Constructor & Destructor Documentation

8.7.2.1 Looper()

yaodaq::Looper::Looper ()

Definition at line 28 of file [Looper.cpp](#).

```
00029 {
00030     if( m_hasBeenAdded == false )
00031     {
00032         m_hasBeenAdded = true;
00033         ++m_instance;
00034     }
00035 }
```

8.7.2.2 ~Looper()

yaodaq::Looper::~~Looper ()

Definition at line 52 of file [Looper.cpp](#).

```
00053 {
00054     if( m_hasBeenAdded == true && m_hasBeenSupressed == false )
00055     {
00056         m_hasBeenSupressed = true;
00057         --m_instance;
00058     }
00059 }
```

8.7.3 Member Function Documentation

8.7.3.1 getInstance()

int yaodaq::Looper::getInstance () [static]

Definition at line 17 of file [Looper.cpp](#).

```
00017 { return m_instance; }
```

8.7.3.2 getSignal()

[Signal](#) yaodaq::Looper::getSignal ()

Definition at line 50 of file [Looper.cpp](#).

```
00050 { return m_interrupt.getSignal(); }
```

8.7.3.3 loop()

Signal yaodag::Looper::loop ()

Definition at line 37 of file [Looper.cpp](#).

```
00038 {
00039     static Signal signal{ yaodag::Signal::NO };
00040     if( m_instance == 0 )
00041     {
00042         do {
00043             signal = m_Interrupt.getSignal();
00044             std::this_thread::sleep_for( std::chrono::microseconds( 1 ) );
00045         } while( signal == yaodag::Signal::NO );
00046     }
00047     return signal;
00048 }
```

8.7.3.4 supressInstance()

void yaodag::Looper::supressInstance ()

Definition at line 19 of file [Looper.cpp](#).

```
00020 {
00021     if( m_hasBeenSupressed == false )
00022     {
00023         m_hasBeenSupressed = true;
00024         m_instance--;
00025     }
00026 }
```

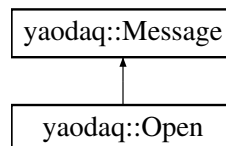
The documentation for this class was generated from the following files:

- [yaodag/Looper.hpp](#)
- [yaodag/Looper.cpp](#)

8.8 yaodag::Message Class Reference

#include <yaodag/Message.hpp>

Inheritance diagram for yaodag::Message:



Public Member Functions

- [Message](#) ()
- [Message](#) (const nlohmann::json &content, const [MessageType](#) &messageType=[MessageType::Unknown](#))
- [Message](#) (const std::string &content, const [MessageType](#) &messageType=[MessageType::Unknown](#))
- [Message](#) (const char *content, const [MessageType](#) &messageType=[MessageType::Unknown](#))
- std::string [dump](#) (const int &indent=-1, const char &indent_char=' ', const bool &ensure_ascii=false, const nlohmann::detail::error_handler_t &error_handler=nlohmann::detail::error_handler_t::strict) const
- nlohmann::json [get](#) () const
- std::string [getContent](#) () const
- std::string [getTypeName](#) () const
- [MessageType](#) [getTypeValue](#) () const
- std::string [getTimestamp](#) () const
- std::time_t [getTime](#) () const
- [Identifier](#) [getIdentifier](#) () const
- void [setFrom](#) (const [Identifier](#) &)

Protected Member Functions

- [Message](#) (const [MessageType](#) &messageType)
- void [setContent](#) (const nlohmann::json &content)
- void [setContent](#) (const std::string &content)
- void [setContent](#) (const char *content)

8.8.1 Detailed Description

Definition at line 19 of file [Message.hpp](#).

8.8.2 Constructor & Destructor Documentation

8.8.2.1 Message() [1/5]

yaodaq::Message::Message ()

Definition at line 23 of file [Message.cpp](#).

```
00024 {
00025     m_JSON["from"];
00026     m_JSON["to"];
00027     m_JSON["type"] = magic_enum::enum_name( MessageType::Unknown );
00028     m_JSON["content"];
00029     m_JSON["timestamp"] = fmt::format( "{:%F %T %Z}", fmt::gmtime(
std::chrono::system_clock::to_time_t( std::chrono::system_clock::now() ) ) );
00030     m_JSON["meta"]["compiler"] = nlohmann::json::meta()["compiler"];
00031     m_JSON["meta"]["platform"] = nlohmann::json::meta()["platform"];
00032     m_JSON["meta"]["versions"]["json"] = nlohmann::json::meta()["version"]["string"];
00033     m_JSON["meta"]["versions"]["yaodaq"] = yaodaq_version.to_string();
00034     m_JSON["meta"]["versions"]["ixwebsocket"] = std::string( IX_WEBSOCKET_VERSION );
00035 }
```

8.8.2.2 Message() [2/5]

yaodaq::Message::Message (

const nlohmann::json & content,

const [MessageType](#) & messageType = [MessageType::Unknown](#)) [explicit]

Definition at line 50 of file [Message.cpp](#).

```
00050 : Message( messageType ) { setContent( content ); }
```

8.8.2.3 Message() [3/5]

yaodaq::Message::Message (

const std::string & content,

const [MessageType](#) & messageType = [MessageType::Unknown](#)) [explicit]

Definition at line 52 of file [Message.cpp](#).

```
00052 : Message( messageType ) { setContent( content ); }
```

8.8.2.4 Message() [4/5]

yaodaq::Message::Message (

const char * content,

const [MessageType](#) & messageType = [MessageType::Unknown](#)) [explicit]

Definition at line 54 of file [Message.cpp](#).

```
00054 : Message( messageType ) { setContent( content ); }
```

8.8.2.5 Message() [5/5]

```
yaodaq::Message::Message (
    const MessageType & messageType ) [explicit], [protected]
```

Definition at line 105 of file [Message.cpp](#).

```
00105 : Message() { m_JSON["type"] = magic_enum::enum_name( messageType ); }
```

8.8.3 Member Function Documentation

8.8.3.1 dump()

```
std::string yaodaq::Message::dump (
    const int & indent = -1,
    const char & indent_char = ' ',
    const bool & ensure_ascii = false,
    const nlohmann::detail::error_handler_t & error_handler = nlohmann::detail::
:error_handler_t::strict ) const
```

Definition at line 56 of file [Message.cpp](#).

```
00056 { return m_JSON.dump( indent, indent_char, ensure_ascii, error_handler ); }
```

8.8.3.2 get()

```
nlohmann::json yaodaq::Message::get ( ) const
```

Definition at line 58 of file [Message.cpp](#).

```
00058 { return m_JSON; }
```

8.8.3.3 getContent()

```
std::string yaodaq::Message::getContent ( ) const
```

Definition at line 64 of file [Message.cpp](#).

```
00065 {
00066     if( m_JSON["content"].is_null() ) return "";
00067     else if( m_JSON["content"].is_string() )
00068         return m_JSON["content"].get<std::string>();
00069     else
00070         return m_JSON["content"].dump();
00071 }
```

8.8.3.4 getIdentifier()

```
Identifier yaodaq::Message::getIdentifier ( ) const
```

Definition at line 93 of file [Message.cpp](#).

```
00094 {
00095     if( m_JSON["from"].is_null() ) return {};
00096     else
00097     {
00098         Identifier id( m_JSON["from"]["type"].get<std::string>(),
m_JSON["from"]["name"].get<std::string>() );
00099         id.generateKey( magic_enum::enum_cast<Domain>( m_JSON["from"]["domain"].get<std::string>()
).value(), magic_enum::enum_cast<Class>( m_JSON["from"]["class"].get<std::string>() ).value(),
00100         magic_enum::enum_cast<Family>( m_JSON["from"]["family"].get<std::string>()
).value() );
00101         return id;
00102     }
00103 }
```

8.8.3.5 getTime()

```
std::time_t yaodaq::Message::getTime ( ) const
```

Definition at line 75 of file [Message.cpp](#).

```
00076 {
00077     std::tm tm;
```

```

00078     memset( &tm, 0, sizeof( tm ) );
00079     std::stringstream ss( getTimestamp() );
00080     ss >> std::get_time( &tm, "%Y-%m-%d %H:%M:%S %Z" );
00081     return mktime( &tm );
00082 }

```

8.8.3.6 getTimestamp()

std::string yaodaq::Message::getTimestamp () const

Definition at line 73 of file [Message.cpp](#).

```

00073 { return m_JSON["timestamp"].get<std::string>(); }

```

8.8.3.7 getTypeName()

std::string yaodaq::Message::getTypeName () const

Definition at line 60 of file [Message.cpp](#).

```

00060 { return m_JSON["type"].get<std::string>(); }

```

8.8.3.8 getTypeValue()

MessageType yaodaq::Message::getTypeValue () const

Definition at line 62 of file [Message.cpp](#).

```

00062 { return magic_enum::enum_cast<MessageType>( m_JSON["type"].get<std::string>() ).value(); }

```

8.8.3.9 setContent() [1/3]

```

void yaodaq::Message::setContent (
    const char * content ) [protected]

```

Definition at line 44 of file [Message.cpp](#).

```

00045 {
00046     m_JSON["content"] = nlohmann::json::parse( content, nullptr, false );
00047     if( m_JSON["content"].is_discarded() ) { m_JSON["content"] = static_cast<std::string>( content ); }
00048 }

```

8.8.3.10 setContent() [2/3]

```

void yaodaq::Message::setContent (
    const nlohmann::json & content ) [protected]

```

Definition at line 37 of file [Message.cpp](#).

```

00037 { m_JSON["content"] = static_cast<nlohmann::json>( content ); }

```

8.8.3.11 setContent() [3/3]

```

void yaodaq::Message::setContent (
    const std::string & content ) [protected]

```

Definition at line 39 of file [Message.cpp](#).

```

00040 {
00041     m_JSON["content"] = nlohmann::json::parse( content, nullptr, false );
00042     if( m_JSON["content"].is_discarded() ) { m_JSON["content"] = static_cast<std::string>( content ); }
00043 }

```

8.8.3.12 setFrom()

```

void yaodaq::Message::setFrom (
    const Identifier & identifier )

```

Definition at line 84 of file [Message.cpp](#).

```

00085 {
00086     m_JSON["from"]["name"] = identifier.getName();
00087     m_JSON["from"]["type"] = identifier.getType();

```

```

00088     m_JSON["from"]["family"] = identifier.getFamily();
00089     m_JSON["from"]["class"]   = identifier.getClass();
00090     m_JSON["from"]["domain"]  = identifier.getDomain();
00091 }

```

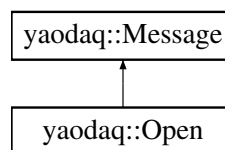
The documentation for this class was generated from the following files:

- [yaodaq/Message.hpp](#)
- [yaodaq/Message.cpp](#)

8.9 yaodaq::Open Class Reference

```
#include <yaodaq/IXWebsocketMessage.hpp>
```

Inheritance diagram for yaodaq::Open:



Public Member Functions

- [Open](#) (const ix::WebSocketOpenInfo &openInfo)
- [Open](#) (const ix::WebSocketOpenInfo &openInfo, std::shared_ptr< [ConnectionState](#) > &connectionState)
- std::string [getURI](#) () const
- std::map< std::string, std::string > [getHeaders](#) () const
- std::string [getProtocol](#) () const
- std::string [dump](#) (const int &indent=-1, const char &indent_char=' ', const bool &ensure_ascii=false, const nlohmann::detail::error_handler_t &error_handler=nlohmann::detail::error_handler_t::strict) const
- nlohmann::json [get](#) () const
- std::string [getContent](#) () const
- std::string [getTypeName](#) () const
- [MessageType](#) [getTypeValue](#) () const
- std::string [getTimestamp](#) () const
- std::time_t [getTime](#) () const
- [Identifier](#) [getIdentifier](#) () const
- void [setFrom](#) (const [Identifier](#) &)

Protected Member Functions

- void [setContent](#) (const nlohmann::json &content)
- void [setContent](#) (const std::string &content)
- void [setContent](#) (const char *content)

8.9.1 Detailed Description

Definition at line 19 of file [IXWebsocketMessage.hpp](#).

8.9.2 Constructor & Destructor Documentation

8.9.2.1 Open() [1/2]

```
yaodag::Open::Open (
    const ix::WebSocketOpenInfo & openInfo ) [explicit]
```

Definition at line 10 of file [IXWebsocketMessage.cpp](#).

```
00010 : Message( MessageType::Open )
00011 {
00012     nlohmann::json j;
00013     j["uri"] = openInfo.uri;
00014     j["headers"] = openInfo.headers;
00015     j["protocol"] = openInfo.protocol;
00016     setContent( j );
00017 }
```

8.9.2.2 Open() [2/2]

```
yaodag::Open::Open (
    const ix::WebSocketOpenInfo & openInfo,
    std::shared_ptr< ConnectionState > & connectionState )
```

Definition at line 19 of file [IXWebsocketMessage.cpp](#).

```
00019 :
00020     Open( openInfo )
00021 {
00022     nlohmann::json j = get();
00023     j["id"] = connectionState->getId();
00024     j["remote_ip"] = connectionState->getRemoteIp();
00025     j["remote_port"] = connectionState->getRemotePort();
00026     setContent( j );
00027 }
```

8.9.3 Member Function Documentation

8.9.3.1 dump()

```
std::string yaodag::Message::dump (
    const int & indent = -1,
    const char & indent_char = ' ',
    const bool & ensure_ascii = false,
    const nlohmann::detail::error_handler_t & error_handler = nlohmann::detail::
:error_handler_t::strict ) const [inherited]
```

Definition at line 56 of file [Message.cpp](#).

```
00056 { return m_JSON.dump( indent, indent_char, ensure_ascii, error_handler ); }
```

8.9.3.2 get()

```
nlohmann::json yaodag::Message::get ( ) const [inherited]
```

Definition at line 58 of file [Message.cpp](#).

```
00058 { return m_JSON; }
```

8.9.3.3 getContent()

```
std::string yaodag::Message::getContent ( ) const [inherited]
```

Definition at line 64 of file [Message.cpp](#).

```
00065 {
00066     if( m_JSON["content"].is_null() ) return "";
00067     else if( m_JSON["content"].is_string() )
00068         return m_JSON["content"].get<std::string>();
00069     else
00070         return m_JSON["content"].dump();
00071 }
```

8.9.3.4 getHeaders()

std::map< std::string, std::string > yaodaq::Open::getHeaders () const

Definition at line 30 of file [IXWebsocketMessage.cpp](#).

```
00031 {
00032     std::map<std::string, std::string> ret = get()["content"]["headers"].get<std::map<std::string,
std::string>>();
00033     return ret;
00034 }
```

8.9.3.5 getIdentifier()

Identifier yaodaq::Message::getIdentifier () const [inherited]

Definition at line 93 of file [Message.cpp](#).

```
00094 {
00095     if( m_JSON["from"].is_null() ) return {};
00096     else
00097     {
00098         Identifier id( m_JSON["from"]["type"].get<std::string>(),
m_JSON["from"]["name"].get<std::string>() );
00099         id.generateKey( magic_enum::enum_cast<Domain>( m_JSON["from"]["domain"].get<std::string>()
).value(), magic_enum::enum_cast<Class>( m_JSON["from"]["class"].get<std::string>() ).value(),
00100             magic_enum::enum_cast<Family>( m_JSON["from"]["family"].get<std::string>()
).value() );
00101         return id;
00102     }
00103 }
```

8.9.3.6 getProtocol()

std::string yaodaq::Open::getProtocol () const

Definition at line 36 of file [IXWebsocketMessage.cpp](#).

```
00036 { return get()["content"]["protocol"].get<std::string>(); }
```

8.9.3.7 getTime()

std::time_t yaodaq::Message::getTime () const [inherited]

Definition at line 75 of file [Message.cpp](#).

```
00076 {
00077     std::tm tm;
00078     memset( &tm, 0, sizeof( tm ) );
00079     std::stringstream ss( getTimestamp() );
00080     ss >> std::get_time( &tm, "%Y-%m-%d %H:%M:%S %z" );
00081     return mktime( &tm );
00082 }
```

8.9.3.8 getTimestamp()

std::string yaodaq::Message::getTimestamp () const [inherited]

Definition at line 73 of file [Message.cpp](#).

```
00073 { return m_JSON["timestamp"].get<std::string>(); }
```

8.9.3.9 getTypeName()

std::string yaodaq::Message::getTypeName () const [inherited]

Definition at line 60 of file [Message.cpp](#).

```
00060 { return m_JSON["type"].get<std::string>(); }
```

8.9.3.10 getTypeValue()

MessageType yaodaq::Message::getTypeValue () const [inherited]

Definition at line 62 of file [Message.cpp](#).

```
00062 { return magic_enum::enum_cast<MessageType>( m_JSON["type"].get<std::string>() ).value(); }
```

8.9.3.11 getURI()

```
std::string yaodaq::Open::getURI ( ) const
```

Definition at line 28 of file [IXWebsocketMessage.cpp](#).

```
00028 { return get()["content"]["uri"].get<std::string>(); }
```

8.9.3.12 setContent() [1/3]

```
void yaodaq::Message::setContent (
    const char * content ) [protected], [inherited]
```

Definition at line 44 of file [Message.cpp](#).

```
00045 {
00046     m_JSON["content"] = nlohmann::json::parse( content, nullptr, false );
00047     if( m_JSON["content"].is_discarded() ) { m_JSON["content"] = static_cast<std::string>( content ); }
00048 }
```

8.9.3.13 setContent() [2/3]

```
void yaodaq::Message::setContent (
    const nlohmann::json & content ) [protected], [inherited]
```

Definition at line 37 of file [Message.cpp](#).

```
00037 { m_JSON["content"] = static_cast<nlohmann::json>( content ); }
```

8.9.3.14 setContent() [3/3]

```
void yaodaq::Message::setContent (
    const std::string & content ) [protected], [inherited]
```

Definition at line 39 of file [Message.cpp](#).

```
00040 {
00041     m_JSON["content"] = nlohmann::json::parse( content, nullptr, false );
00042     if( m_JSON["content"].is_discarded() ) { m_JSON["content"] = static_cast<std::string>( content ); }
00043 }
```

8.9.3.15 setFrom()

```
void yaodaq::Message::setFrom (
    const Identifier & identifier ) [inherited]
```

Definition at line 84 of file [Message.cpp](#).

```
00085 {
00086     m_JSON["from"]["name"] = identifier.getName();
00087     m_JSON["from"]["type"] = identifier.getType();
00088     m_JSON["from"]["family"] = identifier.getFamily();
00089     m_JSON["from"]["class"] = identifier.getClass();
00090     m_JSON["from"]["domain"] = identifier.getDomain();
00091 }
```

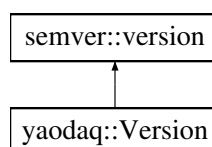
The documentation for this class was generated from the following files:

- [yaodaq/IXWebsocketMessage.hpp](#)
- [yaodaq/IXWebsocketMessage.cpp](#)

8.10 yaodaq::Version Class Reference

```
#include <yaodaq/Version.hpp>
```

Inheritance diagram for yaodaq::Version:



Public Member Functions

- constexpr [Version](#) (const std::uint8_t &mj, const std::uint8_t &mn, const std::uint8_t &pt, const semver::prerelease &prt=semver::prerelease::none, const std::uint8_t &prn=0) noexcept
- constexpr [Version](#) (const std::string_view &str)
- constexpr [Version](#) ()=default
- std::uint8_t [getMajor](#) ()
- std::uint8_t [getMinor](#) ()
- std::uint8_t [getPatch](#) ()
- std::string [getPreRelease](#) ()
- std::uint8_t [getPreReleaseNumber](#) ()

8.10.1 Detailed Description

Definition at line 15 of file [Version.hpp](#).

8.10.2 Constructor & Destructor Documentation

8.10.2.1 Version() [1/3]

```
constexpr yaodaq::Version::Version (
    const std::uint8_t & mj,
    const std::uint8_t & mn,
    const std::uint8_t & pt,
    const semver::prerelease & prt = semver::prerelease::none,
    const std::uint8_t & prn = 0 ) [inline], [constexpr], [noexcept]
```

Definition at line 18 of file [Version.hpp](#).

```
00018 : semver::version( mj, mn, pt, prt, prn ) {}
```

8.10.2.2 Version() [2/3]

```
constexpr yaodaq::Version::Version (
    const std::string_view & str ) [inline], [explicit], [constexpr]
```

Definition at line 19 of file [Version.hpp](#).

```
00019 : semver::version( str ) {}
```

8.10.2.3 Version() [3/3]

```
constexpr yaodaq::Version::Version ( ) [constexpr], [default]
```

8.10.3 Member Function Documentation

8.10.3.1 getMajor()

```
std::uint8_t yaodaq::Version::getMajor ( )
```

Definition at line 12 of file [Version.cpp](#).

```
00012 { return major; }
```

8.10.3.2 getMinor()

```
std::uint8_t yaodaq::Version::getMinor ( )
```

Definition at line 14 of file [Version.cpp](#).

```
00014 { return minor; }
```

8.10.3.3 getPatch()

std::uint8_t yaodaq::Version::getPatch ()

Definition at line 16 of file [Version.cpp](#).

```
00016 { return patch; }
```

8.10.3.4 getPreRelease()

std::string yaodaq::Version::getPreRelease ()

Definition at line 18 of file [Version.cpp](#).

```
00018 { return std::string( magic_enum::enum_name( prerelease_type ) ); }
```

8.10.3.5 getPreReleaseNumber()

std::uint8_t yaodaq::Version::getPreReleaseNumber ()

Definition at line 20 of file [Version.cpp](#).

```
00020 { return prerelease_number; }
```

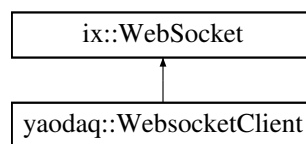
The documentation for this class was generated from the following files:

- [yaodaq/Version.hpp](#)
- [yaodaq/Version.cpp](#)

8.11 yaodaq::WebSocketClient Class Reference

```
#include <yaodaq/WebsocketClient.hpp>
```

Inheritance diagram for yaodaq::WebSocketClient:



Public Member Functions

- [WebSocketClient](#) (const std::string &name, const std::string &type="YAODAQWebSocketClient")
- virtual [~WebSocketClient](#) ()
- void [start](#) ()
- void [stop](#) ()
- void [loop](#) ()
- std::shared_ptr< spdlog::logger > [logger](#) ()

Static Public Member Functions

- static void [throwGeneralIfSameName](#) (const bool &)

8.11.1 Detailed Description

Definition at line 20 of file [WebSocketClient.hpp](#).

8.11.2 Constructor & Destructor Documentation

8.11.2.1 WebSocketClient()

```
yaodaq::WebSocketClient::WebSocketClient (
    const std::string & name,
    const std::string & type = "YAODAQWebSocketClient" ) [explicit]
```

Definition at line 24 of file [WebSocketClient.cpp](#).

```
00024         : m_Identifier( type,
00025             name )
00026 {
00027     ix::initNetSystem();
00028     m_Identifier.generateKey( Domain::Application, Class::Client, Family::WebSocketClient );
00029     m_Logger.setName( m_Identifier.get() );
00030     m_Logger.addSink( std::make_shared<spdlog::sinks::stdout_color_sink_mt>() );
00031
00032     ix::WebSocketHttpHeaders header{ { "id", m_Identifier.get() } };
00033     setExtraHeaders( header );
00034
00035     setOnMessageCallback(
00036         [this]( const ix::WebSocketMessagePtr& msg )
00037         {
00038             if( msg->type == ix::WebSocketMessageType::Message ) { logger()->error( "{}", msg->str ); }
00039             else if( msg->type == ix::WebSocketMessageType::Error )
00040             {
00041                 std::cout << "Connection error: " << msg->errorInfo.reason << std::endl;
00042             }
00043             else if( msg->type == ix::WebSocketMessageType::Close )
00044             {
00045                 disableAutomaticReconnection();
00046                 std::this_thread::sleep_for( std::chrono::milliseconds( 100 ) );
00047                 if( msg->closeInfo.code == magic_enum::enum_integer(
00048                     StatusCode::CLIENT_WITH_SAME_NAME_ALREADY_CONNECTED ) )
00049                 {
00050                     logger()->critical( fmt::format( fg( fmt::color::red ) | fmt::emphasis::bold,
00051                         msg->closeInfo.reason ) );
00052                     if( m_ThrowGeneralIfSameName ) throw Exception(
00053                         StatusCode::CLIENT_WITH_SAME_NAME_ALREADY_CONNECTED, msg->closeInfo.reason );
00054                 }
00055             }
00056         }
00057     );
00058 }
```

8.11.2.2 ~WebSocketClient()

```
yaodaq::WebSocketClient::~~WebSocketClient ( ) [virtual]
```

Definition at line 58 of file [WebSocketClient.cpp](#).

```
00059 {
00060     stop();
00061     ix::uninitNetSystem();
00062 }
```

8.11.3 Member Function Documentation

8.11.3.1 logger()

```
std::shared_ptr< spdlog::logger > yaodaq::WebSocketClient::logger ( ) [inline]
```

Definition at line 29 of file [WebSocketClient.hpp](#).

```
00029 { return m_Logger.logger(); }
```

8.11.3.2 loop()

```
void yaodaq::WebSocketClient::loop ( )
```

Definition at line 83 of file [WebSocketClient.cpp](#).

```
00084 {
00085     WebSocketClient::start();
00086     m_Looper.supressInstance();
00087     onRaisingSignal();
00088 }
```

8.11.3.3 start()

void yaodaq::WebsocketClient::start ()

Definition at line 64 of file [WebsocketClient.cpp](#).

```
00065 {
00066     if( getReadyState() == ix::ReadyState::Closed || getReadyState() == ix::ReadyState::Closing )
00067     {
00068         logger()->trace( "Client started. Connected to {}", getUrl() );
00069         ix::WebSocket::start();
00070     }
00071 }
```

8.11.3.4 stop()

void yaodaq::WebsocketClient::stop ()

Definition at line 73 of file [WebsocketClient.cpp](#).

```
00074 {
00075     if( getReadyState() == ix::ReadyState::Open || getReadyState() == ix::ReadyState::Connecting )
00076     {
00077         logger()->trace( "Client stopped" );
00078         ix::WebSocket::stop();
00079         while( getReadyState() != ix::ReadyState::Closed ) { std::this_thread::sleep_for(
                                std::chrono::microseconds( 1 ) ); }
00080     }
00081 }
```

8.11.3.5 throwGeneralIfSameName()

void yaodaq::WebsocketClient::throwGeneralIfSameName (
 const bool & activate) [static]

Definition at line 22 of file [WebsocketClient.cpp](#).

```
00022 { m_ThrowGeneralIfSameName = activate; }
```

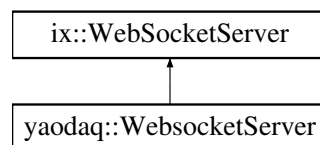
The documentation for this class was generated from the following files:

- [yaodaq/WebsocketClient.hpp](#)
- [yaodaq/WebsocketClient.cpp](#)

8.12 yaodaq::WebsocketServer Class Reference

```
#include <yaodaq/WebsocketServer.hpp>
```

Inheritance diagram for yaodaq::WebsocketServer:



Public Member Functions

- [WebsocketServer](#) (const std::string &name, const int &port=ix::SocketServer::kDefaultPort, const std::string &host=ix::SocketServer::kDefaultHost, const int &backlog=ix::SocketServer::kDefaultTcpBacklog, const std::size_t &maxConnections=ix::SocketServer::kDefaultMaxConnections, const int &handshakeTimeoutSecs=ix::WebsocketServer::kDefaultHandShakeTimeoutSecs, const int &addressFamily=ix::SocketServer::kDefaultAddressFamily, const std::string &type="YAODAQWebsocketServer")
- virtual [~WebsocketServer](#) ()
- void [loop](#) ()
- void [start](#) ()
- void [stop](#) (bool useless=true)
- void [listen](#) ()
- void [setVerbosity](#) (const [yaodaq::LoggerHandler::Verbosity](#) &verbosity)
- std::shared_ptr< spdlog::logger > [logger](#) ()

8.12.1 Detailed Description

Definition at line 20 of file [WebsocketServer.hpp](#).

8.12.2 Constructor & Destructor Documentation

8.12.2.1 WebsocketServer()

```
yaodaq::WebsocketServer::WebsocketServer (
    const std::string & name,
    const int & port = ix::SocketServer::kDefaultPort,
    const std::string & host = ix::SocketServer::kDefaultHost,
    const int & backlog = ix::SocketServer::kDefaultTcpBacklog,
    const std::size_t & maxConnections = ix::SocketServer::kDefaultMaxConnections,
    const int & handshakeTimeoutSecs = ix::WebsocketServer::kDefaultHandShakeTimeoutSecs,
    const int & addressFamily = ix::SocketServer::kDefaultAddressFamily,
    const std::string & type = "YAODAQWebsocketServer" ) [explicit]
```

Definition at line 26 of file [WebsocketServer.cpp](#).

```
00026
:
00027 ix::WebsocketServer( port, host, backlog, maxConnections, handshakeTimeoutSecs, addressFamily ),
    m_Identifier( type, name )
00028 {
00029     ix::initNetSystem();
00030
00031     m_Identifier.generateKey( Domain::Application, Class::Server, Family::WebsocketServer );
00032     m_Logger.setName( m_Identifier.get() );
00033     m_Logger.addSink( std::make_shared<spdlog::sinks::stdout_color_sink_mt>() );
00034
00035     setConnectionFactory( []() { return std::make_shared<ConnectionState>(); } );
00036
00037     setOnClientMessageCallback(
00038         [this]( std::shared_ptr<ix::ConnectionState> connectionState, ix::Websocket& websocket, const
ix::WebsocketMessagePtr& msg )
00039         {
00040             // The ConnectionState object contains information about the connection
00041             std::shared_ptr<ConnectionState> connection = std::static_pointer_cast<ConnectionState>(
connectionState );
00042
00043             if( msg->type == ix::WebsocketMessageType::Open )
00044             {
00045                 // Check if a client with the same name is already connected;
00046                 logger()->critical( fmt::format( fg( fmt::color::red ) | fmt::emphasis::bold, getHost() + ":"
+ std::to_string( getPort() ) ) );
00047                 connection->computeId( getHost() + ":" + std::to_string( getPort() ), Identifier::parse(
msg->openInfo.headers["id"] ) );
00048                 if( connection->isTerminated() )
00049                 {
00050                     logger()->error( fmt::format( fg( fmt::color::red ) | fmt::emphasis::bold, "One client with
the name \"{}\" is already connected !", Identifier::parse( msg->openInfo.headers["id"] ).getName() )
);
00051                     websocket.stop( magic_enum::enum_integer(
StatusCode::CLIENT_WITH_SAME_NAME_ALREADY_CONNECTED ),
00052                         fmt::format( "One client with the name \"{}\" is already connected to
ws{}://{}:{ } !", Identifier::parse( msg->openInfo.headers["id"] ).getName(), "", getHost(), getPort()
) );
00053                     return;
00054                 }
00055             }
00056             else if( msg->type == ix::WebsocketMessageType::Message )
00057             {
00058                 websocket.send( msg->str, msg->binary );
00059             }
00060         } );
00061 }
```

8.12.2.2 ~WebsocketServer()

```
yaodaq::WebsocketServer::~WebsocketServer ( ) [virtual]
```

Definition at line 101 of file [WebsocketServer.cpp](#).

```
00102 {
00103     stop();
```



```
00104     ix::uninitNetSystem();
00105 }
```

8.12.3 Member Function Documentation

8.12.3.1 listen()

void yaodag::WebsocketServer::listen ()

Definition at line 63 of file [WebsocketServer.cpp](#).

```
00064 {
00065     if( !m_isListening )
00066     {
00067         std::pair<bool, std::string> ret = ix::WebSocketServer::listen();
00068         if( ret.first )
00069         {
00070             m_isListening = ret.first;
00071             logger()->info( "Server listening on {0}:{1}", getHost(), getPort() );
00072         }
00073         else
00074             throw Exception( StatusCode::LISTEN_ERROR, ret.second );
00075     }
00076 }
```

8.12.3.2 logger()

std::shared_ptr< spdlog::logger > yaodag::WebsocketServer::logger () [inline]

Definition at line 34 of file [WebsocketServer.hpp](#).

```
00034 { return m_Logger.logger(); }
```

8.12.3.3 loop()

void yaodag::WebsocketServer::loop ()

Definition at line 107 of file [WebsocketServer.cpp](#).

```
00108 {
00109     listen();
00110     start();
00111     m_Looper.supressInstance();
00112     onRaisingSignal();
00113 }
```

8.12.3.4 setVerbosity()

void yaodag::WebsocketServer::setVerbosity (
const yaodag::LoggerHandler::Verbosity & verbosity)

Definition at line 99 of file [WebsocketServer.cpp](#).

```
00099 { m_Logger.setVerbosity( verbosity ); }
```

8.12.3.5 start()

void yaodag::WebsocketServer::start ()

Definition at line 78 of file [WebsocketServer.cpp](#).

```
00079 {
00080     if( !m_isStarted )
00081     {
00082         m_isStarted = true;
00083         logger()->trace( "Server started" );
00084         ix::WebSocketServer::start();
00085     }
00086 }
```

8.12.3.6 stop()

```
void yaodaq::WebsocketServer::stop (
    bool useless = true )
```

Definition at line 88 of file [WebsocketServer.cpp](#).

```
00089 {
00090     if( !m_isStopped )
00091     {
00092         m_isStopped = true;
00093         useless      = !useless;
00094         logger()->trace( "Server stopped" );
00095         ix::WebSocketServer::stop();
00096     }
00097 }
```

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

- [yaodaq/WebsocketServer.hpp](#)
- [yaodaq/WebsocketServer.cpp](#)

Chapter 9

File Documentation

9.1 docs/License.md File Reference

9.2 docs/Third-party licenses.md File Reference

9.3 yaodag/Classification.hpp File Reference

```
#include <cstdint>
```

Namespaces

- namespace `yaodag`

Enumerations

- enum class `yaodag::Domain` : `std::uint_least8_t` { `yaodag::Unknown` = 0 , `yaodag::Application` = 1 , `yaodag::Web` = 2 }
- enum class `yaodag::Class` : `std::uint_least8_t` { `yaodag::Unknown` = 0 , `yaodag::Server` , `yaodag::Client` , `yaodag::Module` , `yaodag::Board` }
- enum class `yaodag::Family` : `std::uint_least16_t` { `yaodag::Unknown` = 0 , `yaodag::WebSocketServer` , `yaodag::WebSocketClient` , `yaodag::Logger` , `yaodag::Controller` , `yaodag::Configurator` , `yaodag::SlowController` , `yaodag::Viewer` , `yaodag::Analyser` , `yaodag::FileWriter` }

9.4 Classification.hpp

[Go to the documentation of this file.](#)

```
00001 #ifndef YAODAG_CLASSIFICATION
00002 #define YAODAG_CLASSIFICATION
00003
00008 #include <cstdint>
00009
00010 namespace yaodag
00011 {
00012
00013  /* The domain specify if we are on browser or standalone program */
00014  enum class Domain : std::uint_least8_t
00015  {
00016      Unknown    = 0,
00017      Application = 1,
00018      Web        = 2,
00019  };
00020
00021  /* The class define if we are a server, module, or board */
00022  enum class Class : std::uint_least8_t
00023  {
00024      Unknown = 0,
```

```

00025     Server,
00026     Client,
00027     // Module is a client with start stop etc...
00028     Module,
00029     // Board is a module with a connector
00030     Board,
00031 };
00032
00033 /* the family */
00034 enum class Family : std::uint_least16_t
00035 {
00036     Unknown = 0,
00037     WebSocketServer,
00038     WebSocketClient,
00039     Logger,
00040     Controller,
00041     Configurator,
00042     SlowController,
00043     Viewer,
00044     Analyser,
00045     FileWriter,
00046 };
00047
00048 } // namespace yaodaq
00049
00050 #endif // YAODAQ_CLASSIFICATION

```

9.5 yaodaq/ConnectionState.hpp File Reference

```

#include <algorithm>
#include <iostream>
#include <ixwebsocket/IXConnectionState.h>
#include <list>
#include <mutex>
#include <string>
#include <utility>

```

Data Structures

- class [yaodaq::ConnectionState](#)

Namespaces

- namespace [yaodaq](#)

9.6 ConnectionState.hpp

[Go to the documentation of this file.](#)

```

00001 #ifndef YAODAQ_CONNECTIONSTATE
00002 #define YAODAQ_CONNECTIONSTATE
00003
00008 #include <algorithm>
00009 #include <iostream>
00010 #include <ixwebsocket/IXConnectionState.h>
00011 #include <list>
00012 #include <mutex>
00013 #include <string>
00014 #include <utility>
00015
00016 namespace yaodaq
00017 {
00018
00019     class Identifier;
00020
00021     class ConnectionState : public ix::ConnectionState
00022     {
00023     public:
00024         virtual void computeId( const std::string& host, const Identifier& id ) final;
00025         ConnectionState();
00026         virtual ~ConnectionState();
00027
00028     private:

```

```

00029     static std::list<std::pair<std::string, std::string>> m_Ids;
00030     std::pair<std::string, std::string> m_Pair;
00031     std::mutex m_Mutex;
00032 };
00033
00034 } // namespace yaodaq
00035
00036 #endif

```

9.7 yaodaq/Exception.hpp File Reference

```

#include <cstdint>
#include <exception>
#include <fmt/color.h>
#include <source_location/source_location.hpp>
#include <string>

```

Data Structures

- class [yaodaq::Exception](#)

Namespaces

- namespace [yaodaq](#)

9.8 Exception.hpp

[Go to the documentation of this file.](#)

```

00001 #ifndef YAODAQ_EXCEPTION
00002 #define YAODAQ_EXCEPTION
00003
00008 #include <cstdint>
00009 #include <exception>
00010 #include <fmt/color.h>
00011 #include <source_location/source_location.hpp>
00012 #include <string>
00013
00014 namespace yaodaq
00015 {
00016
00017     enum class StatusCode : std::int_least32_t;
00018
00019     class Exception : public std::exception, public source_location
00020     {
00021     public:
00022         Exception() = delete;
00023
00024         static void setFormat( const std::string& format ) { m_Format = format; }
00025
00026         static void setStyle( const fmt::text_style& style = {} ) { m_Style = style; }
00027
00028         Exception( const StatusCode& statusCode, const std::string& description, const source_location&
00029             location = source_location::current() );
00029         ~Exception() noexcept override = default;
00030         [[nodiscard]] const char* what() const noexcept final;
00031         [[nodiscard]] const char* description() const noexcept;
00032         [[nodiscard]] std::int_least32_t code() const noexcept;
00033
00034     private:
00035         static fmt::text_style m_Style;
00036         static std::string m_Format;
00037         const std::int_least32_t m_Code{ 0 };
00038         std::string m_Description;
00039         std::string m_Message;
00040         void constructMessage();
00041     };
00042
00043 } // namespace yaodaq
00044
00045 #endif

```

9.9 yaodaq/Identifier.hpp File Reference

```
#include "yaodaq/Key.hpp"
#include <cstdint>
#include <string>
```

Data Structures

- class [yaodaq::Identifier](#)

Namespaces

- namespace [yaodaq](#)

9.10 Identifier.hpp

[Go to the documentation of this file.](#)

```
00001 #ifndef YAODAQ_IDENTIFIER
00002 #define YAODAQ_IDENTIFIER
00003
00008 #include "yaodaq/Key.hpp"
00009
00010 #include <cstdint>
00011 #include <string>
00012
00013 namespace yaodaq
00014 {
00015
00016 class Identifier
00017 {
00018 public:
00019     Identifier() = default;
00020     Identifier( const std::string& type, const std::string& name );
00021     void generateKey( const Domain& domain = Domain::Unknown, const Class& c_class =
Class::Unknown, const Family& family = Family::Unknown );
00022     [[nodiscard]] std::string getDomain() const;
00023     [[nodiscard]] std::string getClass() const;
00024     [[nodiscard]] std::string getFamily() const;
00025     [[nodiscard]] std::string getType() const;
00026     [[nodiscard]] std::string getName() const;
00027     [[nodiscard]] Key getKey() const;
00028     [[nodiscard]] std::string get() const;
00029     bool empty() const;
00030     static Identifier parse( const std::string& );
00031
00032 private:
00033     std::string m_Type{ "Unknown" };
00034     std::string m_Name{ "Unknown" };
00035     Key m_Key;
00036 };
00037
00038 } // namespace yaodaq
00039
00040 #endif // YAODAQ_IDENTIFIER
```

9.11 yaodaq/Interrupt.hpp File Reference

```
#include "yaodaq/Signal.hpp"
#include <atomic>
#include <csignal>
#include <mutex>
```

Data Structures

- class [yaodaq::Interrupt](#)

Namespaces

- namespace `yaodaq`

9.12 Interrupt.hpp

[Go to the documentation of this file.](#)

```

00001 #ifndef YAODAQ_HANDLER
00002 #define YAODAQ_HANDLER
00003
00008 #include "yaodaq/Signal.hpp"
00009
00010 #include <atomic>
00011 #include <csignal>
00012 #include <mutex>
00013
00014 namespace yaodaq
00015 {
00016
00017 enum class Signal;
00018
00019 class Interrupt
00020 {
00021 public:
00022     Interrupt();
00023     void init();
00024     void restore();
00025     Signal getSignal();
00026     ~Interrupt();
00027
00028 private:
00029     volatile static std::atomic<Signal> m_Signal;
00030     void setSignal( const Signal& signal );
00031     std::mutex m_mutex;
00032 };
00033
00034 } // namespace yaodaq
00035
00036 #endif // YAODAQ_HANDLER

```

9.13 yaodaq/IXWebsocketMessage.hpp File Reference

```

#include "yaodaq/ConnectionState.hpp"
#include "yaodaq/Message.hpp"
#include <ixwebsocket/IXWebSocketOpenInfo.h>
#include <map>
#include <memory>
#include <string>

```

Data Structures

- class `yaodaq::Open`

Namespaces

- namespace `yaodaq`

9.14 IXWebsocketMessage.hpp

[Go to the documentation of this file.](#)

```

00001 #ifndef YAODAQ_IXWEBSOCKETMESSAGE
00002 #define YAODAQ_IXWEBSOCKETMESSAGE
00003
00008 #include "yaodaq/ConnectionState.hpp"
00009 #include "yaodaq/Message.hpp"
00010
00011 #include <ixwebsocket/IXWebSocketOpenInfo.h>
00012 #include <map>
00013 #include <memory>

```

```

00014 #include <string>
00015
00016 namespace yaodaq
00017 {
00018
00019 class Open : public Message
00020 {
00021 public:
00022     explicit Open( const ix::WebSocketOpenInfo& openInfo );
00023     Open( const ix::WebSocketOpenInfo& openInfo, std::shared_ptr<ConnectionState>& connectionState );
00024     std::string          getURI() const;
00025     std::map<std::string, std::string> getHeaders() const;
00026     std::string          getProtocol() const;
00027 };
00028
00029 } // namespace yaodaq
00030 #endif

```

9.15 yaodaq/Key.hpp File Reference

```

#include "yaodaq/Classification.hpp"
#include <cstdint>

```

Data Structures

- class `yaodaq::Key`

Namespaces

- namespace `yaodaq`

9.16 Key.hpp

[Go to the documentation of this file.](#)

```

00001 #ifndef YAODAQ_KEY
00002 #define YAODAQ_KEY
00003
00008 #include "yaodaq/Classification.hpp"
00009
00010 #include <cstdint>
00011
00012 namespace yaodaq
00013 {
00014
00015 class Key
00016 {
00017 private:
00018     std::int_least32_t m_Key{ 0 };
00019
00020 public:
00021     Key() = default;
00022     explicit Key( const Domain& domain, const Class& c_class, const Family& family );
00023     [[nodiscard]] std::int_least8_t getDomain() const;
00024     [[nodiscard]] std::int_least8_t getClass() const;
00025     [[nodiscard]] std::int_least16_t getFamily() const;
00026     [[nodiscard]] std::int_least32_t getKey() const;
00027 };
00028
00029 } // namespace yaodaq
00030
00031 #endif // YAODAQ_KEY

```

9.17 yaodaq/LoggerHandler.hpp File Reference

```

#include <memory>
#include <spdlog/fwd.h>
#include <string>
#include <vector>

```


Data Structures

- class [yaodag::LoggerHandler](#)

Namespaces

- namespace [spdlog](#)
- namespace [yaodag](#)

Typedefs

- using [spdlog::sink_ptr](#) = std::shared_ptr< spdlog::sinks::sink >

9.18 LoggerHandler.hpp

[Go to the documentation of this file.](#)

```

00001 #ifndef YAODAG_LOGGERHANDLER
00002 #define YAODAG_LOGGERHANDLER
00003
00008 #include <memory>
00009 #include <spdlog/fwd.h>
00010 #include <string>
00011 #include <vector>
00012
00013 namespace spdlog
00014 {
00015     using sink_ptr = std::shared_ptr<spdlog::sinks::sink>;
00016 }
00017
00018 namespace yaodag
00019 {
00020
00021     class LoggerHandler
00022     {
00023     public:
00024         enum class Verbosity
00025         {
00026             Off,
00027             Trace,
00028             Debug,
00029             Info,
00030             Warn,
00031             Error,
00032             Critical
00033         };
00034         LoggerHandler();
00035         ~LoggerHandler();
00036         void setVerbosity( const Verbosity& verbosity );
00037         void setName( const std::string& );
00038         std::shared_ptr<spdlog::logger> logger();
00039         void addSink( const spdlog::sink_ptr& );
00040         void clearSinks();
00041
00042     private:
00043         std::shared_ptr<spdlog::logger> m_Logger{ nullptr };
00044         std::vector<spdlog::sink_ptr> m_Sinks;
00045         std::string m_Name{ "Unknown" };
00046         Verbosity m_Verbosity{ Verbosity::Trace };
00047         void init();
00048     };
00049
00050 } // namespace yaodag
00051
00052 #endif

```

9.19 yaodag/Looper.hpp File Reference

```
#include "yaodag/Interrupt.hpp"
```

Data Structures

- class [yaodag::Looper](#)

Namespaces

- namespace [yaodag](#)

9.20 Looper.hpp

[Go to the documentation of this file.](#)

```
00001 #ifndef YAODAG_LOOPER
00002 #define YAODAG_LOOPER
00003
00008 #include "yaodag/Interrupt.hpp"
00009
00010 namespace yaodag
00011 {
00012
00013 enum class Signal;
00014
00015 class Looper
00016 {
00017 public:
00018     Looper();
00019     Signal loop();
00020     Signal getSignal();
00021     static int getInstance();
00022     void supressInstance();
00023     ~Looper();
00024
00025 private:
00026     static int m_instance;
00027     bool m_hasBeenAdded{ false };
00028     bool m_hasBeenSupressed{ false };
00029     static Interrupt m_Interrupt;
00030 };
00031
00032 } // namespace yaodag
00033
00034 #endif // YAODAG_LOOPER
```

9.21 yaodag/Message.hpp File Reference

```
#include "nlohmann/json.hpp"
#include "yaodag/MessageType.hpp"
#include <string>
```

Data Structures

- class [yaodag::Message](#)

Namespaces

- namespace [yaodag](#)

9.22 Message.hpp

[Go to the documentation of this file.](#)

```
00001
00002 #ifndef YAODAG_MESSAGE
00003 #define YAODAG_MESSAGE
00004
00009 #include "nlohmann/json.hpp"
00010 #include "yaodag/MessageType.hpp"
00011
00012 #include <string>
00013
00014 namespace yaodag
00015 {
00016
00017 class Identifier;
00018
00019 class Message
00020 {
```

```

00021 public:
00022     Message();
00023     explicit Message( const nlohmann::json& content, const MessageType& messageType =
        MessageType::Unknown );
00024     explicit Message( const std::string& content, const MessageType& messageType = MessageType::Unknown
        );
00025     explicit Message( const char* content, const MessageType& messageType = MessageType::Unknown );
00026     std::string dump( const int& indent = -1, const char& indent_char = ' ', const bool& ensure_ascii
        = false, const nlohmann::detail::error_handler_t& error_handler =
        nlohmann::detail::error_handler_t::strict ) const;
00027     nlohmann::json get() const;
00028     std::string getContent() const;
00029     std::string getTypeName() const;
00030     MessageType getTypeValue() const;
00031     std::string getTimestamp() const;
00032     std::time_t getTime() const;
00033     Identifier getIdentifier() const;
00034     void setFrom( const Identifier& );
00035
00036 protected:
00037     explicit Message( const MessageType& messageType );
00038     void setContent( const nlohmann::json& content );
00039     void setContent( const std::string& content );
00040     void setContent( const char* content );
00041
00042 private:
00043     nlohmann::json m_JSON;
00044 };
00045
00046 } // namespace yaodaq
00047
00048 #endif // YAODAQ_MESSAGE

```

9.23 yaodaq/MessageType.hpp File Reference

```

#include "yaodaq/Interrupt.hpp"
#include <cstdint>
#include <iosfwd>

```

Namespaces

- namespace [yaodaq](#)

Enumerations

- enum class [yaodaq::MessageType](#) : std::int_least16_t {
[yaodaq::Open](#) = -1 , [yaodaq::Close](#) = -2 , [yaodaq::ConnectionError](#) = -3 , [yaodaq::Ping](#) = -4 ,
[yaodaq::Pong](#) = -5 , [yaodaq::Fragment](#) = -6 , [yaodaq::Unknown](#) = 0 }

Functions

- std::ostream & [yaodaq::operator<<](#) (std::ostream &os, const MessageType &messageTypes)

9.24 MessageType.hpp

[Go to the documentation of this file.](#)

```

00001 #ifndef YAODAQ_MESSAGE_TYPE
00002 #define YAODAQ_MESSAGE_TYPE
00003
00007 #include "yaodaq/Interrupt.hpp"
00008
00009 #include <cstdint>
00010 #include <iosfwd>
00011
00012 namespace yaodaq
00013 {
00014
00015 enum class MessageType : std::int_least16_t
00016 {
00017     // IXWebSocket MessageType (Message is not set here)
00018     Open
        = -1,

```

```

00019     Close           = -2,
00020     ConnectionError = -3,
00021     Ping            = -4,
00022     Pong            = -5,
00023     Fragment        = -6,
00024     // Unknown should not be used !
00025     Unknown         = 0,
00026 };
00027
00028 inline std::ostream& operator<<( std::ostream& os, const MessageType& messageTypes ) { return os <<
    static_cast<std::int_least8_t>( messageTypes ) + 0; }
00029
00030 } // namespace yaodaq
00031
00032 #endif // YAODAQ_MESSAGE_TYPE

```

9.25 yaodaq/Severity.hpp File Reference

```
#include <cstdint>
```

Namespaces

- namespace [yaodaq](#)

Enumerations

- enum class [yaodaq::Severity](#) : std::int_least16_t { [yaodaq::Info](#) = 1 , [yaodaq::Warning](#) = 10 , [yaodaq::Error](#) = 100 , [yaodaq::Critical](#) = 1000 }

9.26 Severity.hpp

[Go to the documentation of this file.](#)

```

00001 #ifndef YAODAQ_SEVERITY
00002 #define YAODAQ_SEVERITY
00003
00004 #include <cstdint>
00005
00010 namespace yaodaq
00011 {
00012
00013 enum class Severity : std::int_least16_t
00014 {
00015     Info       = 1,
00016     Warning    = 10,
00017     Error      = 100,
00018     Critical   = 1000,
00019 };
00020
00021 } // namespace yaodaq
00022
00023 #endif // YAODAQ_SEVERITY

```

9.27 yaodaq/Signal.hpp File Reference

```
#include "yaodaq/Severity.hpp"
#include <cstdint>
```

Namespaces

- namespace [yaodaq](#)

Enumerations

- enum class [yaodaq::Signal](#) { [yaodaq::NO](#) = 0 , [yaodaq::ABRT](#) = static_cast<int>(Severity::Critical) + 1 , [yaodaq::FPE](#) = static_cast<int>(

```
Severity::Critical ) + 2 , yaodaq::ILL = static_cast<int>( Severity::Critical ) + 3 ,
yaodaq::SEGV = static_cast<int>( Severity::Critical ) + 4 , yaodaq::INT = static_cast<int>( Severity::Warning ) + 1 , yaodaq::TERM = static_cast<int>( Severity::Warning ) + 2 }
```

9.28 Signal.hpp

[Go to the documentation of this file.](#)

```
00001 #ifndef YAODAQ_SIGNAL
00002 #define YAODAQ_SIGNAL
00003
00008 #include "yaodaq/Severity.hpp"
00009
00010 #include <cstdint>
00011
00012 namespace yaodaq
00013 {
00014
00015 enum class Signal
00016 {
00017     NO = 0, // No Signal.
00018     // Critical
00019     ABRT = static_cast<int>( Severity::Critical ) + 1, // (Signal Abort) Abnormal termination, such as
is initiated by the abort function.
00020     FPE = static_cast<int>( Severity::Critical ) + 2, // (Signal Floating-Point Exception) Erroneous
arithmetic operation, such as zero divide or an operation resulting in overflow (not necessarily with
a floating-point operation).
00021     ILL = static_cast<int>( Severity::Critical ) + 3, // (Signal Illegal Instruction) Invalid function
image, such as an illegal instruction. This is generally due to a corruption in the code or to an
attempt to execute data.
00022     SEGV = static_cast<int>( Severity::Critical ) + 4, // (Signal Segmentation Violation) Invalid
access to storage: When a program tries to read or write outside the memory it has allocated.
00023     // Warning
00024     INT = static_cast<int>( Severity::Warning ) + 1, // (Signal Interrupt) Interactive attention
signal. Generally generated by the application user.
00025     TERM = static_cast<int>( Severity::Warning ) + 2, // (Signal Terminate) Termination request sent to
program.
00026 };
00027
00028 } // namespace yaodaq
00029
00030 #endif // YAODAQ_CLASS
```

9.29 yaodaq/StatusCode.hpp File Reference

```
#include <cstdint>
```

Namespaces

- namespace `yaodaq`

Enumerations

- enum class `yaodaq::StatusCode` : `std::int_least32_t` { `yaodaq::SUCCESS` = 0 , `yaodaq::LISTEN_ERROR` , `yaodaq::WRONG_NUMBER_PARAMETERS` , `yaodaq::CLIENT_WITH_SAME_NAME_ALREADY_CONNECTED` = 4999 }

9.30 StatusCode.hpp

[Go to the documentation of this file.](#)

```
00001 #ifndef YAODAQ_STATUSCODE
00002 #define YAODAQ_STATUSCODE
00003
00008 #include <cstdint>
00009
00010 namespace yaodaq
00011 {
00012
00013 enum class StatusCode : std::int_least32_t
00014 {
00015     SUCCESS = 0,
```

```

00016     LISTEN_ERROR,
00017     WRONG_NUMBER_PARAMETERS,
00018     CLIENT_WITH_SAME_NAME_ALREADY_CONNECTED = 4999,
00019 };
00020
00021 } // namespace yaodag
00022
00023 #endif

```

9.31 yaodag/Version.hpp File Reference

```

#include <cstdint>
#include <semver.hpp>
#include <string>

```

Data Structures

- class [yaodag::Version](#)

Namespaces

- namespace [yaodag](#)

9.32 Version.hpp

[Go to the documentation of this file.](#)

```

00001 #ifndef YAODAG_VERSION
00002 #define YAODAG_VERSION
00003
00008 #include <cstdint>
00009 #include <semver.hpp>
00010 #include <string>
00011
00012 namespace yaodag
00013 {
00014
00015 class Version : public semver::version
00016 {
00017 public:
00018     constexpr Version( const std::uint8_t& mj, const std::uint8_t& mn, const std::uint8_t& pt, const
semver::prerelease& prt = semver::prerelease::none, const std::uint8_t& prn = 0 ) noexcept :
semver::version( mj, mn, pt, prt, prn ) {}
00019     explicit constexpr Version( const std::string_view& str ) : semver::version( str ) {}
00020     constexpr Version() = default;
00021     std::uint8_t getMajor();
00022     std::uint8_t getMinor();
00023     std::uint8_t getPatch();
00024     std::string getPreRelease();
00025     std::uint8_t getPreReleaseNumber();
00026 };
00027
00028 } // namespace yaodag
00029
00030 #endif // YAODAG_VERSION

```

9.33 yaodag/WebsocketClient.hpp File Reference

```

#include "yaodag/Identifier.hpp"
#include "yaodag/LoggerHandler.hpp"
#include "yaodag/Looper.hpp"
#include <ixwebsocket/IXWebSocket.h>
#include <memory>
#include <spdlog/spdlog.h>
#include <string>

```

Data Structures

- class [yaodaq::WebSocketClient](#)

Namespaces

- namespace [yaodaq](#)

9.34 WebSocketClient.hpp

[Go to the documentation of this file.](#)

```
00001 #ifndef YAODAQ_WEBSOCKETCLIENT
00002 #define YAODAQ_WEBSOCKETCLIENT
00003
00008 #include "yaodaq/Identifier.hpp"
00009 #include "yaodaq/LoggerHandler.hpp"
00010 #include "yaodaq/Looper.hpp"
00011
00012 #include <ixwebsocket/IXWebSocket.h>
00013 #include <memory>
00014 #include <spdlog/spdlog.h>
00015 #include <string>
00016
00017 namespace yaodaq
00018 {
00019
00020 class WebSocketClient : public ix::WebSocket
00021 {
00022 public:
00023     static void throwGeneralIfSameName( const bool& );
00024     explicit WebSocketClient( const std::string& name, const std::string& type = "YAODAQWebSocketClient"
00025 );
00026     virtual ~WebSocketClient();
00027     void start();
00028     void stop();
00029     void loop();
00030     std::shared_ptr<spdlog::logger> logger() { return m_Logger.logger(); }
00031 private:
00032     void onRaisingSignal();
00033     Identifier m_Identifier;
00034     LoggerHandler m_Logger;
00035     Looper m_Looper;
00036     static bool m_ThrowGeneralIfSameName;
00037 };
00038
00039 } // namespace yaodaq
00040
00041 #endif
```

9.35 yaodaq/WebsocketServer.hpp File Reference

```
#include "yaodaq/Identifier.hpp"
#include "yaodaq/LoggerHandler.hpp"
#include "yaodaq/Looper.hpp"
#include <ixwebsocket/IXWebSocketServer.h>
#include <memory>
#include <spdlog/spdlog.h>
#include <string>
```

Data Structures

- class [yaodaq::WebsocketServer](#)

Namespaces

- namespace [yaodaq](#)

9.36 WebsocketServer.hpp

[Go to the documentation of this file.](#)

```

00001 #ifndef YAODAQ_WEBSOCKETSERVER
00002 #define YAODAQ_WEBSOCKETSERVER
00003
00008 #include "yaodag/Identifier.hpp"
00009 #include "yaodag/LoggerHandler.hpp"
00010 #include "yaodag/Looper.hpp"
00011
00012 #include <ixwebsocket/IXWebSocketServer.h>
00013 #include <memory>
00014 #include <spdlog/spdlog.h>
00015 #include <string>
00016
00017 namespace yaodag
00018 {
00019
00020 class WebsocketServer : public ix::WebSocketServer
00021 {
00022 public:
00023     explicit WebsocketServer( const std::string& name, const int& port = ix::SocketServer::kDefaultPort,
00024                             const std::string& host = ix::SocketServer::kDefaultHost, const int& backlog =
00025                             ix::SocketServer::kDefaultTcpBacklog,
00026                             const std::size_t& maxConnections =
00027                             ix::SocketServer::kDefaultMaxConnections, const int& handshakeTimeoutSecs =
00028                             ix::WebSocketServer::kDefaultHandShakeTimeoutSecs, const int& addressFamily =
00029                             ix::SocketServer::kDefaultAddressFamily,
00030                             const std::string& type = "YAODAQWebsocketServer" );
00031     virtual ~WebsocketServer();
00032     void loop();
00033     void start();
00034     void stop( bool useless = true );
00035     void listen();
00036
00037     void setVerbosity( const yaodag::LoggerHandler::Verbosity& verbosity );
00038
00039     std::shared_ptr<spdlog::logger> logger() { return m_Logger.logger(); }
00040
00041 private:
00042     void onRaisingSignal();
00043     bool m_isListening{ false };
00044     Identifier m_Identifier;
00045     LoggerHandler m_Logger;
00046     Interrupt m_Interrupt;
00047     Looper m_Looper;
00048     bool m_isStopped{ false };
00049     bool m_isStarted{ false };
00050 };
00051 } // namespace yaodag
00052
00053 #endif // YAODAQ_WEBSOCKETSERVER

```

9.37 yaodag/ConnectionState.cpp File Reference

```

#include "yaodag/ConnectionState.hpp"
#include "yaodag/Identifier.hpp"

```

Namespaces

- namespace [yaodag](#)

9.38 ConnectionState.cpp

[Go to the documentation of this file.](#)

```

00001
00005 #include "yaodag/ConnectionState.hpp"
00006
00007 #include "yaodag/Identifier.hpp"
00008
00009 namespace yaodag
00010 {
00011
00012 std::list<std::pair<std::string, std::string>> ConnectionState::m_Ids{};
00013

```



```

00014 ConnectionState::ConnectionState() : ix::ConnectionState() {}
00015
00016 ConnectionState::~ConnectionState()
00017 {
00018     std::lock_guard<std::mutex> guard( m_Mutex );
00019     m_Ids.remove( m_Pair );
00020 }
00021
00022 void ConnectionState::computeId( const std::string& host, const Identifier& id )
00023 {
00024     std::lock_guard<std::mutex> guard( m_Mutex );
00025     m_Pair = std::pair<std::string, std::string>( host, id.getName() );
00026
00027     if( id.empty() ) { _id = std::to_string( _globalId++ ); }
00028     else
00029     {
00030         std::list<std::pair<std::string, std::string>::iterator found = std::find( m_Ids.begin(),
00031         m_Ids.end(), m_Pair );
00032         if( found == m_Ids.end() )
00033         {
00034             _id = id.getName();
00035             m_Ids.push_back( m_Pair );
00036         }
00037         else
00038         {
00039             setTerminated();
00040         }
00041     }
00042 }
00043 } // namespace yaodaq

```

9.39 yaodaq/Exception.cpp File Reference

```
#include "yaodaq/Exception.hpp"
```

Namespaces

- namespace `yaodaq`

9.40 Exception.cpp

[Go to the documentation of this file.](#)

```

00001
00005 #include "yaodaq/Exception.hpp"
00006
00007 namespace yaodaq
00008 {
00009
00010 std::string Exception::m_Format{ "\n\t[Code] : {Code}\n\t[Description] : {Description}\n\t[File] :
00011 {File}\n\t[Function] : {Function}\n\t[Line] : {Line}\n\t[Column] : {Column}\n" };
00012
00013 fmt::text_style Exception::m_Style = { fg( fmt::color::crimson ) | fmt::emphasis::bold };
00014
00014 Exception::Exception( const StatusCode& statusCode, const std::string& description, const
00015 source_location& location ) : source_location( location ), m_Code( static_cast<std::int_least32_t>(
00016 statusCode ) ), m_Description( description ) { constructMessage(); }
00017
00016 const char* Exception::what() const noexcept { return m_Message.c_str(); }
00017
00018 const char* Exception::description() const noexcept { return m_Description.c_str(); }
00019
00020 std::int_least32_t Exception::code() const noexcept { return m_Code; }
00021
00022 void Exception::constructMessage()
00023 {
00024     m_Message = fmt::format( m_Style, m_Format, fmt::arg( "Code", m_Code ), fmt::arg( "Description",
00025     m_Description ), fmt::arg( "File", file_name() ), fmt::arg( "Function", function_name() ), fmt::arg(
00026     "Column", column() ), fmt::arg( "Line", line() ) );
00027 }
00028 } // namespace yaodaq

```

9.41 yaodaq/Identifier.cpp File Reference

```
#include "yaodaq/Identifier.hpp"
#include "yaodaq/Exception.hpp"
#include "yaodaq/Key.hpp"
#include "yaodaq/StatusCode.hpp"
#include <fmt/color.h>
#include <magic_enum.hpp>
#include <string>
#include <vector>
```

Namespaces

- namespace [yaodaq](#)

9.42 Identifier.cpp

[Go to the documentation of this file.](#)

```
00001
00005 #include "yaodaq/Identifier.hpp"
00006
00007 #include "yaodaq/Exception.hpp"
00008 #include "yaodaq/Key.hpp"
00009 #include "yaodaq/StatusCode.hpp"
00010
00011 #include <fmt/color.h>
00012 #include <magic_enum.hpp>
00013 #include <string>
00014 #include <vector>
00015
00016 namespace yaodaq
00017 {
00018
00019 bool Identifier::empty() const
00020 {
00021     if( get() == Identifier().get() ) return true;
00022     else
00023         return false;
00024 }
00025
00026 Identifier::Identifier( const std::string& type, const std::string& name ) : m_Type( type ), m_Name(
    name ) {}
00027
00028 void Identifier::generateKey( const Domain& domain, const Class& c_class, const Family& family ) {
    m_Key = Key( domain, c_class, family ); }
00029
00030 std::string Identifier::getDomain() const { return static_cast<std::string>( magic_enum::enum_name(
    magic_enum::enum_cast<Domain>( m_Key.getDomain() ).value() ) ); }
00031
00032 std::string Identifier::getClass() const { return static_cast<std::string>( magic_enum::enum_name(
    magic_enum::enum_cast<Class>( m_Key.getClass() ).value() ) ); }
00033
00034 std::string Identifier::getFamily() const { return static_cast<std::string>( magic_enum::enum_name(
    magic_enum::enum_cast<Family>( m_Key.getFamily() ).value() ) ); }
00035
00036 std::string Identifier::getType() const { return m_Type; }
00037
00038 std::string Identifier::getName() const { return m_Name; }
00039
00040 Key Identifier::getKey() const { return m_Key; }
00041
00042 std::string Identifier::get() const { return fmt::format( "{0}/{1}/{2}/{3}/{4}", getDomain(),
    getClass(), getFamily(), getType(), getName() ); }
00043
00044 Identifier Identifier::parse( const std::string& id )
00045 {
00046     std::vector<std::string> result;
00047     std::string tmp = id;
00048     std::string separator = "/";
00049     std::size_t second_pos = tmp.find( separator );
00050     while( second_pos != std::string::npos )
00051     {
00052         if( 0 != second_pos )
00053         {
00054             std::string word = tmp.substr( 0, second_pos - 0 );
00055             result.push_back( word );
```

```

00056     }
00057     else
00058         result.push_back( "" );
00059     tmp = tmp.substr( second_pos + separator.length() );
00060     second_pos = tmp.find( separator );
00061     if( second_pos == std::string::npos ) result.push_back( tmp );
00062 }
00063 if( result.size() == 5 )
00064 {
00065     Identifier identifier( result[3], result[4] );
00066     identifier.generateKey( magic_enum::enum_cast<Domain>( result[0] ).value(),
magic_enum::enum_cast<Class>( result[1] ).value(), magic_enum::enum_cast<Family>( result[2] ).value()
);
00067     return identifier;
00068 }
00069 else
00070 {
00071     throw Exception( StatusCode::WRONG_NUMBER_PARAMETERS, "Number of parameters in key should be 5
(Domain/Class/Family/Type/Name) !" );
00072 }
00073 }
00074
00075 } // namespace yaodaq

```

9.43 yaodaq/Interrupt.cpp File Reference

```

#include "yaodaq/Interrupt.hpp"
#include "yaodaq/Signal.hpp"
#include <atomic>
#include <csignal>
#include <mutex>
#include <thread>

```

Namespaces

- namespace [yaodaq](#)

9.44 Interrupt.cpp

[Go to the documentation of this file.](#)

```

00001
00005 #include "yaodaq/Interrupt.hpp"
00006
00007 #include "yaodaq/Signal.hpp"
00008
00009 #include <atomic>
00010 #include <csignal>
00011 #include <mutex>
00012 #include <thread>
00013
00014 namespace yaodaq
00015 {
00016
00017 volatile std::atomic<Signal> Interrupt::m_Signal = Signal::NO;
00018
00019 Interrupt::Interrupt() { init(); }
00020
00021 void Interrupt::restore()
00022 {
00023     std::signal( SIGTERM, SIG_DFL );
00024     std::signal( SIGSEGV, SIG_DFL );
00025     std::signal( SIGINT, SIG_DFL );
00026     std::signal( SIGILL, SIG_DFL );
00027     std::signal( SIGABRT, SIG_DFL );
00028     std::signal( SIGFPE, SIG_DFL );
00029 }
00030
00031 void Interrupt::init()
00032 {
00033     setSignal( Signal::TERM );
00034     setSignal( Signal::TERM );
00035     setSignal( Signal::SEGV );
00036     setSignal( Signal::INT );
00037     setSignal( Signal::ILL );
00038     setSignal( Signal::ABRT );

```

```

00039  setSignal( Signal::FPE );
00040 }
00041
00042 Interrupt::~Interrupt() { restore(); }
00043
00044 Signal Interrupt::getSignal()
00045 {
00046     if( m_Signal.load() != Signal::NO )
00047     {
00048         std::lock_guard<std::mutex> guard( m_mutex );
00049         init();
00050     }
00051     return m_Signal.load();
00052 }
00053
00054 void Interrupt::setSignal( const Signal& signal )
00055 {
00056     switch( signal )
00057     {
00058         case Signal::ABRT: std::signal( SIGABRT, []( int ) -> void { m_Signal.store( Signal::ABRT ); } );
00059         break;
00059         case Signal::FPE: std::signal( SIGFPE, []( int ) -> void { m_Signal.store( Signal::FPE ); } );
00060         break;
00060         case Signal::ILL: std::signal( SIGILL, []( int ) -> void { m_Signal.store( Signal::ILL ); } );
00061         break;
00061         case Signal::SEGV: std::signal( SIGSEGV, []( int ) -> void { m_Signal.store( Signal::SEGV ); } );
00062         break;
00062         case Signal::INT: std::signal( SIGINT, []( int ) -> void { m_Signal.store( Signal::INT ); } );
00063         break;
00063         case Signal::TERM: std::signal( SIGTERM, []( int ) -> void { m_Signal.store( Signal::TERM ); } );
00064         break;
00064         default: break;
00065     }
00066 }
00067
00068 } // namespace yaodaq

```

9.45 yaodaq/IXWebsocketMessage.cpp File Reference

```
#include "yaodaq/IXWebsocketMessage.hpp"
```

Namespaces

- namespace `yaodaq`

9.46 IXWebsocketMessage.cpp

[Go to the documentation of this file.](#)

```

00001
00005 #include "yaodaq/IXWebsocketMessage.hpp"
00006
00007 namespace yaodaq
00008 {
00009
00010 Open::Open( const ix::WebSocketOpenInfo& openInfo ) : Message( MessageType::Open )
00011 {
00012     nlohmann::json j;
00013     j["uri"] = openInfo.uri;
00014     j["headers"] = openInfo.headers;
00015     j["protocol"] = openInfo.protocol;
00016     setContent( j );
00017 }
00018
00019 Open::Open( const ix::WebSocketOpenInfo& openInfo, std::shared_ptr<ConnectionState>& connectionState )
00020 : Open( openInfo )
00021 {
00021     nlohmann::json j = get();
00022     j["id"] = connectionState->getId();
00023     j["remote_ip"] = connectionState->getRemoteIp();
00024     j["remote_port"] = connectionState->getRemotePort();
00025     setContent( j );
00026 }
00027
00028 std::string Open::getURI() const { return get()["content"]["uri"].get<std::string>(); }
00029
00030 std::map<std::string, std::string> Open::getHeaders() const
00031 {

```

```

00032     std::map<std::string, std::string> ret = get()["content"]["headers"].get<std::map<std::string,
std::string>>();
00033     return ret;
00034 }
00035
00036 std::string Open::getProtocol() const { return get()["content"]["protocol"].get<std::string>(); }
00037
00038 } // namespace yaodaq

```

9.47 yaodaq/Key.cpp File Reference

```

#include "yaodaq/Key.hpp"
#include <cstdint>

```

Namespaces

- namespace [yaodaq](#)

9.48 Key.cpp

[Go to the documentation of this file.](#)

```

00001
00005 #include "yaodaq/Key.hpp"
00006
00007 #include <cstdint>
00008
00009 namespace yaodaq
00010 {
00011 Key::Key( const Domain& domain, const Class& c_class, const Family& family ) { m_Key = (
static_cast<std::int_least8_t>( domain ) << 24 ) + ( static_cast<std::int_least8_t>( c_class ) << 16 ) +
static_cast<std::int_least16_t>( family ); }
00012
00013 std::int_least8_t Key::getDomain() const { return ( m_Key >> 24 ) & 0xFF; }
00014
00015 std::int_least8_t Key::getClass() const { return ( m_Key >> 16 ) & 0xFF; }
00016
00017 std::int_least16_t Key::getFamily() const { return (m_Key)&0xFFFF; }
00018
00019 std::int_least32_t Key::getKey() const { return m_Key; }
00020
00021 } // namespace yaodaq

```

9.49 yaodaq/LoggerHandler.cpp File Reference

```

#include "yaodaq/LoggerHandler.hpp"
#include "spdlog/spdlog.h"

```

Namespaces

- namespace [yaodaq](#)

9.50 LoggerHandler.cpp

[Go to the documentation of this file.](#)

```

00001
00005 #include "yaodaq/LoggerHandler.hpp"
00006
00007 #include "spdlog/spdlog.h"
00008
00009 namespace yaodaq
00010 {
00011
00012 LoggerHandler::LoggerHandler() { init(); }
00013
00014 void LoggerHandler::setName( const std::string& name )
00015 {
00016     m_Name = name;

```

```

00017     init();
00018 }
00019
00020 LoggerHandler::~LoggerHandler() {}
00021
00022 void LoggerHandler::setVerbosity( const Verbosity& verbosity )
00023 {
00024     m_Verbosity = verbosity;
00025     init();
00026 }
00027
00028 void LoggerHandler::init()
00029 {
00030     m_Logger = std::make_shared<spdlog::logger>( m_Name, std::begin( m_Sinks ), std::end( m_Sinks ) );
00031     switch( m_Verbosity )
00032     {
00033         case Verbosity::Off: m_Logger->set_level( spdlog::level::off ); break;
00034         case Verbosity::Trace: m_Logger->set_level( spdlog::level::trace ); break;
00035         case Verbosity::Debug: m_Logger->set_level( spdlog::level::debug ); break;
00036         case Verbosity::Info: m_Logger->set_level( spdlog::level::info ); break;
00037         case Verbosity::Warn: m_Logger->set_level( spdlog::level::warn ); break;
00038         case Verbosity::Error: m_Logger->set_level( spdlog::level::err ); break;
00039         case Verbosity::Critical: m_Logger->set_level( spdlog::level::critical ); break;
00040     }
00041 }
00042
00043 std::shared_ptr<spdlog::logger> LoggerHandler::logger() { return std::shared_ptr<spdlog::logger>(
    m_Logger ); }
00044
00045 void LoggerHandler::addSink( const spdlog::sink_ptr& sink )
00046 {
00047     m_Sinks.push_back( sink );
00048     init();
00049 }
00050
00051 void LoggerHandler::clearSinks()
00052 {
00053     m_Sinks.clear();
00054     init();
00055 }
00056
00057 } // namespace yaodaq

```

9.51 yaodaq/Looper.cpp File Reference

```

#include "yaodaq/Looper.hpp"
#include <chrono>
#include <thread>

```

Namespaces

- namespace [yaodaq](#)

9.52 Looper.cpp

[Go to the documentation of this file.](#)

```

00001
00005 #include "yaodaq/Looper.hpp"
00006
00007 #include <chrono>
00008 #include <thread>
00009
00010 namespace yaodaq
00011 {
00012
00013 int Looper::m_instance{ 0 };
00014
00015 Interrupt Looper::m_Interrupt{ Interrupt{} };
00016
00017 int Looper::getInstance() { return m_instance; }
00018
00019 void Looper::supressInstance()
00020 {
00021     if( m_hasBeenSupressed == false )
00022     {
00023         m_hasBeenSupressed = true;

```

```

00024     m_instance--;
00025 }
00026 }
00027
00028 Looper::Looper()
00029 {
00030     if( m_hasBeenAdded == false )
00031     {
00032         m_hasBeenAdded = true;
00033         ++m_instance;
00034     }
00035 }
00036
00037 Signal Looper::loop()
00038 {
00039     static Signal signal{ yaodaq::Signal::NO };
00040     if( m_instance == 0 )
00041     {
00042         do {
00043             signal = m_Interrupt.getSignal();
00044             std::this_thread::sleep_for( std::chrono::microseconds( 1 ) );
00045         } while( signal == yaodaq::Signal::NO );
00046     }
00047     return signal;
00048 }
00049
00050 Signal Looper::getSignal() { return m_Interrupt.getSignal(); }
00051
00052 Looper::~Looper()
00053 {
00054     if( m_hasBeenAdded == true && m_hasBeenSupressed == false )
00055     {
00056         m_hasBeenSupressed = true;
00057         --m_instance;
00058     }
00059 }
00060
00061 } // namespace yaodaq

```

9.53 yaodaq/Message.cpp File Reference

```

#include "yaodaq/Message.hpp"
#include "fmt/chrono.h"
#include "magic_enum.hpp"
#include "yaodaq/Classification.hpp"
#include "yaodaq/Identifier.hpp"
#include <chrono>
#include <ctime>
#include <string>
#include <ixwebsocket/IXWebSocketVersion.h>
#include <yaodaq/YaodaqVersion.hpp>

```

Namespaces

- namespace [yaodaq](#)

9.54 Message.cpp

[Go to the documentation of this file.](#)

```

00001
00005 #include "yaodaq/Message.hpp"
00006
00007 #include "fmt/chrono.h"
00008 #include "magic_enum.hpp"
00009 #include "yaodaq/Classification.hpp"
00010 #include "yaodaq/Identifier.hpp"
00011
00012 #include <chrono>
00013 #include <ctime>
00014 #include <string>
00015
00016 // Versions numbers
00017 #include <ixwebsocket/IXWebSocketVersion.h>

```

```

00018 #include <yaodag/YaodagVersion.hpp>
00019
00020 namespace yaodag
00021 {
00022
00023 Message::Message()
00024 {
00025     m_JSON["from"];
00026     m_JSON["to"];
00027     m_JSON["type"] = magic_enum::enum_name( MessageType::Unknown );
00028     m_JSON["content"];
00029     m_JSON["timestamp"] = fmt::format( "{:%F %T %z}", fmt::gmtime(
std::chrono::system_clock::to_time_t( std::chrono::system_clock::now() ) ) );
00030     m_JSON["meta"]["compiler"] = nlohmann::json::meta()["compiler"];
00031     m_JSON["meta"]["platform"] = nlohmann::json::meta()["platform"];
00032     m_JSON["meta"]["versions"]["json"] = nlohmann::json::meta()["version"]["string"];
00033     m_JSON["meta"]["versions"]["yaodag"] = yaodag_version.to_string();
00034     m_JSON["meta"]["versions"]["ixwebsocket"] = std::string( IX_WEBSOCKET_VERSION );
00035 }
00036
00037 void Message::setContent( const nlohmann::json& content ) { m_JSON["content"] =
static_cast<nlohmann::json>( content ); }
00038
00039 void Message::setContent( const std::string& content )
00040 {
00041     m_JSON["content"] = nlohmann::json::parse( content, nullptr, false );
00042     if( m_JSON["content"].is_discarded() ) { m_JSON["content"] = static_cast<std::string>( content ); }
00043 }
00044 void Message::setContent( const char* content )
00045 {
00046     m_JSON["content"] = nlohmann::json::parse( content, nullptr, false );
00047     if( m_JSON["content"].is_discarded() ) { m_JSON["content"] = static_cast<std::string>( content ); }
00048 }
00049
00050 Message::Message( const nlohmann::json& content, const MessageType& messageType ) : Message(
messageType ) { setContent( content ); }
00051
00052 Message::Message( const std::string& content, const MessageType& messageType ) : Message( messageType
) { setContent( content ); }
00053
00054 Message::Message( const char* content, const MessageType& messageType ) : Message( messageType ) {
setContent( content ); }
00055
00056 std::string Message::dump( const int& indent, const char& indent_char, const bool& ensure_ascii, const
nlohmann::detail::error_handler_t& error_handler ) const { return m_JSON.dump( indent, indent_char,
ensure_ascii, error_handler ); }
00057
00058 nlohmann::json Message::get() const { return m_JSON; }
00059
00060 std::string Message::getTypeName() const { return m_JSON["type"].get<std::string>(); }
00061
00062 MessageType Message::getTypeValue() const { return magic_enum::enum_cast<MessageType>(
m_JSON["type"].get<std::string>() ).value(); }
00063
00064 std::string Message::getContent() const
00065 {
00066     if( m_JSON["content"].is_null() ) return "";
00067     else if( m_JSON["content"].is_string() )
00068         return m_JSON["content"].get<std::string>();
00069     else
00070         return m_JSON["content"].dump();
00071 }
00072
00073 std::string Message::getTimestamp() const { return m_JSON["timestamp"].get<std::string>(); }
00074
00075 std::time_t Message::getTime() const
00076 {
00077     std::tm tm;
00078     memset( &tm, 0, sizeof( tm ) );
00079     std::stringstream ss( getTimestamp() );
00080     ss » std::get_time( &tm, "%Y-%m-%d %H:%M:%S %z" );
00081     return mktime( &tm );
00082 }
00083
00084 void Message::setFrom( const Identifier& identifier )
00085 {
00086     m_JSON["from"]["name"] = identifier.getName();
00087     m_JSON["from"]["type"] = identifier.getType();
00088     m_JSON["from"]["family"] = identifier.getFamily();
00089     m_JSON["from"]["class"] = identifier.getClass();
00090     m_JSON["from"]["domain"] = identifier.getDomain();
00091 }
00092
00093 Identifier Message::getIdentifier() const
00094 {
00095     if( m_JSON["from"].is_null() ) return {};
00096     else

```



```

00097     {
00098         Identifier id( m_JSON["from"]["type"].get<std::string>(),
00099             m_JSON["from"]["name"].get<std::string>() );
00100         id.generateKey( magic_enum::enum_cast<Domain>( m_JSON["from"]["domain"].get<std::string>()
00101             ).value(), magic_enum::enum_cast<Class>( m_JSON["from"]["class"].get<std::string>() ).value(),
00102             magic_enum::enum_cast<Family>( m_JSON["from"]["family"].get<std::string>()
00103             ).value() );
00104         return id;
00105     }
00106 }
00107
00108 Message::Message( const MessageType& messageType ) : Message() { m_JSON["type"] =
00109     magic_enum::enum_name( messageType ); }
00110
00111 // namespace yaodaq

```

9.55 yaodaq/Version.cpp File Reference

```

#include "yaodaq/Version.hpp"
#include <magic_enum.hpp>

```

Namespaces

- namespace [yaodaq](#)

9.56 Version.cpp

[Go to the documentation of this file.](#)

```

00001
00005 #include "yaodaq/Version.hpp"
00006
00007 #include <magic_enum.hpp>
00008
00009 namespace yaodaq
00010 {
00011
00012 std::uint8_t Version::getMajor() { return major; }
00013
00014 std::uint8_t Version::getMinor() { return minor; }
00015
00016 std::uint8_t Version::getPatch() { return patch; }
00017
00018 std::string Version::getPreRelease() { return std::string( magic_enum::enum_name( prerelease_type ) ); }
00019
00020 std::uint8_t Version::getPreReleaseNumber() { return prerelease_number; }
00021
00022 const static Version yaodaq_version;
00023
00024 } // namespace yaodaq

```

9.57 yaodaq/WebsocketClient.cpp File Reference

```

#include "yaodaq/WebsocketClient.hpp"
#include "yaodaq/Exception.hpp"
#include "yaodaq/IXWebsocketMessage.hpp"
#include "yaodaq/StatusCode.hpp"
#include <chrono>
#include <ixwebsocket/IXNetSystem.h>
#include <magic_enum.hpp>
#include <spdlog/sinks/stdout_color_sinks.h>
#include <thread>

```

Namespaces

- namespace [yaodaq](#)

9.58 WebSocketClient.cpp

[Go to the documentation of this file.](#)

```

00001
00005 #include "yaodaq/WebsocketClient.hpp"
00006
00007 #include "yaodaq/Exception.hpp"
00008 #include "yaodaq/IXWebSocketMessage.hpp"
00009 #include "yaodaq/StatusCode.hpp"
00010
00011 #include <chrono>
00012 #include <ixwebsocket/IXNetSystem.h>
00013 #include <magic_enum.hpp>
00014 #include <spdlog/sinks/stdout_color_sinks.h>
00015 #include <thread>
00016
00017 namespace yaodaq
00018 {
00019
00020 bool WebSocketClient::m_ThrowGeneralIfSameName{ true };
00021
00022 void WebSocketClient::throwGeneralIfSameName( const bool& activate ) { m_ThrowGeneralIfSameName =
    activate; }
00023
00024 WebSocketClient::WebSocketClient( const std::string& name, const std::string& type ) : m_Identifier(
    type, name )
00025 {
00026     ix::initNetSystem();
00027
00028     m_Identifier.generateKey( Domain::Application, Class::Client, Family::WebSocketClient );
00029     m_Logger.setName( m_Identifier.get() );
00030     m_Logger.addSink( std::make_shared<spdlog::sinks::stdout_color_sink_mt>() );
00031
00032     ix::WebSocketHttpHeaders header{ { "id", m_Identifier.get() } };
00033     setExtraHeaders( header );
00034
00035     setOnMessageCallback(
00036         [this]( const ix::WebSocketMessagePtr& msg )
00037         {
00038             if( msg->type == ix::WebSocketMessageType::Message ) { logger()->error( "{}", msg->str ); }
00039             else if( msg->type == ix::WebSocketMessageType::Error )
00040             {
00041                 std::cout << "Connection error: " << msg->errorInfo.reason << std::endl;
00042             }
00043             else if( msg->type == ix::WebSocketMessageType::Close )
00044             {
00045                 disableAutomaticReconnection();
00046                 std::this_thread::sleep_for( std::chrono::milliseconds( 100 ) );
00047                 if( msg->closeInfo.code == magic_enum::enum_integer(
                    StatusCode::CLIENT_WITH_SAME_NAME_ALREADY_CONNECTED ) )
00048                 {
00049                     logger()->critical( fmt::format( fg( fmt::color::red ) | fmt::emphasis::bold,
                        msg->closeInfo.reason ) );
00050                     if( m_ThrowGeneralIfSameName ) throw Exception(
                        StatusCode::CLIENT_WITH_SAME_NAME_ALREADY_CONNECTED, msg->closeInfo.reason );
00051                 }
00052             }
00053         } );
00054
00055     };
00056 }
00057
00058 WebSocketClient::~WebSocketClient()
00059 {
00060     stop();
00061     ix::uninitNetSystem();
00062 }
00063
00064 void WebSocketClient::start()
00065 {
00066     if( getReadyState() == ix::ReadyState::Closed || getReadyState() == ix::ReadyState::Closing )
00067     {
00068         logger()->trace( "Client started. Connected to {}", getUrl() );
00069         ix::WebSocket::start();
00070     }
00071 }
00072
00073 void WebSocketClient::stop()
00074 {
00075     if( getReadyState() == ix::ReadyState::Open || getReadyState() == ix::ReadyState::Connecting )
00076     {
00077         logger()->trace( "Client stopped" );
00078         ix::WebSocket::stop();
00079         while( getReadyState() != ix::ReadyState::Closed ) { std::this_thread::sleep_for(
            std::chrono::microseconds( 1 ) ); }
00080     }

```

```

00081 }
00082
00083 void WebsocketClient::loop()
00084 {
00085     WebsocketClient::start();
00086     m_Looper.supressInstance();
00087     onRaisingSignal();
00088 }
00089
00090 void WebsocketClient::onRaisingSignal()
00091 {
00092     Signal signal = m_Looper.loop();
00093     if( m_Looper.getInstance() == 0 )
00094     {
00095         int value = magic_enum::enum_integer( signal );
00096         if( value >= magic_enum::enum_integer( yaodaq::Severity::Critical ) ) { logger()->critical(
00097 "Signal SIG{} raised !", magic_enum::enum_name( signal ) ); }
00098         else if( value >= magic_enum::enum_integer( yaodaq::Severity::Error ) )
00099         {
00100             logger()->error( "Signal SIG{} raised !", magic_enum::enum_name( signal ) );
00101         }
00102         else if( value >= magic_enum::enum_integer( yaodaq::Severity::Warning ) )
00103         {
00104             fmt::print( "\n" );
00105             logger()->warn( "Signal SIG{} raised !", magic_enum::enum_name( signal ) );
00106         }
00107         else if( value >= magic_enum::enum_integer( yaodaq::Severity::Info ) )
00108         {
00109             fmt::print( "\n" );
00110             logger()->info( "Signal SIG{} raised !", magic_enum::enum_name( signal ) );
00111         }
00112         else
00113         {
00114             fmt::print( "\n" );
00115             logger()->trace( "Signal SIG{} raised !", magic_enum::enum_name( signal ) );
00116         }
00117         if( magic_enum::enum_integer( signal ) >= magic_enum::enum_integer( Severity::Critical ) )
00118             std::exit( magic_enum::enum_integer( signal ) );
00119     }
00120 } // namespace yaodaq

```

9.59 yaodaq/WebsocketServer.cpp File Reference

```

#include "yaodaq/WebsocketServer.hpp"
#include "yaodaq/ConnectionState.hpp"
#include "yaodaq/Exception.hpp"
#include "yaodaq/IXWebsocketMessage.hpp"
#include "yaodaq/Identifier.hpp"
#include "yaodaq/StatusCode.hpp"
#include <chrono>
#include <iostream>
#include <ixwebsocket/IXNetSystem.h>
#include <magic_enum.hpp>
#include <spdlog/sinks/stdout_color_sinks.h>
#include <spdlog/spdlog.h>
#include <string>
#include <thread>
#include <utility>

```

Namespaces

- namespace [yaodaq](#)

9.60 WebsocketServer.cpp

[Go to the documentation of this file.](#)

```

00001
00005 #include "yaodaq/WebsocketServer.hpp"

```

```

00006
00007 #include "yaodaq/ConnectionState.hpp"
00008 #include "yaodaq/Exception.hpp"
00009 #include "yaodaq/IXWebsocketMessage.hpp"
00010 #include "yaodaq/Identifier.hpp"
00011 #include "yaodaq/StatusCode.hpp"
00012
00013 #include <chrono>
00014 #include <iostream>
00015 #include <ixwebsocket/IXNetSystem.h>
00016 #include <magic_enum.hpp>
00017 #include <spdlog/sinks/stdout_color_sinks.h>
00018 #include <spdlog/spdlog.h>
00019 #include <string>
00020 #include <thread>
00021 #include <utility>
00022
00023 namespace yaodaq
00024 {
00025
00026 WebsocketServer::WebsocketServer( const std::string& name, const int& port, const std::string& host,
    const int& backlog, const std::size_t& maxConnections, const int& handshakeTimeoutSecs, const int&
    addressFamily, const std::string& type ) :
00027     ix::WebsocketServer( port, host, backlog, maxConnections, handshakeTimeoutSecs, addressFamily ),
    m_Identifier( type, name )
00028 {
00029     ix::initNetSystem();
00030
00031     m_Identifier.generateKey( Domain::Application, Class::Server, Family::WebsocketServer );
00032     m_Logger.setName( m_Identifier.get() );
00033     m_Logger.addSink( std::make_shared<spdlog::sinks::stdout_color_sink_mt>() );
00034
00035     setConnectionFactory( []() { return std::make_shared<ConnectionState>(); } );
00036
00037     setOnClientMessageCallback(
00038         [this]( std::shared_ptr<ix::ConnectionState> connectionState, ix::Websocket& websocket, const
    ix::WebsocketMessagePtr& msg )
00039         {
00040             // The ConnectionState object contains information about the connection
00041             std::shared_ptr<ConnectionState> connection = std::static_pointer_cast<ConnectionState>(
    connectionState );
00042
00043             if( msg->type == ix::WebsocketMessageType::Open )
00044             {
00045                 // Check if a client with the same name is already connected;
00046                 logger()->critical( fmt::format( fg( fmt::color::red ) | fmt::emphasis::bold, getHost() + ":"
    + std::to_string( getPort() ) ) );
00047                 connection->computeId( getHost() + ":" + std::to_string( getPort() ), Identifier::parse(
    msg->openInfo.headers["id"] ) );
00048                 if( connection->isTerminated() )
00049                 {
00050                     logger()->error( fmt::format( fg( fmt::color::red ) | fmt::emphasis::bold, "One client with
    the name \"{}\" is already connected !", Identifier::parse( msg->openInfo.headers["id"] ).getName() )
    );
00051                     websocket.stop( magic_enum::enum_integer(
    StatusCode::CLIENT_WITH_SAME_NAME_ALREADY_CONNECTED ),
00052                         fmt::format( "One client with the name \"{}\" is already connected to
    ws{}://{}:{1} !", Identifier::parse( msg->openInfo.headers["id"] ).getName(), "", getHost(), getPort()
    ) );
00053                     return;
00054                 }
00055             }
00056             else if( msg->type == ix::WebsocketMessageType::Message )
00057             {
00058                 websocket.send( msg->str, msg->binary );
00059             }
00060             } );
00061 }
00062
00063 void WebsocketServer::listen()
00064 {
00065     if( !m_isListening )
00066     {
00067         std::pair<bool, std::string> ret = ix::WebsocketServer::listen();
00068         if( ret.first )
00069         {
00070             m_isListening = ret.first;
00071             logger()->info( "Server listening on {0}:{1}", getHost(), getPort() );
00072         }
00073         else
00074             throw Exception( StatusCode::LISTEN_ERROR, ret.second );
00075     }
00076 }
00077
00078 void WebsocketServer::start()
00079 {
00080     if( !m_isStarted )

```

```

00081     {
00082         m_isStarted = true;
00083         logger()->trace( "Server started" );
00084         ix::WebSocketServer::start();
00085     }
00086 }
00087
00088 void WebsocketServer::stop( bool useless )
00089 {
00090     if( !m_isStopped )
00091     {
00092         m_isStopped = true;
00093         useless      = !useless;
00094         logger()->trace( "Server stopped" );
00095         ix::WebSocketServer::stop();
00096     }
00097 }
00098
00099 void WebsocketServer::setVerbosity( const yaodaq::LoggerHandler::Verbosity& verbosity ) {
00100     m_Logger.setVerbosity( verbosity ); }
00101
00102 WebsocketServer::~WebsocketServer()
00103 {
00104     stop();
00105     ix::uninitNetSystem();
00106 }
00107
00108 void WebsocketServer::loop()
00109 {
00110     listen();
00111     start();
00112     m_Looper.supressInstance();
00113     onRaisingSignal();
00114 }
00115
00116 void WebsocketServer::onRaisingSignal()
00117 {
00118     Signal signal = m_Looper.loop();
00119     if( m_Looper.getInstance() == 0 )
00120     {
00121         int value = magic_enum::enum_integer( signal );
00122         if( value >= magic_enum::enum_integer( yaodaq::Severity::Critical ) ) { logger()->critical(
00123             "Signal SIG{} raised !", magic_enum::enum_name( signal ) ); }
00124         else if( value >= magic_enum::enum_integer( yaodaq::Severity::Error ) )
00125         {
00126             logger()->error( "Signal SIG{} raised !", magic_enum::enum_name( signal ) );
00127         }
00128         else if( value >= magic_enum::enum_integer( yaodaq::Severity::Warning ) )
00129         {
00130             fmt::print( "\n" );
00131             logger()->warn( "Signal SIG{} raised !", magic_enum::enum_name( signal ) );
00132         }
00133         else if( value >= magic_enum::enum_integer( yaodaq::Severity::Info ) )
00134         {
00135             fmt::print( "\n" );
00136             logger()->info( "Signal SIG{} raised !", magic_enum::enum_name( signal ) );
00137         }
00138         else
00139         {
00140             fmt::print( "\n" );
00141             logger()->trace( "Signal SIG{} raised !", magic_enum::enum_name( signal ) );
00142         }
00143         if( magic_enum::enum_integer( signal ) >= magic_enum::enum_integer( Severity::Critical ) )
00144             std::exit( magic_enum::enum_integer( signal ) );
00145     }
00146 }
00147
00148 } // namespace yaodaq

```

